Oracle® Database Appliance

X6-2-HA Deployment and User's Guide

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Oracle Database Appliance X6-2-HA Deployment and User's Guide, Release 19.9 for Linux x86-64

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Preface

Oracle Database Appliance is an optimized, prebuilt database system that is easy to deploy, operate, and manage. By integrating hardware and software, Oracle Database Appliance eliminates the complexities of nonintegrated, manually assembled solutions. Oracle Database Appliance reduces the installation and software deployment times from weeks or months to just a few hours while preventing configuration and setup errors that often result in suboptimal, hard-to-manage database environments.

- Audience
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Audience

This guide is intended for anyone who configures, maintains, or uses Oracle Database Appliance:

- System administrators
- Network administrators
- Database administrators
- Application administrators and users

This book does not include information about Oracle Database architecture, tools, management, or application development that is covered in the main body of Oracle Documentation, unless the information provided is specific to Oracle Database Appliance. Users of Oracle Database Appliance software are expected to have the same skills as users of any other Linux-based Oracle Database installations.

Documentation Accessibility

For information about Oracle's commitment to accessibility, visit the Oracle Accessibility Program website at http://www.oracle.com/pls/topic/lookup?ctx=acc&id=docacc.

Access to Oracle Support

Oracle customers that have purchased support have access to electronic support through My Oracle Support. For information, visit http://www.oracle.com/pls/topic/lookup?ctx=acc&id=info or visit http://www.oracle.com/pls/topic/lookup?ctx=acc&id=trs if you are hearing impaired.

Related Documents

For more information about Oracle Database Appliance, go to `http://www.oracle.com/goto/oda/docs` and click the appropriate release. The following documents are published in the Oracle Database Appliance online documentation library:

- *Oracle Database Appliance Release Notes*
- *Oracle Database Appliance Licensing Information User Manual*
- *Oracle Database Appliance Security Guide*
- *Oracle Database Appliance Accessibility Guide*
- *Oracle Database Appliance X8-2 Deployment and User's Guide*
- *Oracle Database Appliance X7-2 Deployment and User's Guide*
- *Oracle Database Appliance X6-2-HA Deployment and User's Guide*
- *Oracle Database Appliance X6-2S/M/L Deployment and User's Guide*
- *Oracle Database Appliance X5-2/X4-2 Deployment and User's Guide*
- Oracle Database Appliance Setup Posters and Booklets (a full-size printed copy ships with Oracle Database Appliance)
- *Oracle Database Appliance Owner's Guide*
- *Oracle Database Appliance Service Manual*
- *Oracle Database Appliance Series Safety and Compliance Guide*

For more information about using Oracle Database, go to `http://docs.oracle.com/en/database/` and select the database release from the menu. See the following documents in the Oracle Database online documentation library:

- *Oracle Database Security Guide*
- *Oracle Database Administrator’s Guide*
- *Oracle Database SQL Language Quick Reference*
- *Oracle Database Backup and Recovery User’s Guide*
- *Oracle Database Backup and Recovery Reference*
- *Oracle Database Utilities*
- *Oracle Automatic Storage Management Administrator's Guide*

For more information about Oracle Integrated Lights Out Manager 3.2, see https://docs.oracle.com/cd/E37444_01/.

For more details about other Oracle products that are mentioned in Oracle Database Appliance documentation, see the Oracle Documentation home page at `http://docs.oracle.com`.

Conventions

The following text conventions are used in this document:

Convention	Meaning
boldface	Boldface type indicates graphical user interface elements associated with an action or terms defined in the text.
italic	Italic type indicates book titles, emphasis, or placeholder variables for which you supply particular values.
`monospace`	Monospace type indicates commands within a paragraph, URLs, code in examples, text that appears on the screen, or text that you enter.
# prompt	The pound (#) prompt indicates a command that is run as the root user.

1 Introduction to Oracle Database Appliance

Oracle Database Appliance saves time and money by simplifying deployment, maintenance, and support of database solutions for organizations of every size. Oracle Database Appliance hardware models are optimized to run Oracle Database Standard Edition and Enterprise Edition.

- About Oracle Database Appliance
  Understand Oracle Database Appliance hardware models, deployment plans, and database options.
- Oracle Database Appliance Software Terminology
  Understand the software patches available for Oracle Database Appliance.
- About the Browser User Interface
  Use the Oracle Appliance Manager Browser User Interface to deploy and manage the appliance, databases, networks, and jobs.

About Oracle Database Appliance

Understand Oracle Database Appliance hardware models, deployment plans, and database options.

About Oracle Database Appliance Hardware Models

Choose the Oracle Database Appliance hardware model that suits your business needs.

Oracle Database Appliance Hardware Model	Deployment Use Case
Oracle Database Appliance X8-2S, X8-2M, X8-2-HA	• Oracle Database Appliance X8-2S is a small configuration designed for smaller or entry-level deployments. • Oracle Database Appliance X8-2M is a medium-sized configuration designed for performance. • Oracle Database Appliance X8-2-HA is a large configuration designed for larger databases and high-availability.
Oracle Database Appliance X7-2S, X7-2M, X7-2-HA	• Oracle Database Appliance X7-2S is a small configuration designed for smaller or entry-level deployments. • Oracle Database Appliance X7-2M is a medium-sized configuration designed for performance. • Oracle Database Appliance X7-2-HA is a large configuration designed for larger databases and high-availability.

Oracle Database Appliance Hardware Model	Deployment Use Case
Oracle Database Appliance X6-2S, X6-2M, X6-2L	• Oracle Database Appliance X6-2S is a small configuration designed for smaller or entry-level deployments. • Oracle Database Appliance X6-2M is a medium-sized configuration designed for performance. • Oracle Database Appliance X6-2L is a large configuration designed for larger databases.
Oracle Database Appliance X6-2-HA	Highly-available two-node Oracle RAC clusters that can support both Oracle RAC and single-instance databases.
Oracle Database Appliance X5-2	Highly-available two-node Oracle RAC clusters that can support both Oracle RAC and single-instance databases.

You cannot expand or reconfigure Oracle Database Appliance to a different configuration. For example, you cannot expand Oracle Database Appliance X7-S to Oracle Database Appliance X7-2M. For Oracle Database Appliance hardware configuration details, see the *Oracle Database Appliance Owner's Guide*.

About Oracle Database Appliance Deployment Plans

Oracle Database Appliance X8-2S and X8-2M are single node systems that you deploy as a bare metal platform.

Oracle Database Appliance X8-2-HA is a two-node system with the option to deploy as a bare metal platform or a virtualized platform.

Oracle Database Appliance X7-2S and X7-2M are single node systems that you deploy as a bare metal platform.

Oracle Database Appliance X7-2-HA is a two-node system with the option to deploy as a bare metal platform or a virtualized platform.

Oracle Database Appliance X6-2S, X6-2M, X6-2L are single node systems that you deploy as a bare metal platform.

Oracle Database Appliance X6-2-HA is a two-node system with the option to deploy as a bare metal platform or a virtualized platform.

Oracle Database Appliance X5-2 is a two-node system with the option to deploy as a bare metal platform or a virtualized platform.

About Database Deployment Options for Oracle Database Appliance

The following Oracle Database editions are available:

Database Edition	Supported Releases
Oracle Database Enterprise Edition	Oracle Database release 19c, 18c, 12.2.0.1, 12.1.0.2, and 11.2.0.4
Oracle Database Standard Edition 2	Oracle Database release 19c, 18c, 12.2.0.1, 12.1.0.2, and 11.2.0.4

Database Edition	Supported Releases
Oracle Database Standard Edition 1	Oracle Database release 11.2.0.4

> **Note:**
>
> It is important to understand your Oracle Database licensing before you create databases. You cannot provision Oracle Database Enterprise Edition and Standard Edition databases in the same bare metal platform, or the same ODA_BASE virtualized deployment, subject to Oracle Database licensing requirements. Review the *Oracle Database Licensing Information User Manual* for the Oracle Database release to review supported options and products.

Oracle Database Appliance Software Terminology

Understand the software patches available for Oracle Database Appliance.

The table describes the Oracle Database Appliance patches that are available for download and the purpose of the patch.

> **Note:**
>
> Some hardware models may not use the patches listed in the table.

Table 1-1 Software for Oracle Database Appliance

Patch	Description
Oracle Database Appliance patch bundle (quarterly patch release)	Use the patch bundle to update to the latest release after Oracle Database Appliance is deployed. The patch updates the Oracle Database Appliance server, storage, and database components.
Oracle Database Appliance GI/ RDBMS Clone	Use to perform an initial deployment of Oracle Database Appliance. The bundle contains the latest Grid Infrastructure and RDBMS components, Oracle Database Appliance Manager software, Oracle Linux and hardware drivers for deployment on an Oracle Database Appliance that is shipped from factory state. If you reimage Oracle Database Appliance with the Bare Metal ISO Image, download the GI/RDBMS Clone patch to deploy Oracle Database Appliance.
RDBMS Clone	Use the RDBMS Software Clone files to get the latest RDBMS clone binaries for Oracle Database releases 19c, 18c, 12.2.0.1, 12.1.0.2, and 11.2.0.4. The RDBMS clone files are needed to create Oracle databases and database homes.
Bare Metal ISO Image	Use to reimage the appliance and reset the system back to the factory configuration.

Table 1-1 (Cont.) Software for Oracle Database Appliance

Patch	Description
VM ISO Image (DOM0) (Virtualized Platform ISO Image)	Use to re-image Oracle Database Appliance before deploying the ODA_Base Template and virtualized platform. The Oracle Database Appliance virtualized operating system image contains the following: • Oracle Database Appliance Manager oakcli command-line interface • Oracle Database Appliance Manager Configurator • Oracle Linux • Hardware drivers Required for Virtualized Platform deployments on multi-node high availability (HA) systems.
ODA_BASE Template (Virtualization Template)	Use to create the ODA_Base virtual machine for a virtualized database appliance. The template contains the following: • Oracle Virtual Machine template • Oracle Database clone binaries • Oracle Database templates, customized for Oracle Database Appliance deployments • Oracle Grid Infrastructure clone binaries Required for Virtualized Platform deployments on multi-node HA systems.

> **Note:**
>
> See the *Oracle Database Appliance Release Notes* for the patch numbers and download locations and the component versions available in the patch bundle.

> **Note:**
>
> Starting with Oracle Database 18c, Oracle provides quarterly updates in the form of Release Updates (Updates) and Release Update Revisions (Revisions). Oracle no longer releases patch sets. For more information, see My Oracle Support Note 2285040.1.
>
> Oracle Database releases are of type `version` and `version_full` releases. The `version` release is designated in the form major release version.0.0.0.0. The major release version is based on the last two digits of the year in which an Oracle Database version is released for the first time. The `version_full` release is an update of a version release and is designated based on the major release version, the quarterly release update version (Update), and the quarterly release update revision version (Revision).
>
> Prior to Oracle Database release 18c, changing the first or second digit in the release number was an upgrade, and changing the fourth digit indicated an update. With 18c and later releases, changing the first digit is an upgrade, and changing the second indicates an update.

About the Browser User Interface

Use the Oracle Appliance Manager Browser User Interface to deploy and manage the appliance, databases, networks, and jobs.

The Browser User Interface provides a user-friendly interface to quickly view and perform many of the tasks needed to deploy, patch, and manage your bare metal system. The *Oracle Database Appliance Deployment and User's Guide* for your hardware model describes how to use the Browser User Interface to perform many of the tasks related to deployment, patching, and management of your appliance.

Use the links in the side navigation to view and manage the following:

- **Appliance**
  - Appliance information
  - System information
  - Disk group information including storage utilization such as free and used space
  - Information about all databases that use a storage disk group
  - All the patches and hardware and software components installed on the appliance
  - List of RPMs and RPM Drift information
- **Network**
  - View network details
  - Create, update, and delete networks
  - View interface details
- **Oracle ASR**
  - View Oracle Auto Service Request (Oracle ASR) configuration details
  - Configure, update, test, and delete Oracle ASR
- **Patch Manager**
  - Update the patch repository with Oracle Database Appliance patches
  - View component details of the patch and versions that are installed on the appliance
  - View component details of the patch and versions that are available, but not yet installed, on the appliance
  - Run patch prechecks before applying the patch
  - Update the server and storage components

Use the links in the top navigation to view and manage the following:

- **Database**
  - Create a database
  - View database details
  - Apply a backup policy for the database

  - Create a manual backup
  - Recover a database from a backup
  - View and update the database backup schedule and update the archive log backup schedule for the database
  - Modify associated networks, database shape and class, and the associated backup policy for a database
  - Create, update, and delete backup policies
  - Create, update, and delete database homes
  - Create and delete database backup
  - Clone a database from a database backup or an Oracle ACFS database snapshot
  - Patch database homes
  - Move databases from one Oracle home to another
- **Object Store**
  - Create Object Store Credentials for backup and recovery
  - View the details for Object Store Credentials, including the endpoint URL, user name, and tenant
  - Update and delete Object Store Credentials
- **Monitoring**
  - View the status of hardware, storage, memory, cooling, networking, and power
  - View monitoring information for each node, in the case of High-Availability deployments
  - View system health status and drilldown to details of incidents
  - Click the hardware image to view details
- **Activity**
  - View a list of jobs, details, and status
  - Click a job description to view job details

Update ILOM and User Settings

Expand **About** in the upper right corner of the Browser User Interface to perform the following tasks:

- Click **About** to view the Oracle Database Appliance release that is installed on the appliance.
- Click **Update ILOM Setting** to change the root password. To enable first-time login and access to Oracle ILOM, a default Administrator (root) account and its password are provided with the system.
- Click **Update User Settings** to change the `oda-admin` password.
- Click **Sign Out** to sign out of the Browser User Interface. If you do not sign out, the system automatically signs you out after a period of inactivity. A warning will appear 2 minutes before the session expires.

You can access the Oracle Database Appliance documentation set from the Browser User Interface. For the latest updates to the documentation for a release, see the online Oracle Database Appliance documentation library at https://docs.oracle.com/en/engineered-systems/oracle-database-appliance/index.html.

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Preparing for Oracle Database Appliance Installation and Deployment

Complete these setup tasks before Oracle Database Appliance is delivered.

Tasks:

- Registering Your Support Identifier on My Oracle Support
  Add your hardware Support Identifier (SI) to your My Oracle Support account profile.
- Planning Oracle Database Appliance Configuration Options
  Use these topics to help you to make decisions about your Oracle Database Appliance configuration.
- Gathering System Requirement Information
  Use these checklists to collect information before deploying Oracle Database Appliance.

Registering Your Support Identifier on My Oracle Support

Add your hardware Support Identifier (SI) to your My Oracle Support account profile.

Your hardware SI is supplied when you purchase Oracle Database Appliance. If you acquire new software licenses, then you must also register your new software SIs. The SI registration process can take up to 24 hours to complete.

> **Note:**
>
> You cannot obtain support or software from Oracle without registered SIs.

Planning Oracle Database Appliance Configuration Options

Use these topics to help you to make decisions about your Oracle Database Appliance configuration.

These topics help you to select the correct Oracle Database Appliance and plan for deployment. Record your decisions and the information that you require before you proceed to complete system configuration checklists.

> **Caution:**
>
> Do not use Oracle Database Configuration Assistant (DBCA) to create databases on Oracle Database Appliance. Only use Oracle Appliance Manager for database configuration. Deploying Oracle Database instances using Oracle Appliance Manager ensures that these databases are properly configured, optimized, and supported on Oracle Database Appliance.

Topics:

- Selecting Oracle Database Appliance Bare Metal Options
  Oracle Database Appliance is shipped from the factory to deploy as bare metal.
- Selecting Oracle Database Appliance Virtualized Platform Options
  Review Virtualized Platform options, and requirements for these options, such as shared disks and virtual local area networks.
- Selecting Database Configuration Options
  Select the database templates and configuration options to properly size and configure your initial database.

Selecting Oracle Database Appliance Bare Metal Options

Oracle Database Appliance is shipped from the factory to deploy as bare metal.

Review the systems requirements, database configuration, and software downloads to continue with a bare metal deployment.

Selecting Oracle Database Appliance Virtualized Platform Options

Review Virtualized Platform options, and requirements for these options, such as shared disks and virtual local area networks.

Before you implement virtual machines, you must decide how and where you want them to run. Based on your requirements, you can select High Availability options, or you can select options to reduce interference between competing virtual machines for CPU and network access. You can also select options to provide more storage space, or enable automatic startup for virtual machines. Some of these options require additional network configuration beyond the configuration required for the Oracle Database Appliance servers.

By default, Oracle Database Appliance includes one local repository on each node. The maximum size of that repository depends on your Oracle Database Appliance hardware. The maximum size is 350 GB for Oracle Database Appliance X6-2-HA Virtualized Platform.

When you create virtual machines in the default repositories, the virtual machines can run only on the node where they are located. Because they run on only one node, they have no failover capability.

To obtain the most flexible shared machine environment, use a shared repository with Virtual Local Area Networks (VLANs). Shared repositories provide High Availability options, more storage capacity, and reduced local storage use. VLANs help you partition network traffic for your virtual machines.

When you use a shared repository hosted on shared disks, the virtual machines consume space in Oracle Automatic Storage Management (Oracle ASM) disk groups, DATA and RECO. When you use shared disks, you can convert virtual machines to do the following:

- Start automatically whenever the repository becomes available
- Run on a preferred node
- Start or fail over to the other node, if the preferred node is unavailable

Oracle Database Appliance Virtualized Platform deployments support multiple VLANs on the same network interface card (NIC) port. Each VLAN is essentially an independent logical network that operates with other VLANs over the same physical connection.

Use VLANs to minimize the number of required physical connections and NICs while concurrently separating traffic. Each VLAN is assigned a distinct VLAN identification (ID). The network switch uses VLAN IDs to segregate traffic among the different VLANs operating on the same link. When a VLAN is configured, the VLAN functions exactly like a separate physical connection.

> **Note:**
>
> You must configure virtual LANs on the physical switches before you use them.

Selecting Database Configuration Options

Select the database templates and configuration options to properly size and configure your initial database.

Review the database configuration options and select the templates for Oracle Real Application Clusters (Oracle RAC), and Oracle RAC One Node databases needed to configure your initial database. This information is relevant to you if you plan to configure an initial database during Bare Metal or Virtualized Platform deployments.

Record your decisions and the information that you require for your database templates before you proceed to complete system configuration checklists.

> **Caution:**
>
> Do not use Oracle Database Configuration Assistant (DBCA) to create databases on Oracle Database Appliance. Only use Oracle Appliance Manager for database configuration. Deploying Oracle Database instances using Oracle Appliance Manager ensures that these databases are properly configured, optimized, and supported on Oracle Database Appliance.

Topics:

- Selecting Database Deployment Options for Oracle Database Appliance
  If you plan to create an initial database during deployment, then use these lists to select an Oracle Database deployment option, and prepare for the deployment.
- Selecting Database Templates for Oracle Database Appliance
  Oracle Database Appliance software includes preconfigured templates that incorporate Oracle best practices with optimization for different classes of databases.
- Calculating Required Cores
  After you select templates for your planned Oracle Database, identify your workload type, and determine the total number of CPUs that you require to support the templates.

Selecting Database Deployment Options for Oracle Database Appliance

If you plan to create an initial database during deployment, then use these lists to select an Oracle Database deployment option, and prepare for the deployment.

Oracle Appliance Manager installs Oracle Database software on mirrored disks that are internal to Oracle Database Appliance. During the initial deployment, you can either create a database or you can defer database creation to a later time.

Options:

- **Enterprise Edition**: Oracle Database 18*c* Enterprise Edition (no automated failover), with the following characteristics:
  - Single-instance Oracle Database Enterprise Edition home
  - Oracle Database software installation on both nodes
- **Oracle Real Application Clusters (Oracle RAC) One Node**: Oracle RAC One Node 18*c*, with the following characteristics:
  - Oracle RAC One Node has a designated Oracle Database Appliance home node
  - Oracle RAC One Node software is installed on both servers
  - Automated failover is configured
  - Enterprise Edition license is required
  - Oracle RAC One Node license on each server is required

    Exception: If you designate one server as a backup server, then you can use that server without a license, in accordance with the 10-day rule.
- **Oracle RAC**: Oracle Real Application Clusters 18*c*, with the following characteristics:
  - Oracle RAC home
  - Oracle RAC software is installed on both servers
  - Enterprise Edition license is required
  - Oracle RAC license on each server is required (not eligible for the 10-day rule)

> **Note:**
>
> For information about the 10-day rule, see the *Oracle Software Investment Guide* at https://www.oracle.com/corporate/pricing/.

Selecting Database Templates for Oracle Database Appliance

Oracle Database Appliance software includes preconfigured templates that incorporate Oracle best practices with optimization for different classes of databases.

Because of differences in CPU counts, memory size, and other resources available with different Oracle Database Appliance models, some templates are not supported on all models.

Each Oracle Database template has different workload profile and performance characteristics:

- Memory requirements, which are calculated from the System Global Area (SGA), and Program Global Area (PGA) sizes
- Processing requirements, which are calculated from the number of processes
- Logging requirements, which are based on log buffer size, and online redo log size

1. Review the types of database templates for guidelines and sizing information.
2. Determine the template that you want to use. The following templates are available for Oracle Database Appliance X6-2-HA:
   - Odb-01s
   - Odb-01
   - Odb-02
   - Odb-04
   - Odb-06
   - Odb-12
   - Odb-16
   - Odb-20

> **Note:**
>
> Oracle strongly recommends that you use the Oracle Database Appliance templates. These templates implement best practices, and are configured specifically for Oracle Database Appliance.

On Oracle Database Appliance Virtualized Platform, if you only plan to deploy one Oracle Database, then Oracle recommends that you use a template for your ODA_BASE that has the same name as the template that you choose for your Oracle Database.

You do not have to select database templates with the same size category as the ODA_BASE template. For example, you can use a small ODA_BASE template to host two very small databases, and you can use a large ODA_BASE template to host either one large with one small database, or host one medium database with one small and two very small databases.

> ⚠ **Caution:**
>
> The total requirements for your selected database templates must not exceed the capacity of your ODA_BASE template. You can adjust the size of ODA_BASE after the initial deployment, so can expand ODA_BASE to accommodate more databases in ODA_BASE.

Related Topics

- Types of Database Templates for Oracle Database Appliance X6-2HA
  Use one of the database templates defined for Oracle Database Appliance X6-2-HA.

Calculating Required Cores

After you select templates for your planned Oracle Database, identify your workload type, and determine the total number of CPUs that you require to support the templates.

Oracle Database Appliance templates are configured and tuned for specific types of Oracle Database workloads:

- Generic templates
- Online analytic transaction templates (OLTP)
- Decision support services templates (DSS)
- In-Memory database templates

These templates are designed to run on a specific number of cores. Caging ensures that each database workload is restricted to the set of cores allocated by the template, enabling multiple databases to run concurrently with no performance degradation, up to the capacity of Oracle Database Appliance. You can select database template sizes larger than your current needs to provide for planned growth, which you accommodate later by adjusting System Global Area (SGA) and Program Global Area (PGA) sizes, as well as the number of cores.

Related Topics

- Types of Database Templates for Oracle Database Appliance X6-2-HA
  Use one of the database templates defined for Oracle Database Appliance X6-2-HA.

Gathering System Requirement Information

Use these checklists to collect information before deploying Oracle Database Appliance.

- List of Information You Need Before Deployment
  Collect security, storage, and network information required to prepare for deploying Oracle Database Appliance.
- Checklist for System Details
  Use the checklist to gather system information that you need to obtain for Oracle Database Appliance. Record the values for your system.
- Checklist for Custom Node Network Address Configuration
  Use the checklists in this topic to identify the IP addresses required for Oracle Database Appliance.

List of Information You Need Before Deployment

Collect security, storage, and network information required to prepare for deploying Oracle Database Appliance.

Review your security requirements for `root` passwords, determine your storage requirements and network administration requirements, and complete any required configuration before your Oracle Database Appliance hardware is delivered.

Security Requirements

- What root password should you use for Oracle Database Appliance? Root passwords should comply with your system security requirements.
- Secure operating systems are an important basis for general system security. Ensure that your operating system deployment is in compliance with common security practices.

Storage Administration Requirements

Storage administration is integrated into Oracle Database Appliance. No additional storage configuration is required.

Oracle Database Appliance includes integrated storage for operational files (operating system, Oracle Grid Infrastructure home, Oracle Database homes, tools), user data (database files), and log files (database redo logs). Operational files are stored on mirrored internal system disks in each server. Data and database redo log files are stored on shared disks in the storage shelf.

The Oracle Database Appliance X6-2-HA storage shelf contains ten 1.6 TB SSDs (partitioned to 1.2 TB to improve performance) for data, which are configured as a DATA ASM disk group. Four 200 GB SSDs are used for the database redo logs, which are configured as a REDO ASM disk group.

> **Note:**
>
> Disk hardware capacity is measured using the formula that 1 KB equals 1,000 bytes; software storage requirements are based on 1 KB equals 1,024 bytes.

Network Administration Requirements

Ensure that the names and addresses that you provide for network configuration are configured in your Domain Name System (DNS) servers. The addresses that you provide are configured in the `/etc/hosts` file to provide IP name and address resolution, even if a DNS server is not available.

You have the option to connect either to a copper, or to a fiber public network. Ensure that your network planning is based on the correct type of public network.

Oracle recommends that you resolve addresses using a DNS server, so that you can use Single Client Access Names (SCANs). Having a single name to access the cluster enables the client to use the EZConnect client and the simple JDBC thin URL to access any Oracle Database running in the cluster, independent of the active servers in the cluster. The SCAN provides load-balancing and failover for client connections to these databases. The SCAN works as a cluster alias for Oracle Databases in the cluster.

If you deploy without using a DNS server, then you can add a DNS server later, and add SCANs. If you add SCANs, then you must specify additional VIP addresses for those SCANs.

A correctly configured Oracle Database Appliance requires at least six public addresses on the same subnet for the nodes:

- A public IP name and address for each node
- A virtual IP name and address for each node
- Two addresses that resolve to the SCAN for the cluster.

All names must conform to the RFC 952 standard, which permits alphanumeric characters and hyphens ("-"), but does not allow underscores ("_").

Provide an IP address for the public interface for each node. This interface is `bond0`, or `Eth1` on Oracle Database Appliance Virtualized Platform, (a bond of Eth2 and Eth3), which is used for the host IP address for the node.

Use `bond1` and `bond2` for management, backup, disaster recovery, or other options where you require a network interface. Be prepared to provide a netmask and a gateway for each interface, as both are required when you configure network connections for Oracle Database Appliance. If you select a Custom installation, then provide names and addresses for the `bond1` optional interface.

Also determine answers to the following questions:

- Do you have a Network Time Protocol (NTP) service configured for each server, so that the local system time for each server is synchronized?

  If you have NTP servers, and you want to synchronize time between Oracle Database Appliance nodes using NTP, then be prepared to provide the addresses for the servers. If you do not provide addresses for NTP servers, then Oracle Grid Infrastructure software configures time synchronization between nodes using Cluster Time Synchronization Service (CTSS).
- Do you want to plug in the public IP address cables to redundant switches, so that you can avoid a single point of failure for Oracle Database Appliance? Oracle recommends that you use redundant switches for High Availability.

Checklist for System Details

Use the checklist to gather system information that you need to obtain for Oracle Database Appliance. Record the values for your system.

Table 2-1 Checklist for System Configuration Information for Oracle Database Appliance

System Information	Description
Host Name	The name for the Oracle Database Appliance System. The name must conform with the RFC 952 standard, which allows alphanumeric characters and hyphens (-), but does not allow underscores (_). The name should not begin with a numeral or hyphen and should not end in a hyphen. Oracle recommends that you use all lowercase characters for the host name.
Domain Name	Your domain name. For example: `example.com`
Master Password	The password set for the root password of the system, OS users, database users, and pdbadmin. The password is also used to set the database `SYS` and `SYSTEM` passwords. Ensure that the password you provide is in compliance with common security practices.
DNS Server	(Optional) DNS server details.
NTP Server	(Optional) Network Time Protocol (NTP) service details.
Region	The region where you plan to operate the Oracle Database Appliance system.
Timezone	Select the time zone where you plan to operate the Oracle Database Appliance system.
Database Edition	Select an Oracle Database edition, either Enterprise Edition or Standard Edition. You cannot mix editions. The database edition you select determines the database editions that you create in the appliance. To change editions, you must redeploy Oracle Database Appliance.
Backup Location	Determine the backup location setting. The setting determines how the NVMe Disks are partitioned between DATA and RECO. Select External, Internal, or Custom: • **External** reserves 80% of the storage for DATA and 20% for RECO. • **Internal** reserves 40% of the storage for DATA and 60% for RECO. • **Custom** reserves anywhere from 10% to 90% of the storage for DATA, and the remainder is reserved for RECO.
Percentage of Storage Reserved for Data	If you select a Custom backup location, determine the amount of reserves for DATA storage. The percentage must be a whole number between 10 and 90.
Diskgroup Redundancy	Determine the redundancy level for DATA, RECO, and FLASH: If there are up to two disk groups, then you can select the disk group redundancy as Normal or Flex. A quorum disk must exist, if you want to select Flex redundancy. If there are more than two disk groups, then you can select the redundancy as Normal (two way mirror), High (three way mirror), or Flex. If you select High redundancy, then DATA, RECO, and FLASH are all High redundancy.

Table 2-1 (Cont.) Checklist for System Configuration Information for Oracle Database Appliance

System Information	Description
Network Information	Obtain network information: • Public network • (Optional) Additional network • (Optional) Oracle Integrated Lights Out Manager (Oracle ILOM) network
Initial Database Details (if you want to create one during deployment)	• Database name • Normal or container database • Class (database template) • Database characterset • Database language • Database version • Shape (for example: odb1 or odb2) • Storage (Oracle ASM or Oracle ACFS) • Configure Oracle Enterprise Manager console

Checklist for Custom Node Network Address Configuration

Use the checklists in this topic to identify the IP addresses required for Oracle Database Appliance.

By default, names for network interfaces are derived from the Oracle Database Appliance system name, which you provide during installation. Also, when you use Oracle Appliance Manager Configurator, the addresses for the public IP addresses can be automatically assigned in a sequence starting with the address you provide for the public IP address for Node 0. The other IP addresses generated are, in order, the public address for Node 1; the virtual IP address for Node 0; the virtual IP address for Node 1; and the SCAN addresses.

You can retain the default values, or you can use addresses provided by your system administrator to perform a custom configuration. Ensure that all addresses listed as "Yes” in the "Same Subnet" column are on the same subnet as each other.

Minimum IP Address Requirements for Oracle Database Appliance Bare Metal Deployment

Table 2-2 Minimum IP Address Requirements for Oracle Database Appliance Bare Metal Deployment

Type of IP	Minimum IP Address Counts	IP Address Default Values	Your Values As Applicable	Same Subnet
Host Public Addresses	2	No default	No default	Yes
Host Private Addresses	2	192.168.16.24 192.168.16.25	Not applicable: the private addresses are defined before deployment and should not be changed.	Yes

Table 2-2 (Cont.) Minimum IP Address Requirements for Oracle Database Appliance Bare Metal Deployment

Type of IP	Minimum IP Address Counts	IP Address Default Values	Your Values As Applicable	Same Subnet
Oracle RAC VIP	2	No default	No default	Yes
Single Client Access Name (SCAN)	2	No default	No default	Yes
Oracle Integrated Lights Out Manager (ILOM)	2	No default	No default	No
User Virtual Machine	Not Applicable	No default	No default	No

Minimum IP Address Requirements for Oracle Database Appliance Virtualized Platform Deployment

Table 2-3 Minimum IP Address Requirements for Oracle Database Appliance Virtualized Platform Deployment

Type of IP	Minimum IP Address Counts	IP Address Default Values	Your Values As Applicable	Same Subnet
Host Public Addresses	2 (for ODA_BASE) 2 (for Dom0) (Total of 4)	No default	No default If you are using InfiniBand, IP addresses 192.168.17.24 and 192.168.17.25 are not used	Yes
Host Private Addresses	2	192.168.16.24 (for Dom0) 192.168.16.25 (for Dom0) 192.168.16.27 (for ODA_BASE) 192.168.16.28 (for ODA_BASE)	Not applicable: the private addresses are defined before deployment and should not be changed.	Yes
Oracle RAC VIP	2	No default	No default	Yes
Single Client Access Name (SCAN)	2	No default	No default	Yes
Oracle Integrated Lights Out Manager (ILOM)	2	No default	No default	No
User Virtual Machine	At least 1 for each Virtual Machine	No default	No default	No

3

Readying Oracle Database Appliance for Deployment

Complete these tasks to prepare to deploy Oracle Database Appliance.

Topics:

- About Interconnect Cabling
  Interconnect is reserved for Oracle Grid Infrastructure (GI) and Oracle Relational Database Management System (RDBMS).
- Attaching Supplied Cables for Oracle Database Appliance
  If you are using Oracle Database Appliance with a single storage shelf, attach the interconnect cables.
- Attaching a Storage Expansion Shelf to Oracle Database Appliance
  Review these topics to install and cable a storage expansion shelf for Oracle Database Appliance.
- Attaching Peripheral Devices
  Complete this task if you have direct access to Oracle Database Appliance and you intend to use a locally connected monitor, keyboard and mouse.
- First Startup of Oracle Database Appliance
  Use this procedure to start up either a newly-installed Oracle Database Appliance, or to start up the appliance after you power it down.
- Configuring Oracle Integrated Lights Out Manager
  Configure Oracle Integrated Lights Out Manager (Oracle ILOM) to manage Oracle Database Appliance independent of the operating system.

About Interconnect Cabling

Interconnect is reserved for Oracle Grid Infrastructure (GI) and Oracle Relational Database Management System (RDBMS).

Oracle GI includes Oracle Clusterware, Oracle Automatic Storage Management (Oracle ASM), and Oracle Restart. Even if you do not use Oracle Real Application Clusters (RAC) , Oracle Database Appliance uses the interconnect for RAC ASM and Oracle GI.

> **Note:**
>
> Do not use interconnect for other applications.

When you power on Oracle Database Appliance for the first time, the system automatically defines your public network interface based on the interconnect. If you use the InfiniBand cards, then the InfiniBand network is used for the interconnect. If you ordered the configuration that contains the 10GbE SFP+ (fiber) cards instead of InfiniBand cards, then the onboard 10GBase-T (Copper) ports are used for the interconnect.

Attaching Supplied Cables for Oracle Database Appliance

If you are using Oracle Database Appliance with a single storage shelf, attach the interconnect cables.

Topics:

- Attaching Cables for Oracle Database Appliance X6-2-HA
  Use the diagram in this topic to understand how to attach cable connections between ports on Oracle Database Appliance X6-2-HA.
- Cabling Oracle Database Appliance to Connect to Fiber Public Networks (Optional)
  You can configure Oracle Database Appliance X6-2-HA to use 10GbE SFP+ (fiber) connections for the public network if you ordered the configuration that contains 10GbE SFP+ (fiber) cards instead of InfiniBand cards.

Attaching Cables for Oracle Database Appliance X6-2-HA

Use the diagram in this topic to understand how to attach cable connections between ports on Oracle Database Appliance X6-2-HA.

Single Shelf

The back panel of each node contains three PCIe generation 3 terminal slots, with two sockets in each slot. The PCIe slots are labeled ***X* PCIe3**, where ***X*** is the PCIe slot number.

The following figure illustrates the cable connections between ports on Oracle Database Appliance X6-2-HA in a single storage shelf. The cables are color-coded. Match the colors of the labels at the ends of each cable with the colored line shown in the following illustration. Also match the cable colors to the background colors of the socket identification labels.

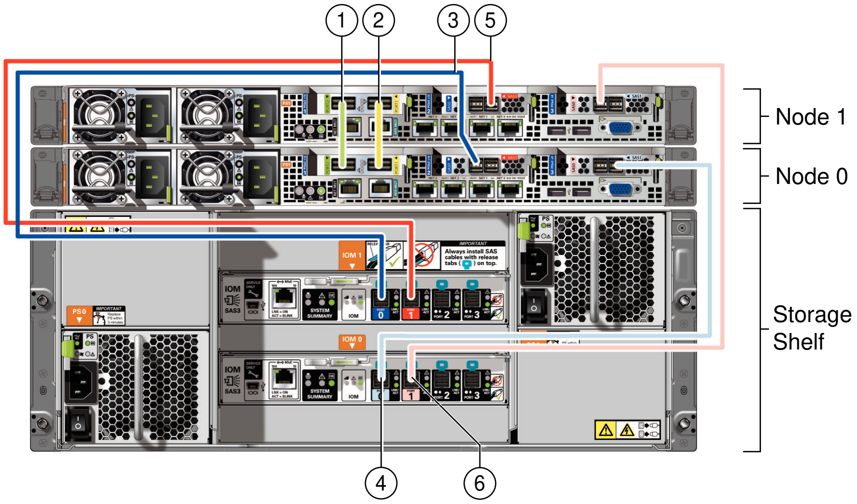


Table 3-1 Description of Callouts for Cabling Oracle Database Appliance X6-2-HA with a Single Storage Shelf

Callout Number	Description
1	Green InfiniBand Cable • From: Node 0, PCIe slot 1, PORT2 • To: Node 1, PCIe slot 1, PORT2
2	Yellow InfiniBand Cable • From: Node 0, PCIe slot 1, PORT1 • To: Node 1, PCIe slot 1, PORT1
3	Dark blue SAS cable: • From: Node 0, PCIe slot 2, SAS0 • To: Storage shelf, top I/O port 0
4	Light blue SAS cable: • From: Node 0, PCIe slot 3, SAS1 • To: Storage shelf, bottom I/O port 0
5	Dark red SAS cable: • From: Node 1, PCIe slot 2, SAS1 • To: Storage shelf, top I/O port 1
6	Light red SAS cable: • From: Node 1, PCIe slot 3, SAS0 • To: Storage shelf, bottom I/O port 1

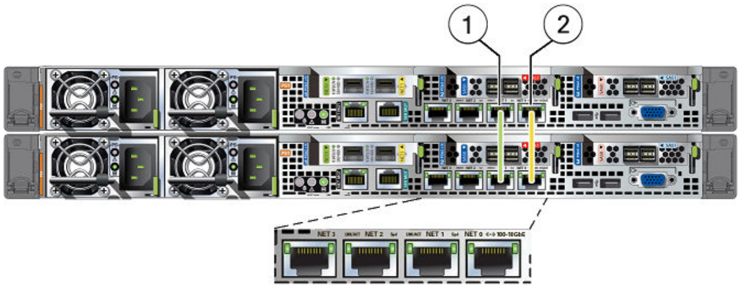
Cabling Oracle Database Appliance to Connect to Fiber Public Networks (Optional)

You can configure Oracle Database Appliance X6-2-HA to use 10GbE SFP+ (fiber) connections for the public network if you ordered the configuration that contains 10GbE SFP+ (fiber) cards instead of InfiniBand cards.

To use fiber connections between Oracle Database Appliance and your public network, you must cable the interconnect by using the green and yellow copper ports (onboard ports `net0` and `net1`). The green and yellow Category 6 (`Cat 6`) interconnect cables for these ports ship with the base system.

The following describes how to connect the ports:

- Plug the green Cat 6 cable into the onboard NET 1 port on each node, as shown in callout 1 in the figure.
- Plug the yellow Cat 6 cable into the onboard NET 0 port on each node, as shown in callout 2 in the figure.



The following sections show the cabling options for 10 GbE SFP+ PCI cards.

Fiber Cables

For optical cables, you must purchase either Short Range (SR) or Long Range (LR) SFP+ transceivers for each of the network ports, and then plug in the appropriate optical cable. Currently, Oracle sells both the SR and LR SFP+ transceivers. In addition to these transceivers, you must purchase the appropriate LC-LC terminated fiber optic cables from a third-party vendor.

Name	Part Number
10 GbE Transceiver SR (SFP+)	X2129A-N
10 GbE Transceiver LR (SFP+)	X5562A-Z

Copper Cables

You can purchase the following copper cables from Oracle. These cables have built-in SFP+ connectors:

Name	Length	Part Number
TwinAx 1m	1m	X2130-1M-N
TwinAx 3m	3m	X2130-3M-N
TwinAx 5m	5m	X2130-3M-N

Attaching a Storage Expansion Shelf to Oracle Database Appliance

Review these topics to install and cable a storage expansion shelf for Oracle Database Appliance.

Topics:

- About Attaching and Cabling Storage Shelves
  Review these options and best practices for adding storage shelves for Oracle Database Appliance X6-2-HA.
- Installing and Cabling a Storage Expansion Shelf
  Use this procedure to install and cable a storage expansion shelf for Oracle Database Appliance

About Attaching and Cabling Storage Shelves

Review these options and best practices for adding storage shelves for Oracle Database Appliance X6-2-HA.

Storage Shelf Options for Oracle Database Appliance X6-2-HA

Oracle Database Appliance X6-2-HA can be shipped with one or two storage shelves. You can obtain the second shelf at a later time to double your storage capacity.

If you originally deployed Oracle Database Appliance with one storage shelf, then you can add a storage expansion shelf at any time without having to shut down your databases or applications.

Best Practice Guidelines for Adding Storage Expansion Shelves

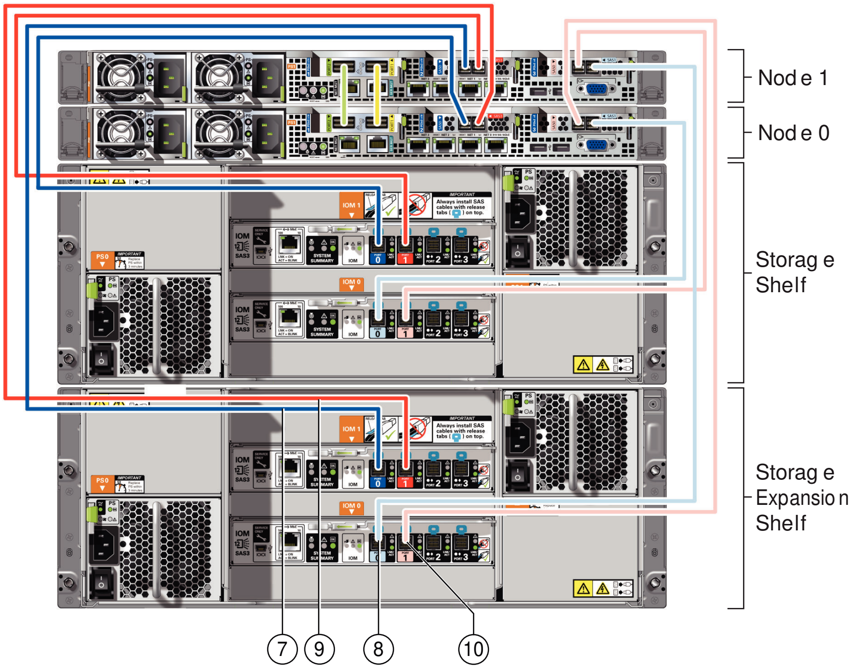
Oracle recommends that you add a storage expansion shelf when you have relatively little activity on your databases. When the system discovers the new storage, Oracle ASM automatically rebalances the disk groups. The rebalance operation may degrade database performance until the operation completes.

> **Caution:**
>
> Review cabling instructions to ensure that you have carried out cabling correctly. Incorrect connections can cause data loss when adding a storage expansion shelf to Oracle Database Appliance with existing databases.
>
> Do not attach cables to Ethernet ports in the I/O modules labeled "SERVICE ONLY" when cabling the system. These ports are intended for use by service engineers only.

How to Cable a Storage Expansion Shelf

The following figure shows you how to insert the required cables into the storage expansion shelf of Oracle Database Appliance. The cables for the two nodes and the original storage shelf are included in the illustration for reference.

The cables are color-coded. Match the colors of the labels at the ends of each cable with the colored line shown in the illustration. Also match the cable colors to the background colors of the socket identification labels. You can also use the callouts in the diagram to identify the cables and ports. Because all cables with the same terminations are interchangeable, you can ignore the color coding. The back panel of each node contains three PCIe generation 3 terminal slots, with two sockets in each slot. The PCIe slots are labeled ***X*** **PCIe3**, where ***X*** is the PCIe slot number. Review the callout table that follows the figure for more information.



The cables identified with callout numbers in the preceding figures are included with each shipped Oracle Database Appliance storage expansion shelf. These cables are all black, but have colored labels at each end that match the references to cable colors in the text and the label colors on the back panels.

Table 3-2 Description of Callouts for Cabling Oracle Database Appliance Storage Expansion Shelf

Callout Number	Description
7	Dark blue SAS cable: • From: Node 1, PCIe slot 2, SAS0 • To: Storage expansion shelf, top I/O port 0
8	Light blue SAS cable: • From: Node 1, PCIe slot 3, SAS1 • To: Storage expansion shelf, bottom I/O port 0
9	Dark red SAS cable: • From: Node 0, PCIe slot 2, SAS1 • To: Storage expansion shelf, top I/O port 1
10	Light red SAS cable: • From: Node 0, PCIe slot 3, SAS0 • To: Storage expansion shelf, bottom I/O port 1

> **Caution:**
>
> Do not attach cables to Ethernet ports in the I/O modules labeled "SERVICE ONLY" when cabling the system. These ports are intended for use by service engineers only.

Installing and Cabling a Storage Expansion Shelf

Use this procedure to install and cable a storage expansion shelf for Oracle Database Appliance

1. Place the storage expansion shelf below your Oracle Database Appliance, if possible, or else close enough to connect the provided cables.

   The storage expansion shelf normally sits at the bottom of Oracle Database Appliance, beneath the storage shelf. However, because racks should always be provisioned from the bottom up, that space may be unavailable. In that case, to avoid re-rack mounting the entire system, you can position the storage expansion shelf above the server nodes, or in a different, but adjacent, rack.

2. Install the extension storage shelf in exactly the same manner as the original storage shelf. To review information about installing optional components for Oracle Database Appliance, see the section "Optional Component Installation" in Chapter 4 of *Oracle Database Appliance Owner’s Guide*.

3. Use the figures in this topic to assist you to cable the storage expansion shelf for your Oracle Database Appliance model.

   > **Caution:**
   >
   > Incorrect connections can cause data loss when adding a storage expansion shelf to Oracle Database Appliance with existing databases.

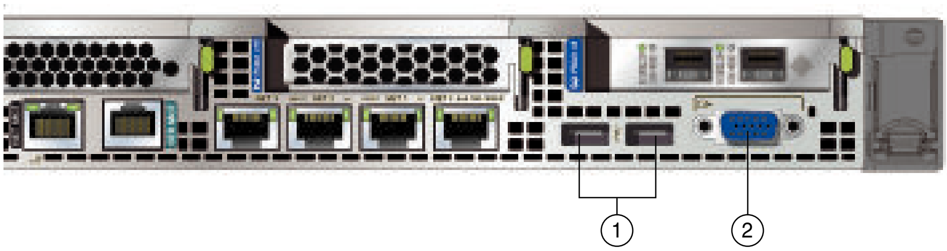
4. Attach the supplied power cords. Refer to the section "Attaching Power Cords and Initializing Components" to obtain information and see figures showing how to attach power cords.

Attaching Peripheral Devices

Complete this task if you have direct access to Oracle Database Appliance and you intend to use a locally connected monitor, keyboard and mouse.

Oracle Database Appliance is not equipped with human-computer interface devices, such as a monitor or keyboard. If you want to log in locally, instead of through a network, then you must attach interface devices.

Attach a monitor to the graphics card port, and attach a keyboard and a mouse to the USB ports. Refer to the figure and table to identify the ports.



In the figure, callout 1 identifies the ports for the keyboard and mouse. Callout 2 identifies the monitor port.

Table 3-3 Peripheral Device Connections for Oracle Database Appliance

Callout Number	Description
1	USB ports for the keyboard and mouse
2	Graphics card port for the monitor

First Startup of Oracle Database Appliance

Use this procedure to start up either a newly-installed Oracle Database Appliance, or to start up the appliance after you power it down.

To ready Oracle Database Appliance for the powering on the first time, you need to attach all of the required power cords and confirm that initialization completes successfully. You can then start up the system by pushing the power button once.

- Attaching Power Cords and Initializing Components
  Attach power cords for Oracle Database Appliance.
- Powering On Oracle Database Appliance the First Time
  Use this procedure the first time you power on Oracle Database Appliance.

Attaching Power Cords and Initializing Components

Attach power cords for Oracle Database Appliance.

> ⚠ **Caution:**
>
> Before plugging in the power cords, ensure that the electrical outlets providing the power are grounded.

If you use only a single AC circuit, then connect both power cords for each component to that circuit. If you want to maintain N+1 power supply redundancy, then use two separate AC circuits. Connect one power cord from each AC circuit into each component.

For more information about cabling with the supplied Cable Management Arm, refer to *Oracle Database Appliance Owner’s Guide*.

Powering On Oracle Database Appliance the First Time

Use this procedure the first time you power on Oracle Database Appliance.

> **Note:**
>
> After you connect power cords, the green SP OK light-emitting diode (LED) lights blink for a few minutes, and then turn to steady ON. The cooling fans also may turn on. However, these events do not indicate that the system is started. You must complete all of the steps in this section to turn on the appliance properly. Read through the entire section to understand the sequence required for initial system startup.

1. Turn on the attached storage shelf, or shelves, before powering on the server nodes.
2. After turning on the storage in the rear of each storage shelf, push the recessed power button to turn on the server nodes.

   > **Note:**
   >
   > The fully-initialized state is indicated by the green SP OK LEDs staying steadily lit. If any of the green LED lights on the server are still blinking, then wait for them to complete their initialization steps.

   The figure is an image of the front of the power panel, see the following callout table to identify the power button and the system initialization status indicator lights.

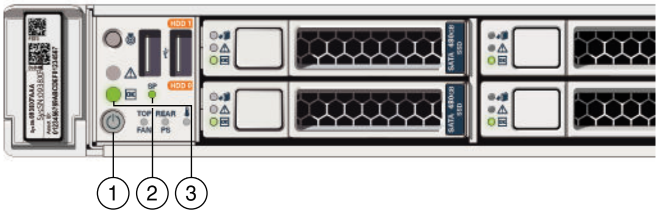


Table 3-4 Description of Callouts for Powering On Oracle Database Appliance

Callout	Function
1	Recessed On/Off power button, which is located on the front panel of the appliance. Push this button only once. Do not repeatedly push the power button.
2	SP OK LED light, located on the front panel of the appliance.

Table 3-4 (Cont.) Description of Callouts for Powering On Oracle Database Appliance

Callout	Function
3	Green Power OK LED, located on the front panel. These lights must be in the steady ON position (Green light does not blink) before you log on to the system.

3. Wait for Oracle Database Appliance to complete startup.

> **Note:**
>
> Do not repeatedly push the power buttons. Startup can take several minutes to complete.

Oracle Database Appliance is ready for use when the green Power OK LEDs (callout 3) on the front of the system remains steadily on.

Configuring Oracle Integrated Lights Out Manager

Configure Oracle Integrated Lights Out Manager (Oracle ILOM) to manage Oracle Database Appliance independent of the operating system.

Oracle ILOM provides alternate ways to restart and troubleshoot Oracle Database Appliance.

You must set up the following items first to configure Oracle ILOM:

- A name and IP address
- A password to replace the default Oracle ILOM password
- Access to a management network, using an assigned netmask
- An Ethernet cable connected from the NET MGT port to the management network

In the default configuration, Dynamic Host Configuration Protocol (DHCP) is enabled in Oracle ILOM and the DHCP server automatically assigns network settings. To determine the IP address or host name assigned by the DHCP server, use the network tools provided with the DHCP server.

If you do not use DHCP, then use the custom option in Oracle Database Appliance Manager Configurator to assign IP addresses and host names to Oracle ILOM when you deploy your database.

> **Note:**
>
> If you have not enabled DHCP, then you must complete Oracle Database Appliance configuration to access Oracle ILOM.

To connect to the Oracle ILOM, use one of the following two methods:

1. Log in using a web interface by completing these steps:

   a. Using a client system's browser, enter the IP address or host name assigned by DHCP into the browser address field and press **Enter**.
   b. At the login page, enter the default user name, `root` and the default password, `changeme`.

      The Oracle ILOM web interface appears.

2. Log in using a command-line interface (CLI) by completing these steps:
   a. Using a client system, establish a secure shell (SSH) connection by entering the following on the command line:

      ```
      ssh -l root sp_ip_address
      ```

      where *`sp_ip_address`* is the IP address assigned by DHCP.
   b. Enter the default user name, `root`, and the default password, `changeme`.

      The Oracle ILOM CLI prompt appears.

Troubleshooting the ILOM Configuration

If the ILOM is not working, then ensure that the ILOM NIC is enabled and that `ipv4` is enabled.

You can configure the ILOM with the IPMI tool or through the BIOS. The following describes how to use the IPMI tool:

1. Open the IPMI tool.

   ```
   # ipmitool –I open sunoem cli
   ```

2. Go to `SP/network` and verify that the port is enabled:

   ```
   cd /SP/network
   ```

3. If the port is not enabled, then enable the port.

   ```
   set state=enabled
   ```

4. In `SP/network`, verify that `ipv4` is enabled.
5. If `ipv6` is enabled, then disable `ipv6` and enable `ipv4`

   ```
   # ipmitool -I open sunoem cli "set /SP/network/ipv6 state=disabled"
   # ipmitool -I open sunoem cli "set /SP/network/ipv4 state=enabled"
   ```

4

Provisioning Oracle Database Appliance Bare Metal System

Understand the process to configure Oracle Database Appliance bare metal system.

The Browser User Interface is the preferred method of deploying your bare metal platform configuration. The Browser User Interface provides all of the fields necessary to provision Oracle Database Appliance, including configuring the system, network, database, and Oracle Auto Service Request (Oracle ASR). If you prefer to use the command-line interface, you must create a JSON file to configure the deployment options.

- Plumbing the Network
  Plumb the Oracle Database Appliance network with the public internet protocol (IP) information assigned to a node, to enable provisioning of the Oracle Database Appliance software.
- Verifying Cabling and Network Connections
  After powering on Oracle Database Appliance, verify that the network connections are set up correctly.
- Downloading Oracle Database Appliance Software
  Download Oracle Database Appliance software and copy to a temporary location before applying updates to your appliance.
- Installing Oracle Database Appliance Software
  Install Oracle Database Appliance software, before creating the appliance.
- Creating the Appliance
  Create the appliance using the Browser User Interface.

Plumbing the Network

Plumb the Oracle Database Appliance network with the public internet protocol (IP) information assigned to a node, to enable provisioning of the Oracle Database Appliance software.

1. Connect to Oracle ILOM remote console, then log into Oracle Database Appliance as `root`.
2. Run the command `configure-firstnet` on **both** nodes.

```
# /opt/oracle/dcs/bin/odacli configure-firstnet
Using bonding public interface (yes/no) [yes]:
Select the Interface to configure the network on (btbond1) 
[btbond1]:
Configure DHCP on btbond1 (yes/no) [no]:
INFO: You have chosen Static configuration
Use VLAN on btbond1 (yes/no) [no]:
```

3. Complete the network configuration as prompted and configure the public network interface. Also provide the netmask and gateway IP address.

You use this network connection to transfer the software to the server node.

Example 4-1   Example of a Bonded Configuration

For a bonded configuration, answer `yes` to using a bonding public interface and configure the first network to use a `btbond1` interface without configuring DHCP.

```
# /opt/oracle/dcs/bin/odacli configure-firstnet
Select the Interface to configure the network on (btbond1 btbond2
sfpbond1) [btbond1]:
Configure DHCP on btbond1 (yes/no) [no]:
INFO: You have chosen Static configuration
Use VLAN on btbond1 (yes/no) [no]:
Enter the IP address to configure : 10.209.13.109
Enter the Netmask address to configure : 255.255.252.0
Enter the Gateway address to configure[10.209.12.1] :
INFO: Plumbing the IPs now
INFO: Restarting the network
Shutting down interface btbond1: [ OK ]
Shutting down interface btbond2: [ OK ]
Shutting down interface p3p1: [ OK ]
Shutting down interface p3p2: [ OK ]
Shutting down interface sfpbond1: [ OK ]
Shutting down loopback interface: [ OK ]
Bringing up loopback interface: [ OK ]
Bringing up interface btbond1: Determining if ip address 10.209.13.109
is already in use for device btbond1...
[ OK ]
Bringing up interface btbond2: [ OK ]
Bringing up interface sfpbond1: [ OK ]
```

Example 4-2   Example of a Non-Bonded Configuration

To create a non-bonded configuration and disable VLAN capabilities, answer `no` to using a bonding public interface.

```
# /opt/oracle/dcs/bin/odacli configure-firstnet
Using bonding public interface (yes/no) [yes]: no
INFO: Breaking the bonding on btbond1
INFO: remove bonding module: rmmod bonding
INFO: remove slave setup in /etc/sysconfig/network-scripts/ifcfg-em2
INFO: remove slave setup in /etc/sysconfig/network-scripts/ifcfg-em3
INFO: Restarting the network
Shutting down interface em1: [ OK ]
Shutting down loopback interface: [ OK ]
Bringing up loopback interface: [ OK ]
Bringing up interface em1: [ OK ]
Bringing up interface em2: [ OK ]
Bringing up interface em3: [ OK ]
INFO: Restarting the DCS agent
initdcsagent stop/waiting
initdcsagent start/running, process 57629
Select the Interface to configure the network on (em2 em3) [em2]:
```

```
Configure DHCP on em2 (yes/no) [no]:
INFO: You have chosen Static configuration
Enter the IP address to configure : 10.31.102.101
Enter the Netmask address to configure : 255.255.240.0
Enter the Gateway address to configure[10.31.96.1] :
INFO: Plumbing the IPs now
INFO: Restarting the network
Shutting down interface em1: [ OK ]
Shutting down interface em2: [ OK ]
Shutting down interface em3: [ OK ]
Shutting down loopback interface: [ OK ]
Bringing up loopback interface: [ OK ]
Bringing up interface em1: [ OK ]
Bringing up interface em2: Determining if ip address 10.31.102.101 is
already in use for device em2...
[ OK ]
Bringing up interface em3: [ OK ]
```

Example 4-3 Example of Configuring VLAN

```
# /opt/oracle/dcs/bin/odacli configure-firstnet
Using bonding public interface (yes/no) [yes]:
Select the Interface to configure the network on (btbond1) [btbond1]:
Configure DHCP on btbond1 (yes/no) [no]:
INFO: You have chosen Static configuration
Use VLAN on btbond1 (yes/no) [no]:yes
Configure VLAN on btbond1, input VLAN ID [2 - 4094] 122
INFO: using network interface btbond1.122
Enter the IP address to configure : 192.0.2.24
Enter the Netmask address to configure : 192.0.2.24
Enter the Gateway address to configure[192.0.2.24] :
INFO: Restarting the network
Shutting down interface btbond1:                            [  OK  ]
Shutting down interface em1:                                [  OK  ]
Shutting down interface p1p1:                               [  OK  ]
Shutting down interface p1p2:                               [  OK  ]
Shutting down loopback interface:                           [  OK  ]
Bringing up loopback interface:                             [  OK  ]
Bringing up interface btbond1:
Determining if ip address 192.0.2.24 is already in use for device
btbond1...
                                                            [  OK  ]
Bringing up interface em1:                                  [  OK  ]
Bringing up interface p1p1:
Determining if ip address 192.0.2.24 is already in use for device
p1p1...
[  OK  ]
Bringing up interface p1p2:
Determining if ip address 192.0.2.24 is already in use for device
p1p2...
                                                            [  OK  ]
Bringing up interface btbond1.122:
Determining if ip address 192.0.2.24 is already in use for device
btbond1.122...
```

```
                                                          [  OK
INFO: Restarting the DCS agent
initdcsagent stop/waiting
initdcsagent start/running, process 32104
```

Verifying Cabling and Network Connections

After powering on Oracle Database Appliance, verify that the network connections are set up correctly.

Run the validation scripts only on Oracle Database Appliance HA models.

1. Log into the Oracle Database Appliance console and access the server node with user name as `root` and password `welcome1`.
2. Run validation scripts on both nodes, to verify cabling. For example:

   ```
   # /opt/oracle/dcs/bin/odacli validate-storagetopology
   INFO : ODA Topology Verification
   INFO : Running on Node0
   INFO : Check hardware type
   SUCCESS : Type of hardware found : X7-2
   INFO : Check for Environment(Bare Metal or Virtual Machine)
   SUCCESS : Type of environment found : Bare Metal
   INFO : Check number of Controllers
   SUCCESS : Number of ahci controller found : 1
   SUCCESS : Number of External SCSI controllers found : 2
   INFO : Check for Controllers correct PCIe slot address
   SUCCESS : Internal RAID controller :
   SUCCESS : External LSI SAS controller 0 : 3b:00.0
   SUCCESS : External LSI SAS controller 1 : 5e:00.0
   INFO : Check if JBOD powered on
   SUCCESS : 2JBOD : Powered-on
   INFO : Check for correct number of EBODS(2 or 4)
   SUCCESS : EBOD found : 4
   INFO : Check for External Controller 0
   SUCCESS : Cable check for port 0 on controller 0
   SUCCESS : Cable check for port 1 on controller 0
   SUCCESS : Overall Cable check for controller 0
   INFO : Check for External Controller 1
   SUCCESS : Cable check for port 0 on controller 1
   SUCCESS : Cable check for port 1 on controller 1
   SUCCESS : Overall Cable check for controller 1
   INFO : Check for overall status of cable validation on Node0
   SUCCESS : Overall Cable Validation on Node0
   SUCCESS : JBOD0 Nickname set correctly
   SUCCESS : JBOD1 Nickname set correctly
   ```

3. If there is a storage expansion shelf connected to the appliance, then power it on. Run the `storagetopology` command on both nodes to make sure the cabling is correct. For example:

   ```
   # /opt/oracle/dcs/bin/odacli validate-storagetopology
   INFO : ODA Topology Verification
   INFO : Running on Node0
   ```

```
INFO : Check hardware type
SUCCESS : Type of hardware found : X7-2
INFO : Check for Environment(Bare Metal or Virtual Machine)
SUCCESS : Type of environment found : Bare Metal
INFO : Check number of Controllers
SUCCESS : Number of ahci controller found : 1
SUCCESS : Number of External SCSI controllers found : 2
INFO : Check for Controllers correct PCIe slot address
SUCCESS : Internal RAID controller :
SUCCESS : External LSI SAS controller 0 : 3b:00.0
SUCCESS : External LSI SAS controller 1 : 5e:00.0
INFO : Check if JBOD powered on
SUCCESS : 2JBOD : Powered-on
INFO : Check for correct number of EBODS(2 or 4)
SUCCESS : EBOD found : 4
INFO : Check for External Controller 0
SUCCESS : Cable check for port 0 on controller 0
SUCCESS : Cable check for port 1 on controller 0
SUCCESS : Overall Cable check for controller 0
INFO : Check for External Controller 1
SUCCESS : Cable check for port 0 on controller 1
SUCCESS : Cable check for port 1 on controller 1
SUCCESS : Overall Cable check for controller 1
INFO : Check for overall status of cable validation on Node0
SUCCESS : Overall Cable Validation on Node0
SUCCESS : JBOD0 Nickname set correctly
SUCCESS : JBOD1 Nickname set correctly
```

4. Verify the interconnect network:

```
# ethtool p1p1
Settings for p1p1:
Supported ports: [ FIBRE ]
Supported link modes: 1000baseT/Full
Supported pause frame use: Symmetric Receive-only
Supports auto-negotiation: Yes
Advertised link modes: 1000baseT/Full
10000baseT/Full
Advertised pause frame use: No
Advertised auto-negotiation: Yes
Speed: 25000Mb/s <<<<<<<<<<<<<<<<<<<<<<< check speed
Duplex: Full
Port: Direct Attach Copper
PHYAD: 1
Transceiver: internal
Auto-negotiation: on
Current message level: 0x00000000 (0)
Link detected: yes
# ethtool p1p2
Settings for p1p2:
Supported ports: [ FIBRE ]
Supported link modes: 1000baseT/Full
Supported pause frame use: Symmetric Receive-only
Supports auto-negotiation: Yes
Advertised link modes: 1000baseT/Full
```

```
10000baseT/Full
Advertised pause frame use: No
Advertised auto-negotiation: Yes
Speed: 25000Mb/s <<<<<<<<<<<<<<<<<<<<<<< check speed
Duplex: Full
Port: Direct Attach Copper
PHYAD: 1
Transceiver: internal
Auto-negotiation: on
Current message level: 0x00000000 (0)
Link detected: yes
```

Downloading Oracle Database Appliance Software

Download Oracle Database Appliance software and copy to a temporary location before applying updates to your appliance.

1. Download the software files from My Oracle Support to a temporary location on an external client. Refer to the release notes for details about the software for the latest release.

   For example, download the Oracle Database Appliance GI Clone for ODACLI/DCS stack (patch 30403673) and Oracle Database Appliance RDBMS Clone for ODACLI/DCS stack (patch 30403662) for 19.9:

   ```
   p30403673_199000_Linux-x86-64.zip
   p30403662_199000_Linux-x86-64.zip
   ```

2. Unzip the software — it contains README.html and one or more zip files for the patch.

   ```
   unzip p30403673_199000_Linux-x86-64.zip
   unzip p30403662_199000_Linux-x86-64.zip
   ```

   The GI and RDBMS Clone files for release 19.9 are extracted.

   ```
   odacli-dcs-19.9.0.0.0-201020-GI-19.9.0.0.zip
   odacli-dcs-19.9.0.0.0-201020-DB-19.9.0.0.zip
   ```

3. Copy the software files from the external client to Oracle Database Appliance. Use the `scp` or `sftp` protocol to copy the bundle.

   Example using `scp` command:

   ```
   scp software_file root@oda_host:/tmp
   ```

   Example using `sftp` command:

   ```
   sftp root@oda_host
   ```

Enter the `root` password, and then copy the file.

```
put software_file
```

For example, for release 19.9:

```
put odacli-dcs-19.9.0.0.0-201020-GI-19.9.0.0.zip
put odacli-dcs-19.9.0.0.0-201020-DB-19.9.0.0.zip
```

The GI and RDBMS Clone files are copied to the temporary location on the appliance. You can update the repository, and create the appliance, as explained in the next topic.

Installing Oracle Database Appliance Software

Install Oracle Database Appliance software, before creating the appliance.

Ensure that the Oracle Database Appliance patches are downloaded and available for updating the repository, as described in the topic *Downloading Oracle Database Appliance Software*.

1. Verify the current system version by running the following command on **both** nodes:

   ```
   [root@oda1 opt]# /opt/oracle/dcs/bin/odacli describe-component -v
   ```

   On a single-node Oracle Database Appliance system, run the command `odacli describe-component` without the `-v` option.

   ```
   [root@oda1 opt]# /opt/oracle/dcs/bin/odacli describe-component
   ```

2. Update the repository with Oracle Grid Infrastructure and Database software.

   ```
   [root@oda1 opt]# /opt/oracle/dcs/bin/odacli update-repository -
   f /tmp/GI_clone_file,/tmp/DB_clone_file
   ```

   For example, for release 19.9:

   ```
   [root@oda1 opt]# /opt/oracle/dcs/bin/odacli
   update-repository -f /tmp/odacli-dcs-19.9.0.0.0-201020-
   DB-19.9.0.0.zip,/tmp/odacli-dcs-19.9.0.0.0-201020-GI-19.9.0.0.zip
   ```

3. Confirm that the repository update is successful:

   ```
   [root@oda1 opt]# /opt/oracle/dcs/bin/odacli describe-job -i job_ID
   ```

4. Delete the software zip files from the temporary location on the appliance to save space:

   ```
   [root@oda1 opt]# rm software_file
   rm: remove regular file software_file? y
   ```

You have now updated the repository with the Oracle Database Appliance software, and can create your appliance, as described in the next topic.

Creating the Appliance

Create the appliance using the Browser User Interface.

Ensure that ports 7070 and 7093 on the network between Oracle Database Appliance and the client machine, are open.

1. Navigate to the Browser User Interface. You are prompted to set the password for the `oda-admin` user.

   ```
   https://ODA-host-ip-address:7093/mgmt/index.html
   ```

2. Log into the Browser User Interface with the new password.

   When you launch the Browser User Interface on an unconfigured appliance, the Appliance page notifies you that the appliance is not configured and provides a link to the pages needed to configure and create the appliance.

   > **Note:**
   >
   > If you face any issues when logging into the Oracle Database Appliance Browser User Interface, then see the topic *Errors When Logging into the Browser User Interface* in the chapter *Troubleshooting Oracle Database Appliance*.

3. Click **Create Appliance**.
4. In the Create Appliance page, if you want to create the appliance from a saved configuration, click **Browse**, and select the JSON file. The information from the saved configuration file is loaded. You can retain or edit the fields. Otherwise, manually, provide the values to create the appliance.
5. In the System Information section, specify the values as follows.
   a. **Host Name**: Enter the host name.

      The host name can contain alphanumeric characters and dashes (-), but cannot start with a number or dash (-) or end with dash (-). Do not exceed 30 characters.

   b. **Domain Name**: Enter the domain name.

   c. **Region**: Select the region of the world where the Oracle Database Appliance is located.

   d. **Time Zone**: Select the time zone where the Oracle Database Appliance is located.

   e. (Optional) **DNS Servers**: Enter addresses for one or more DNS servers.

   f. (Optional) **NTP Servers**: Enter addresses for one or more NTP servers.

   g. **Diskgroup Redundancy**: If there are two disks, then you can select the disk group redundancy as Normal or Flex. To select the the redundancy as **High**, there must exist more than four disks, and a quorum disk. If five or more disks are configured, then the quorum disk is not required. Select **Normal**, **High**, or **Flex**, as per your deployment requirement.

The Flex parameter defines the disk group redundancy. Flex redundancy requires at least 3 storage devices, including a quorum. For a database to be placed on Oracle ASM, you can set the database redundancy during its creation. For a database to be placed on Oracle ACFS, the database inherits the redundancy of the ACFS file system. You can specify an ACFS file system redundancy during its creation. You can set the disk group redundancy only during appliance creation. The database redundancy can be set anytime you create the database.

The redundancy level for DATA, RECO, and FLASH can be set to Normal, Flex, or High based on whether there are two, four, or more disks.

Note: For Oracle Database Appliance hardware models other than X8-2, the redundancy level for REDO is always High.

h. **Data Storage Percentage**: Enter a whole number between 10 and 90 to define the percentage of storage reserved for DATA, the remainder is reserved for RECO. For example, if you enter 80, then 80% of the storage for DATA and 20% for RECO.

i. **System Password** and **Confirm Password**: Enter the system password in both fields.

   The system password is the password set for UNIX and `root` users. The password must begin with an alpha character and cannot contain quotation marks. Do not exceed 30 characters.

6. In the Network Information section, configure the primary client access network, virtual networks, and an Oracle Integrated Lights Out Manager (Oracle ILOM) network. You are only required to configure the client access network. The ILOM configuration is optional if you already configured the ILOM for the appliance and you do not need to make changes.

   Specify the following, depending on whether it is a single-node or two-node Oracle Database Appliance deployment:

   a. **Client Access Network Host Name**: For Node0, enter the host name for the primary client access network.

   b. **Client Access Network IP Address**: For Node0, enter the IP address for the primary client access network.

   c. **VIP Name for Node0**: Enter the name of the virtual IP network for Node0.

   d. **VIP IP Address for Node0**: Enter the virtual IP address that resides on Node0 and is shared between the nodes.

   e. **VIP Name for Node1**: Enter the name of the virtual IP network for Node0.

   f. **VIP IP Address for Node1**: Enter the virtual IP address that resides on Node1 and is shared between the nodes.

   g. (Optional) **ILOM Host Name**: Enter the name of the Oracle ILOM host for Node0 and Node1.

   h. (Optional) **ILOM Network IP Address**: Enter the IP address for the ILOM for Node0 and Node1.

   i. (Optional) **ILOM Network Subnet Mask**: Enter the subnet mask address for the ILOM.

   j. (Optional) **ILOM Network Gateway**: Enter the gateway address for the ILOM.
   k. **Client Access Network Subnet Mask**: Enter the subnet mask address for the primary client access network.
   l. **Client Access Network Gateway**: Enter the gateway address for the primary client access network.
   m. **Client Access Network Interface**: Enter the interface for the primary client access network.

7. Determine how you want to configure your users and groups and whether or not you want to allow operating system role separation:
   - Two users with six groups: Customize Users and Groups, select **No**. Allow OS Role Separation, select **Yes**. This is the default configuration.
   - Two customized users with six customized groups: Customize Users and Groups, select **Yes**. Allow OS Role Separation, select **Yes**.
   - Single user with two groups: Customize Users and Groups, select **No**. Allow OS Role Separation, select **No**
   - Single user with six groups: Customize Users and Groups, select **Yes**. Allow OS Role Separation, select **No**. SAP deployments use this configuration.
8. Do you want to create an initial database? Select **Yes** and go to Step 9 or select **No** and go to Step 10.
9. Enter the following information to configure an initial database:
   a. **DB Name**: Enter a name for the database.

      The name must contain alphanumeric characters and cannot exceed 8 characters.

   b. (Optional) **DB Unique Name**: Enter a globally unique name for the database.

      Databases with the same DB Name within the same domain (for example, copies of a database created for reporting or a physical standby) must have a different DB Unique Name that is unique within the enterprise. The name must contain alphanumeric, underscore (_), dollar ($), and pound (#) characters, but must begin with an alphabetic character. No other special characters are permitted in a database name. The unique name cannot exceed 30 characters.

   c. **DB Version**: Select a database bundle patch number.

   d. **CDB**: Select **Yes** or **No** to specify whether or not you want a Container Database (CDB).

   e. **PDB Name**: Enter a name for the pluggable database (PDB).

      The name must begin with an alphanumeric character. The following characters are valid: alphanumeric characters, and underscore (_).

   f. **PDB Admin User**: Enter an Admin user name for the pluggable database (PDB).

   g. **Database Edition**: Select the Oracle Database edition, either Standard Edition and Enterprise Edition. Your license determines which database edition you are eligible to create in the appliance.

      For Oracle Database 19c Standard Edition, you can only create single-instance Oracle Database, with or without high-availability.

h. **Password**: Provide a password for the database.

i. **Deployment**: Select a deployment type from the list. The options are RAC, RAC-One, or SI (single instance database). If you select a single instance database, then select the node for the SI database deployment.

   If you select a single instance database, then you have the option to create the database on either Node0 or Node1. The default is Node0.

j. **Shape**: Select a database shape from the list.

k. In the **Database Class** field, select a database class from the drop-down list. If an option is not available in the list, it is not supported for the database edition on the Oracle Database Appliance or the version that you selected. The default is OLTP.

l. In the **Storage** field, select **ACFS** or **ASM** from the drop-down list. The default is Oracle ASM.

   Oracle 12.1 and later databases can use Oracle ASM storage. Oracle Database 11.2 is only supported on Oracle ACFS.

m. If you specified the disk group redundancy as **Flex**, then you can select the **Database Redundancy** value as **Mirror** or **High**.

n. **Data Files on Flash Storage**: Select **Yes** or **No**.

   This option is only available if the HA system has HDD storage drives.

o. **Configure EM Express**: Select **Yes** or **No**.

   Select **Yes** to configure the Oracle Enterprise Manager Database Express (EM Express) console for Oracle Database 12.2.1.0 or 12.1.0.2 or the Database Control Console for Oracle Database 11.2.0.4. Selecting Yes enables you to use the console to manage the database.

p. **Character set**: Select a character set.

q. **National Characterset**: Select a national characterset.

r. **Language**: Select the database language.

s. **Territory**: Select a territory or location from the list.

t. For Oracle Database Enterprise Edition 18c or later, you can choose to enable Transparent Database Encryption (TDE). Select **Yes** or **No** in the **Enable TDE** option. Specify and confirm the **TDE Password**. By default, the TDE option is disabled.

10. (Optional) Configure and enable Oracle ASR on the ASR page.

    You can configure and enable Oracle Auto Service Request (Oracle ASR) now or later:

    - To not enable Oracle ASR during deployment, select **No** and click **Submit**. After deployment, you can configure an internal Oracle ASR or register with an external Oracle ASR Manager from either the Browser User Interface or command-line interface.
      - Internal Oracle ASR: choose to configure Oracle ASR Manager on Oracle Database Appliance or use Oracle ASR Manager configured on another server in the same network as your appliance.
      - External Oracle ASR: If you already have Oracle ASR Manager configured elsewhere, you can register Oracle Database Appliance with your existing Oracle ASR Manager.

- To enable Oracle ASR, select **Yes** and complete the fields:
  a. **ASR User Name**: Enter the e-mail address associated with the My Oracle Support account under which the server is registered.
  b. **Password**: Enter the password associated with the My Oracle Support account under which the server is registered.
  c. **SNMP Version**: Select **V2** or **V3**. V3 is the default and recommended version.
  d. **HTTP Proxy used for Upload to ASR**: Select **Yes** or **No**.
  e. **Proxy Server Name**: If you are using a proxy for upload, enter the proxy server name.
  f. **Proxy Port**: If you are using a proxy for upload, enter the proxy port.
  g. **(Optional) HTTP Proxy Requires Authentication**: If you are using a proxy for upload, select **Yes** if you require authentication. If you do not require authentication, select **No**.
  h. **Proxy User Name**: If you are using a proxy for upload, enter the proxy user name.
  i. **(Optional) Proxy Password**: If you are using a proxy for upload and require authentication, enter the proxy password.

11. Click **Submit**. When prompted, click **Yes** to confirm that you want to start the job to deploy the appliance.
12. Verify that the appliance is deployed. Run the `odacli describe-system` command. For multi-node deployments, run the command on both nodes.

The job to create the appliance takes time to complete. To monitor the job progress, click the **Activity** tab. Click the job number to view the tasks.
After deployment, the `root` and database users `SYS`, `SYSTEM`, and `PDBADMIN` are set to the system password. The `oracle` and `grid` passwords are set to the default password. Change these passwords to comply with your user security protocols.

5

Provisioning an Oracle Database Appliance Virtualized Platform

Oracle Database Appliance provides you with the option to reimage the system and configure the appliance as a virtualized platform.

> **Note:**
>
> You can provision Standard Edition and Standard Edition 2 Oracle Real Application Cluster (Oracle RAC) databases, but you must use Oracle VM virtualization on a virtualized platform on Oracle Database Appliance and follow the single socket per server licensing restriction. The single socket restriction means that you can use a maximum of 18 cores per server, in multiples of two. You can use the remaining cores for applications.

- Determining if the System is Configured with a Virtualized OS Image
  Before deploying a Virtualized Platform on Oracle Database Appliance, determine if the system has the Virtualized OS ISO image.
- Setting Up the Virtualized Platform
  Set up the `dom0` virtualized operating system on both nodes and configure the initial public network.
- Installing Virtualized Platform Software and Deploying the Appliance
  Deploy the ODA_BASE domain for a virtualized platform and then deploy the appliance.

Determining if the System is Configured with a Virtualized OS Image

Before deploying a Virtualized Platform on Oracle Database Appliance, determine if the system has the Virtualized OS ISO image.

Oracle Database Appliance ships from the factory with a bare metal ISO image installed. To use the virtualization features, you must reimage the system with the Virtualized OS ISO image.

A bare metal system uses the `odacli` and `odaadmcli` commands. A virtualized system uses the `oakcli` commands.

Perform the following steps to determine if you need to re-image Oracle Database Appliance and install the Virtualization Platform ISO image:

1. Log in as `root`.

2. To verify that a system is a virtualized platform, enter the command `oakcli show env_hw`. For example:

   ```
   # oakcli show env_hw
   VM-ODA_BASE ODA X7-2-HA
   ```

   The system is configured as a virtualized system when the command is valid and returns output that is prefixed with the string VM-ODA_BASE. For example, the output of the command shows that the platform is configured with a virtual machine environment (VM-ODA_BASE) and identifies the hardware platform.

   If the system is configured as a bare metal platform, then the command `oakcli show env_hw` is invalid.

Setting Up the Virtualized Platform

Set up the `dom0` virtualized operating system on both nodes and configure the initial public network.

You must provision the virtualized operating system image on both nodes, either at the same time, or one after another.

1. Download the Oracle Database Appliance 19.9 Virtualized OS ISO Image.
   a. From an external client machine, log on to My Oracle Support.
   b. Locate the patch for the Oracle Database Appliance Virtualized OS ISO Image. Refer to the *Oracle Database Appliance Release Notes* for the patch number.
   c. Select the patch version for release 19.9.
   d. Click **Download** to download the zip file onto your external client. Unzip the zip file onto external client to get the ISO image.
2. Open a browser and connect to Oracle Integrated Lights Out Manager (ILOM) on Node0 as root.

   The Summary home page appears.
3. Launch the Remote Console.
   a. Expand **Remote Control** in the left navigation.
   b. Click the **Redirection** tab.
   c. Click **Launch Remote Console**.

      The state of the system determines what appears on the Console page.
4. Add the Virtualized OS ISO Image.
   a. Click the **Devices** tab, then select **CD-ROM**.

      A file browser on the local client opens.
   b. Browse to the Oracle Database Appliance Virtualized OS ISO Image, highlight the image, then click **Open**.
5. Configure the CD-ROM as the next boot device.
   a. Expand **Host Management** in the left menu of the ILOM Remote Console tab.
   b. Click **Host Control**.

   c. Select **CDROM** from the Next Boot Device menu, then click **Save**.

6. Power cycle the system.

   a. Click **Power Control** in the **Host Management** menu.

   b. Select **Power Cycle**.

   When the node comes back after the power cycle, reimaging starts automatically.

   It can take a couple of hours to reimage. The Running Post-Install scripts page is a static page and might give the impression that the reimaging process is not progressing. The post-install process during reimaging will wait until the synchronization between the partitions of the two mirrored local hard disks is complete, which can take 15 to 20 minutes to complete.

   To check the progress of resynchronization, press the ALT-F2 key combination to open a second console and enter the following command:

   ```
   # cat /proc/mdstat
   ```

   When the resynchronization is complete, reimaging is completed and the machine restarts.

7. Repeat Steps 1 through 6 for Node1.

   Reimaging is node-specific. You must reimage both nodes. You can reimage both nodes at the same time.

8. Verify that the host name in the Console is `oak1` for Node0 and `oak2` for Node1.

   If the host name is something other than `oak1` or `oak2`, then reboot the node. You might need to reboot more than once.

   Once the image is completed on **both** nodes, you will see the screen with `oak1` for Node0 (sc0).
   Note: Ensure that you provide the node numbers for both nodes during the reboot. Specify node number 0 for the first node and node number 1 for the second node.

9. Use the command `oakcli configure firstnet` to configure a `local` or `global` network. For local network, run the command on both nodes. For global network, run the command on any one node.

   The global configuration sets the initial public network for both the nodes on Oracle Database Appliance, enabling you to download the deployment software onto the appliance.

   ```
   # oakcli configure firstnet
   Configure the network for the node(s)(local, global) [global]:
   The network configuration for both nodes:
   Domain Name: example.com
   DNS Server(s): Primary Dns Server: 192.0.2.18
                      Secondary Dns Server: 192.0.2.19
                      Tertiary Dns Server:
   Node Name Host Name
   0 node1
   1 node2
   Choose the network interface to configure (net1, net2) [net1]:
   Configure DHCP on net1 (yes/no) [no]:
   INFO: You have chosen static configuration on net1
   Enter the IP address for net1 on Node 0: 192.0.2.18
   ```

```
Enter the IP address for net1 on Node 1: 192.0.2.19
Netmask for net1: 255.255.252.0
Gateway Address for net1 [192.0.2.18]:
INFO: Plumbing the IPs now on Node 0 ...
INFO: Restarting the network now on Node 0 ...
Determining if ip address 192.0.2.18 is already in use for device
net1...
:::::::::::::::::::::::::::::::::::
INFO: Plumbing the IPs now on Node 1 ...
INFO: Restarting the network now on Node 1 ...
:::::::::::::::::::::::::::::::::::
```

10. Check the IP addresses to the nodes with the command `oakcli show firstnet`. For example:

```
# oakcli show firstnet
Node: 0
Host Name: hostname1
Domain Name: example.com
Network BootProto IP Address Subnet Gateway
--------------------------------------------------------------------
----------------
net1 static 192.0.2.18 255.255.252.0 192.0.2.1
--------------------------------------------------------------------
----------------
Node: 1
Host Name: hostname2
Domain Name: example.com
Network BootProto IP Address Subnet Gateway
--------------------------------------------------------------------
----------------
net1 static 192.0.2.18 255.255.252.0 192.0.2.1
--------------------------------------------------------------------
----------------
DNS Address: 192.0.2.18,192.0.2.19
```

Installing Virtualized Platform Software and Deploying the Appliance

Deploy the ODA_BASE domain for a virtualized platform and then deploy the appliance.

1. Download and copy the template files to the `/OVS` directory on `dom0` (Node 0).
   a. From an external client machine, log on to My Oracle Support and download the Oracle Database Appliance VM Template.
   b. Select the latest version from the menu.
   c. Click **Download** for each of the zip files to download the current Oracle Database Appliance template onto your external client.
2. Copy the template files to the `/OVS` directory on Node 0 (oak1-dom0).

a. Use either a Secure Copy (scp) command or a USB storage device to copy the ODA_BASE template from the external client to dom0 on Node 0. Use the /OVS directory on Node 0 (test0-dom0) as the target location.

> **Note:**
>
> If you use a USB drive to transfer the file, then format it first as FAT32, ext3, or ext4. NTFS file formats are not supported.

b. Log into dom0 as root on Node 0 of Oracle Database Appliance. Remain logged in to dom0 while you complete the remaining steps in this task.

c. From the /OVS directory, use the unzip command to extract the zip files.

```
unzip p16186172_19.9.0.0.0_Linux-x86-64_1of4.zip
unzip p16186172_19.9.0.0.0_Linux-x86-64_2of4.zip
unzip p16186172_19.9.0.0.0_Linux-x86-64_3of4.zip
unzip p16186172_19.9.0.0.0_Linux-x86-64_4of4.zip
```

When extracted, you will have the following files: oda_base_19.9.0.0.0.gz01, oda_base_19.9.0.0.0.gz02, oda_base_19.9.0.0.0.gz03, and oda_base_19.9.0.0.0.gz04.

d. Use the cat command to concatenate the files into a single file.

The file name is determined by the version. Ensure that you use the correct file name from the download. Do not change the file name.

```
cat oda_base_19.9.0.0.0.gz01 oda_base_19.9.0.0.0.gz02
oda_base_19.9.0.0.0.gz03 oda_base_19.9.0.0.0.gz04 >
oda_base_19.9.0.0.0.tar.gz
```

Make a note of the file name and location. You need to specify the following in the next step: /OVS/oda_base_19.9.0.0.0.tar.gz

3. (Optional) Define the virtual local area network (VLAN) and deploy ODA_BASE from the /opt/oracle/oak/bin/ directory. When prompted, enter the absolute path and file name for the template file that you created in the previous step, core licensing, and the base domain memory allocation.

The deploy oda_base option automatically deploys ODA_BASE on both nodes.

Values, such as the number of available CPU cores and default memory, differ between Oracle Database Appliance Virtualized Platform hardware platforms. The following excerpt is an example that creates a VLAN named v1200 with a vlanID of 200 using the bond0 interface. The example defines 20 CPU cores, which means that 20 CPU cores are licensed on each node for a total of 40 CPU cores, and uses the default memory.

```
# /opt/oracle/oak/bin/oakcli create vlan vl200 -vlanid 200 -if bond0
Created vlan vl200

# /opt/oracle/oak/bin/oakcli deploy oda_base
Enter the template location: /OVS/oda_base_19.9.tar.gz
```

```
Core Licensing Options:
  1. 2 CPU Cores
  2. 4 CPU Cores
  3. 6 CPU Cores
  4. 8 CPU Cores
  5. 10 CPU Cores
  6. 12 CPU Cores
  7. 14 CPU Cores
  8. 16 CPU Cores
   9. 18 CPU Cores
 10. 20 CPU Cores
 11. 22 CPU Cores
 12. 24 CPU Cores
 <continued ...>
   Selection[1 .. 37] (default 74 CPU Cores): 10
INFO: Using the 20 cores
    DA base domain memory in GB(min 16, max 244)[default 244]: 244
INFO: Using default memory size i.e. 244 GB
Additional vlan networks to be assigned to oda_base ? (y/n) [n]:
INFO: Deployment in non local mode
INFO: Verifying active cores on local node
INFO: Verified active cores on local node
INFO: Verifying active cores on remote node
NFO: Verified active cores on remote node
INFO: Running the command to copy the template /OVS/
oda_base_19.9.tar.gz to remote node 1

oda_base_19.9.tar.gz    100% 7475MB 62.8MB/s   01:59
INFO: Spawned the process 17728 in the deployment node 0
INFO: Spawned the process 17729 in the node 1
INFO: Validating LSI HBA PCI Cards on node 0
INFO: Validating LSI HBA PCI Cards on node 0
INFO: Validating LSI HBA PCI Cards on node 1
INFO: Validating LSI HBA PCI Cards on node 1
INFO: Deployment in local mode
INFO: Deployment in local mode
templateBuild-2017-02-14-23-51/swap.img
templateBuild-2017-02-14-23-51/swap.img
templateBuild-2017-02-14-23-51/System.img
templateBuild-2017-02-14-23-51/System.img
templateBuild-2017-02-14-23-51/u01.img
templateBuild-2017-02-14-23-51/u01.img
INFO: Extracted the image files on node 1
INFO: The VM Configuration data is written to /OVS/Repositories/
odabaseRepo/VirtualMachines/oakDom1/vm.cfg file
INFO: Running /sbin/losetup /dev/loop0 /OVS/Repositories/
odabaseRepo/VirtualMachines/oakDom1/System.img command to mount the
image file
INFO: Mount is successfully completed on /dev/loop0
INFO: Extracted the image files on node 0
INFO: Validated dom0 and odabase version
INFO: Making change to the /OVS/Repositories/odabaseRepo/
VirtualMachines/oakDom1
/tmpmnt/boot/grub/grub.conf file
INFO: Assigning IP to the second node...
```

```
INFO: The VM Configuration data is written to /OVS/Repositories/
odabaseRepo/VirtualMachines/oakDom1/vm.cfg file
INFO: Running /sbin/losetup /dev/loop0 /OVS/Repositories/
odabaseRepo/VirtualMachines/oakDom1/System.img command to mount the
image file
INFO: Mount is successfully completed on /dev/loop0
INFO: Created oda base pool
INFO: Validated dom0 and odabase version
INFO: Making change to the /OVS/Repositories/odabaseRepo/
VirtualMachines/oakDom1
/tmpmnt/boot/grub/grub.conf file
INFO: Assigning IP to the first node...
INFO: Created oda base pool
INFO: Starting ODA Base...
INFO: Starting ODA Base...
Using config file "/OVS/Repositories/odabaseRepo/VirtualMachines/
oakDom1/vm.cfg"
.
Started domain oakDom1 (id=1)
INFO: Storing the odabase configuration information
Using config file "/OVS/Repositories/odabaseRepo/VirtualMachines/
oakDom1/vm.cfg"
Started domain oakDom1 (id=1)
INFO: Storing the odabase configuration information
#
```

The ODA_BASE setup is complete.

4. Verify that your deployment of ODA_BASE is valid and that ODA_BASE is configured.

   - Run the command `xm list` to confirm that ODA_BASE is configured. When properly deployed, `oakDom1` appears in the output with your configured memory and vcpus.

     ```
     # xm list
     Name                                        ID   Mem VCPUs
     State   Time(s)
     Domain-0                                     0  4096     40
     r----- 482672.4
     oakDom1                                      2 32768      4     -
     b---- 132134.6
     ```

   - Run the command `oakcli show oda_base`

     ```
     # /opt/oracle/oak/bin/oakcli show oda_base
     ODA base domain
     ODA base CPU cores      :2
     ODA base domain memory  :32
     ODA base template       :/OVS/oda_base_19.9.tar.gz
     ODA base vlans          :[ 'priv1', 'eth1']
     ODA base current status :Running
     ```

5. (Optional) After deployment of oda_base, if you want to change CPU or memory of ODA_BASE, run `oakcli configure oda_base`:

   ```
   # oakcli configure oda_base
   Core Licensing Options:
           1. 2 CPU Cores
           2. 4 CPU Cores
           3. 6 CPU Cores
           4. 8 CPU Cores
           5. 10 CPU Cores
           6. 12 CPU Cores
           7. 14 CPU Cores
           8. 16 CPU Cores
           Current CPU Cores :10
           Selection[1 .. 8](default 16 CPU Cores) : 5
           ODA base domain memory in GB(min 16, max 244)(Current
   Memory 160G)[default 160] : 100
   Additional vlan networks to be assigned to oda_base ? (y/n) [n]: n
   Vlan network to be removed from oda_base ? (y/n) [n]: n
   Configure VNC password for oda_base ? (y/n) [n]: y
   Please input your password:
   Please confirm your password:
   ```

   To ensure your changes are reflected in the system, run the `oakcli restart oda_base` command.

6. Connect to ODA_BASE using vncviewer or vncsession using the `dom0` host name and port 5900 (test0-dom0:5900).

7. Use the `oakcli configure firstnet` to configure an initial public network on the first node (Node 0) to complete the ODA_BASE deployment.

   a. ssh to 192.168.16.27 from test0-dom0

   b. Log in as `root` user.

   c. Run the command `oakcli configure firstnet` from the `/opt/oracle/oak/oakcli` directory. Enter the ODA_BASE (Node 0) network information.

      The command uses an interactive script and prompts you for the information needed to configure the network. Enter values based on your environment requirements.

      When prompted to configure the network nodes, select the `local` option that configures the network on the logged-on node.

      Configure `eth1` as the network interface.

      ```
      # /opt/oracle/oak/bin/oakcli configure firstnet
      Select the Interface to configure the network on (eth1 eth2)
      [eth1]:
      Configure DHCP on eth1 (yes/no) [no]:
      INFO: You have chosen Static configuration
      Enter the IP address to configure : ip_odabase_node
      Enter the Netmask address to configure : ip_netmask
      Enter the Gateway address to configure : ip_gateway
      ```

The IP address is plumbed and the network is restarted on the local node.

8. Check the firmware versions on both nodes with the following command:

   ```
   [root@test0 ~]# oakcli show version -detail
   ```

9. If all the component versions are not either up-to-date or at a higher version, then unpack the patch bundle on both nodes.

   ```
   [root@test0 tmp]# oakcli unpack -package patch_number
   ```

10. Use the `oakcli update` command to update the server components such as disks, ILOM, BIOS, and firmware.

    ```
    [root@test0 tmp]# oakcli update -patch release_number --server
    INFO: DB, ASM, Clusterware may be stopped during the patch if
    required
    INFO: Both Nodes may get rebooted automatically during the patch if
    required
    Do you want to continue: [Y/N]?: y
    INFO: User has confirmed for the reboot
    INFO: Patch bundle must be unpacked on the second Node also before
    applying the patch
    Did you unpack the patch bundle on the second Node? : [Y/N]? : y
    INFO: All the VMs except the oda_base will be shutdown forcefully
    if needed
    Do you want to continue : [Y/N]? : y
    INFO: Running pre-install scripts
    INFO: Running prepatching on node 0
    INFO: Running prepatching on node 1
    oakcli update -patch release_number --storage
    [root@test0 ~]# oakcli update -patch release_number --storage
    WARNING: OAKD is not running in foreground mode.
    INFO: Cannot determine if VMs or shared repos are running.
    INFO: Patching may not shutdown all VMs/repos before patching
    Do you want to continue: [Y/N]?: y
    INFO: Proceeding with patching...
    INFO: DB, ASM, Clusterware may be stopped during the patch if
    required
    INFO: Both Nodes may get rebooted automatically during the patch if
    required
    Do you want to continue: [Y/N]?: y
    INFO: User has confirmed for the reboot
    Please enter the 'root' password :
    Please re-enter the 'root' password:
    INFO: Setting up the SSH
    ............Completed
    INFO: Running pre-install scripts
    ............Completed
    INFO: Running prepatching on node 0
    INFO: Running prepatching on node 1
    INFO: Completed pre-install scripts
    INFO: Shared Storage components need to be patched
    INFO: Patching storage on node 192.168.16.28
    ```

11. After the firmware patching is completed, confirm that all appropriate components are updated

    ```
    # oakcli show version -detail
    ```

12. Deploy the Oracle Grid Infrastructure and Oracle Database software on the appliance.

    - With the VNC connection, start the xterm session and navigate to the `/opt/oracle/oak/bin` directory and execute the command `oakcli deploy` to start the Oracle Database Appliance Manager Configurator.

      ```
      # xinit /usr/bin/xterm
      # /opt/oracle/oak/bin/oakcli deploy
      The Oracle Appliance Manager Welcome window is displayed.
      ```

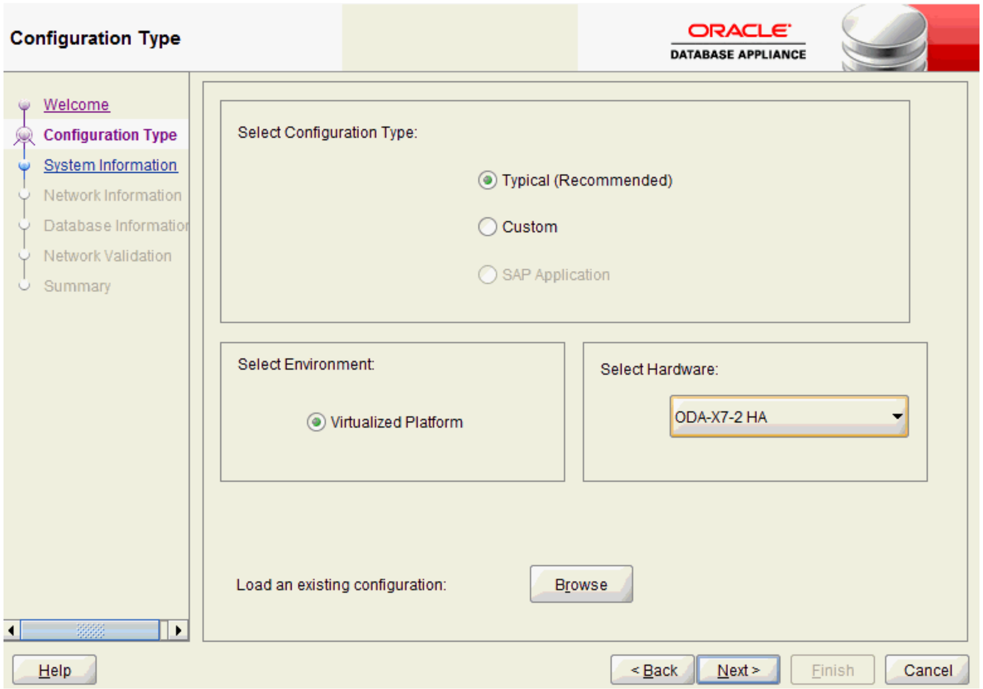
      You can also use X11 tunnelling and deploy the software. From an X11 capable desktop, run the command:

      ```
      # ssh -g -Y ODA_BASE IP -l root
      ```

      Within the `ssh` session, run the command:

      ```
      # /opt/oracle/oak/bin/oakcli deploy
      ```

13. Click **Next** on the Oracle Appliance Manager Welcome window.
14. Complete the Configuration Type.
    - If you want to use a configuration file that you created earlier with this version of the Configurator, then click **Browse** and locate the file on your client. Click **Next**.
    - If you do not have a configuration file, select the **Custom** configuration type and select the hardware model from the menu. Click **Next.**



Configuration Type

Select Configuration Type:

● Typical (Recommended)

○ Custom

○ SAP Application

Select Environment:

● Virtualized Platform

Select Hardware:

ODA-X7-2 HA

Load an existing configuration: Browse

15. Enter or review the configuration details for your system, network, and database information.

16. On the Summary page, review your configuration options and deploy your configuration.

    a. (Optional) Click **Save** to save the configuration file.

    b. Click **Install** to deploy the configuration.

    The deployment can take an hour to complete. Monitor the install progress. When the deployment is complete, go to the next step.

17. Validate the deployment by executing the `oakcli show version -detail` command on ODA_BASE (Node 0).

    ```
    # /opt/oracle/oak/bin/oakcli show version -detail
    ```

    The output displays the System Version, Component Name, Installed Version, and Supported Version for each of the components.

18. If you configured ASR, then verify the deployment, by running the following the command on **Node0**:

    ```
    # oakcli test asr
    ```

6

Oracle Database Appliance Postinstallation Tasks

Complete these administrative tasks after you have deployed software, but before the system is operational.

Configuring CPU Core Count

Oracle Database Appliance is delivered with all cores on each server enabled. Follow this procedure to reduce the number of cores, if required.

1. To reduce the number of cores, run the following command on Node 0 only:

   Set the cores in multiples of 2, for example, 12:

   ```
   [root@oak1 opt]# /opt/oracle/dcs/bin/odacli update-cpucore --cores
   12
   ```

2. Check if the job completed successfully:

   ```
   [root@oak1 opt]# /opt/oracle/dcs/bin/odacli describe-job -i job_ID
   ```

3. Verify that the core count is updated on both nodes:

   ```
   [root@oak1 opt]# /opt/oracle/dcs/bin/odacli describe-cpucore
   ```

Securing Oracle ILOM Service Processors

Change the Oracle ILOM default password after completing Oracle Database Appliance deployment.

Do not change the default password until after you have completed software deployment on the Oracle Database Appliance.

Changing Oracle ILOM Password from the Console

1. In the Oracle ILOM console, from the **Administration** menu, select **User Management**, and then navigate to the **User Accounts** subtab.
2. Select **root** user and click **Edit**.
3. Change the `root` user password.

Changing Oracle ILOM Password Using CLI Commands

1. Connect to the Oracle ILOM service processor (SP) through SSH:

   ```
   # ssh -l root SP-ipaddr
   ```

2. Set the new password:

   ```
   -> set /SP/users/root password=new_password
   Changing password for user /SP/users/root/password...
   Enter new password again: *********
   New password was successfully set for user /SP/users/root
   ```

Changing Oracle Database Appliance Passwords

After deploying your appliance, ensure that you change the following passwords for securing your system.

Changing the Oracle Installation Owner Passwords

During deployment, the root and database users SYS, SYSTEM and PDBADMIN are set to the system password. After deployment, the oracle and grid passwords are also set to the system password. Change the passwords to comply with your enterprise user security protocols. Refer to the *Oracle Database Appliance Security Guide* and *Oracle Database Security Guide* for information about the required configuration and best practices to secure database systems.

Changing the oda-admin User Password through the Command-Line

1. Log in to the appliance as `root`.
2. Run the `odacli-adm set-credential` command to reset the password. Enter the new password when prompted.

   ```
   # odacli-adm set-credential --password --username oda-admin
     Agent password: new password
   ```

Changing the the oda-admin User Password through the Browser User Interface

1. Log into the Browser User Interface using the user name `oda-admin`.
2. Click **About**, then **User Settings** in the upper right corner of the Browser User Interface.
3. Enter the password in the Password field and the Password Confirmation field, then click **Submit**.

A confirmation message is displayed.

4. Click **About**, then click **Sign Out**.
5. Log back into the Browser User Interface with the new password.

> **Note:**
>
> The `oda-admin` password expiration period is 90 days.

7

Patching Oracle Database Appliance

To keep Oracle Database Appliance running with the latest software, check for and apply Oracle Database Appliance patch bundles when they are released.

- About Patching Oracle Database Appliance
  Use the Oracle Database Appliance Patch Bundle to patch your appliance.
- About Patching Pre-Checks
  Patching pre-checks are designed to detect and flag problems that might be encountered during patching.
- Running Patching Pre-Checks Before Applying Patches
  After updating the repository with patches, use the pre-checks to reduce potential update problems, and then apply patches.
- Patching Oracle Database Appliance Bare Metal Systems Using the Command-Line
  Follow these steps to apply patches to your Oracle Database Appliance bare metal deployment and existing Oracle Database homes, using CLI commands.
- Patching Oracle Database Appliance Bare Metal Systems Using the Browser User Interface
  Upload the Oracle Database Appliance Server Patch to the patch repository, deploy the patch bundle using the Browser User Interface, and then update the DCS agent and components using CLI commands.
- Updating Oracle Database Appliance Repository with Database Clone Files For Bare Metal Systems
  Follow these steps to update the Oracle Database Appliance repository with Oracle Database clone files for the latest release using CLI commands.
- Patching Existing Database Homes on Bare Metal Systems Using the Browser User Interface
  Use the Browser User Interface to patch database homes to the latest release on bare metal systems.
- Patching Oracle Database Appliance Virtualized Platform
  Follow these steps to apply patches to Oracle Database Appliance OAKCLI Virtualized Platform using CLI commands.
- Updating Oracle Database Appliance Repository with Database Clone Files For Virtualized Platform
  Follow these steps to update the Oracle Database Appliance repository with Oracle Database clone files for Virtualized Platform for the latest release using CLI commands.
- Applying Additional Patches and Updates on Bare Metal Systems
  Configure additional patch repositories and patch your operating system and databases to ensure that your deployment has the latest updates and security fixes.
- Cleaning Up the Patch Repository
  Use the Browser User Interface or Command Line Interface to delete obsolete or old patches from the repository.

- About Upgrading to a Different Database Home
  Understand how to upgrade to a different database home using either the Browser User Interface or `odacli` commands.

About Patching Oracle Database Appliance

Use the Oracle Database Appliance Patch Bundle to patch your appliance.

Patches offer new features and may improve the functionality of existing features.

About Oracle Database Appliance Patch Bundles

The Oracle Database Appliance Patch Bundle contains the latest patches for DCS Admin, DCS Components, OAK, Oracle Grid Infrastructure, Oracle Database homes, enhancements, and fixes.

The Oracle Database Appliance Release Notes include information about the latest Oracle Database Appliance patch bundle and a list of component versions in the patch bundle. Oracle recommends updating the appliance with the latest Oracle Database Appliance software version to take advantage of new features, fixes, and the latest supported component versions. See the Oracle Database Appliance Release Notes for the upgrade paths.

> **Caution:**
>
> Do not patch Oracle Database Appliance using individual patches for Oracle Grid Infrastructure or Oracle Linux. Also do not use individual infrastructure patches, such as firmware patches. You must only use Oracle Database Appliance patches. If you use patches that are not intended for Oracle Database Appliance, or if you use OPatch, or a similar patching tool, then Oracle Database Appliance inventory is not updated, and you cannot complete future patch updates. If you apply out-of-cycle Oracle Database Release Update (RU), then ensure that you follow the recommendations described in the Readme for the RU.

The patch bundle provides all relevant patches for the entire system, including the following:

- BIOS
- Hardware drivers
- Hardware Management Pack (HWM) and firmware drivers for various components
- Oracle Appliance Manager
- Oracle Linux
- Oracle VM Server
- Java Runtime Environment (JRE)
- Oracle Integrated Lights Out Manager (Oracle ILOM)
- Oracle Database Bundle Patch (BP), Oracle Database Patch Set Update (PSU), and Oracle Database Release Update (RU)
- Oracle Auto Service Request (Oracle ASR)

- Oracle Grid Infrastructure
- Oracle Intelligent Platform Management Interface (Oracle IPMI)
- Network Card Patches for relevant hardware models

About Updating Oracle Linux RPMs

While not recommended, you can update some Oracle Linux RPMs for database nodes. Do not update or customize Oracle Linux kernel, Oracle Optimal Flexible Architecture, Oracle InfiniBand, or related software. Other software may be installed, updated, or customized. However, the Oracle Database Appliance update may not carry newer version dependencies of customized components. Therefore, you might be required to remove and subsequently reapply site-specific changes to successfully update Oracle Database Appliance in the future.

Caution:

For database nodes, do not update the following:

- Oracle Linux Kernel (kernel*)
- Oracle Optimal Flexible Architecture (ofa*)
- Oracle RDMA packages (oracle-rdma-release)

For storage, do not apply any RPM updates.

About Patching Pre-Checks

Patching pre-checks are designed to detect and flag problems that might be encountered during patching.

The pre-checks view the state of the appliance, including the version and hardware specific upgrades, verify that the necessary conditions and checks are complete before attempting an upgrade, and identify conditions that might cause an upgrade to fail. You can avoid potential patching problems by correcting the conditions and resolving the issues before applying the patch.

The pre-checks commands are available on Oracle Database Appliance release 12.2.1.2.0 or later. Update the DCS agent to support the pre-checks commands.

Note:

Patching pre-checks are available only when patching ODACLI stack. If you are patching and migrating from OAKCLI to ODACLI stack for bare metal system, then follow the procedure in the topic *Patching Oracle Database Appliance Bare Metal Systems Using the Command-Line*. For patching Virtualized Platform, see the topic *Patching Oracle Database Appliance Virtualized Platform*.

Components Verified by Patching Pre-Checks

Check	Component Verified
System patching pre-checks	Checks that the agent is online on all nodes Checks that there is sufficient space for the update Validates the minimum agent version and validates the patching tag Confirms that a valid patch is in the repository and calculates the patch bundle `md5 checksum`
Server patching pre-checks	Confirms that Oracle Grid Infrastructure patch is installed Confirms that Oracle Clusterware is running on all nodes Performs a check for required components using `opatch prereq checkcomponents` Analyzes the patch using `opatchauto` Performs a patch conflict check Checks the available disk space Confirms that the yum repository directory exists Performs a `yum` check and `yum check-update` Performs a test (dry run) yum update to check for dependencies in the RPMs
DBHome patching pre-checks	Confirms that the Oracle Grid Infrastructure is installed Confirms that Oracle Clusterware is running on all nodes Confirms that the Oracle Grid Infrastructure is upgraded before upgrading other components Validates that there is sufficient space available in local mount Performs a check for required components using `opatch prereq checkcomponents` Analyzes the patch using `opatchauto` Performs a patch conflict check and determines if a rollback of database patches is required
Storage pre-checks	Validates storage patch location and tag Validates Oracle ASM disk groups status

Running Patching Pre-Checks Before Applying Patches

After updating the repository with patches, use the pre-checks to reduce potential update problems, and then apply patches.

> **Note:**
>
> Follow the procedure in this topic only when patching ODACLI stack. If you are patching and migrating from OAKCLI to ODACLI stack for bare metal system, then follow the procedure in the topic *Patching Oracle Database Appliance Bare Metal Systems Using the Command-Line*. For patching Virtualized Platform, see the topic *Patching Oracle Database Appliance Virtualized Platform*.

Before running the patching pre-checks, ensure that the `dcs-agent` is updated.

1. Run the `create-prepatchreport` command to generate a pre-check report.

   ```
   odacli create-prepatchreport -s -v release_number
   ```

2. Run the `describe-prepatchreport` command to display the pre-check report.

   ```
   odacli describe-prepatchreport -i job_ID
   ```

Patching Oracle Database Appliance Bare Metal Systems Using the Command-Line

Follow these steps to apply patches to your Oracle Database Appliance bare metal deployment and existing Oracle Database homes, using CLI commands.

To patch your Oracle Database Appliance deployment and your existing database homes to the current release, you must download the Oracle Database Appliance Server Patch and update the repository. To patch your existing databases to the latest release, you do **not** need the Oracle RDBMS clone files for the release. Download Oracle RDBMS clone files for a release only if you want to create new database homes for that release.

> **Note:**
>
> Run the commands in this topic in the same order as documented. Run the `odacli update-dcsadmin` and `odacli update-dcscomponents` commands before running the `odacli update-server` command.

Follow these steps to apply patches to your Oracle Database Appliance and update existing database homes.

1. Download the Oracle Database Appliance Server Patch for the ODACLI/DCS stack (patch 31922078) from My Oracle Support to a temporary location on an

external client. Refer to the release notes for details about the software for the latest release.

For example, download the server patch for 19.9:

```
p31922078_199000_Linux-x86-64_1of2.zip
p31922078_199000_Linux-x86-64_2of2.zip
```

2. Unzip the software — it contains README.html and one or more zip files for the patch.

   ```
   unzip p31922078_199000_Linux-x86-64_1of2.zip
   unzip p31922078_199000_Linux-x86-64_2of2.zip
   ```

   The zip file contains the following software files:

   ```
   oda-sm-19.9.0.0.0-201020.2-server1of2.zip
   oda-sm-19.9.0.0.0-201020.2-server2of2.zip
   ```

3. Copy all the software files from the external client to Oracle Database Appliance. For High-Availability deployments, copy the software files to only one node. The software files are copied to the other node during the patching process. Use the `scp` or `sftp` protocol to copy the bundle.

   Example using `scp` command:

   ```
   # scp software_file root@oda_host:/tmp
   ```

   Example using `sftp` command:

   ```
   # sftp root@oda_host
   ```

   Enter the `root` password, and copy the files.

   ```
   put software_file
   ```

4. Update the repository with the server software:

   ```
   # /opt/oracle/dcs/bin/odacli update-repository -f /tmp/
   software_file1,/tmp/software_file2
   ```

   For example, for 19.9:

   ```
   # /opt/oracle/dcs/bin/odacli update-
   repository -f /tmp/oda-sm-19.9.0.0.0-201020.2-server1of2.zip,/tmp/
   oda-sm-19.9.0.0.0-201020.2-server2of2.zip
   ```

5. Confirm that the repository update is successful:

   ```
   [root@oda1 opt]# /opt/oracle/dcs/bin/odacli describe-job -i job_ID
   ```

6. Update the DCS agent:

   ```
   [root@oda1 opt]# /opt/oracle/dcs/bin/odacli update-dcsagent -v
   19.9.0.0.0
   ```

7. Update DCS admin:

   ```
   [root@oda1 opt]# /opt/oracle/dcs/bin/odacli update-dcsadmin -v
   19.9.0.0.0
   ```

8. Update the DCS components:

   ```
   [root@oda1 opt]# /opt/oracle/dcs/bin/odacli update-dcscomponents -v
   19.9.0.0.0
   ```

   This command updates the DCS components such as Zookeeper.

9. Run patching pre-checks:

   ```
   [root@oda1 opt]# /opt/oracle/dcs/bin/odacli create-prepatchreport -
   s -v version
   ```

   For example, for 19.9:

   ```
   [root@oda1 opt]# /opt/oracle/dcs/bin/odacli create-prepatchreport -
   s -v 19.9.0.0.0
   ```

10. Verify that the patching pre-checks ran successfully:

    ```
    [root@oda1 opt]# /opt/oracle/dcs/bin/odacli list-prepatchreports
    ```

    For example:

    ```
    [root@oda1 opt]# /opt/oracle/dcs/bin/odacli list-prepatchreports
    3797791f-72ac-42b6-8bb8-ed5e5c9b32c1 Patch pre-checks for [OS,
    ILOM, GI, ORACHKSERVER] June 30, 2020 6:29:30 AM UTC Running
    ```

    Use the command `odacli describe-prepatchreport` to view details of the pre-patchreport.

11. Apply the server update:

    ```
    [root@oda1 opt]# /opt/oracle/dcs/bin/odacli update-server -v version
    ```

    For example, for 19.9:

    ```
    [root@oda1 opt]# /opt/oracle/dcs/bin/odacli update-server -v
    19.9.0.0.0
    ```

12. Confirm that the server update is successful:

    ```
    [root@oda1 opt]# /opt/oracle/dcs/bin/odacli describe-job -i job_ID
    ```

13. Update the storage components.

    Specify the `-rolling` option to patch shared disks in a rolling fashion.

    ```
    [root@oda1 opt]# /opt/oracle/dcs/bin/odacli update-storage -v
    version --rolling
    ```

    For example, for 19.9:

    ```
    [root@oda1 opt]# /opt/oracle/dcs/bin/odacli update-storage -v
    19.9.0.0.0 --rolling
    ```

14. **To patch existing Oracle Database Homes to release 19.9:**

    a. Run the patching pre-checks and review the prepatch report. For example:

    ```
    [root@oda1 opt]# /opt/oracle/dcs/bin/odacli create-
    prepatchreport --dbhome --dbhomeid DB_Home_ID -v release_number
    [root@oda1 opt]# odacli describe-prepatchreport -i Job_ID
    ```

    ```
    [root@oda1 opt]# /opt/oracle/dcs/bin/odacli create-
    prepatchreport --dbhome --dbhomeid 7c67c5b4-f585-4ba9-865f-
    c719c63c0a6e -v 19.9.0.0.0
    [root@oda1 opt]# odacli describe-prepatchreport -i
    39ef1eeb-70d3-47ad-b3f5-48960ca0607b
    ```

    b. Update the database home to the latest release:

    ```
    [root@oda1 opt]# /opt/oracle/dcs/bin/odacli update-dbhome --
    dbhomeid DB_Home_ID -v release_number
    ```

    For example, for 19.9:

    ```
    [root@oda1 opt]# /opt/oracle/dcs/bin/odacli update-dbhome --
    dbhomeid 7c67c5b4-f585-4ba9-865f-c719c63c0a6e -v 19.9.0.0.0
    ```

15. Confirm that the patch jobs are successful:

    ```
    [root@oda1 opt]# /opt/oracle/dcs/bin/odacli list-jobs
    ```

16. Delete the software zip files from the temporary location on the appliance to save space:

    ```
    [root@oda1 opt]# rm software_file
    rm: remove regular file software_file? y
    ```

Related Topics

- Patching Existing Database Homes on Bare Metal Systems Using the Browser User Interface
  Use the Browser User Interface to patch database homes to the latest release on bare metal systems.

Related Topics

- Oracle Database Appliance Release Notes

Patching Oracle Database Appliance Bare Metal Systems Using the Browser User Interface

Upload the Oracle Database Appliance Server Patch to the patch repository, deploy the patch bundle using the Browser User Interface, and then update the DCS agent and components using CLI commands.

Updating the Patch Repository Using the Browser User Interface

1. Download the Oracle Database Appliance patches from My Oracle Support and save them in a directory on the appliance. See the *Oracle Database Appliance Release Notes* for a list of available patches and links to download the patches.
2. Log into the Browser User Interface with the `oda-admin` user name and password.

   ```
   https://Node0–host-ip-address:7093/mgmt/index.html
   ```

3. Click **Patch Manager**.
4. In the Update Patch Repository page, enter the absolute file path and patch name, then click **Update Repository** to start the update repository job. You can list more than one file to update to the repository with a comma separated list, without spaces, or you can update each file, one at a time.
5. Click **Activity** to monitor the progress. When the job completes successfully, the Patch Repository is updated.

Running Patching Prechecks and Patching Agent, Server, and Storage Using the Browser User Interface

> **Note:**
>
> If your appliance has two nodes, you have the option to update both nodes at the same time or individually. If you update nodes individually, then update Node0 before updating Node1.

1. Do not have any jobs running or pending during the update window.
2. Click the **Appliance** tab, and then click **Patch Manager** in the Browser User Interface.
3. Wait for the Component Details to load. If you just updated the Patch Repository, click **Refresh** in the Component Details section of the page.

After the patch is uploaded to the Patch Repository, the Component Details on the page are updated with the Installed Version and Available Version for each component.

4. Select **Precheck**, click **Update Components**, then click **Submit** to verify the patches in the repository and check for conflicts.

   When the job finishes, go to the next step. Click **Activity** for job status.

5. On the Patch Manager page, click **Refresh** to refresh the Component Details. Select **Update Server**, click **Update Components**, then click **Submit** to begin the job to patch the server components.

   For multi-node systems, select the node to update: All Nodes (default), Node0, or Node1.

   The DCS agent is automatically updated whenever the Server or Storage components are updated.

   When the job finishes, go to the next step. Click **Activity** for job status.

6. On the Patch Manager page, click **Refresh** to refresh the Component Details. Select **Update Storage**, click **Update Components**, then click **Submit** to begin the job to patch the storage components.

   For multi-node systems, select the node to update: All Nodes (default), Node0, or Node1.

   For high-availability environment, you can select the **Rolling** check box to perform rolling patching of storage components.

7. Click **Activity** to monitor the progress, and verify that the job completes successfully.

All patching-related information is logged in the `dcs-agent` log file at `/opt/oracle/dcs/log/dcs-agent.log`.

Updating the DCS Admin and DCS Components After Patching

After patching your appliance using the Browser User Interface, you must update the DCS admin and DCS components manually, through CLI commands.

Follow these steps:

1. Update DCS admin:

   ```
   [root@oda1 opt]# /opt/oracle/dcs/bin/odacli update-dcsadmin -v 
   19.9.0.0.0
   ```

2. Confirm that the update is successful:

   ```
   [root@oda1 opt]# /opt/oracle/dcs/bin/odacli describe-job -i job_ID
   ```

3. Update the DCS components:

   ```
   [root@oda1 opt]# /opt/oracle/dcs/bin/odacli update-dcscomponents -v 
   19.9.0.0.0
   ```

Updating Oracle Database Appliance Repository with Database Clone Files For Bare Metal Systems

Follow these steps to update the Oracle Database Appliance repository with Oracle Database clone files for the latest release using CLI commands.

To create new databases of a specific release version, you must update the Oracle Database Appliance repository with the RDBMS Clone files for a release. Follow these steps to update the repository with Oracle Database clone files for the latest release.

1. Download the RDBMS Clone software file for a release, for example, `p30403662_199000_Linux-x86-64.zip`, and extract the RDBMS Clone software:

   For example, download the RDBMS Clone software patch for 19.9:

   ```
   unzip /tmp/p30403662_199000_Linux-x86-64.zip
   odacli-dcs-19.9.0.0.0-201020-DB-19.9.0.0.zip
   ```

2. Copy all the software files from the external client to Oracle Database Appliance. For High-Availability deployments, copy the software files to only one node. The software files are copied to the other node during the patching process. Use the `scp` or `sftp` protocol to copy the bundle.

   Example using `scp` command:

   ```
   # scp software_file root@oda_host:/tmp
   ```

   Example using `sftp` command:

   ```
   # sftp root@oda_host
   ```

   Enter the `root` password, and copy the files.

   ```
   put software_file
   ```

3. Update the repository with latest release database software:

   ```
   [root@oda1 opt]# /opt/oracle/dcs/bin/odacli update-repository -
   f /tmp/odacli-dcs-db-clone-file.zip/
   ```

   For example, for 19.9:

   ```
   [root@oda1 opt]# /opt/oracle/dcs/bin/odacli update-repository -
   f /tmp/odacli-dcs-19.9.0.0.0-201020-DB-19.9.0.0.zip
   ```

   Follow the same steps to update the repository with the RDBMS Clone software for other supported database versions such as 12.2, 12.1, and so on.

4. Confirm that the repository update is successful:

   ```
   [root@oda1 opt]# /opt/oracle/dcs/bin/odacli list-jobs
   [root@oda1 opt]# /opt/oracle/dcs/bin/odacli describe-job -i job_ID
   ```

5. Delete the software zip files from the temporary location on the appliance to save space:

   ```
   [root@oda1 opt]# rm software_file
   rm: remove regular file software_file? y
   ```

Patching Existing Database Homes on Bare Metal Systems Using the Browser User Interface

Use the Browser User Interface to patch database homes to the latest release on bare metal systems.

Before patching the database home, upload the RDBMS Clone Files for the database version, to the repository. See *Updating Oracle Database Appliance Repository with Database Clone Files Using the CLI* for the procedure to update the repository with the latest RDBMS Clone Files.

1. Log into the Browser User Interface with the `oda-admin` user name and password.

   ```
   https://Node0-host-ip-address:7093/mgmt/index.html
   ```

2. Click the **Database** tab, and then click **Patch** on the left pane.
3. Click Patch, and then select the Action as **Precheck** to run pre-checks before patching the database.

   Click **Activity** for job status.
4. On the Patch page, for the database to be patched, click **View** and select **Pre-patch reports** to view the pre-check report. Fix any errors, and then select Action as **Apply** to patch the database.
5. Verify that the patching job completes successfully.

Related Topics

- Patching Oracle Database Appliance Bare Metal Systems Using the Command-Line
  Follow these steps to apply patches to your Oracle Database Appliance bare metal deployment and existing Oracle Database homes, using CLI commands.

Related Topics

- Oracle Database Appliance Release Notes

Patching Oracle Database Appliance Virtualized Platform

Follow these steps to apply patches to Oracle Database Appliance OAKCLI Virtualized Platform using CLI commands.

1. Download the Oracle Database Appliance Server Patch for OAK Stack and Virtualized Platforms (patch 31922080) from My Oracle Support to a temporary location on an external client. Refer to the *Oracle Database Appliance Release Notes* for 19.9, for details about the software for the latest release.

   For example, download the Oracle Database Appliance Server Patch for OAK Stack and Virtualized Platform for 19.9:

   ```
   p31922080_199000_Linux-x86-64_1of5.zip
   ```

2. Copy the software files from the external client to Oracle Database Appliance. For two-node systems, ensure that you copy the software files to ODA_BASE on **both** nodes. Use the `scp` or `sftp` protocol to copy the bundle.

   Example using `scp` command:

   ```
   scp software_file root@oda_host:/tmp
   ```

   Example using `sftp` command:

   ```
   sftp root@oda_host
   ```

   Enter the `root` password, and copy the files.

   ```
   put software_file
   ```

3. Update the repository with the server software:

   ```
   [root@oda1 opt]# oakcli unpack -package path_to_patch_file
   ```

   For example, for 19.9:

   ```
   # oakcli unpack -package /tmp/OAKPatchBundle_19.9.0.0.0_201013.1.zip
   ```

4. Apply the server update:

   ```
   [root@oda1 opt]# /opt/oracle/oak/bin/oakcli update -patch version --
   server
   ```

   For example, for 19.9:

   ```
   [root@oda1 opt]# /opt/oracle/oak/bin/oakcli update -patch
   19.9.0.0.0 --server
   ```

5. Update the storage components.

   ```
   [root@oda1 opt]# /opt/oracle/oak/bin/oakcli update -patch version --
   storage
   ```

For example, for 19.9:

```
[root@oda1 opt]# /opt/oracle/oak/bin/oakcli update -patch
19.9.0.0.0 --storage
```

6. **To patch existing Oracle Database Homes to release 19.9:**

   a. Download the Oracle Database patches for your database version, available in the server patch (patch 31922080) software file to `/tmp` location. For example, for Oracle Database release 18c, download `p31922080_199000_Linux-x86-64_2of5.zip`. For Oracle Database release 12.2, download `p31922080_199000_Linux-x86-64_3of5.zip`, for Oracle Database release 12.1, download `p31922080_199000_Linux-x86-64_4of5.zip`, and for Oracle Database release 11.2.0.4, download `p31922080_199000_Linux-x86-64_5of5.zip`.

   ```
   p31922080_199000_Linux-x86-64_1of5.zip
   p31922080_199000_Linux-x86-64_2of5.zip
   p31922080_199000_Linux-x86-64_3of5.zip
   p31922080_199000_Linux-x86-64_4of5.zip
   p31922080_199000_Linux-x86-64_5of5.zip
   ```

   b. Unpack the Oracle Database patch for your database version. For example, for Oracle Database 18c, unpack `p31922080_199000_Linux-x86-64_2of5.zip`.

   ```
   oakcli unpack -package /tmp/p31922080_199000_Linux-
   x86-64_2of5.zip
   ```

   c. Update the database homes with latest release database software:

   ```
   [root@oda1 opt]# /opt/oracle/oak/bin/oakcli update -patch
   version --database
   ```

   For example, for 19.9:

   ```
   [root@oda1 opt]# /opt/oracle/oak/bin/oakcli update -patch
   19.9.0.0.0 --database
   ```

   d. Use the interactive command line to specify the database homes that you want to update to the latest release.

7. Verify that the updates are applied.

   ```
   [root@oda1 opt]# /opt/oracle/oak/bin/oakcli show version -detail
   ```

8. Delete the software zip files from the temporary location on the appliance to save space:

   ```
   [root@oda1 opt]# rm software_file
   rm: remove regular file software_file? y
   ```

9. Enable the discovery of repositories from ODA_BASE and restart OAK.

```
[root@oda1 opt]# oakcli enable startrepo -node 0
[root@oda1 opt]# oakcli enable startrepo -node 1
[root@oda1 opt] # oakcli restart oak
```

Updating Oracle Database Appliance Repository with Database Clone Files For Virtualized Platform

Follow these steps to update the Oracle Database Appliance repository with Oracle Database clone files for Virtualized Platform for the latest release using CLI commands.

To create new databases of a specific release version, you must update the Oracle Database Appliance repository with the RDBMS Clone files for a release. Follow these steps to update the repository with Oracle Database clone files for the latest release.

1. Download the RDBMS Clone software for Virtualized Platform for a release, for example, patch 30403653 for release 19.9, and extract the Oracle Database Clone software:

   For example, download the Oracle Database Clone software patch for 19.9:

   ```
   p30403653_199000_Linux-x86-64.zip
   ```

2. Copy the software file from the external client to Oracle Database Appliance.
   For High-Availability deployments, copy the software file to only one node. The software file is copied to the other node during the patching process. Use the `scp` or `sftp` protocol to copy the bundle.

   Example using `scp` command:

   ```
   # scp software_file root@oda_host:/tmp
   ```

   Example using `sftp` command:

   ```
   # sftp root@oda_host
   ```

   Enter the `root` password, and copy the files.

   ```
   put software_file
   ```

3. Unpack the software:

   ```
   [root@hostname ~]# /opt/oracle/oak/bin/oakcli unpack -package /tmp/
   p30403653_199000_Linux-x86-64.zip
   ```

4. Use the `oakcli create database` command to create a database of a specific release.

Applying Additional Patches and Updates on Bare Metal Systems

Configure additional patch repositories and patch your operating system and databases to ensure that your deployment has the latest updates and security fixes.

- Enabling Kernel Updates
  Oracle Ksplice enables you to update your systems with the latest kernel security and bug fix updates.
- Applying Out-of-Cycle Database Patches
  The out-of-cycle patching feature enables administrators to patch databases in the Oracle Database Appliance deployment with the latest Oracle Database Release Update, outside of the Oracle Database Appliance releases.

Enabling Kernel Updates

Oracle Ksplice enables you to update your systems with the latest kernel security and bug fix updates.

You can download and install the latest Oracle Ksplice updates (uptrack-updates) with either the local ULN repository or ULN channel.

Follow these steps to install Oracle KSplice:

1. Register your server with Unbreakable Linux Network (ULN). By default, you are registered for the Oracle Linux Latest channel for your operating system and hardware.
2. Log in to Unbreakable Linux Network:

   https://linux.oracle.com
3. Ensure that you have access to the Internet on the server where you want to use Ksplice. For example, if you are using a proxy server, then set the proxy server and port values in the shell with commands similar to the following:

   ```
   # export http_proxy=http://proxy.company.com:port
   # export https_proxy=http://proxy.company.com:port
   ```
4. Register the server:

   ```
   # uln_register
   ```
5. Set up the local repository as described in the Oracle Ksplice user documentation. This enables you to download the latest Ksplice update packages at regular intervals without requiring a direct connection to the Oracle Uptrack server or to ULN.
6. To update a system to a specific effective kernel version, install the `uptrack-updates` package for the current kernel.

   ```
   yum -y install uptrack-updates-'uname -r'
   ```

You can also download the `uptrack-updates` RPM from the Ksplice channel and install the RPM manually. For example:

```
# rpm -Uvh uptrack-
updates-4.14.35-1902.11.3.1.el7uek.x86_64-20200325-0.noarch.rpm
```

See Also:

Oracle Linux Ksplice User's Guide for information about configuring Oracle Ksplice at: https://docs.oracle.com/cd/E37670_01/E39380/html/ksplice-enhanced-offline.html

Applying Out-of-Cycle Database Patches

The out-of-cycle patching feature enables administrators to patch databases in the Oracle Database Appliance deployment with the latest Oracle Database Release Update, outside of the Oracle Database Appliance releases.

You can apply Oracle Database Release Update (RU) patches manually using OPatch. Refer to the relevant section in this topic to run the OPatch for your database version.

Note:

The OPatch commands and procedures described in this topic are examples, and may need modifications based on a specific Oracle Database Release Update (RU). Always refer to the Readme of the Oracle Database Release Update (RU) for additional commands and steps.

Note:

It is strongly recommended that you patch your deployment through the Oracle Database Appliance releases, whenever possible.

Note:

You can apply out-of-cycle patches to both baremetal and Virtualized Platform deployments using this procedure.

Using OPatchauto to Manually Patch Oracle Database Release 12c and Later

1. Confirm that the `dcs-agent` and other components are updated to the latest release.

   ```
   # odacli describe-component
   # odacli list-dbhomes
   ```

2. Update OPatch to the latest version, if available:
   a. Download the latest OPatch version from My Oracle Support.
   b. Copy the files to the local host and extract them to the *ORACLE_HOME*/`OPatch` directory.
   c. Update the OPatch tool as `oracle` user.

      ```
      /bin/rm -rf $ORACLE_HOME/OPatch/
      su - oracle -c /usr/bin/unzip -q -o OPatch_zip_location/
      p6880880_122010_Linux-x86-64.zip -d $ORACLE_HOME
      ```

3. Download the latest database patches from My Oracle Support and copy the files to the local host.

   ```
   scp patchfilename root@hostname:directory
   ```

4. Unzip patches to an empty directory, for example, `/tmp/patchesDir` as `oracle` user.
   This creates sub directories under `/tmp/patchesDir` with bug numbers. If the patch you are applying is a Release Update (RU), then the patch directory has multiple sub-directories.

   ```
   /usr/bin/unzip -o location_of_patches/p29301631_180000_Linux-
   x86-64.zip -d /tmp/patchesDir
   ```

5. For Oracle Database Appliance High-Availability deployments, set up SSH Keys for secure connection.
6. Analyze the patches.

   ```
   $ORACLE_HOME/OPatch/opatchauto apply
   directory_with_patches_extracted -analyze -oh $ORALCE_HOME -
   log /tmp/opatchAutoAnalyzePatch.log
   ```

7. As `root` user, apply the patches.

   ```
   $ORACLE_HOME/OPatch/opatchauto apply directory_to_extract_patches -
   oh $ORACLE_HOME -inplace
   ```

8. When patching is completed on both nodes, run `utlrp.sql` and `catcon.pl` scripts to recompile invalid objects in the database.
9. Update the registry to ensure that system component values are registered.

   ```
   # odacli update-registry -n dbhome -f
   ```

Using OPatch to Manually Patch Oracle Database Release 11.2.0.4

1. Confirm that the dcs-agent and other components are updated to the latest release.

   ```
   # odacli describe-component
   # odacli list-dbhomes
   ```

2. Update OPatch to the latest version, if available:
   a. Download the latest OPatch version from My Oracle Support.
   b. Copy the files to the local host and extract them to the *ORACLE_HOME*/OPatch directory.
   c. Update the OPatch tool as oracle user.

   ```
   /bin/rm -rf $ORACLE_HOME/OPatch
   su - oracle -c /usr/bin/unzip -q -o OPatch_zip_location/
   p29141056_112040_Linux-x86-64.zip -d $ORACLE_HOME
   ```

3. Download the latest database patches from My Oracle Support and copy the files to the local host. Unzip the database patches to an empty directory, for example, /tmp/patchesDir as oracle user.
   This creates sub directories under /tmp/patchesDir with bug numbers. If the patch you are applying is an Oracle Database Release Update (RU), then the patch directory has multiple sub-directories.

   ```
   su - oracle -c '/usr/bin/unzip -o p29141056_112040_Linux-x86-64.zip
   -d /tmp/patchesDir'
   ```

4. Delete bug#2015 if it exists in the inventory.
   a. Check if bug#2015 exists in the inventory:

   ```
   su - oracle
   export ORACLE_HOME=path_to_the_11.2.0.4_ORACLE_HOME
   $ORACLE_HOME/OPatch/opatch lspatches | grep -i "OCW" | cut -d
   ';' -f1
   ```

   b. The command returns a bug number, for example, 28729234. Navigate to the inventory:

   ```
   cd $ORACLE_HOME/inventory/oneoffs/bug# from above command/etc/
   config
   ```

   c. Check if inventory.xml contains a string such as 'bug number="2015"'. If no match is found, then no action is required, and you can continue with step 6 in this procedure.

   ```
   grep 'bug number="2015"' inventory.xml
   echo $?  ( the command returns 0, if match found )
   ```

   d. Take a backup of inventory.xml.

      ```
      cp inventory.xml inventory.xml.$(date +%Y%m%d-%H%M)
      ```

   e. Delete entry like <bug number="2015" ...> from inventory.xml.

      ```
      sed '/bug number="2015"/d' inventory.xml
      ```

5. Run prechecks using the opatch command for every patch.

   ```
   su - oracle -c '$ORACLE_HOME/OPatch/opatch prereq CheckComponents
   -ph /tmp/patchesDir/29301631 -oh $ORACLE_HOME'
   su - oracle -c '$ORACLE_HOME/OPatch/opatch prereq
   CheckConflictAgainstOH -ph /tmp/patchesDir/29301631 -oh
   $ORACLE_HOME'
   ```

   Run both commands for all the sub patches also. If there are any conflicting bugs, then rollback the one-off patches.

6. Apply the patch using the opatch auto command.

   ```
   $ORACLE_HOME/OPatch/opatch auto /tmp/patchesDir/29301631 -oh
   $ORACLE_HOME -ocmrf /opt/oracle/dcs/rdbaas/config/default-ocm.rsp
   ```

7. Verify that the database is up and running after applying the patch.

   ```
   /u01/app/18.0.0.0/grid/bin/crsctl status resource ora.on6i.db -n
   patched_db
   ```

8. Run catbundle.sql on all databases in this home.

   ```
   su oracle
     export ORACLE_HOME=ORACLE_HOME
     export ORACLE_HOME=ORACLE_SID
           $ORACLE_HOME/bin/sqlplus "/ as sysdba" @$ORACLE_HOME/rdbms/
   admin/catbundle.sql
               @$ORACLE_HOME/rdbms/admin/catbundle.sql
   ```

Cleaning Up the Patch Repository

Use the Browser User Interface or Command Line Interface to delete obsolete or old patches from the repository.

About Cleaning Up the Patch Repository

After patching Oracle Database Appliance with the latest patches, old unused clone files may remain and consume space in the repository. Cleanup repository deletes the unused clone/patch files to reclaim space. You can clean up the repository using the Browser User Interface or ODACLI commands.

Cleaning Up the Patch Repository Using ODACLI command

```
# odacli cleanup-patchrepo [-cl clones] | [-v version [-comp
component]]| [-l local|-n NodeID]
```

Specify the clone file names and the node from which you want to delete the old patches.

For details about the command options, see the chapter *Oracle Database Appliance Command-Line Interface*.

Cleaning Up the Patch Repository Using the Browser User Interface

Follow these steps to clean up the patch repository:

1. In the Browser User Interface, click **Patch Manager**.
2. Click the **Cleanup Repository** tab, and then click **Refresh** to list the available patches in the repository.
3. Select the Components, such as old Oracle Grid Infrastructure or Oracle Database clone files that you want to clean up from the repository, and the Patch Version, for example, an older release of Oracle Database Appliance.
4. Click **Cleanup Clone Files** to clean up clone files for selected components from the repository at `/opt/oracle/oak/pkgrepos/orapkgs/clones/`.
5. Click **Cleanup Repository** to submit the cleanup repository job.
6. Click **Activity** to monitor the progress. When the job completes successfully, the Patch Repository is updated.

Related Topics

- odacli cleanup-patchrepo
  Use the `odacli cleanup-patchrepo` command to delete obsolete or old patches from the repository.

About Upgrading to a Different Database Home

Understand how to upgrade to a different database home using either the Browser User Interface or `odacli` commands.

Prerequisites for Upgrading Database Homes

You can upgrade database homes of the following releases:

- Oracle Database 18c to 19c
- Oracle Database 12.2 to 19c
- Oracle Database 12.1 to 19c
- Oracle Database 11.2.0.4 to 19c
- Oracle Database 12.2 to 18c
- Oracle Database 12.1 to 18c
- Oracle Database 11.2.0.4 to 18c

- Oracle Database 12.1 to 12.2
- Oracle Database 11.2.0.4 to 12.2
- Oracle Database 11.2.0.4 to 12.1

Before upgrading to a different database home, upload the Oracle RDBMS Clone Files for the database version, to the repository, and then create the database home. See *Patching Oracle Database Appliance Using the CLI* for the procedure to update the repository with the latest Oracle RDBMS Clone Files.

About Upgrading Database Homes Using the Browser User Interface

Follow these steps to upgrade to a different database home using the Browser User Interface.

1. Log into the Browser User Interface with the `oda-admin` user name and password.

   ```
   https://Node0–host-ip-address:7093/mgmt/index.html
   ```

2. Click the **Database** tab, and then select a database, click **Actions**, and then click **Upgrade**.
3. Verify that the database upgrade job completes successfully.

About Upgrading Database Homes Using the Command-Line Interface

Run the following command to upgrade to a different database home using the CLI:

```
odacli upgrade-database -i Comma separated list of database ids -from
source dbhome id -to destination dbhome id [-j] [-h]
```

For more information about the options for the `upgrade-database` command, see the chapter *Oracle Database Appliance Command-Line Interface*.

8
Re-imaging Oracle Database Appliance

Bare metal operating system re-imaging installs Oracle Database Appliance operating system software on the local (boot) drive.

Bare Metal is a non-virtualized Oracle Database Appliance configuration. Oracle Database Appliance ships from the factory with a bare metal configuration, default ISO image and Appliance Manager installed. Use the OS ISO Image to restore the OS to the "shipped from factory" state. Use only when necessary. Reimaging does not patch the firmware or update the component versions; it only re-images the local system disk from an operating system perspective. After imaging is completed, redeploy the End User image, then restore from backup, as needed.

- Uninstalling Oracle Database Appliance Components
  Use the Oracle Database Appliance cleanup deploy utility, `/opt/oracle/oak/onecmd/cleanup.pl` to uninstall Oracle Database Appliance components.
- Restoring an Oracle Database Appliance Baremetal System
  Re-image Oracle Database Appliance to perform a bare metal restore of Oracle Database Appliance.
- Performing Secure Erase of Data on Storage Disks
  With this release, you can securely erase data from storage devices. Running the secure erase tool deletes the data on the storage disk permanently.

Related Topics

- Errors when re-imaging Oracle Database Appliance
  Understand how to troubleshoot errors that occur when re-imaging Oracle Database Appliance.

Uninstalling Oracle Database Appliance Components

Use the Oracle Database Appliance cleanup deploy utility, `/opt/oracle/oak/onecmd/cleanup.pl` to uninstall Oracle Database Appliance components.

About the Cleanup Utility

Use the cleanup deploy utility to do the following:

- Uninstall Oracle Auto Service Request (Oracle ASR)
- Uninstall Oracle Trace File Analyzer (TFA)
- Uninstall Oracle ORAchk Health Check Tool
- Uninstall Oracle Grid Infrastructure and the Oracle stack
- Reset or delete the Oracle Linux udev rules
- Delete users and groups that were created when the appliance was created.

The script removes the firstnet config and the client access VLAN UNIX_DB, but does not delete any other VLANs. The script also resets any disabled CPU cores and enables all of the cores.

The cleanup utility runs in two modes: default and force mode. In the default mode, the commands used as part of cleanup do not use the force option. The Oracle ASM disk status is changed from MEMBER to FORMER, but ASM header on the disk is not erased. The default mode can be used only for cleaning up or re-provisioning of the same system.

> **Note:**
>
> For High-Availability systems, run the cleanup utility on both nodes sequentially. Ensure that the cleanup utility has completed on the first node, and then start the process on the second node.

Running the Cleanup Utility for a Baremetal Deployment

```
# perl /opt/oracle/oak/onecmd/cleanup.pl [-griduser grid_user] [-dbuser
db_user] [-groups comma separated list of groups][-erasedata] [f]
```

When the *grid_user* and *db_user* are the same (`roleSeparation=false`), you must run the script for each user (`-gridUser` and `-dbUser`).

Table 8-1 Command Options for Cleanup Utility

Option	Description
`grid_user`	Describes the Oracle Grid Infrastructure user name. The default user is `grid`.
`db_user`	Describes the database user name. The default user is `oracle` Example with `grid` and `oracle` users: `cleanup.pl -griduser oracle -dbuser oracle`
`groups`	Describes the comma-separated list of groups. The default groups are `oinstall,dba,asmadmin,asmoper,asmdba`.
`erasedata`	Erases the data disks which are used by Oracle Database software. It is mandatory to run this option if intention of cleanup is to reuse or move these disks on other systems. Example of secure erase: `cleanup.pl -erasedata`
`cleanDefNet`	Cleans up the default public network.

Table 8-1 (Cont.) Command Options for Cleanup Utility

Option	Description
checkHeader	Checks for OAK/ASM header on disks after successfully running the cleanup script. Use this to validate if the OAK/ASM header was erased by the cleanup script or not. Example of checking disk header: `cleanup.pl -checkHeader`

f	In the force mode, all commands use the force option. The ASM disk header is erased. The oakd header on the disk is erased in both default and force modes.
	Example of default mode:
	`cleanup.pl`
	Example of force mode:
	`cleanup.pl -f`

Running the Cleanup Script for a Virtualized Platform Deployment

You can use the cleanup deploy script tool to clean up ODA_BASE on Oracle Database Appliance Virtualized Platform.

Follow these steps to clean up a Virtualized Platform deployment:

1. Before removing ODA_BASE, ensure that you run the /opt/oracle/oak/onecmd/cleanupDeploy.pl script.

   ```
   # /opt/oracle/oak/onecmd/cleanupDeploy.pl [-h] [-erasedata]
   ```

2. Run the following command from dom0 on Node 0 to remove ODA_BASE and the initial network configuration.

   ```
   # /opt/oracle/oak/tools/cleanOdabase.py
   ```

Restoring an Oracle Database Appliance Baremetal System

Re-image Oracle Database Appliance to perform a bare metal restore of Oracle Database Appliance.

Bare metal restore uses Oracle Integrated Lights Out Manager (ILOM) to re-image the Oracle Database Appliance node. The ILOM must be configured before performing a bare metal restore or re-image. Generally, the ILOM is configured as part of readying for deploying Oracle Database Appliance.

Download the Oracle Database Appliance Bare Metal ISO image to your local machine before you launch the ILOM console.

Follow these steps to re-image your appliance. For Oracle Database Appliance High-Availability deployment, follow these steps on **both** nodes.

1. Open a browser and connect to Oracle Integrated Lights Out Manager (ILOM) on Node 0 as root.

   https://*ilom-ip-address*

2. Launch the Remote Console.

   a. Expand **Remote Control** in the left navigation.

   b. Click the **Redirection** tab.

   c. Click **Launch** for the Remote Console in the Actions menu.

      The state of the system determines what appears on the Console page.

3. Add the image.

   a. Click the **KVMS** tab, then select **Storage**.

   b. Click **Add**.

   c. Browse to the Oracle Database Appliance Bare Metal ISO Image, highlight the image, then click **Select**.

   d. Click **Connect**.

      The mounting of the ISO image is successful when the **Connect** button changes to a **Disconnect** button.

   e. Click **OK**

      The CD-ROM icon in the top right corner is highlighted.

4. Configure the CD-ROM as the next boot device.

   a. Expand **Host Management** in the left menu of the ILOM Remote Console tab.

   b. Click **Host Control**.

   c. Select **CDROM** from the Next Boot Device menu, then click **Save**.

5. Power cycle the node.

   a. Click **Power Control** in the **Host Management** menu.

   b. Select **Power Cycle** , then click **Save**.

   When the node comes back after the power cycle, re-imaging starts automatically. The Oracle Linux page appears, followed by the Running Post-Install scripts page.

   The Running Post-Install scripts page is a static page and might give the impression that the re-imaging process is not progressing. The post-install process during re-imaging will wait until the synchronization between the partitions of the two mirrored local hard disks is complete, which can take 15 to 20 minutes to complete.

   To check the progress of re-synchronization, press the ALT-F2 key combination to open a second console and enter the following command:

   ```
   # cat /proc/mdstat
   ```

When the re-synchronization is complete, re-imaging is completed and the machine restarts.

After the machine restarts, the system is ready for you to deploy the Oracle software on the appliance to create an Oracle Database Appliance bare metal platform.

Performing Secure Erase of Data on Storage Disks

With this release, you can securely erase data from storage devices. Running the secure erase tool deletes the data on the storage disk permanently.

You may want to consolidate storage disks between appliances. For example, you can use X7-2 disks on X6-2 models, and may want to consolidate all X6-2 disks on one system, and use all new X7-2 storage disks on another system. In such cases, use secure erase to erase headers from disks before re-imaging the disks, since the storage disks across the appliances may have different partition ratios.

> **Note:**
>
> Running the secure erase tool removes data from storage disks permanently. If you have any data on the disk, then take a backup of your storage disk before running the secure erase tool.

Follow the steps to run the secure erase tool:

1. Stop `oakd` and the database and Oracle Grid Infrastructure before running the secure erase tool.

   On bare metal systems, run the command:

   ```
   # odaadmcli stop oak
   ```

   On Virtualized Platforms:

   ```
   # oakcli stop oak
   ```

   To stop Oracle Clusterware resources:

   ```
   # crsctl stop crs -f
   ```

2. Run the secure erase tool:

   ```
   # /opt/oracle/oak/bin/odaeraser.py
   ```

3. You can also run the secure erase tool when running the cleanup tool:

   ```
   # /opt/oracle/oak/onecmd/cleanup.pl -erasedata
   ```

Example 8-1 Options for the Secure Erase Tool

Option	Description
`-a`, `--all`	Erases all disks. For example: `# /opt/oracle/oak/bin/odaeraser.py --all`
`--disk` *`disk1,disk2`*	Erases specified disks. For example: `# /opt/oracle/oak/bin/odaeraser.py --disk e0_pd_00,e0_pd_01`
`--dryrun`	Runs the tool in the test mode
`--type HDD|SSD|NVMe`	Erases the type of disk specified
`-v`, `--verbose`	Displays verbose output
`-h`, `--help`	Displays all CLI options for the tool

9

Managing Oracle Databases

Manage the Oracle Databases on your Oracle Database Appliance.

- About Administrative Groups and Users on Oracle Database Appliance
  Oracle Database Appliance Browser User Interface deployment creates operating system groups and users whose members are granted system administration privileges on the appliance.
- About Data Migration Options for Oracle Database Appliance
  Oracle Database Appliance supports the use of standard Oracle Database loading and migration tools.
- About Standard Edition High Availability for Oracle Database Appliance
  Oracle Database Appliance supports Standard Edition High Availability solution with Oracle Grid Infrastructure that provides cluster-based failover for Oracle Database 19c Standard Edition.
- About Transparent Database Encryption (TDE) in Oracle Database Appliance
  Transparent Data Encryption (TDE) enables you to encrypt sensitive data that you store in tables and tablespaces.
- Working with Databases
  Use the Browser User Interface to display a list of databases, database details, and create and delete databases. You can use CLI commands to manage your databases.
- Working with Database Homes
  Use the Browser User Interface to display a list of database homes, details, and create and delete database homes.
- Migrating Databases
  Review these topics to learn how to prepare for and migrate an entire database to your Oracle Database Appliance.
- About Managing Multiple Database Instances Using Instance Caging
  Use instance caging to manage your system resources on Oracle Database Appliance.
- Oracle EM Express and DB Console
  You can use Oracle Enterprise Manager Database Express (EM Express), or the Database Control Console (DB Console) to manage your database.

About Administrative Groups and Users on Oracle Database Appliance

Oracle Database Appliance Browser User Interface deployment creates operating system groups and users whose members are granted system administration privileges on the appliance.

During configuration, two administrative accounts are created for Oracle Database Appliance: the user `grid`, with a user ID (UID) of 1001, and the user `oracle`, with a

UID of 1000. The user `grid` is the Oracle Grid Infrastructure installation owner. The user `oracle` is the Oracle Database installation owner, and the owner of all Oracle Database homes (Oracle homes). By default, these users are members of operating system groups whose members are granted privileges to start up and administer Oracle Database and Oracle Automatic Storage Management.

The following table describes the Oracle system privileges groups, and information about the operating system authentication groups:

Table 9-1 Operating System Groups and Users on Oracle Database Appliance

Oracle System Privileges	Group Name	Group ID (GID)	***grid*** **is a member**	***oracle*** **is a member**
Oracle Inventory group (OINSTALL)	`oinstall`	1001	yes (primary group)	yes (primary group)
OSOPER for dbaoper group	`dbaoper`	1002	yes	yes
OSDBA group	`dba`	1003	no	yes
OSASM group for Oracle ASM	`asmadmin`	1004	yes	no
OSOPER for ASM group	`asmoper`	1005	yes	no
OSDBA for ASM group	`asmdba`	1006	yes	yes

To change the Group Name and GID from the default values on Oracle Database Appliance bare metal platforms, change the default values from the Browser User Interface during the deployment. If you create an initial database during deployment, then the password for the SYS and SYSTEM users is the password that you set in the Browser User Interface.

To change the Group Name and GID from the default values on the Oracle Database Appliance Virtualized Platform, use the `-advance` parameter with the command `oakcli deploy`. If you create an initial database during deployment, then the password for the SYS and SYSTEM users is the ROOT password from the Configurator.

Note:

Change the password for both users as soon as possible after configuration to prevent unauthorized access to your database using these privileged accounts.

About Data Migration Options for Oracle Database Appliance

Oracle Database Appliance supports the use of standard Oracle Database loading and migration tools.

If you are loading data or migrating data from an existing database to Oracle Database Appliance, then you can use the standard Oracle Database loading and migration tools. These tools include the following:

- Oracle GoldenGate
- SQL*Loader
- Oracle Data Pump
- transportable tablespaces
- RMAN

You can also use the RMAN utility to back up and recover databases on Oracle Database Appliance.

About Standard Edition High Availability for Oracle Database Appliance

Oracle Database Appliance supports Standard Edition High Availability solution with Oracle Grid Infrastructure that provides cluster-based failover for Oracle Database 19c Standard Edition.

About Standard Edition High Availability for Oracle Database 19c

With Standard Edition High Availability, when there is an instance or a node failure, the database automatically fails over to the other node, after attempting to restart on the local node. The database is restarted on the surviving node, thereby providing high availability for Oracle Standard Edition databases.

If your Oracle Database deployment contains Standard Edition 2 Oracle Real Application Cluster (Oracle RAC) databases of releases earlier than 19c, then they must be converted to a Standard Edition High Availability configuration as part of the upgrade to Oracle Database 19c.

For more details about this feature, refer to the Oracle Database Documentation Library at https://docs.oracle.com/en/database/oracle/oracle-database/index.html.

About Standard Edition High Availability for Oracle Database Appliance Release 19.9

Standard Edition High Availability for Oracle Database 19c is supported on Oracle Database Appliance for high availability deployments, that is, deployments that have two server nodes, shared storage, and server interconnects.

Oracle Database Appliance enables automatic configuration for failover at deployment time for Oracle Database 19c Standard Edition single-instance databases. Both nodes have Oracle Homes for Standard Edition single-instance databases.

Single-instance Oracle Database 19c Standard Edition databases created using the ODACLI commands or the Browser User Interface (BUI) have Standard Edition High Availability enabled by default. You can also choose to disable the High Availability option. To enable Standard Edition High Availability for existing Standard Edition Oracle RAC databases of releases earlier than 19c, you must convert these Oracle RAC databases to single-instance databases, and then upgrade to single-instance Oracle Database 19c Standard Edition database with Standard Edition High Availability enabled by default.

About Provisioning, Upgrading, and Relocating Standard Edition High Availability Oracle Database

To create a single-instance Oracle Database 19c with Standard Edition High Availability, use the following command:

```
odacli create-database -u db_unique_name -n db_name -dh db_home -y SI
-g target_node
```

To upgrade a Standard Edition Oracle RAC Database to Oracle Database 19c Standard Edition, convert the Oracle RAC Database to a single-instance Oracle Database:

```
odacli modify-database -in db_name -y single-instance
```

Then, upgrade the single-instance database to Oracle Database 19c with Standard Edition High Availability as follows:

```
odacli upgrade-database -i db_id -to destination_dbhome -sh
```

To relocate a Standard Edition High Availability Oracle Database from one node to another outside of a failover, use the following command:

```
odacli modify-database -in db_name -g target_node | -th target_host
```

For detailed information about these ODACLI command options, see the *Oracle Database Appliance Command Line Reference* chapter in this guide.

Related Topics

- Oracle Database Appliance Command-Line Interface
  The command-line interface has different classes of tools to manage Oracle Database Appliance.

About Transparent Database Encryption (TDE) in Oracle Database Appliance

Transparent Data Encryption (TDE) enables you to encrypt sensitive data that you store in tables and tablespaces.

After the data is encrypted, this data is transparently decrypted for authorized users or applications when they access this data. TDE helps protect data stored on media (also called data at rest) in the event that the storage media or data file is stolen.

Oracle Database uses authentication, authorization, and auditing mechanisms to secure data in the database, but not in the operating system data files where data is stored. To protect these data files, Oracle Database provides Transparent Data Encryption (TDE).

TDE encrypts sensitive data stored in data files. To prevent unauthorized decryption, TDE stores the encryption keys in a security module external to the database, called a keystore.

Oracle Database Appliance provides the option to create TDE-enabled databases, backup, recover, and restore TDE-enabled databases, backup and restore TDE wallet, re-keying of TDE master encryption key, and changing the password of password-protected Keystore.

Note:

To enable Transparent Data Encryption (TDE), you must deploy Enterprise Edition Oracle Database 18c or later.

See Also:

Using Transparent Data Encryption in the *Oracle Database Advanced Security Guide*

Caution:

When you enable TDE, you are prompted to set a password for the TDE wallet. Provide a strong password for security compliance. Set the password carefully, and ensure that this password is available to you at all times for database management operations. Failure to provide the TDE wallet password when prompted, will cause an error in accessing encrypted data.

Working with Databases

Use the Browser User Interface to display a list of databases, database details, and create and delete databases. You can use CLI commands to manage your databases.

Note:

Oracle Database Appliance enables unified auditing for databases created in new database homes. Unified audit trail captures audit information and places them in one location and in one format. This consolidated view enables auditors to co-relate audit information from different components. Having a single audit trail also improves management and security of the audit trail. For more information about unified audit trail for Oracle Database, see *Oracle Database Security Guide*.

- Viewing Databases
  Use the Oracle Appliance Manager Browser User Interface to display a list of Oracle databases and database details, create, upgrade, and delete a database in Oracle Database Appliance.
- Creating a Database Using the Browser User Interface
  Use the Oracle Appliance Manager Browser User Interface to create a database in Oracle Database Appliance.

- Creating a Database Using ODACLI Commands
  Create a database from the command-line interface.
- Cloning a Database from Backup
  Use the Browser User Interface to clone a database from a backup.
- Cloning an Oracle ACFS Database Using the Browser User Interface
  Create a database from an existing Oracle ACFS database using the Browser User Interface.
- Cloning an Oracle ACFS Database Using Command Line Interface
  Create a database from an existing Oracle ACFS database using CLI commands.
- Modifying a Database
  Use the Oracle Appliance Manager Browser User Interface or ODACLI commands to modify a database in Oracle Database Appliance.
- Moving a Database from One Oracle Home to Another
  Use the Oracle Appliance Manager Browser User Interface or ODACLI commands to move a database from one Oracle home to another of the same database version.
- Upgrading a Database
  Use the Oracle Appliance Manager Browser User Interface to upgrade an Oracle database to a different database home version.
- Deleting a Database
  Use the Oracle Appliance Manager Browser User Interface to delete an Oracle database.

Viewing Databases

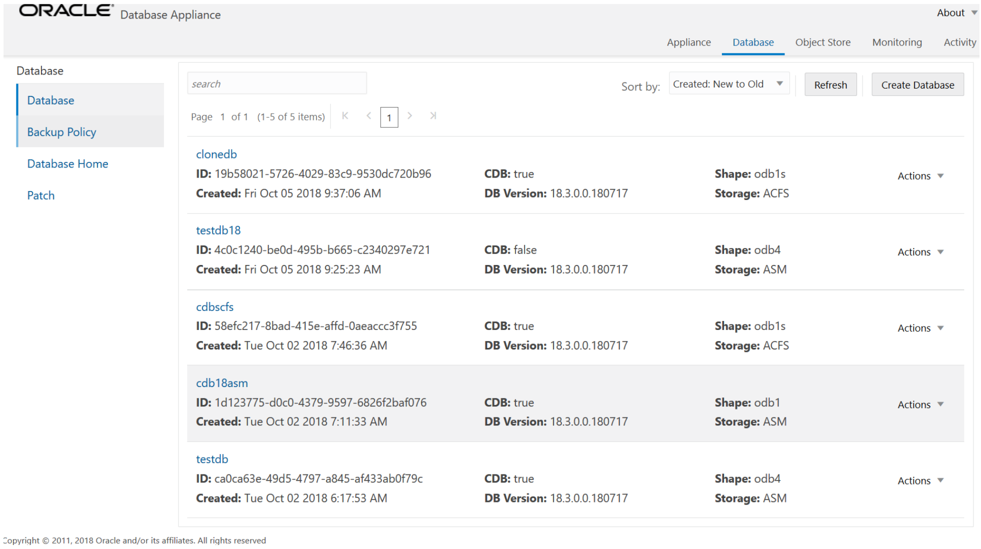
Use the Oracle Appliance Manager Browser User Interface to display a list of Oracle databases and database details, create, upgrade, and delete a database in Oracle Database Appliance.

On the Oracle Database Appliance Virtualized Platform, see the command `oakcli list databases`.

1. Log into the Browser User Interface:

   ```
   https://host name or ip-address:7093/mgmt/index.html
   ```

2. Click the **Database** tab.


ORACLE Database Appliance
About
Appliance
Database
Object Store
Monitoring
Activity
Database
Database
Backup Policy
Database Home
Patch
search
Sort by: Created: New to Old
Refresh
Create Database
Page 1 of 1 (1-5 of 5 items)
1
Actions
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clonedb
ID: 19b58021-5726-4029-83c9-9530dc720b96 **CDB:** true **Shape:** odb1s
Created: Fri Oct 05 2018 9:37:06 AM **DB Version:** 18.3.0.0.180717 **Storage:** ACFS

testdb18
ID: 4c0c1240-be0d-495b-b665-c2340297e721 **CDB:** false **Shape:** odb4
Created: Fri Oct 05 2018 9:25:23 AM **DB Version:** 18.3.0.0.180717 **Storage:** ASM

cdbscfs
ID: 58efc217-8bad-415e-affd-0aeaccc3f755 **CDB:** true **Shape:** odb1s
Created: Tue Oct 02 2018 7:46:36 AM **DB Version:** 18.3.0.0.180717 **Storage:** ACFS

cdb18asm
ID: 1d123775-d0c0-4379-9597-6826f2baf076 **CDB:** true **Shape:** odb1
Created: Tue Oct 02 2018 7:11:33 AM **DB Version:** 18.3.0.0.180717 **Storage:** ASM

testdb
ID: ca0ca63e-49d5-4797-a845-af433ab0f79c **CDB:** true **Shape:** odb4
Created: Tue Oct 02 2018 6:17:53 AM **DB Version:** 18.3.0.0.180717 **Storage:** ASM

3. (Optional) Click the database name, in blue font, to display more details about the database.
4. (Optional) Click **Actions** next to a database entry to view more details, upgrade or delete the database.

Creating a Database Using the Browser User Interface

Use the Oracle Appliance Manager Browser User Interface to create a database in Oracle Database Appliance.

Ensure that the repository is updated with Oracle RDBMS Clone files for a database version, before creating the database as described in *Updating Oracle Database Appliance Repository with Database Clone Files Using the CLI*.

> **Note:**
>
> For Standard Edition Oracle Database 19c or later, you cannot create Oracle RAC Or Oracle RAC One Node Database. You can only create single-instance Oracle Database. For Standard Edition Oracle Database 19.6 or later, you can choose to enable high availability for single-instance database.

The Browser User Interface provides a quick and easy method of creating new databases. The Create New Database page in the Browser User Interface is populated with default options for most of the configuration options. Drop-down lists enable you to quickly view and select from a list of available options. You can use the drop-down list to create a new database Oracle Database Home (ORACLE_HOME) for the database or select an existing ORACLE_HOME that you created earlier.

Oracle Database 19.9 is supported on both Oracle Automatic Storage Management (Oracle ASM) and Oracle ASM Cluster file system (Oracle ACFS). When databases are created in Oracle ACFS, each database is configured with its own Oracle ACFS file system for the datafiles and uses the following naming convention: `/u02/app/db user/oradata/db unique name`. The default size of this mount point is 100 GB.

The fields in the Browser User Interface adjust, depending on the database version you select.
Follow these steps to create a database:

1. Log into the Browser User Interface:

   `https://`*`host-ip-address`*`:7093/mgmt/index.html`

2. Click the **Database** tab.
3. Click **Create Database** to display the Create Database page.
4. Select **Create Database** on the Create Database page.
5. Enter the following information on the Create Database page to configure the database:

   a. In the **DB Name** field, enter a name for the database. The name *`db1`* appears in the field as an example of a database name, but the field is not populated. You must enter a name.

      The name must contain lowercase alphanumeric characters and cannot exceed 8 characters. The Oracle system identifier (SID) is always set to the database name.

   b. (Optional) In the **DB Unique Name** field, enter a name to define a unique name for the database.

   c. In the **Use Existing DB Home** field, select **Yes** or **No**.

   d. In the **DB Version** field, select a database bundle patch number from the drop-down list.

      Available database versions with available clones appear in the list in descending order. Supported versions that are not available in the repository appear in light gray font at the bottom of the list. Search is available for the list. To add a supported version to the repository, download the RDBMS clone file and update the repository.

   e. For the **CDB** option on Oracle Database releases later than 12.1, select **Yes** or **No**, depending on whether or not you want the database to be a container database (CDB). The default is **Yes**.

   f. In the **PDB Name** field, enter a name for the pluggable database (PDB).

      Alphanumeric characters and underscore (_) are valid. The name must begin with an alphanumeric character and cannot exceed 30 characters. The name *`pdb1`* appears in the field in italic text as an example, but it is not populated. You must enter a name.

   g. In the **PDB Admin User** field, enter a name.

      The field shows *`pdbadmin`* as an example, you must enter a name. Alphanumeric characters and underscore (_) are valid.

   h. In the Database Edition field, enter the edition for which you have a license, either **Enterprise Edition** or **Standard Edition**.

      For Standard Edition Oracle Database 19c or later, you can only create single-instance Oracle Database. For Standard Edition Oracle Database 19.6 or later, you can choose to enable high availability for single-instance database.

   i. For single-instance Oracle Database deployment, specify the **Node**, either Node0 or Node1. The default is Node0. Specify whether you want to **Enable High Availability**.

j. In the **Shape** field, select a database shape from the drop-down list. The shape determines the number of cores and total memory allocated to the database. The default is `odb1`.

k. In the **Database Class** field, select a database class from the drop-down list. If an option is not available in the list, it is not supported for the database edition on the Oracle Database Appliance or the version that you selected. The default is OLTP.

l. In the **Storage** field, select **ACFS** or **ASM** from the drop-down list. The default is Oracle ASM.

m. If the disk group redundancy was set to **Flex** during the appliance creation, then you can select the **Database Redundancy** value as **Mirror** or **High**.

n. Select the **Networks** you want to associate with the database.

o. For the **Configure EM Express** or **Configure EM Console** option, select **Yes** or **No**. The default is **No**.

   Select **Yes** to configure the Oracle Enterprise Manager Database Express (EM Express) console for Oracle Database 19.9. Selecting **Yes** enables you to use the console to manage the database.

p. In the **Password** field, enter the password for the `SYS`, `SYSTEM`, and `PDB Admin`.

   The password must begin with an alpha character and cannot exceed 30 characters. Quotation marks are not allowed.

q. In the Confirm Password field, enter the password again to confirm.

r. In the **Characterset** field, select an option from the drop-down list. The default is AL32UTF8.

s. In the **National Characterset** field, select an option from the drop-down list. The default is AL16UTF16.

t. In the **Language** field, select a database language from the drop-down list. The default is American.

u. In the **Territory** field, select a territory or location for the database from the drop-down list. The default is America.

v. For Oracle Database Enterprise Edition 18c or later, you can choose to enable Transparent Database Encryption (TDE). Select **Yes** or **No** in the **Enable TDE** option. Specify and confirm the **TDE Password**. By default, the TDE option is disabled.

6. Click **Create**. When prompted, click **Yes** to confirm that you want to start the job to create the database.

The job is submitted and a confirmation page appears with a link to the job. Click the link to view the job progress, tasks, and status.
After you close the Job confirmation page, you can click the **Activity** tab to monitor the job progress. Click the job number to view the tasks and status details. Click **Refresh** to refresh the page.

Creating a Database Using ODACLI Commands

Create a database from the command-line interface.

> **Note:**
>
> If you provisioned the appliance without creating an initial database, then you must create a Oracle home. If the version of the database home is different from the migrated database, create a database home for the migrated database. You might want to create a database home specifically for the migrated database.

> **Caution:**
>
> When you create a database with Transparent Data Encryption (TDE) enabled, you are prompted to set a password for the TDE wallet. Provide a strong password for security compliance. Enter this password carefully when setting it for the first time, and ensure that this password is available to you at all times for database management operations. Failure to provide the TDE wallet password when prompted, will cause an error in accessing encrypted data.

This example creates a new database named `PRODDB` with database version 19.9, and a new database home, if a database home does not exist.

1. Use the `odacli list-dbhomes` command to display a list of database homes and verify that a database home exists for the database version.

   Note the ID if you want to use an existing database home or if you want to get more details. Use the `odacli describe-dbhomes` command to get more details about a specific database home.

   ```
   # odacli list-dbhomes
   ID                                   Name              DB Version
   ------------------------------------ ----------------- ----------
   b727bf80-c99e-4846-ac1f-28a81a725df6 OraDB199_home1   19.9.0.0.0

   (continued)
   Home Location
   -----------------------------------------
   /u01/app/orauser/product/19.0.0.0/dbhome_1
   ```

2. Create a database home if a database home does not exist for the database version.

   If you want to create a database home for specifically for the migrated database, you can use the `odacli create-dbhome` command, or you can create the database home when you create the database. The example creates a database home for database version 19.9.0.0.0.

```
# odacli  create-dbhome -v 19.9.0.0.0
```

3. Create a database. You can use an existing database home ID or you can create a database home when creating the database.

   To create a database named `PRODDB` that uses an existing database home with ID `b727bf80-c99e-4846-ac1f-28a81a725df6`:

   ```
   # odacli create-database -n PRODDB -io -dh b727bf80-c99e-4846-
   ac1f-28a81a725df6
   ```

   To create a database named `PRODDB` with database version `19.9.0.0.0` and a database home:

   ```
   # odacli create-database -n PRODDB -v 19.9.0.0.0 -io
   ```

   To create a TDE-enabled database named `PRODDB`:

   ```
   # odacli create-database -n PRODDB -t
   ```

Cloning a Database from Backup

Use the Browser User Interface to clone a database from a backup.

When you backup a database in Oracle Database Appliance, a backup report is created. Save the backup report as a JSON file and you can use the file to create a database on the same appliance, or a different appliance.

The following are the prerequisites to cloning a database from a backup:

1. The source database backup location must be Object Store or External FRA (Network File System).
2. If you use Object Store backup location, then obtain Object Store Credentials for the host.
3. If you use an External FRA (Network File System) backup location, then obtain the Network File System (NFS) mount point location.
4. Create a backup policy using the object store credentials or NFS mount point as the backup destination.
5. Attach the backup policy to the database that you want to backup. If the source database does not have TDE enabled, then providing the Backup Encryption password is mandatory when attaching Objectstore backup policy. However, the Backup Encryption password is optional when attaching the NFS backup policy. If the source database has TDE enabled, then you must specify the TDE password, and not the Backup Encryption password.
6. Create a manual backup of the database and save the backup report generated when the backup completes.

Follow these steps to create a database from backup:

1. Log into the Browser User Interface:

```
https://host-ip-address:7093/mgmt/index.html
```

2. Click the **Database** tab.
3. Click **Create Database** to display the Create Database page.
4. Click **Clone Database from Backup**, then click **Next** to display the Clone Database from Backup page.
5. Select the Backup Destination from which you want to create the database. If your backup destination is ObjectStore:
   1. Select Backup Destination as **ObjectStore**.
   2. Select your **Object Store Credential Name**.
   3. Enter the password in the **Backup Encryption Passwords** field and the **Confirm Backup Encryption Passwords** field.

   If your backup destination is Network File System (NFS):
   1. Select Backup Destination as **External FRA**.
   2. Enter the password in the **Backup Encryption Passwords** field and the **Confirm Backup Encryption Passwords** field.
6. Click **Browse** and select the backup report from which you want to create the database.

   When the backup report is loaded, additional fields appear on the page and are populated based on the backup report. You can edit some of the fields.

   For Standard Edition Oracle Database 19c or later, you cannot clone Oracle RAC or Oracle RAC One Node Database. You can only clone an single-instance Oracle Database. For Standard Edition Oracle Database 19.6 or later, you can choose to enable high-availability for single-instance database.
7. In the **DB Name** field, enter a name for the database.

   The name must contain lowercase alphanumeric characters and cannot exceed 8 characters. The Oracle system identifier (SID) is always set to the database name.
8. Enter the password in the **SYS User Password** field and the **Confirm SYS User Password** field.
9. Specify the Networks.
10. If your source database has Transparent Database Encryption (TDE) enabled, then you can enable TDE on the cloned database. If the source database has TDE enabled, then the backup report has the TDE wallet backup location and the **TDE Wallet Backup Location** field in the BUI displays this value. Specify and confirm the **TDE Password**.
11. Click **Create**.
12. Click **Yes** to confirm that you want to clone a database from the selected Object Store or External FRA.

    When you submit the job, the job ID and a link to the job appears. Click the link to display the job status and details.
13. Validate that the job completed. You can track the job in the **Activity** tab in the Browser User Interface, or run the command `odacli describe-job` with the job ID.

    ```
    # odacli describe-job -i jobId
    ```

Cloning an Oracle ACFS Database Using the Browser User Interface

Create a database from an existing Oracle ACFS database using the Browser User Interface.

Cloning enables to:

- Create a database from another database without bringing down the source database
- Create multiple databases from a gold image, thus ensuring standardized mass deployments
- Optimize space utilization, by use of Oracle ACFS snapshots in cloning
- Create different types of databases, from a single source database type. For example, you can create single-instance databases, Oracle RAC databases, or Oracle RAC One Node databases from any type of source database
- Depending on the available memory and CPU cores, specify a supported database shape such as `odb1s`, `odb2`, and so on, to create any class of database from any source database.

> **Note:**
>
> Cloning a Transparent Database Encryption (TDE) enabled database is not supported.

Follow these steps to create a database from an existing Oracle ACFS database:

1. Log into the Browser User Interface:

   ```
   https://host-ip-address:7093/mgmt/index.html
   ```

2. Click the **Database** tab.
3. Click **Create Database** to display the Create Database page.
4. Click **Clone a Database**, then click **Next** to display the Clone Database page.
5. Select the **Source Database** from which you want to create the database.

   For Oracle Database 19c Standard Edition, you can only create single-instance Oracle Database, with or without high-availability.

6. Select the **Database Shape** (template) for your new database. The database shape you select determines the total memory allocated to the database.
7. In the **DB Name** field, enter a name for the database.

   The name must contain lowercase alphanumeric characters and cannot exceed 8 characters. The Oracle system identifier (SID) is always set to the database name.

8. Specify the **DB Unique Name** for the database. If the database unique name is not provided, then the name of the database is set to the database name.
9. Specify the Networks.
10. Enter the password in the **SYS User Password** field and the **Confirm SYS User Password** field.

11. Click **Create**.
12. Click **Yes** to confirm that you want to clone a database from the selected source database.

    When you submit the job, the job ID and a link to the job appears. Click the link to display the job status and details.
13. Validate that the job completed. You can track the job in the **Activity** tab in the Browser User Interface, or run the command `odacli describe-job` with the job ID.

    ```
    # odacli describe-job -i jobId
    ```

Cloning an Oracle ACFS Database Using Command Line Interface

Create a database from an existing Oracle ACFS database using CLI commands.

Cloning enables to:

- Create a database from another database without bringing down the source database
- Create multiple databases from a gold image, thus ensuring standardized mass deployments
- Optimize space utilization, by use of Oracle ACFS snapshots in cloning
- Create different types of databases, from a single source database type. For example, you can create single-instance databases, Oracle RAC databases, or Oracle RAC One Node databases from any type of source database
- Depending on the available memory and CPU cores, specify a supported database shape such as `odb1s`, `odb2`, and so on, to create any class of database from any source database.
- The ability to create clone databases on a standby system enables you to set up test or development environments based on your standby databases. Since standby systems are not production systems, they are a better choice for seeding test or development environments.

Following are the prerequisites to clone a database:

- Ensure that Oracle Clusterware is running on all nodes, and the source database is up and running.
- The source database must use Oracle ACFS storage.
- The source database must not be a multitenant container databases (CDBs)
- The source database must be in the OPEN state.
- The source database must not be in backup mode.
- The source database must be in archive mode.
- The source database must not have Transparent Database Encryption (TDE) enabled.

> **Note:**
>
> For Standard Edition Oracle Database 19c or later, you cannot clone Oracle RAC or Oracle RAC One Node Database. You can only clone an single-instance Oracle Database. For Standard Edition Oracle Database 19.6 or later, you can choose to enable high-availability for single-instance database.

Follow this procedure to clone a database:

- Run the `odacli clone-database` command.

  ```
  odacli clone-database --databaseUniqueName --dbname --dbshape --
  dbtype |SI --json
  --sourcedbname
  ```

  Specify the unique name of the database, the name for the new database, the database shape, the type of database, and the source database name. For information about all the command options, see the *ODACLI Command Reference* chapter.

Related Topics

- odacli clone-database
  Use the `odacli clone-database` command to clone a new database from a source database.

Modifying a Database

Use the Oracle Appliance Manager Browser User Interface or ODACLI commands to modify a database in Oracle Database Appliance.

Modifying a Database Using the Browser User Interface

1. Log into the Browser User Interface:
   `https://host-ip-address:7093/mgmt/index.html`
2. Click the **Database** tab.
3. For the database that you want to modify, select **Modify** in the Actions drop down list.
4. In the Modify Database page, you can attach or detach associated networks and backup policy, and modify database shape and class.
5. To modify the **Database Class** or **Database Shape**, select the new value in the drop down list.
6. To attach or detach networks, modify the values in the **Attach Networks** and **Detach Networks** fields.
7. To remove the associated backup policy from the database, do not select any value in the **Select Back up Policy** drop down list.
8. If you configured Oracle Flex disk group when you created the database, you can also modify the database redundancy. If the database you are modifying is an Oracle ACFS Database, then the database redundancy for all cloned Oracle ACFS databases is modified.

9. You can choose to change the **Backup Encryption Password**. If the database has TDE enabled, then the RMAN Backup Encryption password is not used.
10. Click **Modify**. When prompted, click **Yes** to confirm that you want to start the job to modify the database.

Modifying a Database Using ODACLI Commands

1. Use the `odacli modify-database` command to modify the configuration of a database, such as backup configuration, database class, database type, TDE key.

   ```
   # odacli modify-database -s database_shape  -cl database_class -i 
   dbid
   ```

   For example:

   ```
   # odacli modify-database -i 1941d594-c777-4eca-9fce-18b778d5c153 -s 
   odb2 -cl DSS
   ```

   For example, the following command re-keys the TDE master encryption key of the database after accepting the current TDE Wallet password.

   ```
   # odacli modify-database -in testdb -rkt
   Current password for TDE wallet:
   ```

   For more information about the `odacli modify-database` command options, see the *Oracle Database Appliance Command Line Reference* chapter in this guide.

Related Topics

- odacli modify-database
  Use the `odacli modify-database` command to modify the configuration of a database, such as backup configuration, database class, and database type.

Moving a Database from One Oracle Home to Another

Use the Oracle Appliance Manager Browser User Interface or ODACLI commands to move a database from one Oracle home to another of the same database version.

Moving a Database Using the Browser User Interface

1. Log into the Browser User Interface:
   `https://host-ip-address:7093/mgmt/index.html`
2. Click the **Database** tab.
3. For the database that you want to modify, select **Move** in the Actions drop down list.
4. Select the Destination Database Home where you want to move the database. The destination database home must be of the same base version.
5. Click **Move**. When prompted, click **Yes** to confirm that you want to start the job to move the database.

Moving a Database Using ODACLI Commands

1. Use the `odacli move-database` command to move a database from one Oracle home to another home of the same database version.

   ```
   # odacli move-database -i database_ID -dh
   destination_database_home_ID
   ```

   For more information about the `odacli move-database` command options, see the *Oracle Database Appliance Command Line Reference* chapter in this guide.

Related Topics

- odacli move-database
  Use the command `odacli move-database` to move a database from one Oracle home to another home of the same database version.

Upgrading a Database

Use the Oracle Appliance Manager Browser User Interface to upgrade an Oracle database to a different database home version.

Before upgrading to a different database home, you must upload the Oracle RDBMS clone files to the repository and create the database home.

> **Note:**
>
> You cannot upgrade Oracle RAC or Oracle RAC One Node Database to a destination database home of Standard Edition Oracle Database 19c or later. You must first convert Oracle RAC Or Oracle RAC One Node Database to single-instance Oracle Database using the `odacli modify-database` command and then upgrade the single-instance Oracle Database to a destination database home of Standard Edition 19c or later.

1. Log into the Browser User Interface:

   `https://host name or ip-address:7093/mgmt/index.html`

2. Click the **Database** tab.
3. Click **Actions** next to the database that you want, then select **Upgrade**.
4. Select the destination database home version from the list of available versions, then click **Upgrade**.

   When upgrading single-instance Standard Edition Oracle Database 18.9 or later to Standard Edition Oracle Database 19c or later, you can also choose to enable or disable High Availability.

Deleting a Database

Use the Oracle Appliance Manager Browser User Interface to delete an Oracle database.

1. Log into the Browser User Interface:

   `https://`*`host name or ip-address`*`:7093/mgmt/index.html`
2. Click the **Database** tab.
3. Click **Actions** next to the database that you want, then select **Delete**.
4. Confirm the action.

Working with Database Homes

Use the Browser User Interface to display a list of database homes, details, and create and delete database homes.

- About Managing Multiple Oracle Homes on Oracle Database Appliance
  Create and manage one or more Oracle home directories and Oracle databases on Oracle Database Appliance.
- Viewing Database Homes
  Use the Browser User Interface to display a list of database homes and database home details, including databases associated with a DB home.
- Creating a Database Home
  Use the Browser User Interface to create database homes in Oracle Database Appliance.
- Deleting a Database Home
  Use the Browser User Interface to delete an Oracle database home.

About Managing Multiple Oracle Homes on Oracle Database Appliance

Create and manage one or more Oracle home directories and Oracle databases on Oracle Database Appliance.

Oracle home is the directory in which you install Oracle Database binaries, and from which Oracle Database runs. Oracle Database Appliance supports multiple Oracle homes, including support of different release Oracle Database homes. You can create multiple Oracle databases on a given Oracle home. Use Oracle Appliance Manager Browser User Interface to create and manage multiple Oracle homes and databases on Oracle Database Appliance. Oracle Database Appliance Manager automatically creates an Oracle Database Oracle home that is compliant with Oracle's Optimal Flexible Architecture (OFA) standards.

Check the *Oracle Database Appliance Release Notes* to obtain information about the specific Oracle software releases supported for your Oracle Database Appliance platform.

When you use ODACLI commands to create multiple homes on Oracle Database Appliance, the commands start the Oracle Home cloning process. In Oracle Database Appliance deployments, the user `oracle` is the default software installation owner.

You can use the Browser User Interface or the command-line interface to create and manage databases.

Use ODACLI commands to create, list, describe, and delete databases on Oracle Database Appliance. The `odacli create-database` command enables you to create a database with minimal user input. When you run this command without any additional options, the command creates a new database home (ORACLE_HOME). You can create a database in an existing home by using the `--dbhomeid` option. To find the *dbhomeid*, use the `odacli list-dbhomes` command.

Alternatively, you can use the Browser User Interface to create list, describe and delete databases and database homes. You can display a list of all Database Homes that includes the database home name, ID, version, the date and time that the database home was created and the location on the same page. You can also create and delete database homes on the Browser User Interface.

> **Caution:**
>
> Do not apply Oracle Database patches directly to Oracle Databases on Oracle Database Appliance. Only use Oracle Database Appliance patch bundles, which are tested to work across the whole software stack. If a one-off database patch is required, it may be applied to the Oracle Home. When you apply the Oracle Database Appliance patch bundle, it may cause a conflict during future patching events and you might need to roll back and then re-apply the patch.

Viewing Database Homes

Use the Browser User Interface to display a list of database homes and database home details, including databases associated with a DB home.

1. Log in to the Browser User Interface:

   ```
   https://ip-address:7093/mgmt/index.html
   ```
2. Click the **Database** tab.
3. Click **Database Home** on the left menu to view all database homes. The name, ID, version, location and date and time stamp of when the database home was created appears on the page.
4. (Optional) Click **Actions** next to a database home entry, then **View Databases** to see the databases that are associated with the database home.

Creating a Database Home

Use the Browser User Interface to create database homes in Oracle Database Appliance.

Before you can create a database home, the Oracle Database Appliance RDBMS Clone file image must be in the repository. Follow these steps to create a database home:

1. Log in to the Browser User Interface:

   ```
   https://ip-address:7093/mgmt/index.html
   ```
2. Click the **Database** tab, then click **Database Home**.
3. Click **Create Database Home**.

4. Select a database version from the list of available versions, then select the database edition, either **Enterprise Edition** or **Standard Edition**, per your licensing agreement.
5. Click **Create**. When prompted, click **Yes** to confirm that you want to start the job.

Deleting a Database Home

Use the Browser User Interface to delete an Oracle database home.

You can delete a database home (DB Home) if it is not associated with any databases.

1. Log into the Browser User Interface:

   ```
   https://host name or ip-address:7093/mgmt/index.html
   ```

2. Click the **Database** tab.
3. Click **Database Home** on the left menu to view all database homes. The name, ID, version, location and date and time stamp of when the database home was created appears on the page.
4. Click **Actions** next to a database home entry, then **Delete**, and then confirm the action to delete a database home.

Migrating Databases

Review these topics to learn how to prepare for and migrate an entire database to your Oracle Database Appliance.

- About Migrating Databases
  You can migrate an entire active container database (CDB) or non-CDB database to an Oracle Database Appliance machine by using the RMAN duplicate command.
- Configuring a Static Listener
  Configure a static listener before you duplicate a database.
- Migrating a Database
  Use the `RMAN Duplicate` command to migrate the entire database to the appliance.
- Registering a Database
  Use the `odacli register-database` command to register the migrated database with the appliance.

About Migrating Databases

You can migrate an entire active container database (CDB) or non-CDB database to an Oracle Database Appliance machine by using the RMAN duplicate command.

When using RMAN Duplicate, ensure to have network connectivity from source and target databases:

- Source database: The existing database to be migrated.
- Target database: The new database created on an Oracle Database Appliance environment.

If you do not have network connectivity between the source and the target environments, you can use the offline migration method. Offline migration uses RMAN backup sets for duplication, which does not require connectivity to the primary database.

At a high level, the procedure involves the following steps:

1. **Deploy or update Oracle Database Appliance to the latest version.**

   Confirm that the provisioning completed successfully. On bare metal systems, use the command `odacli list-jobs` and the command `odacli describe-job` to verify the status.

2. **Create an instance only database from the command-line interface.**

   - On bare metal systems, use the command `odacli create-database` with the `instanceonly` flag on an Oracle Database Appliance machine. The new database is the target database.

   Creating an instance only database also creates the following:

   - ACFS Filesystem used to store the database files
   - Directory structures that are required by the database instance/rman duplicate command
   - Password file for the SYS user

3. **Configure a static listener.**

4. **Migrate the existing database to the target database using the backup and restore operations.**

5. **Register the migrated database with the appliance.**

> **Note:**
>
> You can only migrate and register a database of the same storage type. For example, to migrate and register an Oracle ACFS database, you must create an Oracle ACFS database and then migrate and register it. Similarly, to to migrate an Oracle ASM database, you must create an Oracle ASM database and then migrate it.

Configuring a Static Listener

Configure a static listener before you duplicate a database.

The static listener is only required when using RMAN Duplicate command.

Perform the following steps to manually configure the `listener.ora` file:

1. Log in as a grid user.
2. Navigate to `/u01/app/19.0.0.0/grid/network/admin/` directory.
3. Edit the default `listener.ora` file and append the static database entry.

```
SID_LIST_LISTENER=
   (SID_LIST=
      (SID_DESC=
         (GLOBAL_DBNAME=db_unique_name with domain)
         (ORACLE_HOME=db home)
         (SID_NAME=db unique name)
          (ENVS="TNS_ADMIN=database home/network/admin"))
 )
```

For example, the following file is edited for an 19.9.0.0.0 database named PRODDB in the example.com domain:

```
SID_LIST_LISTENER=
 (SID_LIST=
    (SID_DESC=
      (GLOBAL_DBNAME=PRODDB.example.com)
       (ORACLE_HOME=/u01/app/oracle/product/19.0.0.0/dbhome_2)
       (SID_NAME=PRODDB)
            (ENVS="TNS_ADMIN=/u01/app/oracle/product/19.0.0.0/
dbhome_2/network/admin"))
 )
```

4. Save the file.
5. Restart the listener.

```
srvctl stop listener -l listener
srvctl start listener -l listener
```

Migrating a Database

Use the RMAN Duplicate command to migrate the entire database to the appliance.

Before migrating the database, verify that a network connection exists between the source and destination databases.

1. Verify that the sysdba connection to the auxiliary database is working. Use the password that you defined when you created the database with the --instanceonly flag.

```
sqlplus sys/password@hostname:PORT/GLOBAL_DBNAME as sysdba << EOF
select 1 from dual;
exit;
EOF
```

The following example uses the Welcome_12 password for myhost on port 1521 for PRODDB.example.com.

```
sqlplus sys/Welcome_12@myhost:1521/PRODDB.example.com as sysdba <<
EOF
select 1 from dual;
exit;
EOF
```

2. As oracle user, set the ORACLE_HOME and ORACLE_SID environment variables.

   ```
   ORACLE_HOME=path of Oracle Home against which the AUX DB is created
   ORACLE_SID=database unique name
   ```

3. Display a list of all database storage configured on the appliance and database storage identifiers (ID).

   Use the `odacli list-dbstorages` to display the storage IDs for all configured filesystems.

   ```
   # odacli list-dbstorages
   ID Type                               DBUnique  Name         Status
   ------------------------------------  --------  -----------
   ----------
   68d13446-f26c-49ee-ab75-a393732aa88a   Asm       rdb1
   Configured
   ff2023d9-338d-4cff-8bb4-e73a89e32ce4   Acfs      PRODDB
   Configured
   ```

4. Display the database storage details, including the DATA, RECO and REDO locations, for each database storage ID.

   For example, use the `odacli describe-dbstorage` command to display information about the ACFS storage for ID 9fe39332-cc1a-4b4b-8393-165524a6ef6b.

   ```
   # odacli describe-dbstorage -i ff2023d9-338d-4cff-8bb4-e73a89e32ce4
   DBStorage details
   ----------------------------------------------------------------
   ID: ff2023d9-338d-4cff-8bb4-e73a89e32ce4
   DB Name: PRODDB
   DBUnique Name: PRODDB
   DB Resource ID: c5b77384-634e-4dc8-b10b-fa2831d2c59b
   Storage Type: Acfs
   DATA Location: /u02/app/oracle/oradata/PRODDB
   RECO Location: /u03/app/oracle/fast_recovery_area/
   REDO Location: /u03/app/oracle/redo/
   State: ResourceState(status=Configured)
   Created: June 22, 2019 12:07:12 PM SGT
   UpdatedTime: June 22, 2019 12:26:39 PM SGT
   ```

5. Duplicate the database.

   Use the RMAN duplicate database command to duplicate the database.

   ```
   rman target sys/Welcome__12@source database hostname:PORT
   (Continued)
   /Service Name auxiliary sys/Welcome_12@Hostname of the target
   database:1521/service name
   RUN {
   SET NEWNAME FOR DATABASE TO NEW;
   duplicate target database to PRODDB from active database
   SPFILE
   ```

```
SET cluster_database 'false'
SET audit_file_dest '/u01/app/oracle/admin/PRODDB/adump'
SET db_create_file_dest '/u02/app/oracle/oradata/PRODDB'
SET db_create_online_log_dest_1 '/u03/app/oracle/redo'
SET db_recovery_file_dest '/u03/app/oracle/fast_recovery_area'
SET control_files '/tmp/control_PRODDB.ctl' nofilenamecheck;
}
```

Registering a Database

Use the odacli register-database command to register the migrated database with the appliance.

The dbclass, dbshape, servicename and password are mandatory for registering the database. The dbclass and dbshape determine the sga_target and pga_target settings. The database init.ora parameters are reset as part of the odacli register-database command. Review the init.ora parameters after registration and ensure that the parameters set correctly.

> **Note:**
>
> The odacli register-database command is supported only for primary database of type single-instance.

Follow these steps to register a database:

1. If you have Oracle Database version 12.1 with SQL patches, ensure that the sqlpatches are in the Oracle Database Appliance environment. If the patches are not in the environment, copy the $OH/sqlpatch directories from the source database home to the $OH in Oracle Database Appliance before executing the odacli register-database command

   The odacli register-database command invokes the datapatch utility for applying the post patch SQLs. If the source database has any sqlpatches applied that are not present in the Oracle Database Appliance environment, then the datapatch will fail.

2. If you have Oracle Database version 11.2 with SQL patches, you must roll back any patches applied to the source database that are not part of the installed Oracle Database Bundle patch (BP).

3. Register the database with Oracle Database Appliance.

   ```
   # odacli register-database -c OLTP -s odb1 -sn proddb.example.com -p
   Password for SYS:
   {
     "jobId" : "317b430f-ad5f-42ae-bb07-13f053d266e2",
     "status" : "Created",
     "message" : null,
     "reports" : [ ],
     "createTimestamp" : "August 08, 2018 05:55:49 AM EDT",
     "description" : "Database service registration with
                      db service name: proddb.example.com",
     "updatedTime" : "August 08, 2018 05:55:49 AM EDT"
   ```

```
}
rpandrap: ]# odacli describe-job -i "317b430f-ad5f-42ae-
bb07-13f053d266e2"

Job details
----------------------------------------------------------------
            ID: 317b430f-ad5f-42ae-bb07-13f053d266e2
   Description: Database service registration with
             db service name: proddb.example.com
        Status: Success
       Created: November 23, 2018 5:55:49 AM EDT
       Message:

Task Name                       Start Time
----------------------------- ------------------------------
restore control file           November 23, 2018 5:55:49 AM EDT
move spfile to right location  November 23, 2018 5:56:08 AM EDT
register DB with clusterware   November 23, 2018 5:56:13 AM EDT
reset db parameters            November 23, 2018 5:57:05 AM EDT
Running DataPatch              November 23, 2018 5:57:36 AM EDT

(Continued)
  End Time                     Status
------------------------------- --------
November 23, 2018 5:56:08 AM EDT   Success
November 23, 2018 5:56:13 AM EDT   Success
November 23, 2018 5:57:05 AM EDT   Success
November 23, 2018 5:57:36 AM EDT   Success
November 23, 2018 5:57:49 AM EDT   Success
```

4. Use the `odacli list-databases` command to view the registered database.

About Managing Multiple Database Instances Using Instance Caging

Use instance caging to manage your system resources on Oracle Database Appliance.

Oracle Database provides a method for managing CPU allocations on a multi-CPU server that runs multiple database instances. This method is called instance caging. Instance caging uses an initialization parameter to limit the number of CPUs that an instance can use simultaneously.

Instance caging and Oracle Database Resource Manager (the Resource Manager) work together to support your desired service levels across multiple instances. Consolidation can minimize idle resources, maximize efficiency, and lower costs.

Oracle Database Appliance templates are already tuned for the size of each database instance workload. They are designed to run on a specific number of cores. Instance caging ensures that each database workload is restricted to the set of cores allocated by the template, enabling multiple databases to run concurrently with no performance degradation, up to the capacity of Oracle Database Appliance. You can select database template sizes larger than your current needs to provide for planned growth.

> **Note:**
>
> Oracle strongly recommends that you use the Oracle Database Appliance templates, because they implement best practices and are configured specifically for Oracle Database Appliance.
>
> The Oracle Database Appliance Manager interface refers to the database sizing templates as database classes.

By default, instance caging is not enabled on Oracle Database Appliance. To enable instance caging, set the initialization parameter, RESOURCE_MANAGER_PLAN, for each database on Oracle Database Appliance. The parameter specifies the plan to be used by the Resource Manager for the current instance. Setting this parameter directs the Resource Manager to allocate core resources among databases. If a plan is not specified with this parameter, then the Resource Manager and instance caging are not enabled.

Instance caging allocation of core resources is enabled in accordance with the Oracle Database Appliance database template size that you select for each database. The CPU_COUNT initialization parameter is set in the template. Use the CPU_COUNT setting that matches the size of each database to consolidate, and follow the standard instructions for configuring instance caging.

Oracle EM Express and DB Console

You can use Oracle Enterprise Manager Database Express (EM Express), or the Database Control Console (DB Console) to manage your database.

The EM Express console is available for Oracle Database 18c, 12.2.0.1, and 12.1.0.2. The DB Console is available for Oracle Database 11.2.0.4. Both consoles are web-based tools for managing Oracle Databases.

The EM Express console provides the following features:

- Support for basic administrative tasks, such as storage and user management
- Comprehensive solutions for performance diagnostics and tuning
- Performance advisors in a graphic user interface
- Oracle Database utilities in a graphic user interface, such as SQL*Loader and Oracle Recovery Manager (RMAN)

EM Express is built inside the database server and cannot perform actions outside the database.

10

Managing Storage

You can add storage to fully populate the base storage shelf and add a storage expansion shelf to your Oracle Database Appliance.

About Managing Storage

You can add storage at any time without shutting down your databases or applications.

Oracle Database Appliance uses raw storage to protect data in the following ways:

- Flash or Fast Recovery Area (FRA) backup. Flash or fast recovery area is a storage area (directory on disk or Oracle ASM diskgroup) that contains redo logs, control file, archived logs, backup pieces and copies, and flashback logs.
- Mirroring. Double or triple mirroring provides protection against mechanical issues.

The amount of available storage is determined by the location of the FRA backup (external or internal) and if double or triple mirroring is used.

Oracle Database Appliance uses storage shelves, a base shelf and an optional storage expansion shelf. You can expand the base storage by adding a pack of solid-state drives (SSDs) to fully populate the base storage. You can further expand the storage by adding a second storage shelf. External NFS storage is supported for online backups, data staging, or additional database files.

Note:

The storage expansion shelf is no longer available for Oracle Database Appliance X7-2-HA and other older models. You can repurpose an existing storage expansion shelf from one Oracle Database Appliance system to another.

Note:

Oracle recommends that you upgrade your deployment to the latest Oracle Database Appliance software release before adding storage to ensure that your appliance has the latest firmware.

When you add storage, Oracle Automatic Storage Management (Oracle ASM) automatically rebalances the data across all of the storage including the new drives. Rebalancing a disk group moves data between disks to ensure that every file is evenly spread across all of the disks in a disk group and all of the disks are evenly filled to the same percentage. Oracle ASM automatically initiates a rebalance after storage configuration changes, such as when you add disks.

Storage Addition Options for Oracle Database Appliance X6-2-HA

Understand the storage configuration options for Oracle Database Appliance X6-2-HA.

Oracle Database Appliance X6-2-HA uses 1.6 TB raw Solid-State Drives (SSDs), formatted to 1.2 TB for performance.

Note:

The 3.2 TB and 1.6 TB SSDs are no longer available. You can use the 5-pack of 7.68 TB SSDs for storage expansion. The expansion shelf is also no longer available.

The following table explains the base configuration and storage expansion options for Oracle Database Appliance X6-2-HA.

Table 10-1 Storage Addition Options for Oracle Database Appliance X6-2-HA

Configuration	Storage Option	Total Storage
Base Configuration	Ten (10) 1.6TB SSDs in slots 0 - 9 and four (4) 200GB SSDs in slots 20 - 23	200 GB SSDs dedicated for database REDO and 1.6TB SDDs used for DATA.

Table 10-1 (Cont.) Storage Addition Options for Oracle Database Appliance X6-2-HA

Configuration	Storage Option	Total Storage
Base Shelf Expansion	Additional Ten 7.68 TB SSDs in slots 10 - 19 or replace all Twenty 7.68 TB SSDs in slots 0 - 19 Order Qty 2 or 4: 7600790: Five-pack of 7.68TB SSD drives	Power off the appliance and replace any existing 1.6 TB or 3.2 TB SSDs with 7.68 TB SSDs. Perform cleanup, reimage and redeploy the appliance, and restore the database from a backup. If you replace all your existing 1.6 TB or 3.2 TB SSDs with 7.68 TB SSDs, then the entire 7.68 TB capacity of the SSDs is utilized for storage. However, if you add 7.68 TB SSDs to an existing deployment that contains 1.6 TB or 3.2 TB SSDs, then the 7.68 TB SSDs are formatted to 1.6 TB or 3.2 TB for performance.
Storage Shelf Expansion	The expansion shelf is no longer available.	The expansion shelf is no longer available.

Preparing for Storage Expansion

Review and perform these best practices before adding storage to the base shelf or adding the expansion shelf.

1. Update Oracle Database Appliance to the latest Patch Bundle before expanding storage.
2. Confirm both nodes are at the same version and patch bundle level for software and firmware.

   ```
   # odaadmcli show version -detail
   ```

   ```
   # odaadmcli inventory -q
   ```

   > **Note:**
   >
   > If `oakd` is not running in the foreground mode, on either node, fix the problem before adding storage.

3. Check the disk health of the existing storage disks.

Run the check on both nodes and use the default checks option to check the `NetworkComponents`, `OSDiskStorage`, `SharedStorage`, and `SystemComponents`.

```
#  odaadmcli validate -d
```

4. Run the `odaadmcli show diskgroup` command on each node to display and review Oracle Automatic Storage Management (Oracle ASM) disk group information. Verify that all disks are listed, are online, and are in a good state.

   ```
   # odaadmcli show diskgroup data
   ```

   ```
   # odaadmcli show diskgroup reco
   ```

   ```
    # odaadmcli show diskgroup redo
   ```

5. Confirm Oracle ASM and CRS health on both nodes.

   Run the `odaadmcli orachk` command on each node. If there is a problem connecting to either node, then check the `/etc/bashrc` file and remove (or remark out) any values in the profile for `root`, `oracle`, `grid users`.

   Run `odaadmcli orachk` on Node 0:

   ```
   # odaadmcli orachk
   ...

   Checking Status of Oracle Software Stack - Clusterware, ASM, RDBMS

   . . . . . . . . .
   -------------------------------------------------------------------------------------------------
   ------
   Oracle Stack Status
   -------------------------------------------------------------------------------------------------
   ------
   Host Name CRS Installed  ASM HOME   RDBMS Installed    CRS UP    ASM UP    RDBMS UP DB Instance
   Name
   -------------------------------------------------------------------------------------------------
   ------
   odax3rm1       Yes           No          Yes              No        No
   No          ........
   -------------------------------------------------------------------------------------------------
   ------

    ...
   ```

   Run `odaadmcli orachk` on Node 1:

   ```
   # odaadmcli orachk
   ...

   Checking Status of Oracle Software Stack - Clusterware, ASM, RDBMS

   . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . .
   -------------------------------------------------------------------------------------------------
   ------
   Oracle Stack Status
   -------------------------------------------------------------------------------------------------
   ------
   Host Name CRS Installed  ASM HOME   RDBMS Installed    CRS UP    ASM UP    RDBMS UP DB Instance
   Name
   -------------------------------------------------------------------------------------------------
   ------
   odax3rm2      Yes           Yes           Yes            Yes       Yes        Yes      b22S2
   b23S2 b24S2
   -------------------------------------------------------------------------------------------------
   ```

```
------
...
```

6. Confirm communications between the nodes and that SSH is working using the same password for `oracle`, `root`, and `grid`.

   From each node:

   a. ssh to both nodes.

   b. Ping both nodes.

7. Confirm there is at least 10 GB of space available on each node.

   ```
   [root@oda]# df -h
   ```

   ```
   [root@odb]# df -h
   ```

Adding Two 5-Pack SSDs

Add two 5-pack solid-state drives (SSDs) for data storage into the existing base configuration to populate the base storage shelf.

Before adding the disks to the system, ensure that Oracle Database Appliance is on the latest update version.

The 3.2 TB and 1.6 TB SSDs are no longer available. You can use the 5-pack of 7.68 TB SSDs for storage expansion.

1. Insert disks one at a time in slots 10 through 19.

   > **Note:**
   >
   > Allow at least one minute between inserting each disk to avoid flooding of disk events into `oakd`.

   After all 10 disks are added, go to Step 2.

2. Run the `odaadmcli show ismaster` command to determine which node is the master.

   ```
   # odaadmcli show ismaster
   ```

3. Run the `odaadmcli expand storage` command on the master node.

   ```
   # odaadmcli expand storage
   Precheck passed.
   Successfully formatted 1.6TB SSD disks...
   Check the progress of expansion of storage by executing 'odaadmcli
   show disk'
   Waiting for expansion to finish ...
   ```

   Wait 30 seconds before proceeding to the next step.

4. Execute the `odaadmcli expand storage` command on the slave node.

   ```
   #odaadmcli expand storage
   Precheck passed.
   Successfully formatted 1.6TB SSD disks...
   Check the progress of expansion of storage by executing 'odaadmcli
   show disk'
   Waiting for expansion to finish ...
   ```

   It takes 10 to 12 minutes to add all of the disks to the configuration.

5. Run the `odaadmcli show disk` command to ensure that all disks are listed, are online, and are in a good state.

   ```
   # odaadmcli show disk
   ```

6. Verify that the disks in slots 10 to 20 are added to Oracle Automatic Storage Management (Oracle ASM).

   a. Run the `asm_script` to verify that the disks in slots 10 to 20 are added to Oracle Automatic Storage Management (Oracle ASM). If the 10 disks are successfully added (CACHED and MEMBER), then go to Step 7.

      ```
      su grid user /opt/oracle/oak/bin/stordiag/asm_script.sh 1 6
      ```

   b. If the disks are not added to Oracle ASM, then add them manually. As a `grid` user, execute the `sqlplus '/as sysasm'` command on the master node to add the disks to Oracle ASM.

      ```
      # sqlplus '/as sysasm'
      ....
      SQL> alter diskgroup /*+ _OAK_AsmCookie */ data add disk
      '/dev/mapper/SSD_E0_S11_1399764284p1' name
      SSD_E0_S11_1399764284p1,
      '/dev/mapper/SSD_E0_S12_1399765076p1' name
      SSD_E0_S12_1399765076p1,
      '/dev/mapper/SSD_E0_S13_1399765116p1' name
      SSD_E0_S13_1399765116p1,
      '/dev/mapper/SSD_E0_S14_1399765484p1' name
      SSD_E0_S14_1399765484p1,
      '/dev/mapper/SSD_E0_S15_1399765404p1' name
      SSD_E0_S15_1399765404p1,
      '/dev/mapper/SSD_E0_S16_1399766160p1' name
      SSD_E0_S16_1399766160p1,
      '/dev/mapper/SSD_E0_S17_1399765264p1' name
      SSD_E0_S17_1399765264p1,
      '/dev/mapper/SSD_E0_S18_1399763588p1' name
      SSD_E0_S18_1399763588p1,
      '/dev/mapper/SSD_E0_S19_1399765504p1' name
      SSD_E0_S19_1399765504p1;

      SQL> alter diskgroup /*+ _OAK_AsmCookie */ reco add disk
      '/dev/mapper/SSD_E0_S11_1399764284p2' name
      SSD_E0_S11_1399764284p2,
      '/dev/mapper/SSD_E0_S12_1399765076p2' name
      ```

```
SSD_E0_S12_1399765076p2,
'/dev/mapper/SSD_E0_S13_1399765116p2' name
SSD_E0_S13_1399765116p2,
'/dev/mapper/SSD_E0_S14_1399765484p2' name
SSD_E0_S14_1399765484p2,
'/dev/mapper/SSD_E0_S15_1399765404p2' name
SSD_E0_S15_1399765404p2,
'/dev/mapper/SSD_E0_S16_1399766160p2' name
SSD_E0_S16_1399766160p2,
'/dev/mapper/SSD_E0_S17_1399765264p2' name
SSD_E0_S17_1399765264p2,
'/dev/mapper/SSD_E0_S18_1399763588p2' name
SSD_E0_S18_1399763588p2,
'/dev/mapper/SSD_E0_S19_1399765504p2' name
SSD_E0_S19_1399765504p2;
```

7. Use the `odaadmcli show validation storage errors` command to show hard storage errors.

   Hard errors include having the wrong type of disk inserted into a particular slot, an invalid disk model, or an incorrect disk size.

   ```
   # odaadmcli show validation storage errors
   ```

8. Use the `odaadmcli show validation storage failures` command to show soft validation errors.

   A typical soft disk error would be an invalid version of the disk firmware.

   ```
   # odaadmcli show validation storage failures
   ```

9. Confirm that the `oak_storage_conf.xml` file shows the total number of disks on the system, after the addition. For example, if you added 10 disks to the base configuration of 14 disks, then the `oak_storage_conf.xml` file must show 24.

   ```
   # cat /opt/oracle/oak/conf/oak_storage_conf.xml
   ```

Adding the Storage Expansion Shelf

Use the following procedure only if you want to repurpose an existing storage expansion shelf from one Oracle Database Appliance system to another.

> **Note:**
>
> The storage expansion shelf is no longer available for Oracle Database Appliance X7-2-HA and other older models. Use the following procedure only if you want to repurpose an existing storage expansion shelf from one Oracle Database Appliance system to another. If an existing storage shelf is repurposed, that is, moved from a system where `oakd` and Oracle ASM were configured, then you must clean up the disks on the second JBOD before adding them to the new deployment. See the topic *Performing Secure Erase of Data on Storage Disks* in this guide.

Note:

You can follow the same procedure to add storage to tbe base configuration on Virtualized Platform by using `oakcli` command equivalent of the `odacli` or `odaadmcli` commands in the procedure.

Note:

- Oracle recommends that you add a storage expansion shelf when you have relatively little activity on your databases. When the system discovers the new storage, Oracle ASM automatically rebalances the disk groups. The rebalance operation may degrade database performance until the operation completes.
- Only offline addition of X7-2 storage expansion shelf to X6-2-HA Oracle Database Appliance is supported.

The addition of the storage expansion shelf includes checks across both nodes. It is important to confirm that SSH does work across the nodes and all users can connect as expected using their shared password.

1. Install and cable the storage expansion shelf, but do **not** power on the expansion shelf.

   Caution:

   Review cabling instructions carefully to ensure that you have carried out cabling correctly. Incorrect connections can cause data loss when adding a storage expansion shelf to Oracle Database Appliance with existing databases.

2. If this is a new deployment or re-image of Oracle Database Appliance, perform the following steps in order:
   a. Power on the base storage.
   b. Power on Node 0.
   c. Power on Node 1.

   Caution:

   Do not power on the expansion shelf yet.

3. Verify that both nodes plus the base storage shelf are up and running. Log into each server node and run the `odaadmcli validate` command to confirm that the base configuration cabling is correct.

```
# odaadmcli validate -c storagetopology
 ...
```

```
      INFO  : Check if JBOD powered on
 SUCCESS    : JBOD : Powered-
on
      INFO  : Check for correct number of EBODS(2 or 4)
 SUCCESS    : EBOD found :
2

                              INFO       : Check for overall status 
of cable validation on Node0
  SUCCESS   : Overall Cable Validation on Node0
 SUCCESS    : JBOD Nickname set correctly : Oracle Database 
Appliance - E0
```

If the JBOD was configured earlier, then the `EBOD found` message is displayed. If an unconfigured JBOD is added, then a warning message is displayed.

```
# odacli validate-storagetopology
 ...
WARNING : JBOD Nickname is incorrectly set to :
```

> **Note:**
>
> IF the output shows that `EBOD found` is 2, then you only have the base storage shelf. If `EBOD found` is 4, then you have a base storage shelf and a storage expansion shelf.

4. Power on the storage expansion shelf.
5. Log in to each server node and run the `odaadmcli validate` command to validate the storage cabling.

```
# odaadmcli validate -c storagetopology

  INFO    : Check if JBOD powered on
  SUCCESS : 2JBOD : Powered-
on
  INFO    : Check for correct number of EBODS(2 or 4)
  SUCCESS : EBOD found :
4
   ...
   ...

   INFO    : Check for overall status of cable validation on Node0
   SUCCESS : Overall Cable Validation on Node0
   SUCCESS : JBOD0 Nickname set correctly : Oracle Database 
Appliance - E0
   SUCCESS : JBOD1 Nickname set correctly : Oracle Database 
Appliance - E1
```

Look for the following indicators that both storage shelves are recognized:

- When there are two shelves, the JBOD (just a bunch of disks) is numbered. For example:

  ```
  SUCCESS : 2JBOD : Powered-on
  ```

- When both shelves are recognized, the `EBOD found` value is 4.

  ```
  SUCCESS : EBOD found : 4
  ```

- When the expansion shelf is cabled properly, the nickname is `E1`. For example:

  ```
          SUCCESS : JBOD0 Nickname set correctly : Oracle Database 
  Appliance - E0
          SUCCESS : JBOD1 Nickname set correctly : Oracle Database 
  Appliance - E1
  ```

Fix any errors before proceeding.

6. Run the `odaadmcli show disk` command to ensure that all disks in the expansion shelf are listed, are online, and are in a good state.

   ```
   # odaadmcli show disk
   ```

   When all disks are online and in a good state, proceed to the next step.

7. Run the `odaadmcli show enclosure` command to check the health of components in expansion shelf.

   ```
   # odaadmcli show enclosure
   ```

8. Restart `oakd` on each node using the command.

   ```
   # odaadmcli restart oak
   ```

9. Run the `odaadmcli show ismaster` command on Node 0 to check the master and slave configuration.

   ```
   # odaadmcli show ismaster
   ```

   You can change the master and slave configuration by restarting `oakd` on the node.

10. When `oakd` restarts on both nodes, run the command `odaadmcli show disk` on both nodes.

    All 24 disks of the expansion storage shelf `e1_pd_xx` are displayed with the status"`UNKNOWN NewDiskInserted`: in the command output on both nodes. For example:

    ```
    e0_pd_23 /dev/sdab SSD ONLINE Good
    e1_pd_00 /dev/sdax SSD UNKNOWN 
    NewDiskInserted
    ...
    ```

```
e1_pd_23 /dev/sdbu SSD UNKNOWN
NewDiskInserted
```

11. Run the command `odaadmcli add jbod disk` on the master node first, and then on the slave node.

    ```
    # odaadmcli add jbod disk
    Sat Jun 30 01:04:08 UTC 2018
    Successfully formatted 1.6TB SSD disks...
    Check addition of JBOD status by executing
    odaadmcli ' show jbod progress'
    ```

    Wait for the command to finish. It takes about 30 to 40 minutes. Then verify that the expansion storage shelf disk status is `ONLINE GOOD`. If yes, proceed to next step.

12. Run the command `odaadmcli add jbod asm` on the master node first, and then on the slave node.

    Wait for the command to finish. It takes about 2 to 3 minutes. Then verify that the expansion storage shelf disk status in ASM is `ONLINE` and `CACHED`.

13. Run the command `show jbod status` to check Oracle ASM disk group and disk status.

    ```
    # odaadmcli show jbod status
    INFO: 2018-06-30 01:32:46: Present status of Expansion storage shelf
     Disk Added    Disk Not Added     Status
    OAKD     24              0            SUCCESS
    ASM
    DATA      20              0            SUCCESS
    RECO     20              0            SUCCESS
     REDO      4              0            SUCCESS
    INFO: 2018-06-30 01:32:46: DiskGroup Mount Status
    GROUP_NUMBER NAME       STATE      TYPE         TOTAL_MB    FREE_MB

    1 DATA       MOUNTED    HIGH         39321600   37272260
    2 REDO       MOUNTED    HIGH          1525760    1383896
    3 RECO       MOUNTED    HIGH          6461440    5984272
    ```

14. Use the `odaadmcli show validation storage errors` command to show hard storage errors.

    Hard errors include having the wrong type of disk inserted into a particular slot, an invalid disk model, or an incorrect disk size.

    ```
    # odaadmcli show validation storage errors
    ```

15. Use the `odaadmcli show validation storage failures` command to show soft validation errors.

    A typical soft disk error would be an invalid version of the disk firmware.

    ```
    # odaadmcli show validation storage failures
    ```

16. Run the `odaadmcli show version` command to verify that all firmware components in the storage expansion are current.

    ```
    # odaadmcli show version -detail
    ```

17. If needed, update the storage shelf and then run the show version command to confirm that the firmware is current.

    ```
    # odaadmcli update
    # odaadmcli show version -detail
    ```

11

Backup, Restore and Recover Databases

Review backup, restore, and recovery operations for your databases.

- About Database Backup and Recovery Options
  Backup your databases in Oracle Database Appliance and use the restore and recover features to restore a database to the same or another system or to recover database files.
- Creating a Mount Point for NFS Backup Location
  Create a mount point for the Network File System (NFS) location, to set up the NFS backup and recovery option.
- Configuring Agent Proxy Settings for Object Store Access
  If the Object Store IP address is accessible only through proxy setup by the Oracle Database Appliance server, then define the proxy setting for the agent, so that the agent can access the Object Store.
- Creating a Database Backup Policy
  Understand how to create a policy to backup a database to an internal or external Oracle Fast Recovery Area (FRA) location or to the Object Store using the Browser User Interface.
- Updating a Database with a Backup Policy
  Attach a backup policy to a database to define the database backup attributes and destination.
- Updating a Database Backup Policy
  Use the Browser User Interface to update the recovery window, change the ObjectStore Credential, or change the crosscheck option for a database backup policy.
- Backing Up a Database Using the Browser User Interface
  Apply a backup policy to a database, create a manual backup, update a database backup schedule, or update an archive log backup scheduler.
- Viewing Backup Reports
  Understand how you can use the Browser User Interface to view backup reports.
- Recovering a Database Using the Browser User Interface
  Understand the recovery options available for recovering a database.
- Deleting a Backup Using the Browser User Interface
  Use the Browser User Interface to delete database backups.
- Deleting a Backup Policy
  Use the Browser User Interface to delete a database backup policy.
- Using the CLI to Backup, Restore, and Recover
  Use the command-line interface to backup, restore, and recover databases.

About Database Backup and Recovery Options

Backup your databases in Oracle Database Appliance and use the restore and recover features to restore a database to the same or another system or to recover database files.

It is important to create a backup recovery strategy to protect the databases in Oracle Database Appliance from data loss due to a physical problem with a disk that causes a failure of a read from or write to a disk file that is required to run the database, or due to user error. The backup feature provides the ability to PITR restore the database, SCN recovery, and latest recovery. You can create a backup policy in the Browser User Interface or from the command-line interface.

The following backup options are available:

- Backup to an Oracle Fast Recovery Area (FRA) disk (Internal FRA)
- Backup to Oracle Cloud Infrastructure Object Storage (Oracle Object Storage)
- Backup to a Network File System (NFS) location (External FRA)

You can use the backup, restore, and recovery features with databases that have backup policy attached to them in the system. You can choose to manage your backups, and set up your backup, restore, and recovery option.

The backup feature enables you to create a backup policy with your backup parameters, such as backup location, recovery window, enable and disable crosscheck, and ObjectStoreSwift Object details. For new and existing databases, you can create and attach a backup policy to a database to perform a daily backup. Once a backup policy is attached to a database, the `dcs-agent` schedules daily automatic backups for the database. It also schedules archivelog backups for the database. By default, the frequency of the archivelog backup is 30 minutes. The default schedule is a level 0 backup every Sunday and a level 1 backup Monday through Saturday. You can edit or disable the schedule.

The `dcs-agent` generates and saves a backup report for each backup. The backup report contains the metadata required to recover or restore a database.

Recovering a database in Oracle Database Appliance is a full or whole database recovery using RMAN. You can recover from a Backup Report, a point-in-time (PITR), a System Change Number (SCN), or from the latest backup. When a Backup Report is used for recovery, it performs an SCN recovery, by reading the SCN value from the backup report. For recovery of data block, tablespaces, data files, PDBs, see the *Oracle Database Backup and Recovery Reference Guide*.

Backup Policy

The backup policy defines the backup details. When you create a backup policy, you define the destination for the database backups, either Internal FRA (Disk) or External FRA (NFS location), or Cloud Object Storage, and you define the recovery window.

If you use the Oracle Object Storage for backup and recovery, you must have an ObjectStore Resource ID or Name.

You can assign the backup policy to the database when you create the database. You can attach a backup policy to an existing database or update a backup policy.

You can also specify compression algorithm when creating the backup policy. The supported compression algorithms are BASIC, LOW, MEDIUM, and HIGH. For Objectstore backup policy, you can specify any compression algorithm. By default, if you do not specify the compression algorithm while creating the Objectstore backup policy, then MEDIUM compression algorithm is used. By default, if you do not specify the compression algorithm while creating the Disk or NFS backup policy, then BASIC compression algorithm is used. To use LOW, MEDIUM, or HIGH compression algorithms for Disk or NFS backup policy, there are license considerations.

Backup Levels

Specify the backup level when you take a backup. The back levels are:

- **Level 0**: The backup captures all blocks in the datafile. By default, level 0 backups occur every Sunday. You can customize your backup settings through the Browser User Interface or the command-line. A level 0 backup is a full backup and is used as the parent for a level 1 backup.
- **Level 1**: The backup is an incremental backup that captures only those blocks that change between backups in each datafile. By default, a level 1 backup occurs daily, Monday through Saturday, and captures images of each block in a datafile that changed. Level 1 backups are differential backups. The backup includes blocks from the most recent previous level 1 or level 0 backup.
- **LongTerm**: The backup is a long-term, or archival backup. Use LongTerm to create a backup that is all-inclusive and exempt from the backup retention policy. The backup is all-inclusive because every file needed to restore and recover the database is backed up to a single location. The backup is exempt from the retention policy that is defined in the recovery window. For long term backups, you must use non-FRA locations for backup destinations using the backup policy options.
- **Archivelog**: This is a backup of all archivelogs not yet backed up to the backup destination, such as Internal FRA, External FRA (NFS location), or Object Store.

The AutoScheduler creates a level 0 backup on Level 0 Backup Day, by default, on Sunday, and level 1 on the remaining days of the week. You can display a list of scheduled backups, edit your backup schedule, or disable a scheduled backup. It also creates archivelogs backup for the database with a default frequency of 30 minutes.

Backup to Disk

When you backup to disk, you are using the Oracle Fast Recovery Area (FRA) of the disk. FRA is a storage directory that allows backup and recovery operations on Oracle databases. The directory contains archived redo logs, backup pieces and copies, and the control file.

Advantages to backing up to disk are as follows:

- Quick recovery from backups stored on disk
- Automate management of recovery related files (like archived logs)

> **Note:**
>
> - When you backup to disk, the data for non-TDE database is not encrypted and passwords are not allowed. In addition, backup to disk requires a lot of disk space (up to two to three times the size of the database).
> - If the database is TDE-enabled, then the RMAN backup password is not required, irrespective of the backup destination.

The following is a high-level overview of the workflow for backup and recovery when using a disk:

1. Create a backup policy to define the backup destination (disk) and recovery window for the disk destination.
2. Create a database and attach the backup policy to the database. When the backup policy is associated with a database, archivelog backups and database backups are automatically created.
3. Manage obsolete backups.
4. Recover the database from a backup on the disk.

Backup to External FRA (Network File System)

Specifying a Network File System (NFS) location for backups, enables you to safely and securely store or retrieve a database backup at any time.

The advantages of using NFS backup location are:

- With NFS, you can access remote files, locally, by mounting local file systems on a network.
- Provides a centralized backup location, without requiring manual refresh.
- Supports enhanced security options using firewalls and Kerberos.
- Support for encrypted backups using passwords. You optionally, set the backup password, and provide the same during restore operation.
- The RMAN Backup Encryption password is applicable for databases that do not have TDE enabled. If the database has TDE enabled, then the RMAN backup password is not required, irrespective of the backup destination.

The following is a high-level overview of the workflow for backup and recovery when using an NFS location:

1. Create a mount point for the NFS location.

   The mount point must be accessible from both nodes. The `oracle` user must have read/write permissions to the NFS location. If the request is being made to a remote server, ensure that it is running. See *Creating a Mount Point for NFS Backup Location* for the procedure to create a mount point.
2. Create a backup policy specifying the NFS location, and the recovery window for NFS destination.
3. Associate the database with this backup policy, either during database creation, or by updating the backup policy for the database.

4. Backups are automatically scheduled, and you can also run manual backups. You can specify manual backup options in the Browser User Interface or using ODACLI commands.
5. Manage obsolete backups.
6. Restore from backup. When you save your backups to NFS, you can restore the database to the same system or to a different system.
7. Recover the database from a backup on NFS.

Backup to Oracle Object Storage

Oracle Object Storage is a highly secure, scalable storage platform that enables you to safely and securely store or retrieve a database backup at any time. Data and the associated metadata are stored as an object in a logical container (bucket). Oracle Database Appliance creates a Backup Report and a unique ID to identify each backup.

Oracle Object Storage is tightly integrated with Oracle Cloud Infrastructure Identity and Access Management. The data, user-defined metadata associated with the data, and encryption keys are automatically encrypted using 256-bit Advanced Encryption Standard (AES- 256). The encryption keys are rotated frequently and cannot be disabled. By default, only authenticated users that have explicitly been granted access to specific resources can access data stored in Oracle Object Storage. Data is uploaded and downloaded over SSL endpoints using the HTTPS protocol.

When you backup to Oracle Object Storage, you are using your backup policy and your Oracle ObjectStoreSwift credentials. The credentials are stored in an encrypted Oracle wallet. You can attach the credentials to one or more backup policies.

> **Note:**
>
> Credentials are validated when you create the backup policy that uses Oracle Object Storage. The credentials are not validated against the URL and tenancy.

Advantages to using Oracle Object Storage are as follows:

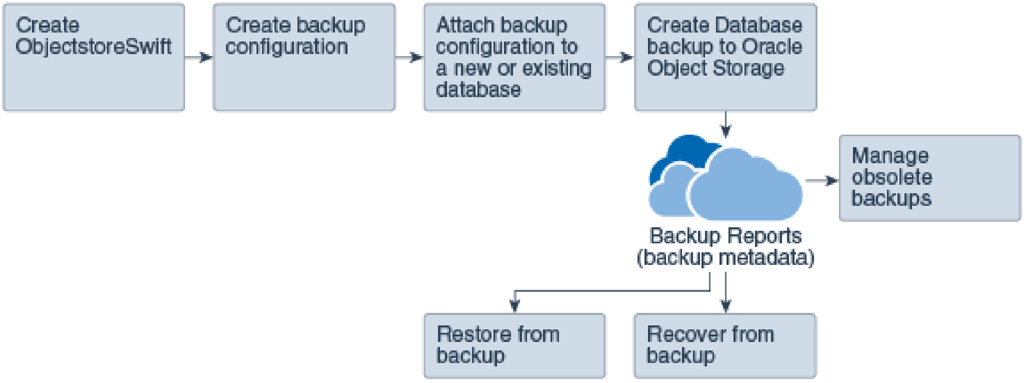
- Backups are encrypted using the password for non-TDE databases. For TDE-enabled databases, backups are encrypted by default and do not require the RMAN backup encryption password to be specified separately.

  > **Caution:**
  >
  > Save the password that you use during backups in a safe location, you must provide the password during recovery operations.

- Quick recovery from backups. With the Oracle Object Storage, you can safely and securely use the Browser User Interface to store or retrieve data directly from within the cloud platform, at any time.
- Automate management of recovery related files (like archived logs)
- Oracle Object Storage is not directly accessed by the operating system, instead it uses APIs to access the storage at the application level.

The following is a high-level overview of the workflow for backup and recovery when using Oracle Object Storage:

1. Create an Object Store object with your credentials.
2. Create a backup policy to define the backup location (Object Store), Object Store Credentials Name, the container (bucket) name where you want to store backups, and the recovery window.
3. Create a database and attach the backup policy either as a part of creating the database, or update the database with backup policy after creating the database. When the backup policy is associated with a database, backups are automatically created.
4. Manage obsolete backups.
5. Restore from backup. When you save your backups to Oracle Object Storage, you can restore the database to the same system or to a different system.
6. Recover the database from a backup on Oracle Object Storage.


Create ObjectstoreSwift
Create backup configuration
Attach backup configuration to a new or existing database
Create Database backup to Oracle Object Storage
Manage obsolete backups
Backup Reports (backup metadata)
Restore from backup
Recover from backup

> **Note:**
>
> Before you can use this backup option, you must create an Oracle Cloud Infrastructure Object Storage account. When you create the account, you define the account credentials, end point URL, and bucket. Go to the Oracle Store and sign up for Oracle Cloud Infrastructure Object Storage.

Backup Reports

A backup report is generated for each backup and is similar to, but does not replace, a recovery catalog. The report contains the Oracle Database Appliance information and metadata needed to restore or recover a database. The Backup Report is designed to keep track of all of the information required to restore or recover a database.

The following is an example of a level 1 backup report:

```
{
  "id" : "2d82460c-d648-4e75-8c7d-72cc90bc442a",
  "dbResId" : "b5fc646e-01a6-4c8b-8286-7633346c4329",
  "tag" : null,
  "dbId" : "2717054291",
  "dbName" : "HRDbO",
  "dbUniqueName" : "HRDbOu",
  "backupType" : "REGULAR-L1",
  "keepDays" : null,
  "backupLocation" : "https://swiftobjectstorage.us-phoenix-1.oraclecloud.com/v1/dbaasimage/backupbucket",
  "cfBackupHandle" : "c-2717054291-20171108-04",
  "spfBackupHandle" : "c-2717054291-20171108-04",
  "pitrTimeStamp" : "November 08, 2017 12:43:14 PM UTC",
  "pitrSCN" : "1175058",
  "resetLogsTimeStamp" : "November 08, 2017 09:55:34 AM UTC",
  "resetLogsSCN" : "1112268",
  "oraHomeVersion" : "12.2.0.1.170814 (26723265, 26609817)",
  "sqlPatches" : "25811364,26609817",
  "backupLogLoc" : "https://swiftobjectstorage.us-phoenix-1.oraclecloud.com/v1/dbaasimage/backupbucket/scaoda702c1n1/
rmanlog/HRDbOu/2717054291/2017-11-08/rman_backup_2017-11-08_12-42-41.0545.log",
  "tdeWalletLoc" : null,
  "dbConfigLoc" : "https://swiftobjectstorage.us-phoenix-1.oraclecloud.com/v1/dbaasimage/backupbucket/scaoda702c1n1/
dbconfig/HRDbOu/2717054291/2017-11-08/DBCONFIG_TAG20171108T124407_2017-11-08_12-44-07.0533.tar.gz",
  "name" : "Backup_Report_HRDbO",
  "createTime" : "November 08, 2017 12:42:08 PM UTC",
  "state" : {
    "status" : "CONFIGURED"
  },
  "updatedTime" : "November 08, 2017 12:44:12 PM UTC",
  "backupReportLogDetail" : "https://swiftobjectstorage.us-phoenix-1.oraclecloud.com/v1/dbaasimage/backupbucket/
scaoda702c1n1/rmandetaillogreport/HRDbOu/2717054291/2017-11-08/rman_list_backup_detail_2017-11-08_12-44-04.0362.log",
  "dbInfo" : {
    "dbClass" : "OLTP",
    "dbType" : "RAC",
    "dbShape" : "odb1",
    "dbEdition" : "EE",
    "dbStorage" : "ASM"
  },
  "dbDataSize" : "1542M",
  "dbRedoSize" : "16403M"
}
```

About Recovery Options

The recovery in Oracle Database Appliance always performs a full database restore or recover. The recovery options are LATEST, PITR, SCN, and BackupReport.

The following types of recovery are available:

- LATEST: Performs a complete recovery (valid backups and all required archived logs and online redo logs must be available)
- PITR: Point-in-Time Recovery that performs a recovery to a specified timestamp within the current incarnation of database
- SCN: SCN-based recovery that performs a recovery is an incomplete recovery to a specified SCN within the current incarnation of database.
- BackupReport: Performs a recovery based on the Backup Report SCN. The BackupReport option is similar to SCN, except that the recovery uses the Backup Report SCN instead of a specified SCN.

Point-in-Time Database Recovery

Point-in-Time Recovery (PITR) recovers the database to a specific point-in-time. You must use specify the timestamp for this type of recovery.

A point-in-time recovery is often used for the following situations:

- You want to recover the database to an SCN before a user or administrative error.
- Complete database recovery failed because all necessary archived redo logs were not available.
- A database upgrade fails.
- You are creating a test database or a reporting database from production database backups.

System Change Number Recovery

A system change number (SCN) is a stamp that defines a committed version of a database at a point in time. Oracle assigns every committed transaction a unique SCN. You can recover a database to the latest time or to an SCN.

The database is restored from backups created before the target time, and then applies incremental backups and logs to re-create all changes between the time of the data file backups and the end point of recovery. When the end point is specified as an SCN, the database applies the redo logs and stops after each redo thread or the specified SCN, whichever occurs first. When the end point is specified as a time, the database internally determines a suitable SCN for the specified time and then recovers to this SCN.

SCN is a primary mechanism to maintain data consistency in Oracle database. With each execution, there is an increase in the count of the SCN. The following are some examples of areas that use SCN:

1. Redo records. Every redo record has an SCN version of the redo record in the redo header (redo records can have non-unique SCN). Given redo records from two threads (as in the case of RAC), recovery will order them in SCN order, essentially maintaining a strict sequential order.
2. Data block. Every data block has block SCN (block version). In addition to that, a change vector in a redo record also has expected block SCN. This means that a change vector can be applied to one and only version of the block. Code checks if the target SCN in a change vector is matching with the block SCN before applying the redo record. If there is a mismatch, corruption errors are thrown.
3. Read consistency. Every query has query environment which includes an SCN at the start of the query. A session can see the transactional changes only if that transaction commit SCN is lower then the query environment SCN.
4. Commit. Every commit generates an SCN (commit SCN) that marks a transaction boundary. Group commits are possible too.

Obsolete Database Backups

It is important to remove older backups once they become obsolete. The type of backup and the recovery window that you define in the database backup policy determines when database backups become obsolete.

For level 0 and level 1 backups, run the command `odacli delete-backup` for a given Database Resource Identifier to delete obsolete backups based on the defined recovery window.

For Longterm backups, provide the corresponding backup report as an input and use the command `odacli delete-backup` to delete the backups from Oracle Object Storage.

Typically, older level 0 and level 1 database backups are considered obsolete and deleted based on the defined recovery window, as follows:

- Disk: 1-14 days
- Object Storage: 1-31 days

Creating a Mount Point for NFS Backup Location

Create a mount point for the Network File System (NFS) location, to set up the NFS backup and recovery option.

Follow these steps to create a mount point for the NFS location:

1. Follow these steps on the source machine:
   1. Create a sharable location on the source machine and give full permissions to this directory.

      ```
      # mkdir /tmp/nfs_test
      chmod 774 /tmp/nfs_test
      ```

   2. Add entries in the `/etc/exports` file in the format *`shared_location destination_IPs (permissions)`*.

      For example:

      ```
      # cat /etc/exports
      /tmp/nfs_test 192.0.2.1(rw,sync)
      /tmp/nfs_test 192.0.2.2(rw,sync)
      ```

   3. Restart the NFS server on the host.

      ```
      # service nfs  restart
      ```

   4. Check the export list for the entries.

      ```
      # showmount -e
      Export list for oda1:
      /tmp/nfs_test 192.0.2.1,192.0.2.2
      ```

2. Follow these steps on the client machine:
   1. Create a client location on the client machine as the `oracle` user.

      ```
      # sudo -E -u oracle mkdir /tmp/client_location
      ```

   2. Mount this location with the source location in the format *`mount_server:source_folder client_location`*.

      ```
      # mount 192.0.2.3:/tmp/nfs_test  /tmp/client_location
      ```

   3. Check if the mount details are correct:

      ```
      # mount
      192.0.2.3:/tmp/nfs_test on /tmp/client_location type nfs
      (rw,vers=4,addr=192.0.2.3,clientaddr=192.0.2.2)
      ```

Specify this NFS location in the backup configuration, either through the Browser User Interface or CLI commands.

Related Topics

- Preparing for Database Backup to NFS Location
  Use the command-line interface to create a policy to backup a database to an External FRA (NFS Location).

Configuring Agent Proxy Settings for Object Store Access

If the Object Store IP address is accessible only through proxy setup by the Oracle Database Appliance server, then define the proxy setting for the agent, so that the agent can access the Object Store.

To create a backup policy that uses Object Store location, the agent must be able to access the Object Store URL.

1. Define the `HttpProxyHost` and `HttpProxyPort` settings in the `update-agentconfig-parameters` command.

   ```
    # odacli update-agentconfig-parameters -n HttpProxyHost -v www-
   proxy.test.com -n HttpProxyPort -v 80 -u

   Job details
   ----------------------------------------------------------------
   ID: 0b0cbf9b-b0ab-4523-a096-5da4e48fc825
   Description: Update agent configuration parameter values
   [HttpProxyHost, HttpProxyPort]
   Status: Created
   Created: October 23, 2018 4:56:53 PM IST
   Message:

   Task Name Start Time End Time Status
   ----------------------------------------
   ```

   For more information about the `update-agentconfig-parameters` command usage, see the Oracle Database Appliance Command-Line Interface.

2. Verify that the update succeeded:

   ```
   # odacli describe-job -i 0b0cbf9b-b0ab-4523-a096-5da4e48fc825

   Job details
   ----------------------------------------------------------------
   ID: 0b0cbf9b-b0ab-4523-a096-5da4e48fc825
   Description: Update agent configuration parameter values
   [HttpProxyHost, HttpProxyPort]
   Status: Success
   Created: October 23, 2018 4:56:53 PM IST
   Message:

   Task Name Start Time End Time Status
   ```

3. Run the `list-agentconfigParameters` command to view the changes in the proxy settings:

   ```
   # odacli list-agentConfigParameters

   Name Value Description Updated
   ------------------------------
   ----------------------------------------
   HttpProxyHost www-proxy.test.com October 23, 2018 4:56:53 PM IST
   HttpProxyPort 80 October 23, 2018 4:56:53 PM IST
   HttpsProxyHost Https proxy server host October 23, 2018 12:23:21 AM
   IST
   HttpsProxyPort Https proxy server port October 23, 2018 12:23:21 AM
   IST
   OSPatchRepos Repo list for OS patching October 23, 2018 12:23:21 AM
   IST
   ```

You can now use the Browser User Interface or the command-line interface to create a backup policy to use the ObjectStore location for backup.

Related Topics

- odacli update-agentconfig-parameters
  Use the `odacli update-agentconfig-parameters` command to modify configuration variables used by the appliance.
- odacli list-agentconfig-parameters
  Use the `odacli list-agentconfig-parameters` command to list configuration variables used by the appliance.

Creating a Database Backup Policy

Understand how to create a policy to backup a database to an internal or external Oracle Fast Recovery Area (FRA) location or to the Object Store using the Browser User Interface.

The backup policy defines the backup, including the location where you want to store the backups and the recovery window. Backup to disk requires a lot of disk space (up to two to three times the size of the database).
Follow these steps to create a backup policy from the Browser User Interface:

1. Click the **Database** tab in the Browser User Interface.
2. Click **Backup Policy** in the left navigation to display a list of backup policies.
3. Click **Create Backup Policy**.
4. Enter a name for the backup policy and select the number of days for the recovery window. Select **Enable Crosscheck** to determine if the files on the disk on in the media management catalog correspond to data in the RMAN repository. Select one of the following as the backup destination:
   - To backup to disk, select **Internal FRA** as the backup destination.
   - To backup to the cloud, select **ObjectStore** as the backup destination. If you have more than one Object Store, then select the Object Store Credential Name from the list. Enter a name in the Container Name field.

- To backup to an NFS location, select **External FRA** as the backup destination, and specify the NFS mount point location.
- To not define a destination, select **None**.

The Backup Policy name must begin with an alpha character and contain only alphanumeric characters.

5. You must specify the **TDE Wallet Backup Location** to associate the backup configuration to a TDE-enabled database.
6. Click **Create**. Click **Yes** to confirm that you want to create the backup policy.

   A link to the job appears. When the job completes successfully, the backup configuration is ready.

Update an existing database to attach the backup configuration to the database using the ID or Name. When you attach the backup configuration to a database, the `dcs-agent` schedules daily automatic backups for the database.

Updating a Database with a Backup Policy

Attach a backup policy to a database to define the database backup attributes and destination.

1. In the Browser User Interface, click the **Database** tab, then select a database from the list.
2. In the Database Information page, click **Apply Backup Policy**.

   If the action is disabled, then you must create a backup policy.
3. Select a backup policy from the list of available backup policies, and provide the **Backup Encryption Password**. For TDE-enabled databases, backups are encrypted by default and do not require the RMAN backup encryption password to be specified separately. Click **Apply**.
4. Expand the **Actions** menu, then click **View** to display the Database Information page.

   The details include whether or not Auto Backup is enabled, the Backup Destination, and options to create a backup, enable or disable automatic backups, update the database, and archive log backup schedule.
5. (Optional) Click **Manual Backup** to create a single backup. Click **Update Database Backup Schedule** to schedule automatic backups. Click **Update Archive Log Backup Schedule** to schedule archive log backups.
6. Click the **Activity** tab to check the job status.

   When the job completes successfully, the backup policy is associated with the database.

Updating a Database Backup Policy

Use the Browser User Interface to update the recovery window, change the ObjectStore Credential, or change the crosscheck option for a database backup policy.

Crosscheck determines if the files on the disk on in the media management catalog correspond to data in the RMAN repository.

1. Click the **Database** tab in the Browser User Interface.

2. Click **Backup Policy** in the left navigation to display a list of backup policies.
3. Expand the **Actions** menu for a backup policy, then click **Update**.
4. To change the recovery window, use the up or down arrow to change the number of days.
5. To enable or disable the crosscheck, select or deselect **Enable Crosscheck**.
6. Click **Update**. Click **Yes** to confirm that you want to update the backup policy.

   A link to the job appears. When the job completes successfully, the backup configuration is ready.

Backing Up a Database Using the Browser User Interface

Apply a backup policy to a database, create a manual backup, update a database backup schedule, or update an archive log backup scheduler.

You can use the Browser User Interface or the command-line interface to create a database backup. In the command-line interface, use the command `odacli create-backup` for a specified Database.

Before creating a database backup, you must have a backup policy. The backup policy defines the recovery window and the backup destination. You must associate a backup policy with the database, otherwise you cannot create backups.
Follow these steps to backup a database from the Browser User Interface:

1. In the Browser User Interface, click the **Database** tab.
2. Click a database name to select a database from the list.
3. Review the database information, including the backup policy name and destination details. To select a backup policy for the database, click **Apply Backup Policy**. Select a policy and specify the **Backup Encryption Password**. For TDE-enabled databases, backups are encrypted by default and do not require the RMAN backup encryption password to be specified separately. For databases that do not have TDE enabled, the **Backup Encryption Password** is mandatory for Objectstore backup destination, optional for NFS backup destination and not required for Disk backup destination.
4. Click **Manual Backup**, **Update Database Backup Schedule** or **Update Archive Log Backup Schedule**.

   If the action is disabled, then apply a backup policy.
5. Click **Yes** to confirm the job.

   A link to the job appears. When the job completes successfully, the backup is ready. A list of backups appears at the bottom of the page.

Viewing Backup Reports

Understand how you can use the Browser User Interface to view backup reports.

A report is generated when a database backup is performed. The backup report lists the type, location, and date and timestamp of the backup.

1. In the Browser User Interface, click the **Database** tab, then click the database name in the list of databases.

Information about the database appears on the Database Information page.

2. Scroll to the bottom of the page to view a list of Backups.
3. Click the Job ID for a backup to view the Backup Report and more details about the backup.

Recovering a Database Using the Browser User Interface

Understand the recovery options available for recovering a database.

1. In the Browser User Interface, click the **Database** tab, then select a database from the list.
2. On the Database Information page, click **Recover**.
3. On the Recover Database page, select any of the following recovery options:

   Recover Full Database to the specified Backup: Select the existing backup from which you want to recover the database

   Recover Full Database to the Latest: Select this option to recover the database from the last known good state, with the least possible data loss.

   Recover Full Database to the specified Timestamp: Specify the timestamp to recover the database.

   Recover Full Database to the System Change Number (SCN): Specify the SCN of the backup from which you want to recover the database.
4. Specify and confirm the **Backup Encryption Password** for databases without Transparent Database Encryption (TDE) enabled.
5. If the database has TDE enabled, then the **TDE Wallet Backup Location** and **TDE Password** fields are displayed.
6. Click the **Activity** tab to check the job status.

   When the job completes successfully, the database is recovered as per the specified recovery options.

Deleting a Backup Using the Browser User Interface

Use the Browser User Interface to delete database backups.

You can delete Level-0, Level-1, and Archive Log backups anytime. To delete long term backups, you must check the Backup Report for the database to determine when the backup is obsolete.

1. Click the **Database** tab in the Browser User Interface.
2. Click the database name, in blue font, to display more details about the database for which you want to delete the backup.
3. Click **Delete Backups** .
4. Select the Backup type you want to delete, whether Level-0, Level-1, and Archive Log backup or long Term backup, then click **Start**. Click **Yes** to confirm that you want to delete the backup.

   A link to the job appears. When the job completes successfully, the backup is deleted.

Deleting a Backup Policy

Use the Browser User Interface to delete a database backup policy.

1. Click the **Database** tab in the Browser User Interface.
2. Click **Backup Policy** in the left navigation to display a list of backup policies.
3. Expand the **Actions** menu for a backup policy, then click **Delete**. Click **Yes** to confirm that you want to delete the backup policy.

   A link to the job appears. When the job completes successfully, the backup policy is deleted.

Using the CLI to Backup, Restore, and Recover

Use the command-line interface to backup, restore, and recover databases.

- Preparing for Database Backup to Disk
  Use the command-line interface to create a policy to backup a database to the Oracle Fast Recovery Area (FRA) of a disk.
- Preparing for Database Backup to NFS Location
  Use the command-line interface to create a policy to backup a database to an External FRA (NFS Location).
- Preparing for Database Backup to Oracle Cloud
  Create a backup configuration to backup a database to Oracle Cloud Infrastructure Object Storage.
- Backing Up a Database with the CLI
  Create a level 0, level 1, LongTerm database backup, or archivelog backup with the command-line interface.
- Recovering a Database with the CLI
  Recover the database to the system using a Backup Report, point-in-time recovery (PITR), a system change number (SCN), or from the latest backup time.
- Restoring a Database with the CLI
  You can restore a database to a system from Oracle Object Storage or NFS backup location using a backup report and the command-line interface.
- Deleting Backups with the CLI
  Delete older, obsolete level 0, level 1 and long term backups.

Preparing for Database Backup to Disk

Use the command-line interface to create a policy to backup a database to the Oracle Fast Recovery Area (FRA) of a disk.

You can create a backup policy using the Browser User Interface or the command-line interface. Most of the backup and recovery commands enable you to provide either a resource name or resource ID to identify the database.

Backup to disk or the **Backup to Internal FRA** option in the Browser User Interface, requires a lot of disk space (up to two to three times the size of the database).

Follow these steps to create a backup policy through the command-line interface:

1. Create a BackupConfig object (backup configuration) using the command `odacli create-backupconfig`.

   The backup configuration defines the backup, including the location where you want to store the backups and the recovery window.

   The following example creates a backup configuration named `mkg1dailydisk` with a backup to `disk` and a 1 day recovery window.

   ```
   # odacli create-backupconfig -d Disk -n mkg1dailydisk -w 1
   ```

2. Check the job status.

   ```
   # odacli list-jobs
   ```

   When the job completes successfully, the backup configuration is ready.

3. Update an existing database to attach the backup configuration to the database using the ID or Name.

   When you attach the backup configuration to a database, the `dcs-agent` schedules daily automatic backups for the database.

   The following example uses the Database Resource ID and Backup Configuration ID:

   ```
   # odacli modify-database -i d3c4d8f6-5eb7-4f9e-ab27-7bdd5013ac90 -
   bi 9d942e0a-ba00-4cbc-9bfb-0de83ed279e5 -bp
   ```

   The following example uses the Database Resource Name, `mydb` and the Backup Configuration Name, `mydb`:

   ```
   # odacli modify-database -in mydb -bin mybcfg -bp
   ```

You can create manual backups or scheduled backups to disk.

Preparing for Database Backup to NFS Location

Use the command-line interface to create a policy to backup a database to an External FRA (NFS Location).

You can create a backup policy using the Browser User Interface or the command-line interface. Most of the backup and recovery commands enable you to provide either a resource name or resource ID to identify the database.

Backup to NFS location or the **Backup to External FRA** option in the Browser User Interface, requires creation of an NFS mount point.

Follow these steps to create a backup policy through the command-line interface:

1. Create a BackupConfig object (backup configuration) using the command `odacli create-backupconfig`.

   The backup configuration defines the backup, including the location where you want to store the backups and the recovery window.

The following example creates a backup configuration named mkg1dailynfs with a backup to disk and a 1 day recovery window.

```
# odacli create-backupconfig -d NFS -n mkg1dailynfs -c absolute-
path-to-parent-directory-for-NFS-destination -w 1
```

2. Check the job status.

```
# odacli list-jobs
```

   When the job completes successfully, the backup configuration is ready.

3. (Optional) Update an existing database to attach the backup configuration to the database using the ID or Name.

   When you attach the backup configuration to a database, the dcs-agent schedules daily automatic backups for the database.

   The following example uses the Database Resource ID and Backup Configuration ID:

```
#  odacli modify-database -i d3c4d8f6-5eb7-4f9e-ab27-7bdd5013ac90
-bi 9d942e0a-ba00-4cbc-9bfb-0de83ed279e5 -bp
```

   The following example uses the Database Resource Name, mydb and the Backup Configuration Name, mydb:

```
# odacli modify-database -in mydb -bin mybcfg -bp
```

   The -bp option to specify the backup password is not applicable for TDE-enabled databases.

You can create manual backups or scheduled backups to NFS location.

Related Topics

- Creating a Mount Point for NFS Backup Location
  Create a mount point for the Network File System (NFS) location, to set up the NFS backup and recovery option.

Preparing for Database Backup to Oracle Cloud

Create a backup configuration to backup a database to Oracle Cloud Infrastructure Object Storage.

Before you can backup to Oracle Object Storage, you must sign up for an Oracle Cloud Infrastructure Object Storage account and know your Oracle Object Storage credentials. When you create an Oracle ObjectStoreSwift object, the command creates and stores the credential details in the system and stores the password in an encrypted Oracle wallet. The Oracle wallet contains the Oracle Object Storage password.

Go to the Oracle Store to sign up for Oracle Cloud Infrastructure Object Storage.

1. Create an Oracle ObjectStoreSwift object using the command `create-objectstoreswift`.

   ```
   # odacli  create-objectstoreswift -e swift end point URL -n Object
   Store Swift name [-p] swiftpassword -t Object Store tenant name -u
   Object Store user name
   ```

   For example:

   ```
   # odacli create-objectstoreswift -e https://
   swiftobjectstorage.r1.oracleiaas.com/v1 -n ossn1 -t mytenant -u
   user.name@example.com -p
   ```

   The output includes an objectstoreswift Resource ID to identify an ObjectStoreSwift credential.

2. Create a BackupConfig object (backup configuration) using the command `odacli create-backupconfig`.

   The backup configuration defines the backup, including the location (container) where you want to store the backups, the recovery window, and the credentials that are defined in your encrypted Oracle wallet.

   The following example creates a backup configuration named `hr_7d_cloud`with a backup to the `ObjectStore`. The following backup parameters are defined: the container is `hr_bucket`, crosscheck is not enabled, the recovery window is 7 days, and the ObjectStoreSwift Resource ID is provided, which attaches the ObjectStoreSwiftObject to the backup configuration.

   ```
    # odacli  create-backupconfig  -n hr_7d_cloud -d ObjectStore -w 7
   -o b974f006-5503-4949-ab6c-6f1a56e4ac37 -c hr_bucket -no-cr
   ```

   > **Note:**
   >
   > If the ObjectstoreSwift Object was not created with valid credentials, then creating the backup configuration will fail.

3. Check the job status.

   ```
   # odacli list-jobs
   ```

   When the job completes successfully, the backup configuration is ready. When you create a new database, you have the option to associate the database with a backup configuration.

4. Update an existing database to attach the backup configuration to the database.

   When you attach the backup configuration to a database, the `dcs-agent` schedules daily automatic backups for the database.

   ```
   # odacli modify-database -i e3c4d8f6-5eb7-4f9e-ab27-7bdd5013ac10 -
   bi 7d942e0a-ba00-4cbc-9bfb-0de83ed279e5 -bp
   ```

You can create manual backups outside of scheduled backups, view backup reports, or disable automatic backups.

Backing Up a Database with the CLI

Create a level 0, level 1, LongTerm database backup, or archivelog backup with the command-line interface.

You can create a database backup in the Browser User Interface or with the command-line interface. When you attach a backup configuration object to a database, the `dcs-agent` automatically schedules daily backups for the database. The day and time are based on the Oracle Database Appliance time zone. The AutoSchedule triggers a level 0 Backup every Sunday, a level 1 the other 6 days of the week, and an archivelog backup every 30 minutes. Use the command `odacli update-schedule` to disable or change the scheduled backup time.

To create a Long Term database backup, or a level 0 or level 1 backup outside of the automatic backups, use the command `odacli create-backup`.

> **Note:**
>
> To recover a database, there must be a level 0 backup taken, so that the backup report contains information about the base backup. Restoring a database to the same system with a different DB Name and DB Unique Name or to another system does not always require a long term database backup report. You can use archivelog, or level 0, or level 1 backup reports as well. If you use the archivelog backup report , a prior database backup must exist.To restore a database to another system, you must have a long term database backup in Oracle Object Storage.

1. Verify that a backup configuration object is associated with the database.
2. Create a single backup, outside of the automatic backups, using the command `odacli create-backup`.

   Use the Database Resource ID or Database Name to identify the database to backup, specify the type of backup, and use a tag to create a name for the backup. You can use up to 30 alphanumeric characters for the backup name tag. If you do not select a backup type (level 0, level 1, LongTerm, or archivelog backup), a level 1 backup is performed. For example, create a level 0 backup named `2018Jan02_HRLevel0` for resource ID `20576eb1-bc32-4e34-bf97-fda0b60ca15b`

   ```
   # odacli create-backup -i 20576eb1-bc32-4e34-bf97-fda0b60ca15b -bt 
   Regular-L0 -t 2018Jan02_HRLevel0
   ```

   When the job finishes, a backup report is generated for the backup. The report contains all of the metadata required to recover a database.
3. (Optional) Display a list of backup reports.

   ```
   # odacli list-backupreports
   ```

4. (Optional) Display a list of all scheduled backups.

   ```
   # odacli list-schedules
   ```

Recovering a Database with the CLI

Recover the database to the system using a Backup Report, point-in-time recovery (PITR), a system change number (SCN), or from the latest backup time.

Recovering a database in Oracle Database Appliance is a full RMAN database recovery.

Recovering from a backup report requires JSON input for the backup report.

When recovering a TDE-enabled database, you need not specify the backup password.

1. Display a list of backup reports and locate the latest Backup Report for the database and save the Backup Report ID.

   ```
   # odacli list-backupreports
   ```

2. Use the Backup Report ID to display the details of the Backup Report. Determine how you want to recover the database: PITR, SCN, or Latest and locate the needed information in the Backup Report.

   ```
   # odacli describe-backupreport -i 7fbb06bf-e3a3-4aed-
   b617-4d1cd3d33387
   {
     "id" : "7fbb06bf-e3a3-4aed-b617-4d1cd3d33387",
     "dbResId" : "4903d18a-6c20-4860-9ed0-d2ea7bd3d7b9",
     "tag" : "auto",
     "dbId" : "3022438697",
     "dbName" : "tdbasm1",
     "dbUniqueName" : "tdbasm1",
     "backupType" : "regular-l0",
     "keepDays" : null,
     "backupLocation" : "https://swiftobjectstorage.us-
   ashburn-1.oraclecloud.com/v1/paasdevdbcssi/Bha_Backups",
     "cfBackupHandle" : "c-3022438697-20201022-03",
     "spfBackupHandle" : "c-3022438697-20201022-03",
     "pitrTimeStamp" : "October 22, 2020 07:51:59 AM UTC",
     "pitrSCN" : "2549429",
     "resetLogsTimeStamp" : "October 22, 2020 05:23:56 AM UTC",
     "resetLogsSCN" : "2510142",
     "oraHomeVersion" : "19.8.0.0.200714",
     "sqlPatches" : "31281355",
     "backupLogLoc" : "https://
   swiftobjectstorage.us-ashburn-1.oraclecloud.com/v1/paasdevdbcssi/
   Bha_Backups/scaoda8s002-c/database/3022438697/tdbasm1/rmanlog/
   2020-10-22/rman_backup_auto_2020-10-22_07-51-06.0546.log",
     "tdeWalletLoc" : "https://
   swiftobjectstorage.us-ashburn-1.oraclecloud.com/v1/paasdevdbcssi/
   TestLtBackupFailur/scaoda8s002-c/database/3022438697/tdbasm1/
   tdewallet/ewallet_2020102207525186_tdbasm1.p12",
   ```

```
  "dbConfigLoc" : "https://
swiftobjectstorage.us-ashburn-1.oraclecloud.com/v1/paasdevdbcssi/
Bha_Backups/scaoda8s002-c/database/3022438697/tdbasm1/dbconfig/
2020-10-22/DBCONFIG_auto_2020-10-22_07-52-43.0230.tar.gz",
  "name" : "Backup_Report_tdbasm1",
  "createTime" : "October 22, 2020 07:51:03 AM UTC",
  "state" : {
    "status" : "CONFIGURED"
  },
  "updatedTime" : "October 22, 2020 07:52:55 AM UTC",
  "backupReportLogDetail" : "https://swiftobjectstorage.us-
ashburn-1.oraclecloud.com/v1/paasdevdbcssi/Bha_Backups/scaoda8s002-
c/database/3022438697/tdbasm1/rmandetaillogreport/2020-10-22/
rman_list_backup_detail_auto_2020-10-22_07-52-33.0919.log",
  "dbInfo" : {
    "dbClass" : "OLTP",
    "dbType" : "SI",
    "dbShape" : "odb1",
    "dbEdition" : "EE",
    "dbStorage" : "ASM",
    "dbRedundancy" : null,
    "pdbName" : null,
    "isCdb" : false
  },
  "dbDataSize" : "1662M",
  "dbRedoSize" : "12298M",
  "rmanBackupPieces" :
"https://swiftobjectstorage.us-ashburn-1.oraclecloud.com/v1/
paasdevdbcssi/Bha_Backups/scaoda8s002-c/database/3022438697/tdbasm1/
backuppieces/2020-10-22/backupPieces_auto_4903d18a-6c20-4860-9ed0-
d2ea7bd3d7b9_20201022075238.json",
  "compressionAlgo" : "MEDIUM",
  "cpuPool" : null,
  "numberOfCores" : null
}
```

3. To recover from a backup report, based on SCN, identify the database ID and the backup report for recovery.

   In the following example, the JSON input file for the backup report is `backupreport.json`.

   ```
   # odacli recover-database -i b5fc646e-01a6-4c8b-8286-7633346c4 -br
   backupreport.json -p
   ```

4. To recover based on PITR, identify the database ID and the date and time stamp for recovery.

   ```
   # odacli recover-database -i b5fc646e-01a6-4c8b-8286-7633346c4 -t
   PITR -r 01/08/2018 12:57:33 –p
   ```

5. To recover based on SCN, identify the database ID and the SCN number.

   ```
   # odacli recover-database -i b5fc646e-01a6-4c8b-8286-7633346c4 -t
   SCN -s 392375947
   ```

6. To recover based on the latest backup, identify the database ID and use the Latest option.

   ```
   # odacli recover-database -i b5fc646e-01a6-4c8b-8286-7633346c4 -t
   Latest -p
   ```

7. Validate that the job completed. You can track the job in the **Activity** tab in the Browser User Interface, or run the command `odacli describe-job` with the job ID.

   ```
   # odacli describe-job -i jobId
   ```

   When the job completes successfully, the recovery is complete.

Restoring a Database with the CLI

You can restore a database to a system from Oracle Object Storage or NFS backup location using a backup report and the command-line interface.

When you restore a database, environment and validation checks and setup tasks are performed. Restoring a database requires a number of tasks and configuration details, such as creating database storage, Oracle Home, recreating the control file, registering the database, and establishing RMAN restore and recovery. An Oracle Database Appliance backup report is generated for each backup and contains the metadata required to restore a database. The report is designed to help you to quickly and efficiently restore a database.

You can restore a database from one appliance to another appliance, or to the same appliance when the source database is deleted:

- To restore to a different system, copy the backup report generated by the command `odacli create-backup` to the other machine's `\bin` folder and use the command `odacli irestore-database` with the backup report.
- To restore to the same system, delete the source database and use the backup report generated by the command `odacli create-backup`.

To restore a database to another system, you must have a database backup report in Oracle Object Storage, valid credentials in an Oracle wallet (ObjectStoreSwift), the Swift Object Store credential ID, and the SYS user password.

> **Note:**
>
> For Standard Edition Oracle Database 19c or later, you cannot restore Oracle RAC or Oracle RAC One Node Database.

Follow these steps to restore a database using the command-line (CLI):

1. Display a list of backup reports and locate the latest Backup Report in Oracle Object Storage for the database and save the Backup Report ID.

   ```
   # odacli list-backupreports
   ```

2. Use the Backup Report ID to display the details of the latest Backup Report.

   ```
   #  odacli  describe-backupreport -i 7fbb06bf-e3a3-4aed-
   b617-4d1cd3d33387
   {
     "id" : "7fbb06bf-e3a3-4aed-b617-4d1cd3d33387",
     "dbResId" : "4903d18a-6c20-4860-9ed0-d2ea7bd3d7b9",
     "tag" : "auto",
     "dbId" : "3022438697",
     "dbName" : "tdbasm1",
     "dbUniqueName" : "tdbasm1",
     "backupType" : "regular-l0",
     "keepDays" : null,
     "backupLocation" : "https://swiftobjectstorage.us-
   ashburn-1.oraclecloud.com/v1/paasdevdbcssi/Bha_Backups",
     "cfBackupHandle" : "c-3022438697-20201022-03",
     "spfBackupHandle" : "c-3022438697-20201022-03",
     "pitrTimeStamp" : "October 22, 2020 07:51:59 AM UTC",
     "pitrSCN" : "2549429",
     "resetLogsTimeStamp" : "October 22, 2020 05:23:56 AM UTC",
     "resetLogsSCN" : "2510142",
     "oraHomeVersion" : "19.8.0.0.200714",
     "sqlPatches" : "31281355",
     "backupLogLoc" : "https://
   swiftobjectstorage.us-ashburn-1.oraclecloud.com/v1/paasdevdbcssi/
   Bha_Backups/scaoda8s002-c/database/3022438697/tdbasm1/rmanlog/
   2020-10-22/rman_backup_auto_2020-10-22_07-51-06.0546.log",
     "tdeWalletLoc" : "https://
   swiftobjectstorage.us-ashburn-1.oraclecloud.com/v1/paasdevdbcssi/
   TestLtBackupFailur/scaoda8s002-c/database/3022438697/tdbasm1/
   tdewallet/ewallet_2020102207525186_tdbasm1.p12",
     "dbConfigLoc" : "https://
   swiftobjectstorage.us-ashburn-1.oraclecloud.com/v1/paasdevdbcssi/
   Bha_Backups/scaoda8s002-c/database/3022438697/tdbasm1/dbconfig/
   2020-10-22/DBCONFIG_auto_2020-10-22_07-52-43.0230.tar.gz",
     "name" : "Backup_Report_tdbasm1",
     "createTime" : "October 22, 2020 07:51:03 AM UTC",
     "state" : {
       "status" : "CONFIGURED"
     },
     "updatedTime" : "October 22, 2020 07:52:55 AM UTC",
     "backupReportLogDetail" : "https://swiftobjectstorage.us-
   ashburn-1.oraclecloud.com/v1/paasdevdbcssi/Bha_Backups/scaoda8s002-
   c/database/3022438697/tdbasm1/rmandetaillogreport/2020-10-22/
   rman_list_backup_detail_auto_2020-10-22_07-52-33.0919.log",
     "dbInfo" : {
       "dbClass" : "OLTP",
       "dbType" : "SI",
       "dbShape" : "odb1",
       "dbEdition" : "EE",
   ```

```
    "dbStorage" : "ASM",
    "dbRedundancy" : null,
    "pdbName" : null,
    "isCdb" : false
  },
  "dbDataSize" : "1662M",
  "dbRedoSize" : "12298M",
  "rmanBackupPieces" :
"https://swiftobjectstorage.us-ashburn-1.oraclecloud.com/v1/
paasdevdbcssi/Bha_Backups/scaoda8s002-c/database/3022438697/tdbasm1/
backuppieces/2020-10-22/backupPieces_auto_4903d18a-6c20-4860-9ed0-
d2ea7bd3d7b9_20201022075238.json",
  "compressionAlgo" : "MEDIUM",
  "cpuPool" : null,
  "numberOfCores" : null
}
```

3. (Optional) If you need to generate a new backup report, use the command `odacli create-backup`.

   ```
   # odacli create-backup
   ```

4. Locate the Swift Object Store credential ID for the database backup.

   ```
   # odacli list-objectstoreswifts
   ```

5. Save the backup report as a JSON file in a folder in the `\bin` directory on the appliance. For example, `backupreport.json`.

6. Restore the database to the system using the JSON file in the command `odacli irestore-database`.

   Run the command, then enter the SYS user password when prompted.

   ```
   # odacli irestore-database -r backupreport.json -oid Object Store
   ID -m
   ```

   To restore a TDE-enabled database, the TDE wallet password must be provided. If source database is TDE enabled, then the target database which was restored will also have TDE enabled.

7. Validate that the job completed. You can track the job in the **Activity** tab in the Browser User Interface, or run the command `odacli describe-job` with the job ID.

   ```
   # odacli describe-job -i jobId
   ```

Deleting Backups with the CLI

Delete older, obsolete level 0, level 1 and long term backups.

For level 0 and level 1 backups, the recovery window defined in the Backup Configuration determines when the backup is obsolete. The ranges are as follows:

- Backup to disk: between 1 and 14 days

- Backup to the Oracle Object Storage: between 1 and 31 days

For Long Term backups to the Oracle Object Storage, view the Backup Report for a database to determine when the backup is obsolete. To delete Long Term Backup, the Database Resource ID or Database name and the Backup Report are required.

Follow these steps to delete database backups using `odacli` commands:

1. Display a list of all backup reports.

   ```
   # odacli  list-backupreports
   ```

2. Obtain the Database ID and type of backup.

   ```
   # odacli  describe-backupreport -i Backup Report ID
   ```

3. To delete obsolete level 0 and level 1 backups, use the Database ID or Database Name to delete the backup.

   ```
   # odacli delete-backup -i 20576eb1-bc32-4e34-bf97-fda0b60ca15b
   ```

4. To delete Long Term backups, use the Backup Report and a JSON file to delete the backup.

   In the following example, the JSON input file for the backup report is `backupreport.json`.

   ```
   # odacli delete-backup -i 20576eb1-bc32-4e34-bf97-fda0b60ca15b -br
   backupreport.json
   ```

12 Using Oracle Data Guard for Disaster Management and Recovery on Oracle Database Appliance

Understand how you can use Oracle Data Guard for disaster management and recovery on Oracle Database Appliance.

About Oracle Data Guard on Oracle Database Appliance

Oracle Database Appliance provides client interface through ODACLI commands for easy configuration and management of Oracle Data Guard for high availability, data protection, and disaster recovery.

Oracle Data Guard provides a comprehensive set of services that create, maintain, manage, and monitor one or more standby databases to enable production Oracle databases to survive disasters and data corruptions. Oracle Data Guard maintains these standby databases as copies of the production database. Then, if the production database becomes unavailable because of a planned or an unplanned outage, Oracle Data Guard can switch any standby database to the production role, minimizing the downtime associated with the outage. Oracle Data Guard can be used with traditional backup, restoration, and cluster techniques to provide a high level of data protection and data availability. Oracle Data Guard transport services are also used by other Oracle features such as Oracle Streams and Oracle GoldenGate for efficient and reliable transmission of redo from a source database to one or more remote destinations.

With Oracle Data Guard, administrators can optionally improve production database performance by offloading resource-intensive backup and reporting operations to standby systems.

The ability to create clone databases on a standby system enables you to set up test or development environments based on your standby databases. Since standby systems are not production systems, they are a better choice for seeding test or development environments.

> **Note:**
>
> Oracle Database Enterprise Edition includes Oracle Data Guard.

Configuring Oracle Data Guard on Oracle Database Appliance

Oracle Database Appliance enables you to set up Oracle Data Guard using ODACLI commands.

Prerequisites for Oracle Database Guard Configuration

Before you begin:

- Oracle recommends running the primary and the standby databases on separate Oracle Database Appliance hardware, so ensure that you have at least two separate Oracle Database Appliance machines.
- Oracle recommends running the primary and the standby databases on two homogeneous Oracle Database Appliance systems. For example, if the primary database is a High-Availability system, then the standby database must be on a similar High-Availability system.
- Oracle recommends that the primary and standby systems have the same Oracle Database Appliance configuration. The database must have similar configuration for database shape, version, memory, networking, and storage (both must have either Oracle ASM or Oracle ACFS storage) to avoid any unpredictability with the database switch roles.
- The primary and standby systems must be the same Oracle Database Appliance release, and must be on Oracle Database Appliance release 19.8 or later.

- If you have customized the operating system, then ensure that environments on both machines are identical.
- Ensure that your deployment follows Oracle Maximum Availability Architecture (MAA) best practices. See the Oracle Maximum Availability Architecture (MAA) page on Oracle Technology Network.
- If you decide to use Oracle ObjectStore for backup and recovery, then you must configure access for both the primary and standby systems.
- You need the TrustStore password to configure Oracle Data Guard. The TrustStore password is available in the location `/opt/oracle/dcs/dcscli/dcscli.conf`.

Setting up Backup and Recovery for Oracle Database Guard Configuration

You can use either Object Store or External FRA (NFS) to set up the backup for primary and standby databases when configuring Oracle Data Guard on Oracle Database Appliance. A backup is necessary to instantiate a standby database.

To set up Object Store backup (recommended):

1. Configure the agent proxy settings:

   ```
   # odacli update-agentConfigParameters -n HttpProxyHost -v www-
   proxy.test.com -n HttpProxyPort -v 80 -u
   ```

   For more information, see the topic *Configuring Agent Proxy Settings for Object Store Access* in this guide.
2. Create the Object Store credentials on both primary and standby systems:

   ```
   # odacli create-objectstoreswift -e swift_end_point_URL -
   n Object Store_Swift_name -t Object_Store_tenant_name -u
   Object_Store_user_name
   ```

   For example:

   ```
   # odacli create-objectstoreswift -e https://swiftobjectstorage.us-
   ashburn-1.oraclecloud.com/v1  -n aaa -t test_user -u testuser
   ```
3. View the Object Store Swift name:

   ```
   # odacli list-objectstoreswifts
   ```
4. Create the backup configuration:

   ```
   # odacli create-backupconfig -d objectstore -c testuser -on aaa -w
   7 -cr -n backupConfig7days
   ```
5. Associate the backup configuration with the database:

   ```
   # odacli modify-database -in test_db -bin backupConfig7days -bp
   ```

To set up NFS backup:

1. Create the backup configuration. For High-Availability deployments, run the command on one node only.

   ```
   # odacli create-backupconfig -n nfsbkup -w 10 -d NFS -c /u01/
   nfs_backup
   ```

2. Associate the backup configuration with the database:

   ```
   # odacli modify-database -in test_db -bin nfsbkup
   ```

Configuring Oracle Data Guard using ODACLI commands

Follow these steps:

1. Take a backup of your primary database to Object Store or External FRA (NFS) with the `-ka` option to keep archivelogs after backup.

   ```
   # odacli create-backup --backupType Regular-L0 -in primary_DB -ka
   ```

   For example:

   ```
   # odacli create-backup --backupType Regular-L0 -in test_db -ka
   ```

2. Save the backup report:

   ```
   # odacli describe-backupreport -i eba406c7-ae46-4d1d-
   a1e5-3e985397b171 > backup_report_test_db_0620.json
   ```

   The backup report ID is the ID of the backup created in step 1 and can be obtained by running the `odacli list-backupreports` command.

3. Copy the backup report to the standby system and restore the backup to a standby database.

   ```
   # odacli irestore-database -ro STANDBY
   ```

   If you want to use Object Store, then specify the Object Store location:

   ```
   # odacli irestore-database -r backup_report.json -u dbUniqueName
   -on objectStoreName -bp -ro STANDBY
   Rman Backup Encryption Password(s). Multiple passwords needs to be
   comma separated.:
   Password for SYS user:
   ```

   In the above command, specify the `dbUniqueName` of the standby system.

   If your backup option is NFS, then specify the NFS location:

   ```
   odacli irestore-database -r backup_report.json -u dbUniqueName -ro
   STANDBY
   Password for SYS user:
   ```

4. Copy the trust store file of the standby machine to the primary machine, and set the file permissions to 400.

```
# scp root@standby_host:/opt/oracle/dcs/dcscli/dcscli.conf /opt/
oracle/dcs/dcscli/dcscli.conf.standby_host_name
# chmod 400 /opt/oracle/dcs/dcscli/dcscli.conf.standby_host_name
```

5. Configure Oracle Data Guard, by running the `odacli configure-dataguard` command on the primary system. Provide the values for your configuration through the interactive command line interface.
   In the interactive CLI configuration steps, the parameters are as follows:
   - Standby site address is IP address or host name of the standby host. Provide the fully qualified domain name and hostname if the primary and the standby systems are in the same domain and DNS is configured.
   - The *TrustStore_password* is the value in the `TrustStorePassword` field in the `/opt/oracle/dcs/dcscli/dcscli.conf` file on the standby system.
   - Select Oracle Data Guard protection modes to meet availability, performance and data protection requirements. Oracle Data Guard Protection Modes are Maximum Availability, Maximum Performance, and Maximum Protection. The log transport modes are ASYNC, SYNC, and FASTSYNC.
     You can select the following combinations of protection modes and transport types:

Table 12-1 Oracle Data Guard protection modes and transport modes

Protection Mode \ Transport Type	ASYNC	FASTSYNC**	SYNC
MAXPERFORMANCE	Y*	Y	Y
MAXAVAILABILITY	N	Y	Y*
MAXPROTECTION	N	N	Y*

* in the table indicates the default supported pair and ** FASTSYNC mode is available only in Oracle Database 12.1 or later.

```
# odacli configure-dataguard
Standby site address: test_domain
BUI username for Standby site (default: oda-admin):
BUI password for Standby site:
TrustStore path for Standby DCS server: /cacerts.a
TrustStore password for Standby DCS server: TrustStore_Password
Database name for Data Guard configuration: cpub
Primary database syspassword:
********************************************************************
***********************
Data Guard default settings
Primary site network for Data Guard configuration: Public-network
Standby site network for Data Guard configuration: Public-network
Primary database listener port: 1521
Standby database listener port: 1521
Transport type: ASYNC
Protection mode: MAX_PERFORMANCE
```

```
Data Guard configuration name: pcpub_scpub
Active Data Guard: disabled
Do you want to edit this Data Guard configuration? (Y/N,
default:N):
The TrustStore of the Standby site should be removed unless it is
necessary for some other purpose. Do you want to delete it? (Y/N,
default:Y): n
As a requirement, Standby database's SYS password will be set to
Primary database's after Data Guard configuration. Are you sure you
want to proceed with Data Guard configuration? (Y/N): y
********************************************************************
***********************
Configure Data Guard pcpub_scpub started
********************************************************************
***********************
Step 1: Validate Data Guard configuration request (Primary site)
Description: Validate DG Config Creation
Job ID: bafb8ef4-d3c9-4421-84a1-4c75d73e71a0
Started August 25, 2020 05:51:20 UTC
Validate create Data Guard configuration request
Finished August 25, 2020 05:51:27 UTC
********************************************************************
***********************
Step 2: Validate Data Guard configuration request (Standby site)
Description: Validate DG Config Creation
Job ID: a7b80880-40ab-4dbf-b8be-22717ae87711
Started August 25, 2020 05:51:27 UTC
Validate create Data Guard configuration request
Finished August 25, 2020 05:51:33 UTC
********************************************************************
***********************
Step 3: Download password file from Primary database (Primary site)
Description: Download orapwd file from Primary database
Started August 25, 2020 05:51:33 UTC
Prepare orapwd file for Primary database cpub
Finished August 25, 2020 05:51:38 UTC
********************************************************************
***********************
Step 4: Upload password file to Standby database (Standby site)
Description: Upload orapwd file to Standby database
Started August 25, 2020 05:51:38 UTC
Write orapwd file to Standby database cpub
Finished August 25, 2020 05:51:47 UTC
********************************************************************
***********************
Step 5: Configure Primary database (Primary site)
Description: DG Config service creation - ConfigurePrimary
Job ID: b6726f76-0a3a-4bb1-8fec-a3eb311531cf
Started August 25, 2020 05:51:47 UTC
Configure host DNS on primary env
Configure Data Guard Tns on primary env
Enable Data Guard related Db parameters for primary env
Enable force logging and archivelog mode in primary env
Enable FlashBack
Configure network parameters for local listener on primary env
```

```
Restart listener on primary env
Create services for primary db
Finished August 25, 2020 05:52:10 UTC
********************************************************************
***********************
Step 6: Configure Standby database (Standby site)
Description: DG Config service creation - ConfigureStandby
Job ID: e6b552be-fef0-4cd6-a61d-81292f957a6e
Started August 25, 2020 05:52:10 UTC
Configure Data Guard Tns on standby env
Configure host DNS on standby env
Clear Data Guard related Db parameters for standby env
Enable Data Guard related Db parameters for standby env
Enable force logging and archivelog mode in standby env
Populate standby database metadata
Configure network parameters for local listener on standby env
Reset Db sizing and hidden parameters for ODA best practice
Restart Listener on standby env
Create services for standby db
Finished August 25, 2020 05:53:40 UTC
********************************************************************
***********************
Step 7: Configure and enable Data Guard (Primary site)
Description: DG Config service creation - ConfigureDg
Job ID: 0b79511f-794a-4bc2-936d-5c651110467f
Started August 25, 2020 05:53:40 UTC
Config and enable Data Guard
Post check Data Guard configuration
Finished August 25, 2020 05:55:06 UTC
********************************************************************
***********************
Step 8: Enable Flashback (Standby site)
Description: DG Config service creation - EnableFlashback
Job ID: b526445e-67df-4c35-a7ca-8420298b8bd2
Started August 25, 2020 05:55:06 UTC
Enable FlashBack
Finished August 25, 2020 05:55:17 UTC
********************************************************************
***********************
Step 9: Re-enable Data Guard (Primary site)
Description: DG Config service creation - ReenableDg
Job ID: 4833133f-da65-44a9-beb7-2c4d347c9120
Started August 25, 2020 05:55:23 UTC
Re-enable Data Guard if inconsistent properties found
Post check Data Guard configuration
Finished August 25, 2020 05:55:29 UTC
********************************************************************
***********************
Step 10: Create Data Guard status (Primary site)
Description: DG Status service creation - NewDgconfig
Job ID: 430d0613-bcd3-4e34-9418-c5f4dfddc052
Started August 25, 2020 05:55:33 UTC
Create Data Guard status
Finished August 25, 2020 05:55:37 UTC
********************************************************************
```

```
***********************
Step 11: Create Data Guard status (Standby site)
Description: DG Status service creation - NewDgconfig
Job ID: 93bcdd39-657f-4d7c-b893-c50dc5e708c4
Started August 25, 2020 05:55:40 UTC
Create Data Guard status
Finished August 25, 2020 05:55:43 UTC
********************************************************************
***********************
Configure Data Guard pcpub_scpub completed
********************************************************************
***********************
```

Example with Oracle Data Guard custom configuration:

```
# odacli configure-dataguard
Standby site address: test_domain
BUI username for Standby site (default: oda-admin):
BUI password for Standby site:
TrustStore path for Standby DCS server: /cacerts.a
TrustStore password for Standby DCS server: <TrustStore_Password>
Database name for Data Guard configuration: cpub
Primary database syspassword:
********************************************************************
***********************
Data Guard default settings
Primary site network for Data Guard configuration: Public-network
Standby site network for Data Guard configuration: Public-network
Primary database listener port: 1521
Standby database listener port: 1521
Transport type: ASYNC
Protection mode: MAX_PERFORMANCE
Data Guard configuration name: pcpub_scpub
Active Data Guard: disabled
Do you want to edit this Data Guard configuration? (Y/N,
default:N): y
********************************************************************
***********************
Primary site network for Data Guard configuration [Public-network]
(default: Public-network):
Standby site network for Data Guard configuration [Public-network]
(default: Public-network):
Primary database listener port (default: 1521):
Standby database listener port (default: 1521):
Transport type [ASYNC, FASTSYNC, SYNC] (default: ASYNC): SYNC
Protection mode [MAX_PROTECTION, MAX_PERFORMANCE, MAX_AVAILABILITY]
(default: MAX_PERFORMANCE): MAX_PROTECTION
Data Guard configuration name (default: pcpub_scpub):
custom_pcpub_scpub
Enable Active Data Guard? (Y/N, default:N): y
The TrustStore of the Standby site should be removed unless it is
necessary for some other purpose. Do you want to delete it? (Y/N,
default:Y): n
As a requirement, Standby database's SYS password will be set to
```

```
Primary database's after Data Guard configuration. Are you sure you
want to proceed with Data Guard configuration? (Y/N): y
*********************************************************************
***********************
Configure Data Guard custom_pcpub_scpub started
*********************************************************************
***********************
Step 1: Validate Data Guard configuration request (Primary site)
Description: Validate DG Config Creation
Job ID: 64baff1f-3759-4a63-a203-fc369329cb7e
Started August 25, 2020 18:07:59 UTC
Validate create Data Guard configuration request
Finished August 25, 2020 18:08:05. UTC
*********************************************************************
***********************
Step 2: Validate Data Guard configuration request (Standby site)
Description: Validate DG Config Creation
Job ID: 52e5757c-0006-45d5-ac10-40443dbbde24
Started August 25, 2020 18:08:06 UTC
Validate create Data Guard configuration request
Finished August 25, 2020 18:08:12 UTC
*********************************************************************
***********************
Step 3: Download password file from Primary database (Primary site)
Description: Download orapwd file from Primary database
Started August 25, 2020 18:08:12 UTC
Prepare orapwd file for Primary database cpub
Finished August 25, 2020 18:08:17 UTC
*********************************************************************
***********************
Step 4: Upload password file to Standby database (Standby site)
Description: Upload orapwd file to Standby database
Started August 25, 2020 18:08:17 UTC
Write orapwd file to Standby database cpub
Finished August 25, 2020 18:08:26 UTC
*********************************************************************
***********************
Step 5: Configure Primary database (Primary site)
Description: DG Config service creation - ConfigurePrimary
Job ID: 7f30ee42-3bce-411d-90b3-ac35619f7280
Started August 25, 2020 18:08:26 UTC
Configure host DNS on primary env
Configure Data Guard Tns on primary env
Enable Data Guard related Db parameters for primary env
Enable force logging and archivelog mode in primary env
Enable FlashBack
Configure network parameters for local listener on primary env
Restart listener on primary env
Create services for primary db
Finished August 25, 2020 18:08:49 UTC
*********************************************************************
***********************
Step 6: Configure Standby database (Standby site)
Description: DG Config service creation - ConfigureStandby
Job ID: f071504f-ee2c-4d1d-8cdb-3879c9c27958
```

```
Started August 25, 2020 18:08:49 UTC
Configure Data Guard Tns on standby env
Configure host DNS on standby env
Clear Data Guard related Db parameters for standby env
Enable Data Guard related Db parameters for standby env
Enable force logging and archivelog mode in standby env
Populate standby database metadata
Configure network parameters for local listener on standby env
Reset Db sizing and hidden parameters for ODA best practice
Restart Listener on standby env
Create services for standby db
Finished August 25, 2020 18:10:18 UTC
**********************************************************************
************************
Step 7: Configure and enable Data Guard (Primary site)
Description: DG Config service creation - ConfigureDg
Job ID: 6055ad23-0d2a-430a-80fc-f23f4fd3c8ab
Started August 25, 2020 18:10:19 UTC
Config and enable Data Guard
Post check Data Guard configuration
Finished August 25, 2020 18:11:54 UTC
**********************************************************************
************************
Step 8: Enable Flashback (Standby site)
Description: DG Config service creation - EnableFlashback
Job ID: 33537107-0cb3-41f4-831d-443b6a268591
Started August 25, 2020 18:11:54 UTC
Enable FlashBack
Finished August 25, 2020 18:12:07 UTC
**********************************************************************
************************
Step 9: Re-enable Data Guard (Primary site)
Description: DG Config service creation - ReenableDg
Job ID: 4833133f-da65-44a9-beb7-2c4d347c9120
Started August 25, 2020 18:12:12 UTC
Re-enable Data Guard if inconsistent properties found
Post check Data Guard configuration
Finished August 25, 2020 18:12:17 UTC
**********************************************************************
************************
Step 10: Enable Active Data Guard (Standby site)
Description: DG Config service creation - EnableActivedg
Job ID: 3117c046-2d71-453d-9950-c85bed19f5f2
Started August 25, 2020 18:12:19 UTC
Started
Open standby db
Restart standby db
Finished
Started August 25, 2020 18:12:21 UTC
**********************************************************************
************************
Step 11: Create Data Guard status (Primary site)
Description: DG Status service creation - NewDgconfig
Job ID: bf3e1a5e-fcf2-414c-a73b-b7350b67acac
Started August 25, 2020 18:12:22 UTC
```

```
Create Data Guard status
Finished August 25, 2020 18:12:24 UTC
********************************************************************
***********************
Step 12: Create Data Guard status (Standby site)
Description: DG Status service creation - NewDgconfig
Job ID: 5c2fb574-bd98-4348-9cf1-5900b4613268
Started August 25, 2020 18:12:28 UTC
Create Data Guard status
Finished August 25, 2020 18:12:32 UTC
********************************************************************
***********************
Configure Data Guard custom_pcpub_scpub completed
********************************************************************
***********************
```

You can also specify a JSON file to configure Oracle Data Guard. An example JSON file is described in this topic.

```
# odacli configure-dataguard -r configdg_ODA_HA.json
Standby machine address: test_domain
BUI username for Standby machine (default: oda-admin):
BUI password for Standby machine:
TrustStore path for Standby DCS server (copy from /opt/oracle/dcs/
dcscli/dcscli.conf on Standby machine to this machine and set file
permissions to 400): /dcscli.conf
TrustStore password for Standby DCS server: TrustStore_password
Primary database syspassword:
The TrustStore of the Standby machine should be removed unless it
is necessary for some other purpose. Do you want to delete it?
(Y/N, default:Y): n
As a requirement, Standby database’s SYS password will be set to
Primary database’s after Data Guard configuration. Are you sure you
want to proceed? (Y/N): y
Data Guard configuration for database 'test' started
********************************************************************
***********************
Step 1: Validate Data Guard configuration request (Primary machine)
.....
```

For more information about these command options, see the *Oracle Database Appliance Command Line Reference* chapter in this guide.

Example JSON for configuring Oracle Data Guard on Oracle Database Appliance

```
{
  "name": "test1_test7",
  "protectionMode": "MAX_PERFORMANCE",
  "enableFlashback": true,
  "enableActiveDg": false,
  "replicationGroups": [
    {
      "sourceEndPoints": [
        {
```

```
     "endpointType": "PRIMARY",
     "hostName": test_domain1",
     "listenerPort": 1521,
     "databaseUniqueName": "test1",
     "ipAddress": "test_IPaddress"
    },
  {
   "endpointType": "PRIMARY",
   "hostName": "test_domain1",
   "listenerPort": 1521,
   "databaseUniqueName": "test1",
   "ipAddress": "test_IPaddress2"
  }
   ],
   "targetEndPoints": [
    {
     "endpointType": "STANDBY",
     "hostName": "test_domain2",
     "listenerPort": 1521,
     "databaseUniqueName": "test7",
     "ipAddress": "test_IPaddress3"
    },
    {
     "endpointType": "STANDBY",
     "hostName": "test_domain2",
     "listenerPort": 1521,
     "databaseUniqueName": "test7",
     "ipAddress": "test_IPaddress4"
    }
   ],
   "transportType": "ASYNC"
  }
 ]
}
```

Related Topics

- Configuring Agent Proxy Settings for Object Store Access
  If the Object Store IP address is accessible only through proxy setup by the Oracle Database Appliance server, then define the proxy setting for the agent, so that the agent can access the Object Store.
- https://www.oracle.com/in/database/technologies/high-availability/maa.html

Viewing Oracle Data Guard Status on Oracle Database Appliance

View Oracle Data Guard status using ODACLI commands.

Viewing Oracle Data Guard Status using ODACLI commands

Follow these steps:

- To view the status of primary and standby databases in your Oracle Data Guard configuration, use the following command:

  ```
  # odacli list-dataguardstatus
  ```

- To view the status of your specific Oracle Data Guard configuration, use the following command:

  ```
  # odacli describe-dataguardstatus -i 5f0ed48a-366d-454c-a389-
  fe367772dbb7
  ```

For more information about these command options, see the *Oracle Database Appliance Command Line Reference* chapter in this guide.

Related Topics

- Oracle Data Guard odacli Commands
  Use ODACLI commands to configure and manage Oracle Data Guard in your Oracle Database Appliance deployment.

Performing Oracle Data Guard Operations

Perform failover, switchover, and reinstate operations on Oracle Data Guard using ODACLI commands.

Performing Oracle Data Guard operations using ODACLI commands

Follow these steps:

- To switch roles between the primary database and standby database in your Oracle Data Guard configuration, run the following command on the **primary** system:

  ```
  # odacli switchover-dataguard -i dg_ID -u
  standby_db_unique_name_to_switchover
  ```

  For example:

  ```
  # odacli switchover-dataguard -i 75f23ce0-006a-4aeb-ba6d-
  b4b60275c19 -u test_db2
  ```

  Confirm that the switchover of roles completed successfully:

  ```
  # odacli describe-dataguardstatus -i 75f23ce0-006a-4aeb-ba6d-
  b4b60275c19
  ```

- A failover provides for transitioning a standby database in your configuration to take over the primary database role, if all instances of an Oracle RAC primary database fail, or are unreachable.

To failover a standby database to the primary database in your Oracle Data Guard configuration, run the following command on your current **standby** system:

```
# odacli failover-dataguard -i dg_ID -u
standby_db_unique_name_to_failover_to
```

For example:

```
# odacli failover-dataguard -i 75f23ce0-006a-4aeb-ba6d-b4b60275c19
-u test_db2
```

Confirm that the requested database failover to the new primary database has completed successfully:

```
# odacli describe-dataguardstatus -i 75f23ce0-006a-4aeb-ba6d-
b4b60275c19
```

- To reinstate a failed primary database after a failover and convert it to a new standby database in your Oracle Data Guard configuration, run the following command on your new primary system:

  ```
  # odacli reinstate-dataguard -i dg_ID -u db_unique_name_to_reinstate
  ```

  For example:

  ```
  # odacli reinstate-dataguard -i 75f23ce0-006a-4aeb-ba6d-b4b60275c19
  -u test_db2
  ```

  Confirm that the requested database is reinstated as a new standby database:

  ```
  # odacli describe-dataguardstatus -i 75f23ce0-006a-4aeb-ba6d-
  b4b60275c19
  ```

For more information about these command options, see the *Oracle Database Appliance Command Line Reference* chapter in this guide.

Related Topics

- Oracle Data Guard odacli Commands
  Use ODACLI commands to configure and manage Oracle Data Guard in your Oracle Database Appliance deployment.

Creating an Oracle Data Guard Network

Create an Oracle Data Guard network and associate it with a database using ODACLI commands.

Configuring an Oracle Data Guard Network using ODACLI commands

You can configure Oracle Data Guard using a network of type Public, Database, or Dataguard.

Follow these steps:

1. Create the network:

   ```
   # odacli create-network -n btbond1 -t VLAN -p 192.209.10.227 -w
   Dataguard -no-d -s 255.255.255.240 -v 369 -g 192.209.10.225
   ```

2. View the new network:

   ```
   # odacli list-networks

   ID                                     Name
   NIC          Interface Type  Subnet Mask        Gateway
   VLAN ID  Node Networks
   ------------------------------------ -------------------
   ------------ -------------- ----------------- -----------------
   -------- ----------------------
   836cfa4b-5d2c-45e3-a62d-099fc7c57984   Private-network
   priv0        INTERNAL        255.255.255.240   [ IP Address on
   node0:  192.168.16.24 ]
   1a312239-761d-4321-84d2-8da406f21e5c   Public-network
   btbond1.359  VLAN            255.255.255.240    10.209.10.65
   359  [ IP Address on node0:  192.209.10.69 ]
   f279ac96-5a4a-4b73-86af-1afbdb6ae5d4   vlan369
   btbond1.369  VLAN            255.255.255.240    10.209.10.225
   369  [ IP Address on node0:  192.209.10.227]
   ```

3. To attach a network of type Dataguard to a database:

   ```
   # odacli modify-database -in test_db -an vlan369
   ```

For more information about these command options, see the *Oracle Database Appliance Command Line Reference* chapter in this guide.

Related Topics

- Oracle Data Guard odacli Commands
  Use ODACLI commands to configure and manage Oracle Data Guard in your Oracle Database Appliance deployment.

Migrating an Oracle Data Guard Database from One System to Another

You can migrate Oracle Data Guard databases using ODACLI commands.

Migrating Oracle Data Guard Database using ODACLI commands

If your database is on an old Oracle Database Appliance hardware model, and you want to move your deployment to a new Oracle Database Appliance hardware, then you can use your Oracle Data Guard configuration on Oracle Database Appliance to migrate from one system to another.

Before you begin:

- Oracle recommends running the primary and the standby databases on separate Oracle Database Appliance hardware, so ensure that you have at least two separate Oracle Database Appliance machines.

- The primary and standby systems must be the same Oracle Database Appliance release, and must be on Oracle Database Appliance release 19.8 or later. The instances on the primary and standby databases must have similar configuration for database parameter settings including database version, memory, CPU, networking, and storage (Oracle ASM or Oracle ACFS), thus avoiding any unpredictability when the databases switch roles.
- If you have customized the operating system, then ensure that environments on both machines are identical.
- Ensure that your deployment follows Oracle Maximum Availability Architecture (MAA) best practices.

Follow these steps:

1. Take a backup of your primary database to Object Store or External FRA (NFS) with the option to keep archivelogs enabled.

   ```
   # odacli create-backup primary_DB -ka
   ```

   For example:

   ```
   # odacli create-backup --backupType Regular-L0 -in test_db -ka
   ```

2. Save the backup report:

   ```
   # odacli describe-backupreport -i eba406c7-ae46-4d1d-
   a1e5-3e985397b171 > backup_report_test_db_0620.json
   ```

   The backup report ID is the ID of the backup created in step 1 and can be obtained by running the `odacli list-backupreports` command.

3. Copy the backup report to the standby system and restore the backup to a standby database.

   ```
   # odacli irestore-database -ro STANDBY
   ```

   If your backup option is Object Store, then specify the Object Store location:

   ```
   # odacli irestore-database -r backup_report.json -u dbUniqueName
   -on objectStoreName -bp -ro STANDBY -dh
   Password for SYS user:
   Rman Backup Encryption Password(s). Multiple passwords needs to be
   comma separated.:
   ```

   If your backup option is NFS, then specify the NFS location:

   ```
   odacli irestore-database -r backup_report.json -u dbUniqueName -ro
   STANDBY
   Password for SYS user:
   ```

4. Copy the trust store file of the standby machine to the primary machine, and set the file permissions to 400.

   ```
   # scp root@standby_host:/opt/oracle/dcs/dcscli/cacerts/opt/
   oracle/dcs/dcscli/cacerts.standby_host_name
   # chmod 400 /opt/oracle/dcs/dcscli/cacerts.standby_host_name
   ```

5. Configure Oracle Data Guard, by running the following command on the primary system:

   ```
   # odacli configure-dataguard
   Standby site address: test_domain
   BUI username for Standby site (default: oda-admin):
   BUI password for Standby site:
   TrustStore path for Standby DCS server: /cacerts.a
   TrustStore password for Standby DCS server: <TrustStore_Password>
   Database name for Data Guard configuration: cpub
   Primary database syspassword:
   ********************************************************************
   ***************
   Data Guard default settings
   Primary site network for Data Guard configuration: Public-network
   Standby site network for Data Guard configuration: Public-network
   Primary database listener port: 1521
   Standby database listener port: 1521
   Transport type: ASYNC
   Protection mode: MAX_PERFORMANCE
   Data Guard configuration name: pcpub_scpub
   Active Data Guard: disabled
   Do you want to edit this Data Guard configuration? (Y/N,
   default:N):
   The TrustStore of the Standby site should be removed unless it is
   necessary for some other purpose. Do you want to delete it? (Y/N,
   default:Y): n
   As a requirement, Standby database's SYS password will be set to
   Primary database's after Data Guard configuration. Are you sure you
   want to proceed with Data Guard configuration? (Y/N): y
   ********************************************************************
   ***********************
   Configure Data Guard pcpub_scpub started
   ********************************************************************
   ***********************
   Step 1: Validate Data Guard configuration request (Primary site)
   Description: Validate DG Config Creation
   Job ID: bafb8ef4-d3c9-4421-84a1-4c75d73e71a0
   Started August 25, 2020 05:51:20 UTC
   Validate create Data Guard configuration request
   Finished August 25, 2020 05:51:27 UTC
   ********************************************************************
   ***********************
   Step 2: Validate Data Guard configuration request (Standby site)
   Description: Validate DG Config Creation
   Job ID: a7b80880-40ab-4dbf-b8be-22717ae87711
   Started August 25, 2020 05:51:27 UTC
   Validate create Data Guard configuration request
   ```

```
Finished August 25, 2020 05:51:33 UTC
********************************************************************
***********************
Step 3: Download password file from Primary database (Primary site)
Description: Download orapwd file from Primary database
Started August 25, 2020 05:51:33 UTC
Prepare orapwd file for Primary database cpub
Finished August 25, 2020 05:51:38 UTC
********************************************************************
***********************
Step 4: Upload password file to Standby database (Standby site)
Description: Upload orapwd file to Standby database
Started August 25, 2020 05:51:38 UTC
Write orapwd file to Standby database cpub
Finished August 25, 2020 05:51:47 UTC
********************************************************************
***********************
Step 5: Configure Primary database (Primary site)
Description: DG Config service creation - ConfigurePrimary
Job ID: b6726f76-0a3a-4bb1-8fec-a3eb311531cf
Started August 25, 2020 05:51:47 UTC
Configure host DNS on primary env
Configure Data Guard Tns on primary env
Enable Data Guard related Db parameters for primary env
Enable force logging and archivelog mode in primary env
Enable FlashBac
Configure network parameters for local listener on primary env
Restart listener on primary env
Create services for primary db
Finished August 25, 2020 05:52:10 UTC
********************************************************************
***********************
Step 6: Configure Standby database (Standby site)
Description: DG Config service creation - ConfigureStandby
Job ID: e6b552be-fef0-4cd6-a61d-81292f957a6e
Started August 25, 2020 05:52:10 UTC
Configure Data Guard Tns on standby env
Configure host DNS on standby env
Clear Data Guard related Db parameters for standby env
Enable Data Guard related Db parameters for standby env
Enable force logging and archivelog mode in standby env
Populate standby database metadata
Configure network parameters for local listener on standby env
Reset Db sizing and hidden parameters for ODA best practice
Restart Listener on standby env
Create services for standby db
Finished August 25, 2020 05:53:40 UTC
********************************************************************
***********************
Step 7: Configure and enable Data Guard (Primary site)
Description: DG Config service creation - ConfigureDg
Job ID: 0b79511f-794a-4bc2-936d-5c651110467f
Started August 25, 2020 05:53:40 UTC
Config and enable Data Guard
Post check Data Guard configuration
```

```
Finished August 25, 2020 05:55:06 UTC
********************************************************************
***********************
Step 8: Enable Flashback (Standby site)
Description: DG Config service creation - EnableFlashback
Job ID: b526445e-67df-4c35-a7ca-8420298b8bd2
Started August 25, 2020 05:55:06 UTC
Enable FlashBack
Finished August 25, 2020 05:55:17 UTC
********************************************************************
***********************
Step 9: Re-enable Data Guard (Primary site)
Description: DG Config service creation - ReenableDg
Job ID: 4833133f-da65-44a9-beb7-2c4d347c9120
Started August 25, 2020 05:55:23 UTC
Re-enable Data Guard if inconsistent properties found
Post check Data Guard configuration
Finished August 25, 2020 05:55:29 UTC
********************************************************************
***********************
Step 10: Create Data Guard status (Primary site)
Description: DG Status service creation - NewDgconfig
Job ID: 430d0613-bcd3-4e34-9418-c5f4dfddc052
Started August 25, 2020 05:55:33 UTC
Create Data Guard status
Finished August 25, 2020 05:55:37 UTC
********************************************************************
***********************
Step 11: Create Data Guard status (Standby site)
Description: DG Status service creation - NewDgconfig
Job ID: 93bcdd39-657f-4d7c-b893-c50dc5e708c4
Started August 25, 2020 05:55:40 UTC
Create Data Guard status
Finished August 25, 2020 05:55:43 UTC
********************************************************************
***********************
Configure Data Guard pcpub_scpub completed
********************************************************************
***********************
```

Note: The *TrustStore_password* is the value in the `TrustStorePassword` field in the `/opt/oracle/dcs/dcscli/dcscli.conf` file on the standby system.

6. Check the status of Oracle Data Guard and ensure it is working:

```
# odacli describe-dataguardstatus
```

7. Switch over to the standby database:

```
# odacli switchover-dataguard -i 75f23ce0-006a-4aeb-ba6d-
b4b60275c19 -u houdg02
```

8. Deconfigure Oracle Data Guard. The process also deletes the standby database on the old Oracle Database Appliance hardware machine.

```
# odacli deconfigure-dataguard -i 8396aac4-f7e7-42e4-
a2e8-0cbbc89ce31b
Standby site address: test_domain
BUI username for Standby site (default: oda-admin):
BUI password for Standby site:
TrustStore path for Standby DCS server : /cacerts.a
TrustStore password for Standby DCS server: TrustStore_Password
The TrustStore of the Standby site should be removed unless it is
necessary for some other purpose. Do you want to delete it? (Y/N,
default:Y): n
Standby database will be deleted after Data Guard configuration is
removed. Are you sure you want to proceed? (Y/N): y
Deconfigure Dataguard Started
********************************************************************
***********************
Step 1: Deconfigure Data Guard (Primary site)
Description: Deconfigure DG service
Job ID: 8deb3e4c-09cd-4593-8184-f7706dd2ec8a
Started
Deconfigure Data Guard service
Cleanup broker resources
Finished
********************************************************************
***********************
Step 2: Delete Data Guard status (Primary site)
Description: DG Status service creation - UpdateDgconfig
Job ID: 59c61629-6c7d-474c-8c29-c0a9565d91a3
Started
Update Data Guard status
Finished
********************************************************************
***********************
Step 3: Delete Data Guard status (Standby site)
Description: DG Status service creation - UpdateDgconfig
Job ID: 93dcf4cd-1019-4bcd-984a-d3efeb3fae6e
Started
Update Data Guard status
Finished
********************************************************************
***********************
Step 4: Delete Standby database (Standby site)
Description: Database service deletion with db name: panda with
id : 30dd49da-a54f-4a9a-abbf-d3a4e39abee5
Job ID: 0b1cb921-fd41-4e01-86df-beff3adb6de0
Started
Validate db 30dd49da-a54f-4a9a-abbf-d3a4e39abee5 for deletion
Database Deletion
Unregister Db From Cluster
Kill Pmon Process
Database Files Deletion
Deleting Volume
Delete File Groups of Database panda
```

```
Finished
*********************************************************************
***********************
Data Guard configuration is removed
```

For more information about these command options, see the *Oracle Database Appliance Command Line Reference* chapter in this guide.

Related Topics

- Oracle Data Guard odacli Commands
  Use ODACLI commands to configure and manage Oracle Data Guard in your Oracle Database Appliance deployment.

Patching Oracle Data Guard Databases on Oracle Database Appliance

Understand how you can patch primary and standby databases on Oracle Data Guard using ODACLI commands.

Patching Oracle Data Guard primary and standby databases using ODACLI commands

Before patching the database homes, upload the RDBMS Clone Files for the database version, to the repository. See *Updating Oracle Database Appliance Repository with Database Clone Files Using the CLI* for the procedure to update the repository with the latest RDBMS Clone Files. Also ensure that the primary Oracle Database Appliance system and the standby Oracle Database Appliance system are on the same Oracle Database Appliance release. It is recommended that the two systems be on the latest Oracle Database Appliance release. See *Patching Oracle Database Appliance Bare Metal Systems Using the Command-Line* for the procedure to patch your Oracle Database Appliance deployment.

Follow these steps to patch the databases in your Oracle Data Guard configuration on Oracle Database Appliance:

1. Run the following command on the standby database:

   ```
   # odacli update-dbhome
   ```

2. After patching job on the standby database is successful, run the following command on the primary database:

   ```
   # odacli update-dbhome
   ```

3. Confirm that the patching jobs are successful:

   ```
   # /opt/oracle/dcs/bin/odacli list-jobs
   ```

4. Confirm the existing Data Guard configuration is working properly by running the following command on both primary and standby systems:

   ```
   odacli describe-dataguardstatus -i dgid
   ```

For more information about these command options, see the *Oracle Database Appliance Command Line Reference* chapter in this guide.

Upgrading Oracle Data Guard Databases on Oracle Database Appliance

Understand how you can upgrade primary and standby databases on Oracle Data Guard using ODACLI commands.

Upgrading Oracle Data Guard primary and standby databases using ODACLI commands

Before upgrading the database homes, upload the RDBMS Clone Files for the database version, to the repository. See *Updating Oracle Database Appliance Repository with Database Clone Files Using the CLI* for the procedure to update the repository with the latest RDBMS Clone Files. Ensure that the primary Oracle Database Appliance system and the standby Oracle Database Appliance system are on the same Oracle Database Appliance release, and on Oracle Database Appliance release 19.8 or later. It is recommended that the two systems be on the latest Oracle Database Appliance release. See *Patching Oracle Database Appliance Bare Metal Systems Using the Command-Line* for the procedure to patch your Oracle Database Appliance deployment.

Follow these steps to upgrade the databases in your Oracle Data Guard configuration on Oracle Database Appliance:

1. Run the following command to disable log transport and apply:

   ```
   EDIT DATABASE primary_database SET STATE='TRANSPORT-OFF';
   EDIT DATABASE standby_database SET STATE='APPLY-OFF';
   ```

2. Upgrade the standby database:

   ```
   # odacli upgrade-database -i standby_databaseId -to
   destination_DbHomeId
   ```

3. Upgrade the primary database:

   ```
   # odacli upgrade-database -i primary_databaseId -to
   destination_DbHomeId
   ```

4. Run the following command to enable log transport and apply:

   ```
   EDIT DATABASE primary_database SET STATE='TRANSPORT-ON';
   EDIT DATABASE standby_database SET STATE='APPLY-ON';
   ```

5. Confirm the existing Data Guard configuration is working properly by running the following command on both primary and standby systems several times:

   ```
   odacli describe-dataguardstatus -i dgid
   ```

For more information about these command options, see the *Oracle Database Appliance Command Line Reference* chapter in this guide.

Related Topics

- Oracle Data Guard odacli Commands
  Use ODACLI commands to configure and manage Oracle Data Guard in your Oracle Database Appliance deployment.

Enabling Oracle Active Data Guard on Existing Configurations

Understand how you can enable Oracle Active Data Guard on existing configurations.

Oracle Active Data Guard is licensed option to the Oracle Database Enterprise Edition and enables advanced capabilities that extend the basic Oracle Data Guard functionality.

Oracle Active Data Guard function requires database to be open as read-only while enabling the *redo log apply* option. Follow these steps to enable Oracle Active Data Guard on existing configurations:

1. Modify database to have read-only start option:

   ```
   srvctl modify database -d standby_db_unique_name -startoption "read
   only"
   srvctl stop database -d standby_db_unique_name
   srvctl start database -d standby_db_unique_name
   ```

   To check if Oracle Data Guard has read-only start option set, run the following command:

   ```
   srvctl config database -d standby_db_unique_name | grep "Start
   options"
   ```

2. Enable redo log apply by running the following PL/SQL commands:

   ```
   ALTER DATABASE RECOVER MANAGED STANDBY DATABASE CANCEL;
   ALTER DATABASE RECOVER MANAGED STANDBY DATABASE DISCONNECT FROM
   SESSION;
   ```

Deconfiguring Oracle Data Guard on Oracle Database Appliance

Deconfigure Oracle Data Guard status using ODACLI commands.

Deconfiguring Oracle Data Guard Status using ODACLI commands

Follow these steps:

- To deconfigure Oracle Data Guard and delete the standby database, run the following command on the primary system:

  ```
  # odacli deconfigure-dataguard -i 8396aac4-f7e7-42e4-
  a2e8-0cbbc89ce31b
  ```

```
Standby site address: test_domain
BUI username for Standby site (default: oda-admin):
BUI password for Standby site:
TrustStore path for Standby DCS server : /cacerts.a
TrustStore password for Standby DCS server: TrustStore_Password
The TrustStore of the Standby site should be removed unless it is
necessary for some other purpose. Do you want to delete it? (Y/N,
default:Y): n
Standby database will be deleted after Data Guard configuration is
removed. Are you sure you want to proceed? (Y/N): y
Deconfigure Dataguard Started
********************************************************************
***********************
Step 1: Deconfigure Data Guard (Primary site)
Description: Deconfigure DG service
Job ID: 8deb3e4c-09cd-4593-8184-f7706dd2ec8a
Started
Deconfigure Data Guard service
Cleanup broker resources
Finished
********************************************************************
***********************
Step 2: Delete Data Guard status (Primary site)
Description: DG Status service creation - UpdateDgconfig
Job ID: 59c61629-6c7d-474c-8c29-c0a9565d91a3
Started
Update Data Guard status
Finished
********************************************************************
***********************
Step 3: Delete Data Guard status (Standby site)
Description: DG Status service creation - UpdateDgconfig
Job ID: 93dcf4cd-1019-4bcd-984a-d3efeb3fae6e
Started
Update Data Guard status
Finished
********************************************************************
***********************
Step 4: Delete Standby database (Standby site)
Description: Database service deletion with db name: panda with
id : 30dd49da-a54f-4a9a-abbf-d3a4e39abee5
Job ID: 0b1cb921-fd41-4e01-86df-beff3adb6de0
Started
Validate db 30dd49da-a54f-4a9a-abbf-d3a4e39abee5 for deletion
Database Deletion
Unregister Db From Cluster
Kill Pmon Process
Database Files Deletion
Deleting Volume
Delete File Groups of Database panda
Finished
********************************************************************
***********************
Data Guard configuration is removed
```

For deconfiguring Oracle Data Guard, you must specify the Oracle Data Guard Configuration ID. Run the `odacli list-dataguardstatus` command to find the Oracle Data Guard Configuration ID.

For more information about these command options, see the *Oracle Database Appliance Command Line Reference* chapter in this guide.

Related Topics

- Oracle Data Guard odacli Commands
  Use ODACLI commands to configure and manage Oracle Data Guard in your Oracle Database Appliance deployment.

13
Managing an Oracle Database Appliance Virtualized Platform

Review the concepts and procedures for Oracle Database Appliance Virtualized Platform.

These topics provides a conceptual overview of the Oracle Database Appliance Virtualized Platform architecture, and procedures for how to deploy a guest virtual machine, manage high availability, manage CPU pools, and configure network settings for Oracle Database Appliance Virtualized Platform. Learn about resizing your Oracle Database domain (ODA_BASE), a privileged virtual machine.

- How to Manage Virtual Machines on Oracle Database Appliance Virtualized Platform
  Review these topics for an overview of virtual machines, and for procedures to create and manage virtual machines.
- How to Create Driver Domain Virtual Machines
  Use driver domain virtual machines to improve performance.
- How to Manage High Availability on Oracle Database Appliance Virtualized Platform
  Use the `oakcli configure vm` command to configure high availability services for your virtual machines.
- How to Manage CPU Pools on Oracle Database Appliance Virtualized Platform
  These topics describe how to use OAKCLI to create and manage CPU pools on Oracle Database Appliance Virtualized Platform.

About Oracle Database Appliance Virtualized Platform

You can use Oracle VM to optimize your system resource use for databases and applications.

You can deploy a virtualized platform on Oracle Database Appliance. The virtual platform is based on Oracle VM. With Oracle Database Appliance Virtualized Platform, you can use the capabilities of Oracle VM to effectively allocate resources to databases and applications running on the same physical Oracle Database Appliance. Rather than simply disabling unnecessary server cores, you can use the excess capacity to host other workloads. This enables consolidation of both databases and applications, while retaining the ease of deployment and management associated with Oracle Database Appliance.

Oracle Database Appliance Virtualized Platform is supported on all versions of Oracle Database Appliance hardware. All templates and operating systems supported by Oracle VM are also supported on Oracle Database Appliance Virtualized Platform. Supported operating systems include Linux, Windows, and Solaris x86.

> **Note:**
>
> All new systems are currently shipped from the factory with the nonvirtualized ISO image
>
> If you are currently on the nonvirtualized deployment of Oracle Database Appliance, and you want to use Oracle Database Appliance as a virtualized platform, then you must reimage the servers with the Oracle Database Appliance Virtualized Platform ISO image.

Why Virtualize?

Oracle Appliance Manager (oakcli) makes it easy to setup and manage the virtualized environment with little virtualization expertise. With the Virtualized Platform deployment, you can consolidate entire multi-tier environments within a single Oracle Database Appliance system.

The following are some of the advantages of deploying Oracle Database Appliance with the Virtualized Platform option:

- Deploy database and applications in a single hardware environment.
- Use the pre-configured VM application templates to rapidly deploy database and applications.
- Run the database in a virtual machine (ODA_BASE) with direct access to storage (for native performance).
- Control licensed CPUs by configuring ODA_BASE domain with the required number of CPU cores (and memory).
- Use your CPU cores (and memory) efficiently. CPU cores not assigned to the ODA_BASE domain are not wasted and are available for use by other, non-database virtual machines.
- Use virtual local area networks (VLANs) to provide separate networks to different virtual machines.
- Use shared repository to grow storage for the virtual machine (VM) repository.
- Improves data center efficiency by increasing space utilization and reducing energy consumption and cooling costs.

Oracle Database Appliance Virtualized Platform Architecture

Review these topics to understand Oracle Database Appliance Virtualized Platform, and how you can use it to optimize system resource use.

- About Oracle Database Appliance Virtualized Platform Architecture
  Review this topic to understand how Oracle Database Appliance Virtualized Platform works with Oracle Database Appliance hardware.
- About Virtual Machines and Oracle Database Appliance Virtualized Platforms
  Oracle Database Appliance Virtualized Platform is designed to run and deploy virtual machines to manage system resources.

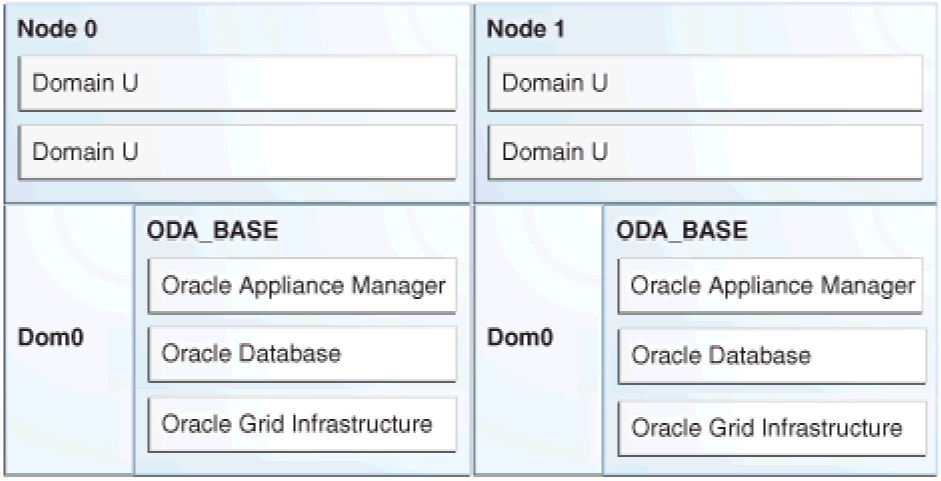
About Oracle Database Appliance Virtualized Platform Architecture

Review this topic to understand how Oracle Database Appliance Virtualized Platform works with Oracle Database Appliance hardware.

Oracle Database Appliance Virtualized Platform provides virtualization technology that enables multiple isolated databases and applications to share the same physical server. The Oracle Database Appliance Virtualized Platform ISO image is engineered specifically to leverage the Oracle Database Appliance hardware capabilities.

The Oracle Database Appliance Virtualized Platform architecture uses the virtual machine components shown in the following illustration:

Figure 13-1 Oracle Database Appliance Virtualized Platform Architecture



- **Oracle Database Appliance Base Domain (ODA_BASE):** A privileged virtual machine domain, specifically for databases, that provides database performance similar to bare metal deployments. A PCI pass-through driver provides ODA_BASE direct access to the shared storage.
- **Domain 0 (Dom0)**: Default domain that initiates Oracle Database Appliance Virtualized Platform provisioning processes and hosts virtual machine templates. Most of the responsibility of hardware detection in an Oracle Database Appliance Virtualized Platform environment is passed to the management domain, referred to as domain zero (or Dom0). On x86-based servers, the Dom0 kernel is actually a small-footprint Linux kernel with support for a broad array of devices, file systems, and software RAID and volume management. In Oracle Database Appliance Virtualized Platform, Dom0 provides access to much of the system hardware, creating, deleting and controlling guest operating systems, and presenting those guests with a set of common virtual hardware.
- **Guest Domains (Domain U)**: Virtual machines that are provisioned to host non-database workloads, such as applications and middleware. Guest operating systems each have their own management domain, called a *user domain*, abbreviated to "Domain U". These domains are unprivileged domains that have no direct access to the hardware or to the device drivers. Each Domain U starts after `Dom0` is running on Oracle Database Appliance Virtualized Platform.

About Virtual Machines and Oracle Database Appliance Virtualized Platforms

Oracle Database Appliance Virtualized Platform is designed to run and deploy virtual machines to manage system resources.

Configure virtual machines on Oracle Database Appliance Virtualized Platform to manage your application use of shared repository resources, such as the CPU pool, memory, and other shared resources.

Virtual Machine Templates

Virtual machines can be created from a template or assembly containing preconfigured virtual machines. The creation of a virtual machine from a template is based on cloning: the template is imported as an archive, unpacked, and stored as a virtual machine configuration file with disk images. These disk images are cloned to create a new instance in the form of a virtual machine. In the same way, an existing virtual machine can be cloned to create a new virtual machine, or cloned to create a new template.

Virtual Machine Assemblies

Virtual machine assemblies are often described as a template of a group of virtual machines, or a collection of virtual machine templates. An assembly can contain a single virtual machine or a collection of virtual machine templates.

Domains, Guests and Virtual Machines

The terms *domain*, *guest*, and *virtual machine* are often used interchangeably, but they have subtle differences. A *domain* is a configurable set of resources, including memory, virtual CPUs, network devices, and disk devices, in which virtual machines run. A *guest* is a virtualized operating system running within a domain. Multiple guests can run on the same instance of Oracle Database Appliance Virtualized Platform, each within its own domain. A *virtual machine* is granted virtual resources, and can be started, stopped, and restarted independently.

Virtual Disks

In addition to virtual machines, you can create virtual disks in shared repositories. Virtual disks provide additional storage options for virtual machines by enabling you to attach additional block storage to your virtual machines. Similarly, you can detach the storage if you no longer need the additional space. You can use virtual disks to expand existing file system storage inside the virtual machine by extending the storage volume onto a virtual disk, or by creating a new file system on a virtual disk. Your virtual disks can also share multiple virtual machines running on the same shared repository.

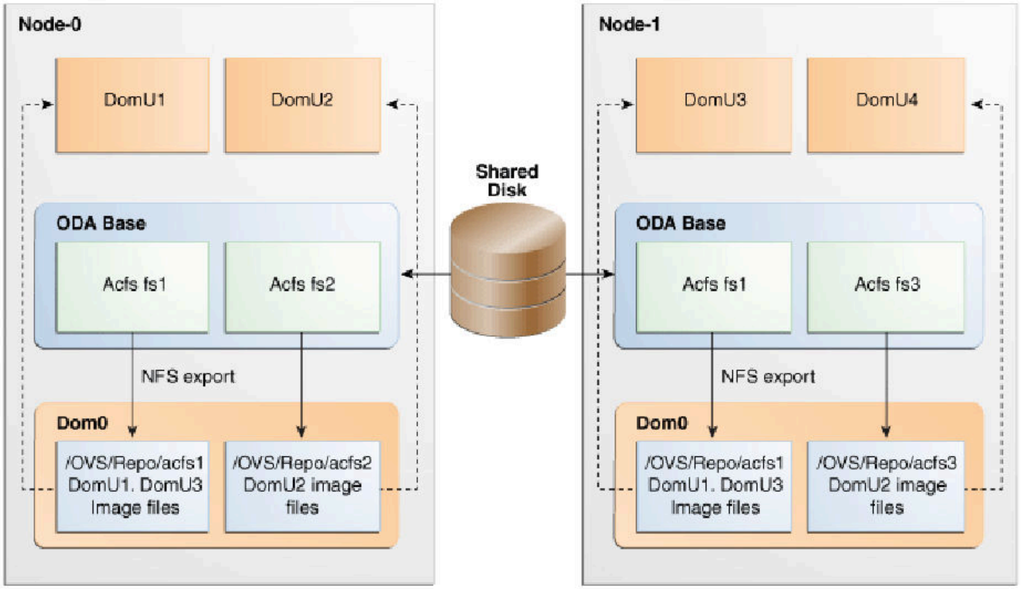
A *driver domain* is a user domain that has special privileges and responsibilities for a particular piece of hardware. When you use the driver domain option, the newly created virtual disks are mounted directly from `ODA_BASE` to a guest virtual machine. The option improves performance by enabling guest virtual machines to use `ODA_BASE` instead of `Dom0` to access virtual disks. The driver domain option is available beginning with release 12.1.2.7.0 and is supported with Oracle Linux, Windows, and Oracle Solaris x86 guest operating systems. Live migration of driver domain virtual machines is not supported.

Shared Repositories

A *shared repository* is a central location for storing resources that are essential to creating and managing virtual machines. These resources include virtual machine templates and assemblies, ISO files (virtual DVD images), virtual machine configuration files, and virtual disks. Shared repositories are configured on an Oracle Automatic Storage Management Cluster File System (Oracle ACFS) and then presented to the Oracle Database Appliance nodes that need access to those resources. Oracle Database Appliance Virtualized Platform uses shared repositories to optimize available disk space usage in the environment, and for easy reallocation of virtual machines if a physical server fails. The virtual machine files can be stored on shared disks, providing shared storage for the virtual machines. Additionally, you can configure CPU pools and a resizeable Oracle Database domain (ODA_BASE) to ensure that the virtual machines do not consume cycles from each other or from your assigned database CPU cores.

- The shared disks on Oracle Database Appliance Virtualized Platform are connected directly to ODA_BASE.
- ODA_BASE contains three shared repositories named `fs1`, `fs2`, and `fs3`.
- Each shared repository is an Oracle ACFS in ODA_BASE created on top of the Oracle Automatic Storage Management (Oracle ASM) disk group (DATA or RECO) chosen by the user when creating the shared repository.
- The process that creates a shared repository also performs a network file system (NFS) export of the shared repository to the respective `Dom0` by using the private network.
- The export enables shared storage for the virtual machine files.

Figure 13-2 Architecture Overview of Oracle Database Appliance Virtualized Platform Shared Repositories


Node-0
DomU1
DomU2
ODA Base
Acfs fs1
Acfs fs2
NFS export
Dom0
/OVS/Repo/acfs1 DomU1, DomU3 Image files
/OVS/Repo/acfs2 DomU2 image files
Shared Disk
Node-1
DomU3
DomU4
ODA Base
Acfs fs1
Acfs fs3
NFS export
Dom0
/OVS/Repo/acfs1 DomU1, DomU3 Image files
/OVS/Repo/acfs3 DomU2 image files

With the configuration shown in the illustration, you can:

- Create multiple repositories.
- Mount these repositories either on the nodes where the virtual machine needs to run (such as `fs2` and `fs3` in the illustration), or on both the nodes (such as `fs1` in the illustration).
- Create one or more virtual machines or virtual machine templates on the shared repositories.
- Use OAKCLI commands to create and manage shared repositories, virtual disks, and their virtual machines, and the underlying architecture shown in the illustration.

Note:

Virtual machine (VM) repositories on Oracle Database Appliance can only be on the boot drives or an Oracle Database Appliance shared storage shelf. External storage cannot be used for VM shared repositories on Oracle Database Appliance.

About Network Infrastructure and VLANs on Oracle Database Appliance Virtualized Platform

Oracle Database Appliance Virtualized Platform supports multiple VLANs on the same network port or bond.

Virtual local area networks (VLANs) are multiple logical networks that are created from a single physical network switch port. VLANs provide network security isolation for multiple workloads that share a common network. For example, application, backup, and management networks. Each VLAN acts as an independent logical network operating with other VLANs over the same physical connection. This means that virtual machines deployed on different networks, connected through the same Oracle VM Server port (or bond), can have traffic directed to different VLANs.

The physical ports in the system at deployment (either copper or fiber) are bonded as `bond0` to `bond5`. The VLAN is created on `bond0/net1` to `bond5/net6`, if they are available.

The network interfaces differ, depending on your Oracle Database Appliance hardware. In all cases, connections to user domains are through the selected interfaces. A switch that supports tagged VLANs uses VLAN IDs to identify the packet, including to which network the packet belongs.

Configuration Overview of Oracle Database Appliance Virtual Machine Local Area Networks

To specify which network you want to use to access a virtual machine, you employ network infrastructure components of Oracle Database Appliance Virtualized Platform. Oracle Database Appliance Virtualized Platform manages all of the high-level network infrastructure components for you by pre-creating the bridges for all networks. The front-end point for accessing a virtual machine is one of the bridges defined for `Dom0`.

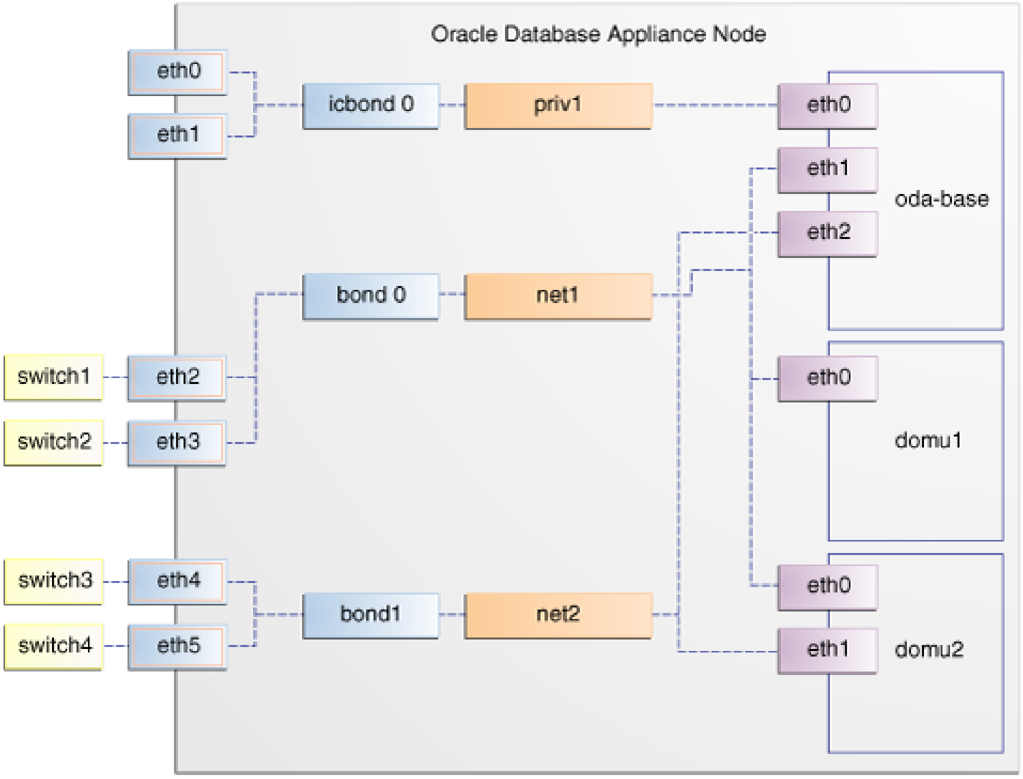
When you configure a virtual machine, you define which network the virtual machine should use by identifying the related bridge.

For example, to connect a virtual machine named `myvm1` to the `net1` network, you would use the following command:

```
# oakcli modify vm myvm1 -addnetwork net1
```

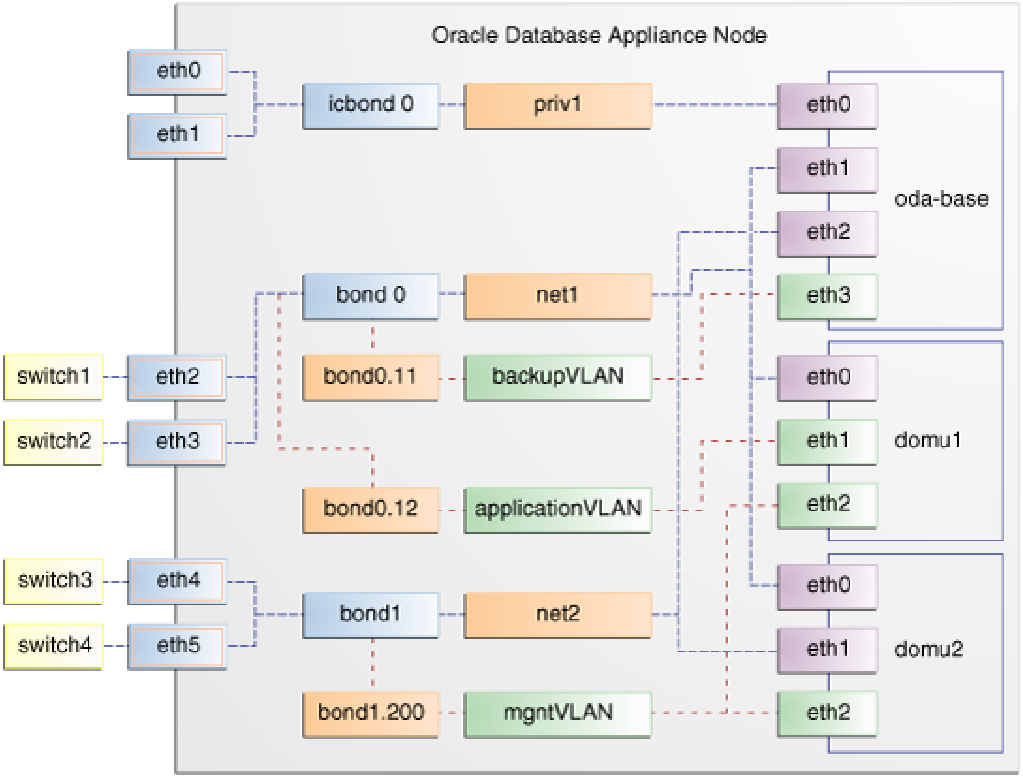
The illustration “Basic Virtual Machine Local Area Network" shows a typical Oracle Database Appliance local area network configuration that results from this virtual machine network configuration:

Figure 13-3 Basic Virtual Machine Local Area Network



You assign default VLANs to ODA_BASE during the installation and configuration of Oracle Database Appliance Virtualized Platform. The figure "Oracle Database Appliance Virtualized Platform with Virtual Local Area Networks" shows a typical Oracle Database Appliance configuration using VLANs. The illustration shows the same configuration as in "Basic Virtual Machine Local Area Networks," but with three tagged VLANs added for backups (backup), for applications (application), and for management (mgnt).

Figure 13-4 Oracle Database Appliance Virtualized Platform with Virtual Local Area Networks



Configuring Additional Networks on Virtualized Platform

Use the `oakcli configure additionalnet` command to create additional networks.

The `oakcli configure additionalnet` command runs an interactive script that requires you to provide the interface name, DHCP [Y/N], IP address, and netmask.

Example of Creating an Additional Network

When you run the command on `Dom0`, the interface name expects a net name. If you run the command on Dom1, then the interface name expects an `eth` name.

```
# oakcli configure additionalnet
```

Related Topics

- oakcli configure additionalnet
  Use the `oakcli configure additionalnet` command to configure any unconfigured public networks in bare metal, Domain 0, and ODA_BASE.

Adding a Network Interface on Virtualized Platform

Understand how you can add a network interface on Virtualized Platform.

This procedure explains how to add a network interface card on Oracle Database Appliance X8-2.

1. Power off the appliance.
2. Add the network interface card.
3. Power on the appliance.
4. The network bridge is automatically created.
5. Attach the network interface to ODA_BASE, VM, and VM_Template by running the commands `oakcli configure oda_base`, `oakcli modify vm`, and `oakcli modify vmtemplate`.

```
[root@oak ~]# oakcli configure oda_base
Core Licensing Options:
        1. 2 CPU Cores
        2. 4 CPU Cores
        3. 6 CPU Cores
        4. 8 CPU Cores
        5. 10 CPU Cores
        6. 12 CPU Cores
        7. 14 CPU Cores
        8. 16 CPU Cores
        9. 18 CPU Cores
        10. 20 CPU Cores
        11. 22 CPU Cores
        12. 24 CPU Cores
        13. 26 CPU Cores
        14. 28 CPU Cores
        15. 30 CPU Cores
        16. 32 CPU Cores
        Current CPU Cores       :28
        Selection[1 .. 16](default 32 CPU Cores)        : 14
        ODA base domain memory in GB(min 16, max 362)(Current
Memory 200G)[default 362] : 200

Additional vlan networks to be assigned to oda_base ? (y/n) [n]:
Vlan network to be removed from oda_base ? (y/n) [n]:
Additional networks to be assigned to oda_base ? (y/n) [n]: y
Select the network to assign (net3): net3
Additional networks to be assigned to oda_base ? (y/n) [n]: y
INFO: No networks to add !
Network to be removed from oda_base ? (y/n) [n]:
INFO: Node 0:Configured oda base pool
INFO: Node 1:Configured oda base pool
INFO: Node 0:ODA Base configured with new memory
INFO: Node 0:ODA Base configured with new vcpus
INFO: Node 0:New vlans added in ODA Base
INFO: Changes will be incorporated after the domain is restarted on
Node 0.
```

```
INFO: Node 1:ODA Base configured with new memory
INFO: Node 1:ODA Base configured with new vcpus
INFO: Node 1:New vlans added in ODA Base
INFO: Changes will be incorporated after the domain is restarted on
Node 1.
INFO: Updating /etc/sysctl.conf in oda_base domain with parameter
"vm.nr_hugepages=53776"
INFO: Updating /etc/security/limits.conf in oda_base domain with
new memlock value 150000000
```

6. Identify the bridge assigned to each Virtual Machine.

   ```
   [root@oak ~]# oakcli show oda_base

   ODA base domain
   ODA base CPU cores      :28
   ODA base domain memory  :200
   ODA base template       :/OVS/templateBuild-2019-09-16-03-34.tar.gz
   ODA base vlans          :['priv1', 'net1', 'net4', 'vlan10', 'net3']
   ODA base current status :Running

   [root@oak ~]# oakcli restart oda_base

   INFO: Stopping ODA base domain...
   INFO: Stopping all the shared repos
   ```

   On ODA_BASE, run:

   ```
   [root@oak ~]# ls -l /sys/class/net/

   total 0
   lrwxrwxrwx 1 root root 0 Oct 17 11:41 eth0 -> ../../devices/
   vif-0/net/eth0
   lrwxrwxrwx 1 root root 0 Oct 17 11:41 eth1 -> ../../devices/
   vif-1/net/eth1
   lrwxrwxrwx 1 root root 0 Oct 17 11:41 eth2 -> ../../devices/
   vif-2/net/eth2
   lrwxrwxrwx 1 root root 0 Oct 17 11:41 eth3 -> ../../devices/
   vif-3/net/eth3
   lrwxrwxrwx 1 root root 0 Oct 17 11:41 lo -> ../../devices/
   virtual/net/lo
   ```

7. Restart ODA_BASE and verify that the new network interface displays in ODA_BASE:

   ```
   # oakcli restart oda_base
   # ls -l /sys/class/net/
   total 0
   lrwxrwxrwx 1 root root 0 Oct 17 12:15 eth0 -> ../../devices/
   vif-0/net/eth0
   lrwxrwxrwx 1 root root 0 Oct 17 12:15 eth1 -> ../../devices/
   vif-1/net/eth1
   lrwxrwxrwx 1 root root 0 Oct 17 12:15 eth2 -> ../../devices/
   vif-2/net/eth2
   ```

```
lrwxrwxrwx 1 root root 0 Oct 17 12:15 eth3 -> ../../devices/
vif-3/net/eth3
lrwxrwxrwx 1 root root 0 Oct 17 12:15 eth4 -> ../../devices/
vif-4/net/eth4
lrwxrwxrwx 1 root root 0 Oct 17 12:15 lo -> ../../devices/
virtual/net/lo
```

Deleting a Network on Virtualized Platform

Understand how you can delete a configured network on Virtualized Platform.

This procedure explains how to delete a network on Oracle Database Appliance X8-2 Virtualized Platform.

1. Delete the network.

```
[root@oak ~]# brctl show
bridge name     bridge id               STP enabled     interfaces

net1            8000.b02628321ca0       no              bond0
                                                        vif1.1
net4            8000.3cfdfe7a0e33       no              bond3
net7            8000.0010e0dd9c2a       no              eth2
priv1           8000.b0262831f3b0       no              icbond0
                                                        vif1.0
vlan10          8000.b02628321ca0       no              bond0.10
                                                        vif1.3

[root@oak ~]# oakcli delete network bond3
Network bond3 has been deleted successfully
```

2. Verify that the network interface and the corresponding bridge are deleted.

```
[root@oak ~]# brctl show

bridge name     bridge id               STP enabled     interfaces
net1            8000.b02628321ca0       no              bond0
                                                        vif1.1
net3            8000.3cfdfe7a0e30       no              bond2
                                                        vif1.2
net7            8000.0010e0dd9c2a       no              eth2
priv1           8000.b0262831f3b0       no              icbond0
                                                        vif1.0
vlan10          8000.b02628321ca0       no              bond0.10
```

Deleting a Network Interface on Virtualized Platform

Understand how you can delete a configured network interface on Virtualized Platform.

This procedure explains how to delete a network interface card on Oracle Database Appliance X8-2.

1. Detach the network interface card from the Virtualized Platform, including ODA_BASE, VM, and VM Template.

```
[root@oak ~]# ls -l /sys/class/net/

total 0
lrwxrwxrwx 1 root root 0 Oct 14 22:36 eth0 -> ../../devices/
vif-0/net/eth0
lrwxrwxrwx 1 root root 0 Oct 14 22:36 eth1 -> ../../devices/
vif-1/net/eth1
lrwxrwxrwx 1 root root 0 Oct 14 22:36 eth2 -> ../../devices/
vif-2/net/eth2
lrwxrwxrwx 1 root root 0 Oct 14 22:36 eth3 -> ../../devices/
vif-3/net/eth3
lrwxrwxrwx 1 root root 0 Oct 14 22:35 lo -> ../../devices/
virtual/net/lo

[root@oak ~]# oakcli configure oda_base

Core Licensing Options:
        1. 2 CPU Cores
        2. 4 CPU Cores
        3. 6 CPU Cores
        4. 8 CPU Cores
        5. 10 CPU Cores
        6. 12 CPU Cores
        7. 14 CPU Cores
        8. 16 CPU Cores
        9. 18 CPU Cores
        10. 20 CPU Cores
        11. 22 CPU Cores
        12. 24 CPU Cores
        13. 26 CPU Cores
        14. 28 CPU Cores
        15. 30 CPU Cores
        16. 32 CPU Cores
        Current CPU Cores       :28
        Selection[1 .. 16](default 32 CPU Cores)        : 14
        ODA base domain memory in GB(min 16, max 362)(Current
Memory 200G)[default 362] : 200
Additional vlan networks to be assigned to oda_base ? (y/n) [n]:
Vlan network to be removed from oda_base ? (y/n) [n]:
Additional networks to be assigned to oda_base ? (y/n) [n]: y
INFO: No networks to add !
Network to be removed from oda_base ? (y/n) [n]: y
Select the network to remove (net1,net3,net4): net3
Network to be removed from oda_base ? (y/n) [n]:
INFO: Node 0:Configured oda base pool
INFO: Node 1:Configured oda base pool
INFO: Node 0:ODA Base configured with new memory
INFO: Node 0:ODA Base configured with new vcpus
INFO: Node 0:Vlans removed from ODA Base
INFO: Changes will be incorporated after the domain is restarted on
Node 0.
INFO: Node 1:ODA Base configured with new memory
```

```
INFO: Node 1:ODA Base configured with new vcpus
INFO: Node 1:Vlans removed from ODA Base
INFO: Changes will be incorporated after the domain is restarted on
Node 1.
INFO: Updating /etc/sysctl.conf in oda_base domain with parameter
"vm.nr_hugepages=53776"
INFO: Updating /etc/security/limits.conf in oda_base domain with
new memlock value 150000000

[root@oak ~]# oakcli show oda_base
ODA base domain
ODA base CPU cores      :28
ODA base domain memory  :200
ODA base template       :/OVS/templateBuild-2019-09-16-03-34.tar.gz
ODA base vlans          :['priv1', 'net1', 'net4', 'vlan10']
ODA base current status :Running

[root@oak ~]# oakcli modify vmtemplate vmtemp1 -deletenetwork net3
Modify Network succeeded

[root@oak ~]# oakcli modify vmtemplate vmtemp1 -deletenetwork net3
Modify Network succeeded
```

2. Power off the appliance.
3. Remove the network interface card.
4. Power on the appliance.
5. Run the command `oakcli delete network` *`network_name`* to delete the network interface and the corresponding bridge.

   ```
   oakcli delete network network_name
   ```

   ```
   [root@oak ~]# oakcli delete-network bond2
   Network bond2 has been deleted successfully
   ```

6. Verify that the network interface and the corresponding bridge are deleted.

   ```
   [root@oak ~]# brctl show

   bridge name     bridge id               STP enabled     interfaces

   net1            8000.b02628321ca0       no              bond0
                                                           vif1.1
   net3            8000.3cfdfe7a0e30       no              bond2
                                                           vif1.2
   net7            8000.0010e0dd9c2a       no              eth2
   priv1           8000.b0262831f3b0       no              icbond0
                                                           vif1.0
   vlan10          8000.b02628321ca0       no              bond0.10
   ```

How to Create and Manage Shared Repositories

These topics describe how to use OAKCLI to create and manage shared repositories on Oracle Database Appliance Virtualized Platform.

- Creating a Shared Repository
  Use the `oakcli create repo` command to create a shared repository on Oracle Database Appliance Virtualized Platforms.
- Showing the Status of Shared Repositories
  Use the `oakcli show repo` command to display information about virtual machine repositories on Oracle Database Appliance Virtualized Platforms.
- Starting a Shared Repository
  Use the `oakcli start repo` command to start a virtual machine and assign it to a shared repository on Oracle Database Appliance Virtualized Platforms
- Stopping a Shared Repository
  Use the `oakcli stop repo` command to command to stop a shared repository on a node on Oracle Database Appliance Virtualized Platforms.
- Deleting a Shared Repository
  Use the `oakcli delete repo` command to delete a shared repository on Oracle Database Appliance Virtualized Platforms.
- Increasing the Size of a Shared Repository
  Use the `oakcli configure repo` command to increase the size of a shared repository on Oracle Database Appliance Virtualized Platforms.

Creating a Shared Repository

Use the `oakcli create repo` command to create a shared repository on Oracle Database Appliance Virtualized Platforms.

When you run the `oakcli create repo` command, you identify the repository name using the option `repo`, you identify the disk group that you want to use for its storage (DATA or RECO) using the option `-dg`, and you identify the size of the repository in gigabytes or megabytes (the default size unit is gigabytes) using the `-size` option.

Other Oracle Appliance Manager shared repository commands, including commands to show and to stop (dismount) existing repositories, are similar to those used for nonshared repositories. Unlike the default repositories, which are permanent, you can delete a shared repository that has no active (mounted) virtual machines.

Example of Creating a Shared Repository

The following command creates a shared repository named `repo1` in the ASM DATA disk group (`data`) with 30 gigabytes of available storage:

```
# oakcli create repo repo1 -dg data -size 30
```

Showing the Status of Shared Repositories

Use the `oakcli show repo` command to display information about virtual machine repositories on Oracle Database Appliance Virtualized Platforms.

To see all repositories, omit the repository name and node number. To see a specific shared repository, include the repository name and node number.

Example 13-1 Example of Showing the Status of All Shared Repositories

To show the status of all shared repositories, use the `oakcli show repo` command:

```
# oakcli show repo
NAME     TYPE   NODENUM  FREE SPACE STATE  SIZE

odarepo1 local  0        N/A        N/A    N/A

odarepo2 local  1        N/A        N/A    N/A

srepo1   shared 0        76.24%     ONLINE 1024000.0M

srepo1   shared 1        76.24%     ONLINE 1024000.0M
```

Example 13-2 Example of Showing the Status of a Selected Shared Repository

To display information for a particular node in a shared repository, specify the repository name and node number as part of the command syntax. In the following example, information is displayed for Node 1 in the *`repo1`* shared repository:

```
# oakcli show repo srepo1 -node 0
The Resource is : srepo1_0
      AutoStart : restore
      DG : RECO
      Device : /dev/asm/srepo1-402
      ExpectedState : Online
      FreeSpace : 780688.2M
      MountPoint : /u01/app/sharedrepo/srepo1
      Name : srepo1_0
      PFreeSpace : 76.24%
      RepoType : shared
      Size : 1024000.0M
      State : Online
      Version : 2
```

Starting a Shared Repository

Use the `oakcli start repo` command to start a virtual machine and assign it to a shared repository on Oracle Database Appliance Virtualized Platforms

Before you can assign a virtual machine to a shared repository, use the `oakcli start repo` command to start the repository and make the storage available. Note that the `oakcli start repo` command will also start any virtual machines assigned to the repository that are defined to be automatically started.

You must have a repository already configured. Identify the repository that you start by using the option `repo` *`name`*, where *`name`* is the repository name. Identify the name of the node on which the repository is located by using the option `-node` *`nodename`*, where *`nodename`* is the name of the node on which the repository is located.

Example 13-3 Example of Starting a Shared Repository

This command starts the shared repository named `repo1` on Node 1:

```
# oakcli start repo repo1 -node 1
```

Stopping a Shared Repository

Use the `oakcli stop repo` command to command to stop a shared repository on a node on Oracle Database Appliance Virtualized Platforms.

Identify the repository that you want to stop by using the `repo` *`reponame`* option, where *`reponame`* identifies the repository that you want to stop. Identify the node on which the repository that you want to stop is running by using the `-node` *`number`* option where *`number`* is the node number that you want to stop.

> **Note:**
>
> Do not issue an `oakcli stop repo` command while virtual machines are still active in the repository for the selected node.

Example 13-4 Example of Stopping a Shared Repository

The following example stops the shared repository named `repo1` on Node 0:

```
# oakcli stop repo repo1 -node 0
```

Deleting a Shared Repository

Use the `oakcli delete repo` command to delete a shared repository on Oracle Database Appliance Virtualized Platforms.

Identify the repository that you want to delete by using the `repo` *`reponame`* option, where *`reponame`* identifies the repository that you want to delete.

> **Note:**
>
> The shared repository that you want to delete must be offline (stopped) on both nodes before you attempt to delete it.

Example 13-5 Example of Deleting a Shared Repository

The following command deletes the shared repository named `repo1` on both nodes:

```
# oakcli delete repo repo1
```

Increasing the Size of a Shared Repository

Use the `oakcli configure repo` command to increase the size of a shared repository on Oracle Database Appliance Virtualized Platforms.

Identify the repository that you want to expand by using the `-repo` *`reponame`* option, where *`reponame`* identifies the repository that you want to expand. Use the option `-incsize` *`size`* to specify the size of the increase that you want to configure, where *`size`* is the size (in gigabytes) that you want to add to the configured size.

Example 13-6 Example of Increasing the Size of a Shared Repository

The following command increases the size of the shared repository `repo1` by 2 gigabytes:

```
# oakcli configure repo repo1 -incsize 2G

Configured Shared Repo : repo1 with new size 3712.0.
```

How to Manage Virtual Disks in Shared Repositories

These topics describe how to use OAKCLI to create, view, clone, attach, and delete virtual disks on Oracle Database Appliance Virtualized Platform.

- Creating a Virtual Disk for Use in a Shared Repository
  Use the command `oakcli create vdisk` to create a virtual disk within a shared repository on Oracle Database Appliance Virtualized Platforms.
- Viewing Information About Virtual Disks
  Use the command `oakcli show vdisk` to view information about virtual disks on Oracle Database Appliance Virtualized Platforms.
- Cloning Virtual Disks
  Use the `oakcli clone vdisk` command to create clones of virtual disks on Oracle Database Appliance Virtualized Platforms.
- Attaching a Virtual Disk to a Virtual Machine
  Use the `oakcli modify vm` command to attach a virtual disk to a virtual machine on Oracle Database Appliance Virtualized Platforms.
- Deleting a Virtual Disk
  Use the `oakcli delete vdisk` command to remove a virtual disk from a shared repository on Oracle Database Appliance Virtualized Platforms.

Creating a Virtual Disk for Use in a Shared Repository

Use the command `oakcli create vdisk` to create a virtual disk within a shared repository on Oracle Database Appliance Virtualized Platforms.

The command `oakcli create vdisk` defines the size of the virtual disk, the shared repository in which that disk is created, defines the unique name for that disk within that shared repository, and defines if the disk is used for one virtual machine, or can be shared by multiple virtual machines.

The name of the vdisk you create is defined by the command `oakcli create vdisk` *`name`*, where *`name`* is the name of the vdisk you create. Identify the repository in which you create the vdisk by using the `-repo` *`reponame`* option, where *`reponame`* identifies the repository where you want to create the vdisk. Use the option `-size sizeG` to specify the vdisk size (in gigabytes), where *`sizeG`* is the size (in gigabytes) that you want to add to the configured size. If you want to configure the vdisk as a shared disk, then use the option `-type shared` to designate the vdisk as a shared disk.

Example 13-7 Example of Creating a Shared Virtual Disk

This example creates a virtual disk named `sdisk1` in the `repo2` shared repository that is 1 gigabyte in size, and that virtual machines can share:

```
# oakcli create vdisk sdisk1 -repo repo2 -size 1G -type shared
```

Viewing Information About Virtual Disks

Use the command `oakcli show vdisk` to view information about virtual disks on Oracle Database Appliance Virtualized Platforms.

You can use `oakcli show vdisk` by itself to see information about all of your configured virtual disks. To see information about an individual virtual disk, enter the command `oakcli show vdisk diskname -repo reponame`, where *`diskname`* is the name of the disk that you want to check, and *`reponame`* is the name of the shared repository where the virtual disk is located. If *`diskname`* is specified, then *`reponame`* must be given.

Example 13-8 Example of Displaying the Information for All Vdisks

This example displays information about all virtual disks configured on an Oracle Database Appliance:

```
# oakcli show vdisk
        NAME      SIZE TYPE REPOSITORY
       ddomssdvd1 100G local srepo1
       ddomssdvd2 10G  local srepo1
       vd11       10G  local srepo1
```

Example 13-9 Example of Displaying Information for a Single Vdisk

This example displays information for the virtual disk named `myvdisk1`:

```
# oakcli show vdisk vd11 -repo srepo1
  The Resource is : vd11_srepo1
             Name : vd11_srepo1
         RepoName : srepo1
             Size : 10G
             Type : local
       VmAttached : 1
```

Cloning Virtual Disks

Use the `oakcli clone vdisk` command to create clones of virtual disks on Oracle Database Appliance Virtualized Platforms.

The command `oakcli clone vdisk` defines the size of the virtual disk, the shared repository in which that disk is created, defines the unique name for that disk within that shared repository, and defines if the disk is used for one virtual machine, or can be shared by multiple virtual machines.

The name of the vdisk you create is defined by the command `oakcli clone vdisk` *`name`*, where *`name`* is the name of the vdisk you create. Identify the repository in which you create the vdisk by using the `-repo` *`reponame`* option, where *`reponame`* is the name of the repository where the original vdisk is located. Use the option `-src` *`sourcevdiskname`*, where *`sourcevdiskname`* is the name of the virtual disk that you are cloning. Add the option `-h` to display help for this command.

> **Note:**
>
> Once the virtual disk is attached to a virtual machine, the system administrator should perform normal disk addition tasks for the given operating system to make the newly added storage available to the virtual machine.

Syntax

```
# oakcli clone vdisk name -repo reponame -src sourcevdiskname [-h]
```

Example 13-10   Example of Cloning a Virtual Disk

This example clones a virtual disk named `my_vdisk2` from an existing virtual disk named `vdisk1` that is stored in the repository named `vrepo1`:

```
# oakcli clone vdisk my_vdisk2 -repo vrepo1 -src vdisk1
```

Attaching a Virtual Disk to a Virtual Machine

Use the `oakcli modify vm` command to attach a virtual disk to a virtual machine on Oracle Database Appliance Virtualized Platforms.

The command `oakcli modify vm` *`name`* enables you to modify a virtual machine, where *`name`* is the name of the virtual machine that you want to modify. To attach a disk to a virtual machine, use the option `-attachvdisk vdiskname`, where *`vdiskname`* is the name of the virtual disk that you want to attach to the virtual machine.

Example 13-11   Example of Attaching a Virtual Disk To a Virtual Machine

This example attaches the virtual disk named `sdisk1` to the virtual machine named `myol6u_test`:

```
# oakcli modify vm myo16u_test -attachvdisk sdisk1
```

Deleting a Virtual Disk

Use the `oakcli delete vdisk` command to remove a virtual disk from a shared repository on Oracle Database Appliance Virtualized Platforms.

The command `oakcli delete vdisk vdiskname` removes a virtual disk, where `vdiskname` is the name of the virtual disk that you want to remove. The option `-repo` *reponame* indicates the shared repository on which the virtual disk is located, where *reponame* is the name of the shared repository.

Example 13-12 Example of Deleting a Virtual Disk from a Shared Repository

This example removes a virtual disk named t2g from the shared repository named repoprod1:

```
# oakcli delete vdisk t2g -repo repoprod1
```

How to Manage Virtual Machine Templates

These topics describe how to use OAKCLI to import, configure, modify and check virtual machine templates on Oracle Database Appliance Virtualized Platform.

- About Managing Virtual Machine Templates
  Import and configure virtual machine templates as the source for the virtual machines deployed on Oracle Database Appliance Virtualized Platform.
- Listing Virtual Machine Templates
  Use the oakcli show vmtemplate command to display virtual machine template details.
- Importing Virtual Machine Templates
  Use the oakcli import vmtemplate command to import virtual machine templates and assemblies on Oracle Database Appliance Virtualized Platforms.
- Configuring a Virtual Machine Template
  Use the oakcli configure vmtemplate command to configure a virtual machine template on Oracle Database Appliance Virtualized Platform.
- Showing Configured Values for a Virtual Machine Template
  Use the oakcli show vmtemplate command to show values for the configurable options in a virtual machine template.
- Modifying a Virtual Machine Template Configuration
  Use the oakcli modify vmtemplate command to modify a virtual machine template.
- Removing a Virtual Machine Template
  Use the oakcli delete vmtemplate command to remove a virtual machine template.

About Managing Virtual Machine Templates

Import and configure virtual machine templates as the source for the virtual machines deployed on Oracle Database Appliance Virtualized Platform.

If you have created shared repositories, then import templates into one of those shared repositories. If you have not created shared repositories, then import templates into the local repository on one of the local nodes.

You can import assemblies that contain one or more templates. When you import a template or assembly into a shared repository, select a node that you want to perform the operation. Select the node carefully to avoid overloading the node. After you create the repository, the repository becomes available to both nodes, regardless of which node performs the import.

Templates imported into local nodes use the repository name supplied in the import command to identify the node that completes the import, and that provides the storage. On Node 0, the local repository is named odarepo1 and on Node 1, the local repository is named odarepo2. If you want to import a template to both local repositories, then you must provide a different template name when you import the template into the second node.

> **Note:**
>
> You cannot create or clone templates directly on Oracle Database Appliance Virtualized Platform, you must use the Oracle VM templates that are available in Oracle Software Delivery.

If you import an assembly that contains more than one template, then the command automatically modifies the template name that you provide, so that all template names remain unique. The first template you import has the number "1" appended to the name. The second template as the number "2" appended, and additional templates have 3, 4, 5 and so on appended in sequence.

After you import a virtual machine template, you can customize the template using OAKCLI commands.

> **Note:**
>
> Find virtual machine templates at the following URL:
>
> http://edelivery.oracle.com/linux.

Listing Virtual Machine Templates

Use the oakcli show vmtemplate command to display virtual machine template details.

The oakcli show vmtemplate command displays the name and repository for each virtual machine template as well as the default number of CPUs and default amount of memory that Oracle Database Appliance Virtualized Platform would assign to a virtual machine created from the template.

Example

Display information about the sample1_odarepo1 virtual template:

```
# oakcli show vmtemplate sample_odarepo1
  Resource: sample1_odarepo1
        CPUPriority     :       100
        Disks           :       |file:/OVS/Repositories/odarepo1/Te
                                mplates/otml_sample1_odarepo1/Syste
                                m.img,xvda,w||file:/OVS/Repositorie
                                s/odarepo1/Templates/otml_sample1_o
                                darepo1/u01.img,xvdb,w|
        Domain          :       XEN_PVM
```

```
Keyboard        :       en-us
MaxMemory       :       2048
MaxVcpu         :       2
Memory          :       2048
Mouse           :       OS_DEFAULT
Name            :       sample1_odarepo1
Networks        :       |bridge=priv1||bridge=net1||bridge=
                        net2|
NodeNum         :       0
OS              :       OL_5
ProcessorCap    :       100
RepoName        :       odarepo1
Vcpu            :       2
```

Importing Virtual Machine Templates

Use the `oakcli import vmtemplate` command to import virtual machine templates and assemblies on Oracle Database Appliance Virtualized Platforms.

You import virtual machine templates and assemblies contained in an external repository assembly file. Use the name of the shared repository and include a clause to identify the node where you want to import a template or an assembly.

You can import virtual machine templates and assemblies directly from a remote repository using a URL to identify the source of the files. You can choose to use a remote copy command to copy files from the remote repository into your `Dom0 /OVS` directory, and then import the files using the path and names to identify the downloaded files.

> **Note:**
>
> When importing templates or assemblies to a local repository, do not use the `-node` option. The target node is implicit in the name of the repository.

Syntax

```
# oakcli import vmtemplate vmtemplatename -files image_files | -assembly
assembly_file -repo repo_name [- node 0 | 1 ]
```

Example 13-13   Example of Importing Virtual Machine Templates from an External Repository Assembly File

Use the `oakcli import vmteplate` *`vmtemplatename`* `-assembly` *`assembly_file`* `-repo` *`repo_name`* command to import virtual machine templates contained in an external template repository assembly file.

This example imports the template in an external template repository assembly file located at the URL `'http://example.com/assemblies/OEL6/`

OVM_OL6U1_x86_PVHVM.ova' to a new template named OL6U1 in a new repository named odarepo1:

```
# oakcli import vmtemplate OL6U1 -assembly 'http://example.com/
assemblies/OEL6/OVM_OL6U1_x86_PVHVM.ova' -repo odarepo1
```

Note the single quotation marks that enclose the URL.

Example 13-14 Example of Importing a Virtual Machine Template from Dom0

Use this command syntax to import a virtual machine template from the /OVS file system on Dom0:

```
# oakcli import vmtemplate vmtemplatename -files image_files -repo repo_name
```

This example imports the virtual machine template named OVM_OL5U7_X86_64_PVM_10GB.tgz from the /OVS directory in Dom0 into the odarepo1 repository. The template is assigned the name OL5U7:

```
# oakcli import vmtemplate OL5U7 -files /OVS/
OVM_OL5U7_X86_64_PVM_10GB.tgz -repo odarepo1
```

Example 13-15 Example of Importing a Virtual Machine Template Using an External Repository URL

Use the command oakcli import vmtemplate *vmtemplatename* -files *image_files* -repo *repo_name* to import a virtual machine template file from an external template repository.

This example imports a virtual machine template named OVM_OL5U7_X86_64_PVM_10GB.tgz from an external template repository at the URL 'http://example.com/assemblies/OEL6/OVM_OL6U1_x86_PVHVM.tgz'. Note the single quotation marks that enclose the URL. The template is assigned the name OL5U7, and is imported into the odarpo1 repository:

```
# oakcli import vmtemplate OL5U7 -files 'http://example.com/assemblies/
OEL6/OVM_OL6U1_x86_PVHVM.tgz'-repo odarepo1
```

Configuring a Virtual Machine Template

Use the oakcli configure vmtemplate command to configure a virtual machine template on Oracle Database Appliance Virtualized Platform.

The values become the default values for any virtual machine cloned from this template. You can change any or all of them later with the oakcli configure vm command.

Example

Set values for the virtual machine template named *myol5u7_10gb*:

```
# oakcli configure vmtemplate myol5u7_10gb -vcpu 2 -maxvcpu 4 -cpucap 40 -memory
1536M -maxmemory 2G -os OTHER_LINUX
```

- `-vcpu 2` sets the number of CPUs to be assigned when the virtual machine starts up to 2.
- `-maxvcpu 4` sets the maximum number of CPUs that can be assigned to the virtual machine to 4.
- `-cpucap 40` sets the maximum percentage of a CPU's capacity that can be assigned to the virtual machine to 40%.
- `-memory 1536M` sets the amount of memory to be assigned when the virtual machine starts up to 1536 MB.
- `-maxmemory 2G` sets the maximum amount of memory that can be assigned to the virtual machine to 2 GB.
- `-os OTHER_LINUX` sets OTHER_LINUX as the operating system used by the virtual machine.

Showing Configured Values for a Virtual Machine Template

Use the `oakcli show vmtemplate` command to show values for the configurable options in a virtual machine template.

Example

Display information about the `sample1_odarepo1` virtual template:

```
# oakcli show vmtemplate sample_odarepo1
Resource: sample1_odarepo1
        CPUPriority     :       100
        Disks           :       |file:/OVS/Repositories/odarepo1/Te
                                mplates/otml_sample1_odarepo1/Syste
                                m.img,xvda,w||file:/OVS/Repositorie
                                s/odarepo1/Templates/otml_sample1_o
                                darepo1/u01.img,xvdb,w|
        Domain          :       XEN_PVM
        Keyboard        :       en-us
        MaxMemory       :       2048
        MaxVcpu         :       2
        Memory          :       2048
        Mouse           :       OS_DEFAULT
        Name            :       sample1_odarepo1
        Networks        :       |bridge=priv1||bridge=net1||bridge=
                                net2|
        NodeNum         :       0
        OS              :       OL_5
        ProcessorCap    :       100
        RepoName        :       odarepo1
        Vcpu            :       2
```

Modifying a Virtual Machine Template Configuration

Use the `oakcli modify vmtemplate` command to modify a virtual machine template.

After you import a virtual machine template to a storage repository, examine the template configuration parameters with the `oakcli show vmtemplate` command. If you need to reconfigure the template for specific requirements, then use the `oakcli configure vmtemplate` command. This is useful if you plan to deploy multiple virtual machines with the same characteristics from a single template. If you will be deploying only one virtual machine or many virtual machines but with different characteristics, then set required values in the virtual machines with the `oakcli configure vm` command after you deploy the template.

When you are satisfied with the configuration of your virtual machine template, use the `oakcli modify` command to assign a new network to the virtual machine template.

Example

Replace the network assigned to the *`gc_11g`* virtual machine template with the *`net1`* network:

```
# oakcli modify vmtemplate gc_11g -addnetwork net1
```

Removing a Virtual Machine Template

Use the `oakcli delete vmtemplate` command to remove a virtual machine template.

If you no longer need a template that you previously stored, then you can remove the template from the repository.

Example

Remove the virtual machine template named *`myol6u_15gb3`* from Oracle Database Appliance Virtualized Platform:

```
# oakcli delete vmtemplate my0l6u_15gb3
```

How to Create Clones and Snap Clones of a Template

Review these topics for an overview of clones and snap clones, and for procedures to use to create clones.

- About Creating Clones and Snap Clones of a Template
  You can create, or *clone*, virtual machines from imported templates (or assemblies) or from an existing virtual machine on Oracle Database Appliance Virtualized Platforms.
- Cloning a Template With OAKCLI
  Use the `oakcli clone vm` command to clone virtual machines that have attached virtual disks on Oracle Database Appliance Virtualized Platforms.
- Creating a Snap Clone from a Template With OAKCLI
  Use the `oakcli clone vm` command to create a snap clone of a virtual machine template on Oracle Database Appliance Virtualized Platforms.
- Creating a Snap Clone of an Existing Virtual Machine With OAKCLI
  Use the `oakcli clone vm` command to create a snap clone of an existing virtual machine on Oracle Database Appliance Virtualized Platforms.

About Creating Clones and Snap Clones of a Template

You can create, or *clone*, virtual machines from imported templates (or assemblies) or from an existing virtual machine on Oracle Database Appliance Virtualized Platforms.

Clones and snap clones can be an effective way to provision and clone new databases for test and development systems. They are much more efficient to create than using RMAN scripts, or other cloning approaches.

You can create virtual machines that are a complete clone of the template or assembly, or you can create virtual machines that are snap clones. Snap clones contain only the metadata defined for the virtual machine.

Creating snap clones is a very fast operation compared to cloning the entire template or assembly. However, if you update the contents of a snap clone, then review your space requirements. Unless your changes to the snap clone are carried out on shared virtual disks, you require additional storage on your system for the clone to retain both the original content, as well as changed content.

Cloning a Template With OAKCLI

Use the `oakcli clone vm` command to clone virtual machines that have attached virtual disks on Oracle Database Appliance Virtualized Platforms.

When you clone virtual machines with attached virtual disks, a clone of a virtual machine contains the contents of virtual disks attached locally, but does not contain contents of virtual disks attached in shared mode. If needed, you can clone the virtual disks required by a cloned virtual machine in a separate step.

Use the command `oakcli clone vm` to create a virtual machine from a virtual machine template. Use the `-repo` *`name`* option to provide the name of the shared repository, where *`name`* is the name of the repository. Use the `-node` *`number`* option to identify clause to identify the node on which you want to perform the cloning process, where *`number`* is the number of the node.

> **Note:**
>
> The `-node` option identifies the node where the cloning activity is carried out. The node value does not assign the default startup node for the virtual machine. You can set the startup assignment with the command `oakcli configure vm`.

Example 13-16 Example of Creating a Virtual Machine Clone from a Virtual Machine Template

This example creates a virtual machine named `myol6u_test` from the virtual machine template named `myol6u_15gb1`, which is located in a shared repository named `repo2` on `Node 0`:

```
# oakcli clone vm myol6u_test -vmtemplate myol6u_15gb1 -repo repo2
-node 0
```

Creating a Snap Clone from a Template With OAKCLI

Use the `oakcli clone vm` command to create a snap clone of a virtual machine template on Oracle Database Appliance Virtualized Platforms.

Use the `-vmtemplate` *`name`* option to provide the name of the virtual machine template that you want to clone, where *`name`* is the name of the template. Use the `-snap` option to designate that you want to create a snap clone.

Example 13-17 Example of Creating a Snap Clone From a Virtual Machine Template

This example creates a snap clone named `myol15u_snap` from the virtual machine template named `myol5u`:

```
# oakcli clone vm myol15u_snap -vmtemplate myol5u -snap
```

Creating a Snap Clone of an Existing Virtual Machine With OAKCLI

Use the `oakcli clone vm` command to create a snap clone of an existing virtual machine on Oracle Database Appliance Virtualized Platforms.

Use the `-vm` *`name`* option to provide the name of the virtual machine that you want to clone, where *`name`* is the name of the virtual machine. Use the `-snap` option to designate that you want to create a snap clone.

Example 13-18 Example of Creating a Snap Clone From an Existing Virtual Machine

This example creates a snap clone named `myol15u_test1` from a virtual machine named `myol15u_test`:

```
# oakcli clone vm myol15u_test1 -vm myol15u_test1 -snap
```

How to Manage Virtual Machines on Oracle Database Appliance Virtualized Platform

Review these topics for an overview of virtual machines, and for procedures to create and manage virtual machines.

- About Managing Virtual Machines on Oracle Database Appliance Virtualized Platform
  Deploy virtual machines on Oracle Database Appliance Virtualized Platform to run other workloads that are independent of databases running in ODA_BASE
- Listing the Virtual Machines in Your Repositories
  Use the `oakcli show vm` command to display details for all of your existing virtual machines or to display details of a specific virtual machine.
- Creating a Virtual Machine
  Create a virtual machine by cloning an imported template, cloning an assembly that contains configured virtual machines, or cloning an existing virtual machine.

- Configuring a Virtual Machine
  Use the `oakcli configure vm` command to configure a virtual machine on Oracle Database Appliance Virtualized Platform.
- Starting and Stopping a Virtual Machine
  Use the `oakcli start vm` command to start a virtual machine on Oracle Database Appliance Virtualized Platform and use the `oakcli stop vm` command to stop a virtual machine.
- Externally Configuring a Virtual Machine
  You can initially configure your virtual machines externally without connecting to the virtual machine console by using Oracle VM Guest Additions by passing key-value pairs to the virtual machine.
- Opening a Virtual Machine Console for a Virtual Machine
  Use the `oakcli show vmconsole` command to open a virtual machine console window for an active virtual machine
- Creating an Image for a New Virtual Machine
  Use the `oakcli clone vm` command to create an image for a new virtual machine on Oracle Database Appliance Virtualized Platform.
- Setting Up a Virtual Machine for Access from eth0 Using an IP Address
  Configure a network device (`eth0`) with an IP address for a virtual machine.
- Adding or Removing a Virtual Disk to or from a Virtual Machine
  Use the `oakcli modify vm` command to add or remove a virtual disk (vdisk) from a virtual machine.
- Removing a Virtual Machine from a Shared Repository
  Use the `oakcli delete vm` command to delete the virtual machine and reclaim its storage and resources.
- Performing a Live Migration for an Oracle Database Appliance Virtual Machine
  If your system meets requirements for live migration, then you can use the `oakcli migrate vm` command to migrate a virtual machine from the currently running node to another node.

About Managing Virtual Machines on Oracle Database Appliance Virtualized Platform

Deploy virtual machines on Oracle Database Appliance Virtualized Platform to run other workloads that are independent of databases running in ODA_BASE

Use OAKCLI commands to create and manage virtual machines, including starting and stopping them, and opening consoles for graphical user interface (GUI) access.

> **Note:**
>
> You can use a Virtual Network Computing (VNC) session to open a GUI console for a virtual machine.

You can reconfigure an active virtual machine. However, your changes do not take effect until you stop and restart the virtual machine. You can display high-level information about all of your virtual machines, or display detailed information about the configuration of single virtual machines. When you no longer have use for a particular virtual machine, delete the virtual machine to regain storage.

> **Note:**
>
> Do not modify the default settings for the following parameters in the guest virtual machine:
>
> - xen_blkfront.max: Max Indirect Descriptors, default 32
> - xen_blkback.max_ring_page_order: Shared Ring Page Order, default 0

Listing the Virtual Machines in Your Repositories

Use the `oakcli show vm` command to display details for all of your existing virtual machines or to display details of a specific virtual machine.

The command displays the name, the repository, and the current state (online or offline) for each virtual machine. The output also contains the default number of CPUs and default amount of memory that Oracle Database Appliance Virtualized Platform will assign to each virtual machine.

- Use the `oakcli show vm` command to display the virtual machine names, memory and vCPU allocations, status, virtual disks, and repository name for all virtual machines.

  ```
  # oakcli show vm
          NAME  NODENUM MEMORY VCPU  STATE  REPOSITORY
          vm1   0       8192M   4    ONLINE srepo1
          vm2   0       8192M   4    ONLINE srepo1
  ```

- Use the `oakcli show vm` *`virtual machine name`* command to display information about a specific virtual machine.

  For example, use the following command to display details about the `vm1_odarepo1` virtual machine:

  ```
  # oakcli show vm vm1_odarepo1
    Resource: vm1_odarepo1
          AutoStart       :       restore
          CPUPriority     :       100
          Disks           :       |file:/OVS/Repositories/odarepo1/Vi
                                  rtualMachines/vm1_odarepo1/System.i
                                  mg,xvda,w||file:/OVS/Repositories/o
                                  darepo1/VirtualMachines/vm1_odarepo
                                  1/u01.img,xvdb,w|
          Domain          :       XEN_PVM
          ExpectedState   :       online
          FailOver        :       false
          IsSharedRepo    :       false
          Keyboard        :       en-us
          MaxMemory       :       3000
          MaxVcpu         :       4
          Memory          :       4096
  ```

```
Mouse            :       OS_DEFAULT
Name             :       vm1_odarepo1
Networks         :       |mac=00:21:F6:00:00:E4|
NodeNum          :       0
NodeNumStart     :
OS               :       OL_5
PrivateIP        :       None
ProcessorCap     :       100
RepoName         :       odarepo1
State            :       Online
TemplateName     :       otml_sample1_odarepo1
Vcpu             :       4
cpupool          :       twocpu
vncport          :       5901
```

Creating a Virtual Machine

Create a virtual machine by cloning an imported template, cloning an assembly that contains configured virtual machines, or cloning an existing virtual machine.

A virtual machine is a software emulation of a computer system that is granted virtual resources, and can be started, stopped, and restarted independently.

When you clone a template, the template is imported as an archive, unpacked, and stored as a virtual machine configuration file with disk images. The disk images are cloned to create a new instance in the form of a virtual machine.

Instead of creating a complete clone of a template or assembly, you can create a snap clone, which contains only the metadata defined for the virtual machine.

Configuring a Virtual Machine

Use the `oakcli configure vm` command to configure a virtual machine on Oracle Database Appliance Virtualized Platform.

Include a `-prefnode` clause, to identify the node where you want the virtual machine to run by default and a `-failover` clause to indicate if you want the virtual machine to use the other node when the preferred node is not available (either at startup or while already active).

If you reconfigure a virtual machine that is currently running, then your changes do not take effect until you stop and restart the virtual machine.

Table 13-1 Parameters Available for Configuring a Virtual Machine

Parameter	Description
`-vcpu 2`	Sets two (2) as the number of CPUs to be assigned to the virtual machine when started
`-cpuprio 150`	Sets the CPU access priority to 150
`-cpucap 20`	Sets the maximum percentage of a CPU's capacity that will be assigned to the virtual machine to 20%
`-memory 1G`	Sets the amount of memory assigned when the virtual machine starts to 1 GB

Table 13-1 (Cont.) Parameters Available for Configuring a Virtual Machine

Parameter	Description
`-cpupool linpool`	Specifies `linpool` as the CPU pool to be assigned to the virtual machine
`-keyboard en-us`	Defines the keyboard type used to access the virtual machine as `en-us`
`-mouse USB_MOUSE`	Defines the mouse type used to access the virtual machine as a USB mouse

These values will override values assigned to these same parameters in the virtual machine template from which this virtual machine was derived. The virtual machine will use default values for parameters that are not defined in either the parent template or in a configuration command.

> **Note:**
>
> CPU capacity is controlled by the CPU pool assigned to a virtual machine by either the `-cpupool` parameter or by the `default_unpinned_pool` (if the virtual machine is not configured with a `-cpupool` parameter). Values for `-vcpu` and `-maxvcpu` parameters that are larger than the number of CPUs in the assigned CPU pool are ignored.

Use the `oakcli configure` command and parameters to configure the virtual machine:

```
# oakcli modify vm  vmname parameters
```

Example 13-19 Example of Configuring a Virtual Machine

Set values for specific resources in the virtual machine named `myol15u`:

```
# oakcli configure vm myol5u
-vcpu 2 -cpuprio 150 -cpucap 20 -memory 1G
-cpupool linpool -keyboard en-us -mouse USB_MOUSE
```

Starting and Stopping a Virtual Machine

Use the `oakcli start vm` command to start a virtual machine on Oracle Database Appliance Virtualized Platform and use the `oakcli stop vm` command to stop a virtual machine.

> **Note:**
>
> If you reconfigure a virtual machine that is currently running, then your changes will not be effective until you stop and restart the virtual machine.

Externally Configuring a Virtual Machine

You can initially configure your virtual machines externally without connecting to the virtual machine console by using Oracle VM Guest Additions by passing key-value pairs to the virtual machine.

Use the `oakcli modify vm -s` command to pass parameters to the virtual machine:

```
# oakcli modify vm  vmname -s 'key1:value1;key2:value2...'
```

The following example has two value pairs:

```
# oakcli modify vm vmo16u3 -s
'com.oracle.linux.network.device.0:eth0;com.oracle.linux.network.ipaddr.
0:192.1.2.18'
```

Note:

- For more information about Oracle VM Guest Additions, see "*Using the Oracle VM Guest Additions*" in the *Oracle VM Utilities Guide for x86* at http://docs.oracle.com/cd/E35328_01/E35333/html/vmutl-guestadd.html.
- Refer to the whitepaper *Oracle Database Appliance: Automated Virtual Machine Provisioning* for more information.

Related Topics

- http://www.oracle.com/technetwork/database/database-appliance/overview/oda-automatedvmprovisioning-2348232.pdf

Opening a Virtual Machine Console for a Virtual Machine

Use the `oakcli show vmconsole` command to open a virtual machine console window for an active virtual machine

If the console does not display correctly, then close the console, set the `DISPLAY` environment variable to an appropriate value for your monitor, and then rerun the `oakcli show vmconsole` command.

You can also configure your virtual machine (using `oakcli modify vm` command with the `-s` parameter) to allow access from the OAKCLI command line instead of a graphical user interface (GUI) virtual machine console.

Use the `oakcli show vmconsole` *`vm name`* to open a console for a virtual machine.Open a For example, use the following command to open a console for the virtual machine named `vm1_odarepo1`:

```
# oakcli show vmconsole vm1_odarepo1
```

Creating an Image for a New Virtual Machine

Use the `oakcli clone vm` command to create an image for a new virtual machine on Oracle Database Appliance Virtualized Platform.

By default, the image inherits the content and configuration information from the template or from the virtual machine that you are cloning and resides in the same repository as the source. Unless you are using local repositories for your virtual machines, include the`-node` clause in the `oakcli clone` command to identify the node that should run the cloning process. To create a snap clone, which will only contain the configuration metadata, include the `-snap` clause in the `oakcli clone` command.

Setting Up a Virtual Machine for Access from eth0 Using an IP Address

Configure a network device (`eth0`) with an IP address for a virtual machine.

The following set of commands configures the virtual machine `vmol6u3` (which has `ovmd`) with the IP address `192.168.16.51` for the `eth0` interface and sets the `root` password.

```
# oakcli clone vm vmol6u3 -vmtemplate ol6u3 -repo shrepo -node 0
# oakcli modify vm vmol6u3 -addnetwork priv1
# oakcli start vm vmol6u3
# oakcli modify vm vmol6u3 -s 'com.oracle.linux.network.device.0:eth0'
# oakcli modify vm vmol6u3 -s 'com.oracle.linux.network.onboot.0:yes'
# oakcli modify vm vmol6u3 -s
'com.oracle.linux.network.bootproto.0:static'
# oakcli modify vm vmol6u3 -s
'com.oracle.linux.network.ipaddr.0:192.168.16.51'
# oakcli modify vm vmol6u3 -s
'com.oracle.linux.network.netmask.0:255.255.255.0'
# oakcli modify vm vmol6u3 -s 'com.oracle.linux.root-password:password'
```

Adding or Removing a Virtual Disk to or from a Virtual Machine

Use the `oakcli modify vm` command to add or remove a virtual disk (vdisk) from a virtual machine.

Do not use the `-attachvdisk` or the `-detachvdisk` option with the `-addnetwork`, `-deletenetwork`, or `-s` key:value pair parameters.

- To attach a virtual disk to a virtual machine, use the `oakcli modify vm` *`vm_name`* command with the `-attachvdisk` clause that names the virtual disk.

  ```
  # oakcli modify vm vm_name -attachvdisk vdisk_name
  ```

- To detach a virtual disk from a virtual machine, use the `oakcli modify vm` *`vm_name`* command with the `-detachvdisk` clause that names the virtual disk.

  ```
  # oakcli modify vm vm_name -detachvdisk vdisk_name
  ```

Removing a Virtual Machine from a Shared Repository

Use the `oakcli delete vm` command to delete the virtual machine and reclaim its storage and resources.

When you no longer have use for a particular virtual machine, delete the machine. When deleting the machine, you can specify the Oracle Database Appliance node from which you want to remove the virtual machine. If this optional parameter is not included, then the virtual machine is removed from both nodes.

- Delete the virtual machine from Node 1.

  For example, run the following command to delete the `ovu22` virtual machine from Node 1.

  ```
  # oakcli delete vm ovu22 -server 1
  ```

- Delete the virtual machine from both nodes.

  For example, run the following command to delete the `ovu22` virtual machine from both nodes.

  ```
  # oakcli delete vm ovu22
  ```

Performing a Live Migration for an Oracle Database Appliance Virtual Machine

If your system meets requirements for live migration, then you can use the `oakcli migrate vm` command to migrate a virtual machine from the currently running node to another node.

Live Migration refers to the process of moving a running virtual machine between physical machines without disconnecting the client or application running in the virtual machine. Memory, storage, and network connectivity of the virtual machine are transferred from the original host machine to the destination.

You must meet the following requirements before performing a live migration:

- The virtual machine must be on a shared repository and the repository must be online on both nodes.
- The virtual machine must be running.
- The destination host must have the required resources (memory, CPUs and so on) for successful migration.
- The destination host must have a CPU pool with the same name as the CPU pool of the virtual machine that is being migrated.

Use the `oakcli migrate vm` *`vmname`* command to migrate a virtual machine from the currently running node to another node. *`vmname`* is the name of the virtual machine to be migrated.

When you run this command, the virtual machine must be online and corresponding, and the shared repository must be online on both nodes. If a virtual machine is in the migration process, then OAKCLI will display the virtual machine state as `MIGRATING`.

Example 13-20 Example of Migrating a Virtual Machine from the Currently Running Node to Another Node

This example migrates a virtual machine named `myvm1`

```
# oakcli migrate vm myvm1
```

How to Create Driver Domain Virtual Machines

Use driver domain virtual machines to improve performance.

- About Driver Domain Virtual Machines
  Use driver domain virtual machines to improve performance by enabling guest virtual machines (VMs) to use `ODA_BASE` instead of `Dom0` to access virtual disks.
- Creating a Driver Domain Virtual Machine from a Template
  Create a driver domain virtual machine from a virtual machine template.
- Converting a Virtual Machine to a Driver Domain Virtual Machine
  Convert a guest virtual machine to a driver domain virtual machine to improve performance.
- Converting a Root Disk to a Driver Domain Disk
  Set up your guest virtual machine (guest VM) root disk as a driver domain and create a new disk as the boot driver.

About Driver Domain Virtual Machines

Use driver domain virtual machines to improve performance by enabling guest virtual machines (VMs) to use `ODA_BASE` instead of `Dom0` to access virtual disks.

A *driver domain* is a user domain that has special privileges and responsibilities for a particular piece of hardware. When you use the driver domain option, the newly created virtual disks are mounted directly from `ODA_BASE` to a guest virtual machine. The option improves I/O performance by enabling guest virtual machines to use `ODA_BASE` instead of `Dom0` to access virtual disks.

The driver domain functionality applies to non-system disks. Once a virtual machine is created in driver domain mode, any new vDisks are added in driver domain mode. Newly created virtual disks are mounted directly from `ODA_BASE` to a guest virtual machine. To determine if a virtual machine is configured in driver domain mode, use the `oakcli show vm` *vmname* command. When the virtual machine is in driver mode, the output for the DriverDomain attribute is TRUE.

The virtual disk and `vm.cfg` files are stored in the following directories:

- `Dom0`: `/Repositories/`*`vm_repo_name`*`/.ACFS/snaps/`*`vm_name`*`/VirtualMachines/`*`vm_name`*
- `ODA_BASE`: `/app/sharedrepo/`*`vm_repo_name`*`/.ACFS/snaps/`*`vm_name`*`/VirtualMachines/`*`vm_name`*

The driver domain only works when you add virtual disks to a guest virtual machine. When a virtual machine is in driver domain mode, the corresponding virtual machine configuration file, `vm.cfg`, has the following disk entries:

When `-driverdomain` is specified, the cloned virtual machine is configured with the driver domain. The corresponding virtual machine configuration file, `vm.cfg`, has the following disk entries:

```
disk = [u'file:/OVS/Repositories/repo5/.ACFS/snaps/vm10/
VirtualMachines/

vm10/System.img,xvda,w',

u'file:/u01/app/sharedrepo/repo5/.ACFS/snaps/

vm10/VirtualMachines/vm10/u01.img,xvdb,w,oakDom1']
```

All disks, with the exception of the `xvda` boot disk, have the path from `oakDom1`, that is `odabase`.

The following guest operating systems are supported for driver domain virtual machines:

- Oracle Linux with the latest Unbreakable Enterprise Kernel 2 (UEK2) or Unbreakable Enterprise Kernel 3 (UEK3).
- Microsoft Windows with Oracle VM Windows PV Driver 3.4.2. Oracle VM Windows PV Driver 3.4.2 release is available for download on My Oracle Support as patch number 23346086.
- Oracle Solaris 11.3 or higher x86.

Creating a Driver Domain Virtual Machine from a Template

Create a driver domain virtual machine from a virtual machine template.

Several options are available to create, or import, a template that you will use to create the clone. Determine the virtual machine template you want, the method to import the template, and the naming convention for the template.

This example imports a virtual machine template from `Dom0` and uses the template to create a driver domain virtual machine. The virtual machine image is named `myol6u_test myol6u_ ol5u7_vm_alpha` from the virtual machine template named `myol6u_15gb1 (OL5U7)`, which is stored in the shared repository named `repo2 (odarepo1)`on Node 0 in driver domain mode.

1. Use the `oakcli import vmtemplate` command to import a virtual machine template and name the template.

   For example, import virtual machine template `OVM_OL5U7_X86_64_PVM_10GB.tgz` from the `/OVS` directory in `Dom0` into the `odarepo1` shared repository on Node 0 in driver domain mode and name the template file `OL5U7`.

   ```
   # oakcli import vmtemplate OL5U7 -files /OVS/
   OVM_OL5U7_X86_64_PVM_10GB.tgz -repo odarepo1
   ```

2. Use the `oakcli clone vm` command to create a clone that uses the driver domain.

   For example, create a virtual machine image named `vm1_ol5u7` from the virtual machine template named `OL5U7`, which is stored in the shared repository named `odarepo1` on Node 0:

clone virtual machine

```
# oakcli clone vm vm1_ol5u7 -vmtemplate OL5U7 -repo odarepo1 -node
0 -driverdomain
```

3. Run the `oakcli show vm` command to confirm that the virtual machine is configured in driver domain mode.

   When the virtual machine is in driver mode, the output for the DriverDomain attribute is TRUE.

   ```
   oakcli show vm vm1_ol5u7
   ```

4. Use the `oakcli start vm` command to start the virtual machine.

   For example, start the virtual machine named `vm1_ol5u7` on Node 0.

   ```
   # oakcli start vm vm1_ol5u7 -node 0
   ```

Converting a Virtual Machine to a Driver Domain Virtual Machine

Convert a guest virtual machine to a driver domain virtual machine to improve performance.

You can clone an existing virtual machine that uses `Dom0` to create a clone virtual machine that uses the driver domain `ODA_BASE` instead of Dom0.

In this example, virtual machine `vm-dom0_ol5u7` is on Dom0 and is not a driver domain virtual machine. The example creates a clone virtual machine named `vm-dd1_ol5u7` that uses the driver domain `ODA_BASE`.

1. Use the `oakcli stop` command to shut down the virtual machine.

   For example, stop the virtual machine named `vm-dom0_ol5u7`. Shutting down the virtual machine ensures that there is consistent data from the virtual machine (vm) and virtual disks (vdisks)

   ```
   # oakcli stop vm vm2_ol5u7 -force
   ```

2. Detach the virtual disk (vdisk) from `vm-dom0_ol5u7`

3. Use the `oakcli clone vm` command to clone a new virtual machine from the original.

   Create a new virtual machine named `vm-dd1_ol5u7` from the original virtual machine named `vm-dom0_ol5u7`. Use the `-snap` option to create a snapshot of the source virtual machine. Because the original virtual machine is not a driver domain machine, use the `-force` and `-driverdomain` options to create a clone virtual machine that does use the driver domain.

   ```
   oakcli clone vm vm-dd1_ol5u7 -vm vm-dom0_ol5u7 -snap -force -
   driverdomain
   ```

4. Attach the virtual disk (vdisk) that you detached from the source virtual machine in Step 2 to the new driver domain virtual machine.

Attaching the vdisk ensures that the vm.cfg has the disk information with the driver domain feature.

5. Verify that oakDom1is the vdisk in the new vm.cfg.

6. Run the oakcli show vm to confirm that the newly created virtual machine is configured in driver domain mode.

   When the virtual machine, vm-dd1_ol5u7, is in driver domain mode, the output for the DriverDomain attribute is TRUE .

   oakcli show vm vm–dd1_ol5u7

7. Use the oakcli start vm command to start the virtual machine.

   For example, start the virtual machine named vm-dd1_ol5u7 on Node 0.

   ```
   # oakcli start vm vm-dd1_ol5u7 -node 0
   ```

Converting a Root Disk to a Driver Domain Disk

Set up your guest virtual machine (guest VM) root disk as a driver domain and create a new disk as the boot driver.

This example clones an existing guest virtual machine as a driver domain guest VM and then uses the OL6U7_x86_64_PVHVM template to create a guest VM and create a new disk for the boot driver.

Using the driver domain improves the guest VM disk IO performance; however, the driver domain is not applicable for a guest VM virtual disk that is a boot disk. Because the boot disk is generally the root disk, you must create a new disk to be the boot driver.

You can create a guest virtual machine by cloning an existing guest, or use one of the templates, such as OL6U7_x86_64_PVHVM or OVM_OL5U7_X86_64_PVM_10GB.tgz, that are available in the /OVS directory in Dom0.

Using driver domains requires at least Oracle Database Appliance version 12.1.2.7.0. In this example, the following is the layout of disks in the original OL6U7 virtual machine:

```
- boot/root disk '/dev/xvda' (echo -e "p" | fdisk /dev/xvda):
Device Boot Start End Blocks Id System
/dev/xvda1 * 2 503 514048 83 Linux
/dev/xvda2 504 11264 11019264 83 Linux
/dev/xvda3 11265 15360 4194304 82 Linux swap / Solaris
- u01 disk '/dev/xvdb' (echo -e "p" | fdisk /dev/xvdb):
Device Boot Start End Blocks Id System
/dev/xvdb1 1 13054 104856223+ 83 Linux
```

The /etc/fstab is as follows:

```
# cat /etc/fstab
UUID=b072e1e9-05a9-4544-a4dd-b15ba49cea2f / ext4 defaults 1 1
UUID=301e09e2-78e4-47d6-b501-d4f1098b419d /boot ext4 defaults 1 2
UUID=39e5a125-a1d8-48f4-9e81-f9e89b4dd51b swap swap defaults 0 0
tmpfs /dev/shm tmpfs defaults 0 0
```

```
devpts /dev/pts devpts gid=5,mode=620 0 0
sysfs /sys sysfs defaults 0 0
proc /proc proc defaults 0 0
UUID=770078eb-c083-4d52-81bf-e026ab3f3fa7 /u01 ext4 defaults 1 2
```

The `df -h` is as follows:

```
# df -h
Filesystem Size Used Avail Use% Mounted on
/dev/xvda2 11G 814M 8.9G 9%
/tmpfs 3.9G 0 3.9G 0% /dev/shm
/dev/xvda1 479M 51M 399M 12% /boot
/dev/xvdb1 92G 55G 33G 63% /u01
```

1. Clone a guest VM as a driver domain guest VM.

   You can use one of the following commands to clone a virtual machine:

   - `oakcli clone vm` *`vm_name`* `-vmtemplate` *`template_name`* `-repo` *`repo_name`* `[-node 0|1] [-driverdomain]`
   - `oakcli clone vm` *`vm_name`* `-vmtemplate` *`src_vmtempl_name`* `-snap [-driverdomain]`
   - `oakcli clone vm` *`vm_name`* `-vm` *`src_vm_name`* `-snap [-force] [-driverdomain]`

   > **Note:**
   >
   > You must stop the virtual machine before taking a snapshot.

   For example, create a driver domain guest VM named `OL6U7` from the `OL6U7_x86_64_PVHVM` source VM template. Use the `-snap` option to designate that you want to create a snapshot of the source virtual machine and the –`driverdomain` option to indicate that the new virtual machine will use the driver domain.

   ```
   oakcli clone vm OL6U7 -vm OL6U7_x86_64_PVHVM -snap -driverdomain
   ```

2. Create a new boot virtual disk.

   ```
   dd if=/dev/zero of=/u01/app/sharedrepo/repo name/.ACFS/snaps/
   vm_name/VirtualMachines/vm_name/virtual diskfile name.img
   oflag=direct count=0 bs=1M seek=new size in MB
   ```

   For example, create a 500 MB boot virtual disk named `newboot` for the `OL6U7` virtual machine that is in the `odarepo1` repository:

   ```
   # dd if=/dev/zero of=/u01/app/sharedrepo/odarepo1/.ACFS/snaps/OL6U7/
   VirtualMachines/OL6U7/newboot.img oflag=direct count=0 bs=1M
   seek=500
   ```

3. Edit the vm.cfg file to attach the new boot disk to your guest VM.

   a. Navigate to the vm.cfg file.

      ```
      /u01/app/sharedrepo/vm repo/.ACFS/snaps/vm name/
      VirtualMachines/vm name/vm.cfg
      ```

      For example, the OL6U7 virtual machine is in the odarepo1 repository:

      ```
      /u01/app/sharedrepo/odarepo1/.ACFS/snaps/OL6U7/VirtualMachines/
      OL6U7/vm.cfg
      ```

   b. Add the new disk entry on the disk parameter.

      ```
      disk = ['file:virtual disk file path,virtual device,r/w option']
      ```

      For example, add the newboot virtual disk for the OL6U7 virtual machine, which is in the odarepo1 repository.

      ```
      disk =
      [u'file:/OVS/Repositories/odarepo1/.ACFS/
      snaps/OL6U7/VirtualMachines/
      OL6U7/15f96d92a66c4b808035116ab6348d0d.img,xvda,w',
      u'file:/u01/app/sharedrepo/odarepo1/.ACFS/snaps/oakvdk_ol6u7_u01/
      VirtualDisks/oakvdk_ol6u7_u01,xvdb,w,oakDom1',
      u'file:/u01/app/sharedrepo/odarepo1/.ACFS/
      snaps/oakvdk_ol6u7_bootdsk/VirtualDisks/
      oakvdk_ol6u7_bootdsk,xvdc,w,oakDom1']
      (...)
      ```

      The following example shows the newboot virtual disk:

      ```
      disk =
      [u'file:/OVS/Repositories/odarepo1/.ACFS/
      snaps/OL6U7/VirtualMachines/
      OL6U7/15f96d92a66c4b808035116ab6348d0d.img,xvda,w',
      u'file:/u01/app/sharedrepo/odarepo1/.ACFS/snaps/oakvdk_ol6u7_u01/
      VirtualDisks/oakvdk_ol6u7_u01,xvdb,w,oakDom1',
      u'file:/OVS/Repositories/odarepo1/.ACFS/snaps/OL6U7/
      VirtualMachines/OL6U7/newboot.img,xvdc,w']
      (...)
      ```

4. Stop and restart your guest VM.

   ```
   oakcli stop vm vm_name
   oakcli start vm vm_name
   ```

   For example, stop and restart the OL6U7 guest.

   ```
   oakcli stop vm OL6U7oakcli start vm OL6U7
   ```

   The new disks are available to the guest VM after the restart.

5. Create a disk partition on the new boot driver.

   A new empty virtual disk appears as an `/dev/xvdc` device.

   ```
   # dmesg |grep xvdc
   blkfront: xvdc: flush diskcache: enabled; persistent grants:
   enabled; indirect descriptors: enabled;
   xvdc: unknown partition table
   ```

   Use the `fdisk` command to partition the disk and make the partition bootable.

   ```
   echo -e "n\np\n1\n\n\nt\n83\na\n1\nw" | fdisk /dev/xvdc
   Device      Boot Start End Blocks Id System
   /dev/xvdc1 *          1  63  506016 83 Linux
   ```

6. Format the new boot disk partition `/dev/xvdc1`.

   ```
   mkfs.ext4 /dev/xvdc1
   ```

7. Setup and mount the new boot disk partition and get the single blockID.

   ```
   mkdir /virtual diskfile namemount /dev/xvdc1 /virtual diskfile name
   ```

   a. Setup and mount the new boot disk.

      ```
      mkdir /virtual diskfile namemount /dev/xvdc1 /virtual diskfile
      name
      ```

      For example, make a directory and mount the `newboot` boot disk:

      ```
      mkdir /newbootmount /dev/xvdc1 /newboot
      ```

   b. Get the single blockID.

      ```
      # blkid /dev/xvdc1/dev/xvdc1: UUID="3d7a177b-0fa0-4212-9c0c-
      c5554bb1817a" TYPE="ext4"
      ```

8. Copy the original boot content to the new boot disk.

   ```
   cp -dpR /boot/* /virtual diskfile name
   ```

   For example, for the disk named `newboot`:

   ```
   cp -dpR /boot/* /newboot
   ```

9. Make the new boot partition the active boot partition

   ```
   umount /virtual diskfile nameumount /bootmount /dev/xvdc1 /boot
   ```

   ```
   umount /newbootumount /bootmount /dev/xvdc1 /boot
   ```

10. Setup Grub in the new boot disk.

    Use the `grub` or `grub2` command, where `/dev/xvdc` is the new boot disk device.

    - If you are using Oracle Linux 6U7, use grub:

      ```
      # grub
      grub> device (hd0) /dev/xvdc
      grub> root (hd0,0)
      grub> setup (hd0)
      ```

    - If you are using Oracle Linux 7u2, use grub2:

      ```
      # grub2-mkconfig -o /boot/grub2/grub.cfg
      # grub2-install /dev/xvdc
      ```

    The following example uses grub:

    ```
    # grub
    Probing devices to guess BIOS drives. This may take a long time.
    GNU GRUB version 0.97 (640K lower / 3072K upper memory)
    [ Minimal BASH-like line editing is supported. For the first word,
    TAB
    lists possible command completions. Anywhere else TAB lists the
    possible
    completions of a device/filename.]
    grub> device (hd0) /dev/xvdc
    device (hd0) /dev/xvdc
    grub> root (hd0,0)
    root (hd0,0)
    Filesystem type is ext2fs, partition type 0x83
    grub> setup (hd0)
    setup (hd0)
    Checking if "/boot/grub/stage1" exists... no
    Checking if "/grub/stage1" exists... yes
    Checking if "/grub/stage2" exists... yes
    Checking if "/grub/e2fs_stage1_5" exists... yes
    Running "embed /grub/e2fs_stage1_5 (hd0)"... 27 sectors are
    embedded.
    succeeded
    Running "install /grub/stage1 (hd0) (hd0)1+27 p (hd0,0)/grub/
    stage2 /grub/grub.conf"... succeeded
    Done.
    grub> quit
    quit
    ```

    The following example uses grub2:

    ```
    # grub2-mkconfig -o /boot/grub2/grub.cfg
    Generating grub configuration file ...
    Found linux image: /boot/vmlinuz-3.10.0-327.3.1.el7.x86_64
    Found initrd image: /boot/initramfs-3.10.0-327.3.1.el7.x86_64.img
    Found linux image: /boot/vmlinuz-3.8.13-118.2.1.el7uek.x86_64
    Found initrd image: /boot/
    initramfs-3.8.13-118.2.1.el7uek.x86_64.img
    ```

```
Found linux image: /boot/vmlinuz-0-
rescue-8f9df86c6d4c4640a01315a3aa93790e
Found initrd image: /boot/initramfs-0-
rescue-8f9df86c6d4c4640a01315a3aa93790e.img
done

# grub2-install /dev/xvdc
Installing for i386-pc platform.
Installation finished.
No error reported.
```

11. Edit `/etc/fstab` with the new boot device.

```
UUID=b072e1e9-05a9-4544-a4dd-b15ba49cea2f / ext4 defaults 1 1
#UUID=301e09e2-78e4-47d6-b501-d4f1098b419d /boot ext4 defaults 1 2
<<--- Original boot device
UUID=3d7a177b-0fa0-4212-9c0c-c5554bb1817a /boot ext4 defaults 1 2

UUID=39e5a125-a1d8-48f4-9e81-f9e89b4dd51b swap swap defaults 0 0
tmpfs /dev/shm tmpfs defaults 0 0
devpts /dev/pts devpts gid=5,mode=620 0 0
sysfs /sys sysfs defaults 0 0
proc /proc proc defaults 0 0

UUID=770078eb-c083-4d52-81bf-e026ab3f3fa7 /u01 ext4 defaults 1 2
```

12. Edit the `vm.cfg` file and make the new boot virtual disk the first disk on the list.

> **Note:**
>
> The driver domain device use the following root path `/u01/app/sharedrepo`. The boot disk root path is `/OVS/Repositories`.

The entries in the disk section of the `vm.cfg` file will look something like the following:

```
u'file:/OVS/Repositories/rcrepo/.ACFS/snaps/OL6U7/VirtualMachines/
OL6U7/15f96d92a66c4b808035116ab6348d0d.img,xvda,w',
<<-- original boot/root disk
u'file:/u01/app/sharedrepo/rcrepo/.ACFS/snaps/oakvdk_ol6u7_u01/
VirtualDisks/oakvdk_ol6u7_u01,xvdb,w,oakDom1',
<<-- original u01 disku'file:/OVS/Repositories/rcrepo/.ACFS/
snaps/OL6U7/VirtualMachines/OL6U7/newboot.img,xvdc,w'
<<-- new boot disk
```

Move the new boot virtual disk, `newboot`, to the first disk on the list.

```
u'file:/OVS/Repositories/rcrepo/.ACFS/snaps/OL6U7/VirtualMachines/
OL6U7/newboot.img,xvda,w'
<<-- new boot disk
u'file:/u01/app/sharedrepo/rcrepo/.ACFS/snaps/OL6U7/VirtualMachines/
```

```
OL6U7/15f96d92a66c4b808035116ab6348d0d.img,xvdb,w,oakDom1
<<-- original boot/root disku'file:/u01/app/sharedrepo/rcrepo/.ACFS/
snaps/oakvdk_ol6u7_u01/VirtualDisks/oakvdk_ol6u7_u01,xvdc,w,oakDom1'
<<-original u01 disk
```

The new boot device (`xvdc`) becomes the first device (not driver domain) and `xvda` is the second domain driver device.

The following is an example of the `vm.cfg` before the edit:

```
# cat vm.cfg
vif = ['type=netfront,bridge=net1']
name = 'OL6U7'
extra = 'NODENAME=OL6U7'
builder = 'hvm'
cpus =
'24,25,26,27,28,29,30,31,32,33,34,35,36,37,38,39,40,41,42,43,44,45,4
6,47,48,49,50,51,52,53,54,55,56,57,58,59,60,61,62,63,64,65,6
vcpus = 2
memory = 8192
cpu_cap = 0
vnc = 1
serial = 'pty'
disk =
[u'file:/OVS/Repositories/rcrepo/.ACFS/snaps/OL6U7/VirtualMachines/
OL6U7/15f96d92a66c4b808035116ab6348d0d.img,xvda,w',
u'file:/u01/app/sharedrepo/rcrepo/.ACFS/snaps/oakvdk_ol6u7_u01/
VirtualDisks/oakvdk_ol6u7_u01,xvdb,w,oakDom1',
u'file:/OVS/Repositories/rcrepo/.ACFS/snaps/OL6U7/VirtualMachines/
OL6U7/newboot.img,xvdc,w']
maxvcpus = 2
maxmem = 8192
```

The following is an example of the `vm.cfg` after the edit, where the new boot device (xvdc) is the first device and xvda is the driver domain device:

```
# cat vm.cfg
vif = ['type=netfront,bridge=net1']
name = 'OL6U7'
extra = 'NODENAME=OL6U7'
builder = 'hvm'
cpus =
'24,25,26,27,28,29,30,31,32,33,34,35,36,37,38,39,40,41,42,43,44,45,4
6,47,48,49,50,51,52,53,54,55,56,57,58,59,60,61,62,63,64,65,6
vcpus = 2
memory = 8192
cpu_cap = 0
vnc = 1
serial = 'pty'
disk =[
[u'file:/OVS/Repositories/rcrepo/.ACFS/snaps/OL6U7/VirtualMachines/
OL6U7/newboot.img,xvda,w',
u'file:/u01/app/sharedrepo/u'file:/u01/app/sharedrepo/rcrepo/.ACFS/
snaps/oakvdk_ol6u7_u01/VirtualDisks/
oakvdk_ol6u7_u01,xvdc,w,oakDom1']
maxvcpus = 2
maxmem = 8192
```

13. Stop and restart the guest VM

    ```
    oakcli stop vm vm_name
    oakcli start vm vm_name


    oakcli stop vm OL6U7
    oakcli start vm OL6U7
    ```

14. Check the layout of the new disks.

    The layout should be similar to the following:

    ```
    # df -h
    Filesystem Size Used Avail Use% Mounted on/dev/xvdb2 11G 814M 8.9G
    9% /
    tmpfs 3.9G 0 3.9G 0% /dev/shm
    /dev/xvda1 471M 51M 391M 12% /boot
    /dev/xvdc1 92G 55G 33G 63% /u01
    ```

    The swap device is now under the driver domain: `/dev/xvdb`

    ```
    # swapon -s
    Filename    Type      Size    Used Priority
    /dev/xvdb3  partition 4194300 0    -1
    ```

15. (Optional) Synchronize the oakcli virtual machine inventory with the `vm.cfg` file.

    When you edit the `vm.cfg` file, the `oakcli show vm` *`vm name`* output displays incorrect information about the disk. You can create a temporary duplicate (snapshot) of the virtual machine to fix the output.

    ```
    oakcli stop vm vm_name
    oakcli clone vm tmp_vm_name -vm vm_name -snap -driverdomain
    oakcli delete vm vm_name
    oakcli clone vm vm_name -vm tmp_vm_name -snap -driverdomain
    oakcli delete vm tmp_vm_name
    ```

    > **Note:**
    >
    > Stop the virtual machine before taking a snapshot.

    For example, create a temporary clone called `tmp_OL6U7` of the virtual machine `OL6U7` using the `-snap` and `-driverdomain` options. Delete the virtual machine

OL6U7, and then use the temporary clone to create a new clone. Delete the temporary virtual machine.

```
oakcli stop vm OL6U7
oakcli clone vm tmp_OL6U7 -vm OL6U7 -snap -driverdomain
oakcli delete vm OL6U7
oakcli clone vm OL6U7 -vm tmp_OL6U7 -snap -driverdomain
oakcli delete vm tmp_OL6U7
```

Note:

The `oakcli clone vm` command creates a duplicate (snapshot) of the VDisks that are attached to the guest VM. Use the `oakcli delete vdisk` command to remove the orphan VDisks.

Run the `oakcli show vm` *`vm_name`* command to verify that the oakcli virtual machine inventory is in sync with the `vm.cfg` file.

```
# oakcli show vm OL6U7
The Resource is : OL6U7
AutoStart : restore
CPUPriority : 100
Disks : |file:/OVS/Repositories/rcrepo/.ACF
S/snaps/OL6U7/VirtualMachines/OL6U7
/newboot.img,xvda,w||file:/u01/app/
sharedrepo/rcrepo/.ACFS/snaps/OL6U7
/VirtualMachines/OL6U7/15f96d92a66c
4b808035116ab6348d0d.img,xvdb,w,oak
Dom1|
Domain : XEN_PVM
DriverDomain : True
ExpectedState : offline
FailOver : false
IsSharedRepo : true
Keyboard : en-us
MaxMemory : 8192M
MaxVcpu : 2
Memory : 8192M
Mouse : OS_DEFAULT
Name : OL6U7
Networks : |type=netfront,bridge=net1|
NodeNumStart : 0
OS : OL_5
PrefNodeNum : 0
PrivateIP : None
ProcessorCap : 0
RepoName : rcrepo
State : Offline
TemplateName : tmp_OL6U7
VDisks : |oakvdk_snap_3_ol6u7_u01_rcrepo|
Vcpu : 2
cpupool : default-unpinned-pool
```

How to Manage High Availability on Oracle Database Appliance Virtualized Platform

Use the `oakcli configure vm` command to configure high availability services for your virtual machines.

A system that is highly available is designed to provide uninterrupted computing services during essential time periods, during most hours of the day, and during most days of the week throughout the year. Reliability, recoverability, timely error detection, and continuous operations are primary characteristics of a highly available solution. Two essential parts of high availability are automatic restart and failover.

Unless you are using local repositories, you can set high availability options for your virtual machines. High availability options identify the node where the virtual machine should be started by default and whether the virtual machine should be failed over to the other node. Failover can occur if the node where the virtual machine is already running fails or if the preferred node is not available when the virtual machines attempt to start.

Configuring Automatic Restart for High Availability

A virtual machine automatically restarts after a hardware or software failure or whenever your database host computer restarts. Use the `oakcli configure vm` command to start a virtual machine on a preferred node by using the`-prefnode` option.

Configuring Failover for High Availability

Configuring failover provides high availability by enabling a virtual machine to restart on the other node after an unplanned failure, without requiring manual intervention. Use the command `oakcli configure vm` with the `-failover` option to configure fail over from one node to another.

How to Manage CPU Pools on Oracle Database Appliance Virtualized Platform

These topics describe how to use OAKCLI to create and manage CPU pools on Oracle Database Appliance Virtualized Platform.

- About Managing CPU Pools for Resource Allocation
  Use CPU pools to cage and manage resource allocations to workloads for virtual machines on Oracle Database Appliance Virtualized Platforms.
- About Over-Subscribed CPU Pools
  Configure virtual machines so that they do not subscribe to more CPU resources than the resources available in CPU pools.
- Creating a New CPU Pool on Oracle Database Appliance Virtualized Platform Nodes
  Use the command `oakcli create cpupool` to create a CPU pool.

- Showing the CPU Pools Configured on Oracle Database Appliance Virtualized Platform Nodes
  Use the command `oakcli show cpupool` command to display the CPUs assigned to each defined CPU pool.
- Changing the Number of CPUs Assigned to a CPU Pool on Oracle Database Appliance Virtualized Platform Nodes
  Use the `oakcli configure cpupool` command to change the number of CPUs assigned to a CPU pool.
- Assigning a Virtual Machine to a CPU Pool on Oracle Database Appliance Virtualized Platform
  Use the command `oakcli configure vm` to assign a virtual machine to a CPU pool.

About Managing CPU Pools for Resource Allocation

Use CPU pools to cage and manage resource allocations to workloads for virtual machines on Oracle Database Appliance Virtualized Platforms.

Workloads are isolated by creating CPU pools and assigning (pinning) virtual machines to a specific CPU pool. When you pin a virtual machine to a CPU pool, you ensure that the virtual machine uses CPUs in only that CPU pool.

When you initially configure Oracle Database Appliance Virtualized Platform, a default-unpinned-pool is created on each node. The size of this pool depends on the hardware model.

When you create the ODA_BASE domain, a new CPU pool is created on both nodes. The pool is named `odaBaseCpuPool`. The CPUs required for this pool are removed from the default-unpinned-pool. ODA_BASE is the only domain allowed to use the CPUs in the `odaBaseCpuPool`. When you start other virtual machines, the virtual machines run on CPUs that are left in the default-unpinned-pool, effectively removing ODA_BASE from the work being done by other virtual machines.

You can also cage groups of virtual machines by creating additional CPU pools. These additional pools enable you to pin a virtual machine, or a set of virtual machines, to its own CPU pool. Virtual machines running in a specific CPU pool do not share CPU cycles with virtual machines running in other CPU pools. Define as many CPU pools as you want, up to the number of available CPUs on your system.

If your application requirements change over time, then Oracle recommends that you resize, add, or drop CPU pools as needed to make the best use of your resources. You may also want to resize ODA_BASE. However, if you want to resize ODA_BASE, then you must use a special command that also updates your Oracle Database Appliance Virtualized Platform license.

Example 13-21 Example of Showing CPU Pools on a Node

A CPU pool can have a different size on each node (except for the `odaBaseCpuPool`), as shown by the following `oakcli show cpupool` commands, one for each node:

```
# oakcli show cpupool -node 0
                 Pool                           Cpu List
default-unpinned-pool   [14, 15, 16, 17, 18, 19, 20, 2
                                             1, 22, 23]
               twocpu                           [12, 13]
```

```
       odaBaseCpuPool   [0, 1, 2, 3, 4, 5, 6, 7, 8, 9,
                                               10, 11]


# oakcli show cpupool -node 1
                 Pool                         Cpu List
default-unpinned-pool   [12, 13, 14, 15, 16, 17, 18, 1
                                    9, 20, 21, 22, 23]
       odaBaseCpuPool   [0, 1, 2, 3, 4, 5, 6, 7, 8, 9,
                                                10,11]
```

About Over-Subscribed CPU Pools

Configure virtual machines so that they do not subscribe to more CPU resources than the resources available in CPU pools.

A CPU resource can belong to one, and only one, CPU pool. You can assign multiple virtual machines to a CPU pool. A CPU pool becomes oversubscribed when the virtual machines that are active in the pool require more CPUs than you configured for the pool. For example, if a CPU pool has four CPUs, then you can start two virtual machines that are defined to use four CPUs each. In this case, the CPU pool is oversubscribed, because each of the four CPUs is supporting two virtual machines.

If you stop one of those virtual machines, but start another one that requires two CPUs, then the CPU pool is still oversubscribed. This is because two of the CPUs are supporting both virtual machines. When oversubscribing a CPU pool, assess the performance of the virtual machines in that pool. Reassign one or more virtual machines to a different CPU pool if sharing an oversubscribed pool degrades performance to unacceptable levels.

Creating a New CPU Pool on Oracle Database Appliance Virtualized Platform Nodes

Use the command `oakcli create cpupool` to create a CPU pool.

Manage resource use by creating CPU pools, and then assign these resources to virtual machines.

Example 13-22 Example of Creating a New CPU Pool on Oracle Database Appliance Virtualized Platform Nodes

This example creates a CPU pool named `winpool` that is allocated 4 CPUs on Node 0:

```
# oakcli create cpupool winpool -numcpu 4 -node 0
```

Showing the CPU Pools Configured on Oracle Database Appliance Virtualized Platform Nodes

Use the command `oakcli show cpupool` command to display the CPUs assigned to each defined CPU pool.

You can use `oakcli show cpupool` to display any virtual machines assigned to each CPU pool.

Example 13-23 Example of Showing CPUs Assigned to Defined CPU Pools on Oracle Database Appliance Virtualized Platform Nodes

This `oakcli show cpupool` example shows the CPUs assigned to each defined CPU pool on Node 0:

```
# oakcli show cpupool -node 0
```

Changing the Number of CPUs Assigned to a CPU Pool on Oracle Database Appliance Virtualized Platform Nodes

Use the `oakcli configure cpupool` command to change the number of CPUs assigned to a CPU pool.

An Oracle VM Server can belong to only one virtual pool. However, you can change the resources allocated to a virtual pool to increase the CPU resources available to the virtual machine.

Example 13-24 Example of Changing the Number of CPUs Assigned to a CPU Pool on Oracle Database Appliance Virtualized Platform Nodes

This `oakcli configure cpupool` example changes the number of CPUs assigned to the CPU pool named `linpool` on Node 1. After the command runs, the new number of CPU resources assigned to the CPU are six.

```
# oakcli configure cpupool linpool -numcpu 6 -node 1
```

Assigning a Virtual Machine to a CPU Pool on Oracle Database Appliance Virtualized Platform

Use the command `oakcli configure vm` to assign a virtual machine to a CPU pool.

Review the availability of CPU pools on nodes as part of your placement policy for virtual machines on Oracle Database Appliance Virtualized Platforms.

If your virtual machine is assigned to a specific CPU pool, and the virtual machine is allowed to fail over, then the virtual machine attempts to use the same CPU pool on the secondary node. If the CPU pool exists on the other node, but the CPU pool is a different size, then the performance of your virtual machine can be affected when it runs on the secondary node. If the assigned CPU pool does not exist on the secondary node, then the virtual machine cannot fail over.

> **Note:**
>
> Do not manage `odaBaseCpuPool` by using `oakcli cpupool` commands. Instead, use commands that configure ODA_BASE, as discussed in "How to Resize ODA_BASE."

Example 13-25 Example of Assigning a Virtual Machine to a CPU Pool on Oracle Database Appliance Virtualized Platform

This `oakcli configure vm` example pins the virtual machine named `wintest` to the CPU pool named `winpool`:

```
# oakcli configure vm wintest -cpupool winpool
```

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Managing CPU Pools on Oracle Database Appliance Bare Metal and KVM Deployments

Use CPU pools to manage CPU resources on Oracle Database Appliance bare metal and KVM deployments.

About CPU Pools

CPU pools enable management of CPU resources on Oracle Database Appliance on both bare metal and KVM deployments. There are two types of CPU pools, that is, BM and VM.

Use the BM CPU pool to ensure that the database on a bare metal host runs exclusively on the CPU lists specified in the CPU pool. All Oracle processes are bound to the CPUs in this CPU pool and run only on these CPUs. The bare metal CPU pool is assigned to database by updating the `init.ora` parameter `processor_group_name`.

Use the VM CPU pools to cage and manage CPU resource allocations to workloads for virtual machines. Workloads are isolated by creating CPU pools and assigning or pinning virtual machines to a specific CPU pool. When you pin a virtual machine to a CPU pool, you ensure that the virtual machine uses CPUs in only that CPU pool.

Resources in CPU pools cannot overlap, that is, CPU pools cannot share CPUs. But one CPU pool can be assigned to multiple databases (BM CPU pool) or VMs (VM CPU pools).

Oracle Database Appliance provides ODACLI commands to create, update, modify, and delete CPU pools.

About Bare Metal CPU Pools

For new databases, you can attach the new CPU pool using the `create-database` command. For existing databases, use the `modify-database` command to attach the CPU pool to the database. Restart the database manually for changes to take effect. Clone, irestore and recover database operations will also try to use the same CPU pool if the CPU pool is used by the source database. Specify the `--cpupool` option to use the new cpupool. The standby database uses the CPU pool configured for the primary database. Specify the `--cpupool` option in the `irestore-database` command when restoring the backup to the standby site if you want to use a separate CPU pool on the standby site. For more details about the command syntax, see the *Oracle Database Appliance Command Line Interface* chapter in this guide.

About VM CPU Pools

For new VMs, you can attach the new CPU pool using the `create-vm` command. For existing VMs, use the `modify-vm` command to attach or update the CPU pool. Use the `--live` option to apply the changes to a running VM, and use the `--config` parameter to persist the change. For more details about the command syntax, see the *Oracle Database Appliance Command Line Interface* chapter in this guide.

About Audit Records for CPU Pools

CPU pool operations history are recorded in audit records metadata and system log for audit purposes. The CPU pool changes include create, modify, delete operations, and attach and detach operations from VMs and databases. The CPU pool audit records can be queried using `odacli list-auditrecords` and `odacli describe-auditrecord` commands but they can not be changed or deleted. For more details about the command syntax, see the *Oracle Database Appliance Command Line Interface* chapter in this guide.

Understanding the Effect of Changing the CPU Cores on CPU Pool Allocation

You may have changed the CPU core count on Oracle Database Appliance using the `odacli update-cpucore` command. You must assign cores in multiples of two, with a minimum of two cores. If you change the CPU core count, then you can subsequently only increase the CPU core count.

If you change the CPU core count in an Oracle Database Appliance environment which has CPU pools, then the following behavior is seen:

- `odacli create-cpupool` and `odacli modify-cpupool` will always select the online CPUs. Therefore, on both bare metal and KVM deployments, any CPU pool created after running the `odacli update-cpucore` command, will select from the available online CPUs.
- For existing CPU pools on bare metal and KVM deployments, some CPUs can become offline when you run the `odacli update-cpucore` command. Check the

CPU pools for any offline CPUs using the `odacli describe-cpupool` command. You can then update the CPU pool to use available ONLINE CPUs by using the `odacli modify-cpupool` command.

- If the databases use a CPU pool and some CPUs become offline, then use the `odacli modify-cpupool` command to update the CPU pool. Restart the databases to use the updated CPU pool.

Creating a CPU Pool in a Bare Metal or KVM Deployment

Use ODACLI commands or the Browser User Interface to create a CPU pool in a bare metal or KVM deployment.

Using ODACLI to Create a CPU Pool

Use the command `odacli create-cpupool` to create a CPU pool.

Create a VM CPU pool named `cpupool1` with 6 cores associated to it.

```
# odacli create-cpupool -n cpupool1 -c 6 -vm
```

Using Browser User Interface to Create a CPU Pool

Follow these steps:

1. Log into the Browser User Interface:

   ```
   https://host-ip-address:7093/mgmt/index.html
   ```

2. Click the **Appliance** tab.
3. Click **CPU Pool** to display the CPU Pool page.
4. Click **Create CPU Pool**.
5. In the Create CPU Pool page, specify the following:
   - CPU Pool Name: Name of the CPU pool
   - CPU Pool Type: Specify if the CPU pool is bare metal or virtual
   - Number of CPU Cores: Number of CPU cores allocated to the pool
   - Configure on: For high-availability deployments, select the nodes where you want to configure the CPU pool.
6. Click **Create**.
7. When you submit the job, the job ID and a link to the job appears. Click the link to display the job status and details.
8. Validate that the job completed. You can track the job in the **Activity** tab in the Browser User Interface, or run the command `odacli describe-job` with the job ID.

Viewing CPU Pools in a Bare Metal or KVM Deployment

Use ODACLI commands or the Browser User Interface to view all CPU pools or details about a CPU pool in a bare metal or KVM deployment.

Using ODACLI to View CPU Pools

The command `odacli describe-cpupool` displays details about a CPU pool. Use the command `odacli list-cpupools` to view all CPU pools in the deployment.

```
# odacli list-cpupools
```

```
# odacli describe-cpupool -n cpupool1
```

Using Browser User Interface to View CPU Pools

Follow these steps:

1. Log into the Browser User Interface:

   ```
   https://host-ip-address:7093/mgmt/index.html
   ```

2. Click the **Appliance** tab.
3. Click **CPU Pool** to display the CPU Pool page.
4. You can view the list of all configured CPU pools.
5. To view the details of a CPU pool, click on the CPU pool or click on the Actions drop down and select View Details.

Modifying a CPU Pool in a Bare Metal or KVM Deployment

Use ODACLI commands or the Browser User Interface to modify a CPU pool in a bare metal or KVM deployment.

Using ODACLI to Modify CPU Pool

Use the command `odacli modify-cpupool` to modify a CPU pool.

```
# odacli modify-cpupool -n cpupool1 -c 10
```

Restart the associated databases to use the updated CPU pool.

Using Browser User Interface to Modify CPU Pool

Follow these steps:

1. Log into the Browser User Interface:

   ```
   https://host-ip-address:7093/mgmt/index.html
   ```

2. Click the **Appliance** tab.

3. Click **CPU Pool** to display the CPU Pools page.
4. From the Actions drop down list for the CPU pool you want to modify, select **Modify**.
5. In the Modify CPU Pool page, specify any changes in the Number of CPU Cores, and select if you want to apply the changes to running VMs or if you want to force the modify operation. Then click **Modify**.
6. When you submit the job, the job ID and a link to the job appears. Click the link to display the job status and details.
7. Validate that the job completed. You can track the job in the **Activity** tab in the Browser User Interface, or run the command `odacli describe-job` with the job ID.

Deleting a CPU Pool in a Bare Metal or KVM Deployment

Use ODACLI commands or the Browser User Interface to delete a CPU pool in a bare metal or KVM deployment.

Using ODACLI to Delete CPU Pool

Use the command `odacli delete-cpupool` to delete a CPU Pool.

Delete a CPU pool named `cpupool1`.

```
# odacli delete-cpupool -n cpupool1
```

Using Browser User Interface to Delete CPU Pool

Follow these steps:

1. Log into the Browser User Interface:

   ```
   https://host-ip-address:7093/mgmt/index.html
   ```

2. Click the **Appliance** tab.
3. Click **CPU Pool** to display the CPU Pool page.
4. From the Actions drop down list for the CPU pool you want to delete, select **Delete**.
5. Click Yes to confirm your choice.
6. When you submit the job, the job ID and a link to the job appears. Click the link to display the job status and details.
7. Validate that the job completed. You can track the job in the **Activity** tab in the Browser User Interface, or run the command `odacli describe-job` with the job ID.

Viewing CPU Pool Audit Records in a Bare Metal or KVM Deployment

Use ODACLI commands or the Browser User Interface to delete a CPU pool in a bare metal or KVM deployment.

Using ODACLI to View Audit Record Details for CPU Pools

Use the `odacli list-auditrecords` command to list the audit records for a CPU Pool:

```
# odacli list-auditrecords
```

Use the `odacli describe-auditrecord` command to describe the audit record for a CPU Pool.

```
# odacli describe-auditrecord
```

Using Browser User Interface to View Audit Record Details for CPU Pools

Follow these steps:

1. Log into the Browser User Interface:

   ```
   https://host-ip-address:7093/mgmt/index.html
   ```

2. Click the **Security** tab.
3. Select **Show Advanced Search** and specify the filters for the CPU audit records details such as the From and To dates, Resource type, Resource name, DCS user name, Operation type, and the number of records to display the CPU Pool details.
4. From the list of audit records displayed, click on the audit record ID for which you to drill down for more details.

About Over-Subscribed CPU Pools

Configure virtual machines so that they do not subscribe to more CPU resources than the resources available in CPU pools.

A CPU resource can belong to one, and only one, CPU pool. You can assign multiple virtual machines to a CPU pool. A CPU pool becomes oversubscribed when the virtual machines that are active in the pool require more CPUs than you configured for the pool. For example, if a CPU pool has four CPUs, then you can start two virtual machines that are defined to use four CPUs each. In this case, the CPU pool is oversubscribed, because each of the four CPUs is supporting two virtual machines.

If you stop one of those virtual machines, but start another one that requires two CPUs, then the CPU pool is still oversubscribed. This is because two of the CPUs are supporting both virtual machines. When oversubscribing a CPU pool, assess the performance of the virtual machines in that pool. Reassign one or more virtual machines to a different CPU pool if sharing an oversubscribed pool degrades performance to unacceptable levels.

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Managing an Oracle Database Appliance KVM Deployment

KVM virtualization uses a kernel-based virtual machine (KVM) to create a virtualized environment for your Linux applications

Understand the Oracle Database Appliance KVM architecture, and procedures to deploy a guest virtual machine, manage high availability, manage CPU pools, and configure network settings for Oracle Database Appliance KVM deployment.

- About Oracle Database Appliance KVM Deployment
  You can use Oracle KVM to optimize your system resource use for databases and applications.
- About Oracle Database Appliance KVM Virtualization Architecture
  Review this topic to understand how Oracle Database Appliance KVM deployment works with Oracle Database Appliance hardware.
- About Virtual Machines and Oracle Database Appliance KVM Deployments
  Oracle Database Appliance KVM deployment is designed to run and deploy virtual machines to manage system resources.
- Setting Up and Configuring a KVM Deployment
  Understand the steps to set up and configure KVM deployment.
- Managing VM Storage in KVM Deployment
  Use ODACLI to create, view, modify, and delete VM storage in an Oracle Database Appliance KVM deployment.
- Managing Virtual Networks in KVM Deployment
  Use ODACLI to create, view, start, stop, and delete virtual networks in an Oracle Database Appliance KVM deployment.
- Managing Virtual Disks in KVM Deployment
  Use ODACLI to create, view, clone, modify, and delete virtual disks on Oracle Database Appliance KVM deployment.
- Managing Virtual Machines in KVM Deployment
  Use ODACLI to create, view, clone, modify, start, stop, and delete virtual machines in an Oracle Database Appliance KVM deployment.

> **See Also:**
>
> For more about Oracle Linux KVM on Oracle Database Appliance, see the KVM series in the Oracle Database Appliance blog at https://blogs.oracle.com/oda/kvm.

About Oracle Database Appliance KVM Deployment

You can use Oracle KVM to optimize your system resource use for databases and applications.

You can deploy a KVM-based virtual platform on Oracle Database Appliance. With Oracle Database Appliance KVM deployments, you can use the capabilities of Oracle KVM to effectively allocate resources to databases and applications running on the same physical Oracle Database Appliance. Rather than simply disabling unnecessary server cores, you can use the excess capacity to host other workloads. This enables consolidation of both databases and applications, while retaining the ease of deployment and management associated with Oracle Database Appliance.

The Kernel-based Virtual Machine (KVM) feature provides a set of modules that enable you to use the Oracle Linux kernel as a hypervisor. KVM supports both x86_64 and aarch64 processor architectures. By default, KVM is built into the Unbreakable Enterprise Kernel (UEK) release. KVM features are actively developed and may vary depending on platform and kernel release. If you are using Unbreakable Enterprise Kernel, you should refer to the release notes for the kernel release that you are currently using to obtain information about features and any known issues or limitations that may apply. KVM is supported on Oracle Linux 7.

What are the differences between KVM and Oracle VM Virtualization?

Oracle KVM makes it easy to setup and manage the virtualized environment with little virtualization expertise. With the KVM deployment, you can consolidate entire multi-tier environments within a single Oracle Database Appliance system.

The following are some of the advantages of deploying Oracle Database Appliance with the KVM option:

- Deploy database and applications in a single hardware environment.
- Use your CPU cores (and memory) efficiently.
- Use virtual local area networks (VLANs) to provide separate networks to different virtual machines.
- Use VM storage to grow storage for the virtual machine repository.
- Enables easy resource management per VM and maintainence of quality of service (QoS)
- Provides solution-in-a-box with application, middleware, and databases.
- Improves data center efficiency by increasing space utilization and reducing energy consumption and cooling costs.
- Oracle KVM virtualization is available on bare metal deployments of Oracle Database Appliance, whereas Oracle VM virtualization on Oracle Database Appliance requires Virtualized Platform setup.
- Oracle Database Appliance supports KVM on all hardware models, whereas Virtualized Platform deployments using Oracle VM are supported on only Oracle Database Appliance High-Availability models.
- Oracle Database Appliance KVM deployments use Type 2 host operating system-based hypervisor, whereas Oracle Database Appliance Virtualized Platform deployments use Type 1 bare metal hypervisor.

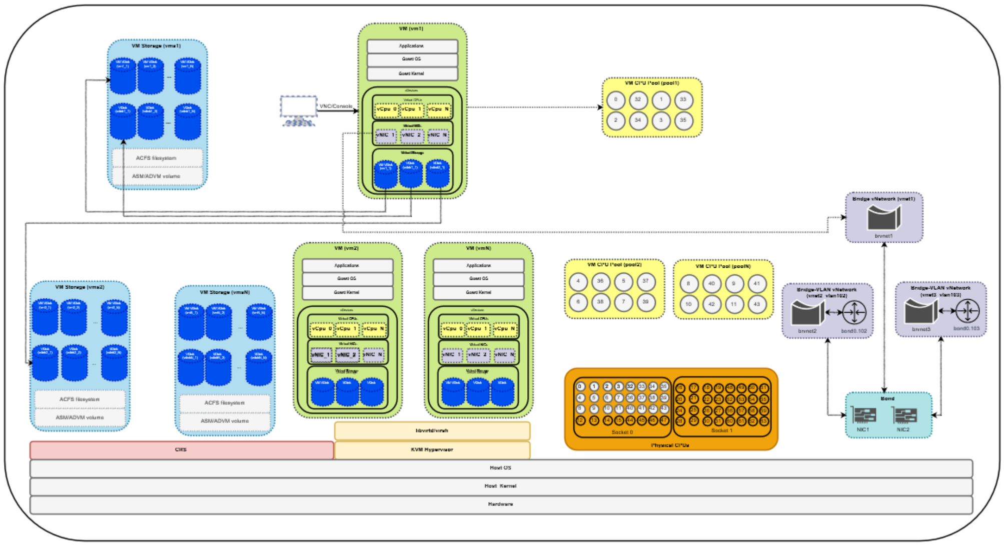
- KVM is the virtualization technology used in Oracle Cloud Infrastructure (OCI), where as Oracle Database Appliance Virtualized Platform is based on Xen technology.

About Oracle Database Appliance KVM Virtualization Architecture

Review this topic to understand how Oracle Database Appliance KVM deployment works with Oracle Database Appliance hardware.

Oracle Database Appliance KVM deployment provides virtualization technology that enables multiple applications to share the same physical server. The Oracle Database Appliance KVM architecture is engineered specifically to leverage the Oracle Database Appliance hardware capabilities. Oracle Database Appliance KVM stack is integrated with Oracle Clusterware. The KVM resources such as VM storages and Virtual Machines are registered as CRS resources and are automatically managed by CRS for high availability.

The Oracle Database Appliance Virtualized Platform architecture uses the virtual machine components shown in the following illustration:



About Virtual Machines and Oracle Database Appliance KVM Deployments

Oracle Database Appliance KVM deployment is designed to run and deploy virtual machines to manage system resources.

Configure virtual machines on Oracle Database Appliance KVM deployment to manage your application use of resources, such as the CPU pool, memory, and other shared resources.

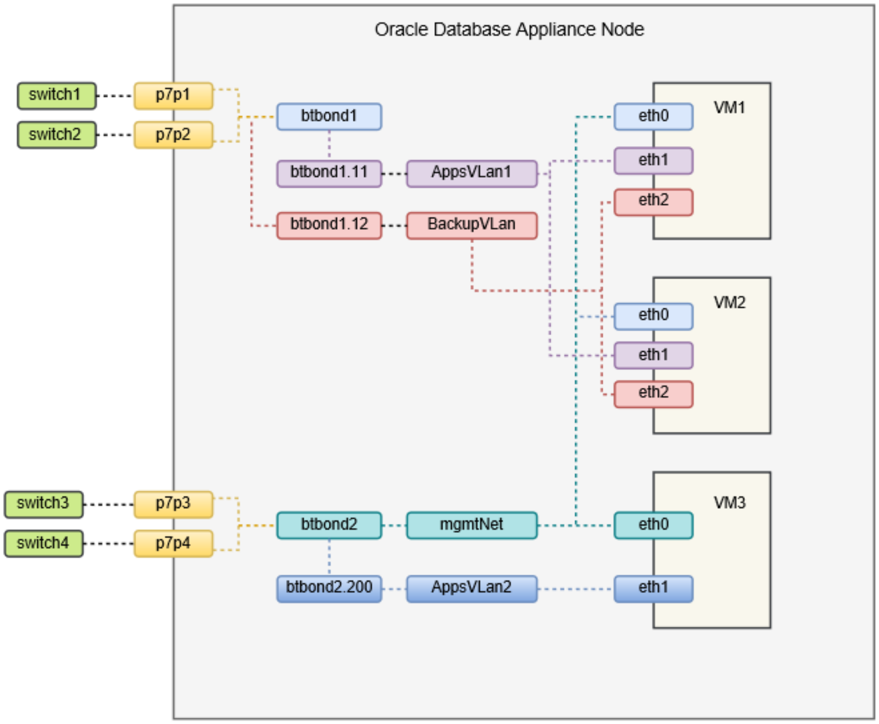
Understand the terminlogy of the various components you need to set up for an Oracle Database Appliance KVM deployment. The ODACLI tooling handles all the required configuration for your Oracle Database Appliance KVM deployment.

VM Storage

A *vm storage* is a central location for storing resources that are essential to creating and managing virtual machines. These resources include ISO files (virtual DVD images), virtual machine configuration files, and virtual disks. Virtual storage is configured on an Oracle Automatic Storage Management Cluster File System (Oracle ACFS) and then presented to the Oracle Database Appliance nodes that need access to those resources. Oracle Database Appliance Virtualized Platform uses virtual storage to optimize available disk space usage in the environment, and for easy reallocation of virtual machines if a physical server fails. The virtual machine files can be stored on shared disks, providing shared storage for the virtual machines. You can:

- Create one or more virtual machines on the virtual storage.
- Use ODACLI commands to create and manage virtual storage, virtual disks, and their virtual machines, and the underlying architecture shown in the illustration.

Virtual Networks



Oracle Database Appliance KVM virtual network supports two type of networks, bridged and bridged-vlan. The above figure is an example of the KVM virtual network on Oracle Database Appliance X8-2 hardware models.

In a bridged network, a Linux bridge is created and the network interface or bond interface, is attached to the bridge. The bridged vnetwork can be created on other interfaces that is not used for the host or Oracle Grid Infrastructure public network. It cannot be created on the existing interface that is already used by the host or Oracle Grid Infrastructure public network. In the above diagram, the "mgmtNet" bridged network is created with btbond2. eth0 of VMs are attached to this mgmtNet vnetwork. A bridge network cannot be created on btbond1 which is already used by the host or Oracle Grid Infrastructure public network.

In a bridged-vlan network, VLAN can be created on all available public interfaces, including the interface where public network is already configured. For example, you can create a VLAN on both `btbond1` and `btbond2`. Follow proper procedures to configure the VLAN on the switch before creating the bridged-vlan network. In the figure above, `backupVLan` and `AppsVlan1` are created from `btbond1` and attached to `eth1` and `eth2` of VM1 and VM2 respectively.

vnetwork is not supported on private interfaces and secondary interfaces of the bond interface.

Virtual Disks

In addition to virtual machines, you can create virtual disks in virtual storage. Virtual disks provide additional storage options for virtual machines by enabling you to attach additional block storage to your virtual machines. Similarly, you can detach the disk if you no longer need the additional space. You can use virtual disks to expand existing file system storage inside the virtual machine by extending the storage volume onto a virtual disk, or by creating a new file system on a virtual disk. Virtual disks can optionally be attached to multiple virtual machines.

Virtual Machines

A *virtual machine* is granted virtual resources, and can be started, stopped, cloned, and restarted independently. By default, virtual machines are created with autostart and failover enabled for high-availability models. During failover, the VM is automatically started during the reboot, and there will be attempt to restart once before failing over to a different node on high-availability models. You can enable or disable autostart and failover using the `odacli modify-vm` command options. The option to autostart is also available on single-node Oracle Database Appliance models.

Setting Up and Configuring a KVM Deployment

Understand the steps to set up and configure KVM deployment.

Follow these steps to set up a KVM deployment on Oracle Database Appliance

1. Create a VM storage.
2. Create a virtual network.
3. Create virtual disks.
4. Create virtual machines.

The following links provide information about performing these steps:

Related Topics

- Creating a VM Storage in a KVM Deployment
  Use ODACLI commands or the Browser User Interface to create a VM storage in a KVM deployment.

- Creating a Virtual Network in a KVM Deployment
  Use ODACLI commands or the Browser User Interface to create a virtual network in a KVM deployment.
- Creating a Virtual Disk in a KVM Deployment
  Use ODACLI commands or the Browser User Interface to create a virtual disk in a KVM deployment.
- Creating a Virtual Machine in a KVM Deployment
  Use ODACLI commands or the Browser User Interface to create a virtual machine in a KVM deployment.

Managing VM Storage in KVM Deployment

Use ODACLI to create, view, modify, and delete VM storage in an Oracle Database Appliance KVM deployment.

- Creating a VM Storage in a KVM Deployment
  Use ODACLI commands or the Browser User Interface to create a VM storage in a KVM deployment.
- Viewing VM Storage in a KVM Deployment
  Use ODACLI commands or the Browser User Interface to view all VM storage or details about a VM storage in a KVM deployment.
- Modifying a Virtual Storage in a KVM Deployment
  Use ODACLI commands or the Browser User Interface to modify a virtual storage in a KVM deployment.
- Deleting a VM Storage in a KVM Deployment
  Use ODACLI commands or the Browser User Interface to delete a VM storage in a KVM deployment.

Creating a VM Storage in a KVM Deployment

Use ODACLI commands or the Browser User Interface to create a VM storage in a KVM deployment.

Using ODACLI to Create VM Storage

Use the command `odacli create-vmstorage` to create a VM Storage.

Create a VM storage named `share1` of 8 GB.

```
# odacli create-vmstorage -n share1 -s 8G
```

Using Browser User Interface to Create VM Storage

Follow these steps:

1. Log into the Browser User Interface:

   ```
   https://host-ip-address:7093/mgmt/index.html
   ```

2. Click the **Appliance** tab.
3. Click **Show VM Instances** to display the VM Instances page.

4. In the page, select the **Create VM Storage** option and click **Next**.
5. In the Create VM Storage page, specify the following:
   - Storage Name: Name of the VM storage
   - Storage Size: Size of the storage to be allocated
6. Click **Create**.
7. When you submit the job, the job ID and a link to the job appears. Click the link to display the job status and details.
8. Validate that the job completed. You can track the job in the **Activity** tab in the Browser User Interface, or run the command `odacli describe-job` with the job ID.

Viewing VM Storage in a KVM Deployment

Use ODACLI commands or the Browser User Interface to view all VM storage or details about a VM storage in a KVM deployment.

Using ODACLI to View VM Storage

The command `odacli describe-vmstorage` displays details about VM storage. Use the command `odacli list-vmstorages` to view all VM storages in the deployment.

```
# odacli list-vmstorages
```

```
# odacli describe-vmstorage
```

Using Browser User Interface to View VM Storage

Follow these steps:

1. Log into the Browser User Interface:

   ```
   https://host-ip-address:7093/mgmt/index.html
   ```

2. Click the **Appliance** tab.
3. Click **VM Instances** to display the VM Details page.
4. Click the **Show VM Storage** tab to view the list of all configured virtual storages.
5. Click on a VM Storage to view the details of the virtual storage.

Modifying a Virtual Storage in a KVM Deployment

Use ODACLI commands or the Browser User Interface to modify a virtual storage in a KVM deployment.

Using ODACLI to Modify Virtual Storages

Use the command `odacli modify-vm` to modify VM storage.

Increase the size of a VM storage named share1 by 10 gigabytes.

```
# odacli modify-vmstorage -n share1 -i 10G
```

Using Browser User Interface to Modify VM Storage

Follow these steps:

1. Log into the Browser User Interface:

   ```
   https://host-ip-address:7093/mgmt/index.html
   ```

2. Click the **Appliance** tab.
3. Click **VM Instances** to display the VM Details page.
4. Click the **Show VM Storage** tab.
5. In the page, select a Virtual Storage, select the **Modify** option and click **Next**.
6. In the Modify VM Storage page, specify Increment in size and click **Modify**.
7. When you submit the job, the job ID and a link to the job appears. Click the link to display the job status and details.
8. Validate that the job completed. You can track the job in the **Activity** tab in the Browser User Interface, or run the command `odacli describe-job` with the job ID.

Deleting a VM Storage in a KVM Deployment

Use ODACLI commands or the Browser User Interface to delete a VM storage in a KVM deployment.

Using ODACLI to Delete VM Storage

Use the command `odacli delete-vmstorage` to delete a VM storage.

Delete a VM storage named vs1.

```
# odacli delete-vmstorage -n vs1
```

Using Browser User Interface to Modify VM Storage

Follow these steps:

1. Log into the Browser User Interface:

   ```
   https://host-ip-address:7093/mgmt/index.html
   ```

2. Click the **Appliance** tab.
3. Click **VM Instances** to display the VM Details page.
4. Click the **Show VM Storage** tab.
5. In the page, select a VM Storage, select the **Delete** option.
6. Click Yes to confirm your choice.

7. When you submit the job, the job ID and a link to the job appears. Click the link to display the job status and details.
8. Validate that the job completed. You can track the job in the **Activity** tab in the Browser User Interface, or run the command `odacli describe-job` with the job ID.

Managing Virtual Networks in KVM Deployment

Use ODACLI to create, view, start, stop, and delete virtual networks in an Oracle Database Appliance KVM deployment.

- Creating a Virtual Network in a KVM Deployment
  Use ODACLI commands or the Browser User Interface to create a virtual network in a KVM deployment.
- Viewing Virtual Networks in a KVM Deployment
  Use ODACLI commands or the Browser User Interface to view all virtual networks or details about a virtual network in a KVM deployment.
- Starting and Stopping Virtual Networks in a KVM Deployment
  Use ODACLI commands or the Browser User Interface to start or stop virtual networks in a KVM deployment.
- Modifying a Virtual Network in a KVM Deployment
  Use ODACLI commands or the Browser User Interface to modify a virtual network in a KVM deployment.
- Deleting a Virtual Network in a KVM Deployment
  Use ODACLI commands or the Browser User Interface to delete a virtual network in a KVM deployment.

Creating a Virtual Network in a KVM Deployment

Use ODACLI commands or the Browser User Interface to create a virtual network in a KVM deployment.

Using ODACLI to Create Virtual Network

Use the command `odacli create-vnetwork` to create a virtual network.

Create a VM network of type `bridged` using the interface `btbond2`.

```
# odacli create-vnetwork --name mgmtNet --bridge mgmtNet --type
bridged --interface btbond2 --ip 192.168.120.26 --gateway 192.168.120.1
--netmask 255.255.255.0
```

Create a VM network of type `bridged-vlan` using the interface `btbond1`.

```
# odacli create-vnetwork --name backupvlan --bridge backupvlan --type
bridged-vlan --vlan-id 12 --interface btbond1 --ip 192.168.100.10 --
gateway 192.168.100.1 --netmask 255.255.255.0
```

Using Browser User Interface to Create Virtual Network

Follow these steps:

1. Log into the Browser User Interface:

   ```
   https://host-ip-address:7093/mgmt/index.html
   ```

2. Click the **Appliance** tab.
3. Click **Show VM Instances** to display the VM Instances page.
4. In the page, select the **Create Virtual Network** option and click **Next**.
5. In the Create Virtual Network page, specify the following:
   - Name: Name of the virtual network
   - IP Address: Virtual network IP address
   - Subnet Mask and Gateway: Virtual network subnet mask and gateway
   - Network Type: Virtual network type
   - Interface: Virtual network interface
   - Bridge Name: Name of the network bridge
   - VLAN ID: ID of the VLAN network
6. Click **Create**.
7. When you submit the job, the job ID and a link to the job appears. Click the link to display the job status and details.
8. Validate that the job completed. You can track the job in the **Activity** tab in the Browser User Interface, or run the command `odacli describe-job` with the job ID.

Viewing Virtual Networks in a KVM Deployment

Use ODACLI commands or the Browser User Interface to view all virtual networks or details about a virtual network in a KVM deployment.

Using ODACLI to View Virtual Networks

The command `odacli describe-vnetwork` displays details about a virtual network. Use the command `odacli list-vnetworks` to view all virtual networks in the deployment.

```
# odacli list-vnetworks
```

```
# odacli describe-vnetwork -n vnet1
```

Using Browser User Interface to Create Virtual Networks

Follow these steps:

1. Log into the Browser User Interface:

   ```
   https://host-ip-address:7093/mgmt/index.html
   ```

2. Click the **Appliance** tab.
3. Click **VM Instances** to display the VM Details page.

4. Click the **Show Virtual Networks** tab to view the list of all configured virtual networks.
5. Click on a Virtual Network to view the details of the virtual network.

Starting and Stopping Virtual Networks in a KVM Deployment

Use ODACLI commands or the Browser User Interface to start or stop virtual networks in a KVM deployment.

Using ODACLI to Start and Stop Virtual Networks

The command `odacli start-vnetwork` starts a virtual network. Use the command `odacli stop-vnetwork` to stop a virtual network in the deployment.

```
# odacli start-vnetwork -n vnet1
```

```
# odacli stop-vnetwork -n vnet1
```

Using Browser User Interface to Start and Stop Virtual Networks

Follow these steps:

1. Log into the Browser User Interface:

   `https://host-ip-address:7093/mgmt/index.html`

2. Click the **Appliance** tab.
3. Click **VM Instances** to display the VM Details page.
4. Click the **Show Virtual Networks** tab to view the list of all configured virtual networks.
5. To start a virtual network, click on a Virtual Network, and then click **Start**.
6. To stop a virtual network, click on a virtual network, and then click **Stop**.

Modifying a Virtual Network in a KVM Deployment

Use ODACLI commands or the Browser User Interface to modify a virtual network in a KVM deployment.

Using ODACLI to Modify Virtual Network

Use the command `odacli modify-vnetwork` to modify a virtual network.

```
# odacli modify-vnetwork -n vnet1 -g 10.11.44.41
```

Using Browser User Interface to Modify Virtual Network

Follow these steps:

1. Log into the Browser User Interface:

   `https://host-ip-address:7093/mgmt/index.html`

2. Click the **Appliance** tab.
3. Click **VM Instances** to display the VM Details page.
4. Click the **Show Virtual Networks** tab.
5. In the page, select a Virtual Network, select the **Modify** option and click **Next**.
6. In the Modify Virtual Network page, specify any changes in the Subnet Mask, Gateway, or IP Address, and click **Modify**.
7. When you submit the job, the job ID and a link to the job appears. Click the link to display the job status and details.
8. Validate that the job completed. You can track the job in the **Activity** tab in the Browser User Interface, or run the command `odacli describe-job` with the job ID.

Deleting a Virtual Network in a KVM Deployment

Use ODACLI commands or the Browser User Interface to delete a virtual network in a KVM deployment.

Using ODACLI to Delete Virtual Networks

Use the command `odacli delete-vnetwork` to delete a virtual network.

Delete a virtual network named `vnet1`.

```
# odacli delete-vnetwork -n vnet1
```

Using Browser User Interface to Modify Virtual Networks

Follow these steps:

1. Log into the Browser User Interface:

   ```
   https://host-ip-address:7093/mgmt/index.html
   ```

2. Click the **Appliance** tab.
3. Click **VM Instances** to display the VM Details page.
4. Click the **Show Virtual Networks** tab.
5. In the page, select a virtual network, select the **Delete** option.
6. Click Yes to confirm your choice.
7. When you submit the job, the job ID and a link to the job appears. Click the link to display the job status and details.
8. Validate that the job completed. You can track the job in the **Activity** tab in the Browser User Interface, or run the command `odacli describe-job` with the job ID.

Managing Virtual Disks in KVM Deployment

Use ODACLI to create, view, clone, modify, and delete virtual disks on Oracle Database Appliance KVM deployment.

- Creating a Virtual Disk in a KVM Deployment
  Use ODACLI commands or the Browser User Interface to create a virtual disk in a KVM deployment.
- Viewing Virtual Disks in a KVM Deployment
  Use ODACLI commands or the Browser User Interface to view all virtual disks or details about a virtual disk in a KVM deployment.
- Cloning a Virtual Disk in a KVM Deployment
  Use ODACLI commands or the Browser User Interface to clone a virtual disk in a KVM deployment.
- Modifying a Virtual Disk in a KVM Deployment
  Use ODACLI commands or the Browser User Interface to modify a virtual disk in a KVM deployment.
- Deleting a Virtual Disk in a KVM Deployment
  Use ODACLI commands or the Browser User Interface to delete a virtual disk in a KVM deployment.

Creating a Virtual Disk in a KVM Deployment

Use ODACLI commands or the Browser User Interface to create a virtual disk in a KVM deployment.

Ensure that a VM storage exists before you create a virtual disk.

Using ODACLI to Create Virtual Disks

Use the command `odacli create-vdisk` to create a virtual disk.

Specify the name of the virtual disk in the command `odacli create-vdisk -n` *`name`*. Identify the storage in which you create the virtual disk by using the `-st` *`storage`* option. Use the option `-s` *`size`* to specify the virtual disk size. If you want to configure the virtual disk as a shared disk, then use the option `-sh`.

Create a 2 GB non-sparse and shareable virtual disk named `vdisk1` inside the VM storage `vms1`.

```
odacli create-vdisk -n vdisk1 -st vms1 -s 2G -sh
```

Using Browser User Interface to Create Virtual Disks

Follow these steps:

1. Log into the Browser User Interface:

   ```
   https://host-ip-address:7093/mgmt/index.html
   ```

2. Click the **Appliance** tab.
3. Click **VM Instances** to display the Virtual Disk page.
4. Click **Create Virtual Disk**.
5. In the page, select the **Create Virtual Disk** option and click **Next**.
6. In the Create Virtual Disk page, specify the following:

- Virtual Disk Name: Name assigned to the virtual disk that is unique within the name repository
- VM Storage Name: Name of the VM storage where the virtual disk will be created
- Disk Size: Size of the virtual disk
- Shared: Specify if you want to share the virtual disk
- Sparse or Shared: Specify if the virtual disk is sparse

7. Click **Create**.
8. When you submit the job, the job ID and a link to the job appears. Click the link to display the job status and details.
9. Validate that the job completed. You can track the job in the **Activity** tab in the Browser User Interface, or run the command `odacli describe-job` with the job ID.

Viewing Virtual Disks in a KVM Deployment

Use ODACLI commands or the Browser User Interface to view all virtual disks or details about a virtual disk in a KVM deployment.

Using ODACLI to View Virtual Disks

The command `odacli describe-vdisk` displays details about a virtual disk. Use the command `odacli list-vdisks` to view all virtual disks in the deployment.

```
# odacli list-vdisks
```

```
# odacli describe-vdisk -n vdisk_name
```

Using Browser User Interface to Create Virtual Disks

Follow these steps:

1. Log into the Browser User Interface:

   ```
   https://host-ip-address:7093/mgmt/index.html
   ```

2. Click the **Appliance** tab.
3. Click **VM Instances** to display the VM Details page.
4. Click the **Show Virtual Disks** tab to view the list of all configured virtual disks.
5. Click on a virtual disk to view the details of the virtual disk.

Cloning a Virtual Disk in a KVM Deployment

Use ODACLI commands or the Browser User Interface to clone a virtual disk in a KVM deployment.

Using ODACLI to Clone Virtual Disks

Use the command `odacli clone-vdisk` to clone an existing virtual disk.

Specify the source vdisk from which you want to clone with the `-n` option, and specify the name of the cloned virtual disk with the `-cn` option.

Create a clone of a virtual disk named `vdisk1`, with the name `vdisk1_clone`. The cloned disk is created on the same storage as `vdisk1`.

```
# odacli clone-vdisk -n vdisk1 -cn vdisk1_clone
```

Using Browser User Interface to Create Virtual Disks

Follow these steps:

1. Log into the Browser User Interface:

   ```
   https://host-ip-address:7093/mgmt/index.html
   ```

2. Click the **Appliance** tab.
3. Click **VM Instances** to display the Virtual Disk page.
4. Click **Create Virtual Disk**.
5. In the page, select the **Clone Virtual Disk** option and click **Next**.
6. In the Clone Virtual Disk page, specify the following:
   - Select the Source Virtual Disk you want to clone
   - Specify the name of the cloned virtual disk
7. Click **Create**.
8. When you submit the job, the job ID and a link to the job appears. Click the link to display the job status and details.
9. Validate that the job completed. You can track the job in the **Activity** tab in the Browser User Interface, or run the command `odacli describe-job` with the job ID.

Modifying a Virtual Disk in a KVM Deployment

Use ODACLI commands or the Browser User Interface to modify a virtual disk in a KVM deployment.

Using ODACLI to Modify Virtual Disks

Use the command `odacli modify-vdisk` to increase the size of a virtual disk.

Increase the size of a virtual disk named `vdisk1` by 4 gigabytes.

```
# odacli modify-vdisk -n vdisk1 -i 4G
```

Using Browser User Interface to Modify Virtual Disks

Follow these steps:

1. Log into the Browser User Interface:

   ```
   https://host-ip-address:7093/mgmt/index.html
   ```

2. Click the **Appliance** tab.
3. Click **VM Instances** to display the VM Details page.
4. Click the **Show Virtual Disks** tab.
5. In the page, select a Virtual Disk, select the **Modify Virtual Disk** option and click **Next**.
6. In the Modify Virtual Disk page, specify Increment in size and if you want to share the virtual disk.
7. Click **Modify**.
8. When you submit the job, the job ID and a link to the job appears. Click the link to display the job status and details.
9. Validate that the job completed. You can track the job in the **Activity** tab in the Browser User Interface, or run the command `odacli describe-job` with the job ID.

Deleting a Virtual Disk in a KVM Deployment

Use ODACLI commands or the Browser User Interface to delete a virtual disk in a KVM deployment.

Using ODACLI to Delete Virtual Disks

Use the command `odacli delete-vdisk` to delete a virtual disk.

Delete a virtual disk named `vdisk1`.

```
# odacli delete-vdisk -n vdisk1
```

Using Browser User Interface to Modify Virtual Disks

Follow these steps:

1. Log into the Browser User Interface:

   ```
   https://host-ip-address:7093/mgmt/index.html
   ```

2. Click the **Appliance** tab.
3. Click **VM Instances** to display the VM Details page.
4. Click the **Show Virtual Disks** tab.
5. In the page, select a Virtual Disk, select the **Delete** option.
6. Click Yes to confirm your choice.
7. When you submit the job, the job ID and a link to the job appears. Click the link to display the job status and details.
8. Validate that the job completed. You can track the job in the **Activity** tab in the Browser User Interface, or run the command `odacli describe-job` with the job ID.

Managing Virtual Machines in KVM Deployment

Use ODACLI to create, view, clone, modify, start, stop, and delete virtual machines in an Oracle Database Appliance KVM deployment.

- Creating a Virtual Machine in a KVM Deployment
  Use ODACLI commands or the Browser User Interface to create a virtual machine in a KVM deployment.
- Cloning a Virtual Machine in a KVM Deployment
  Use ODACLI commands or the Browser User Interface to clone a virtual machine instance in a KVM deployment.
- Modifying a Virtual Machine in a KVM Deployment
  Use ODACLI commands or the Browser User Interface to modify a virtual machine in a KVM deployment.
- Viewing Virtual Machines in a KVM Deployment
  Use ODACLI commands or the Browser User Interface to view all virtual machines or details about a virtual machine in a KVM deployment.
- Starting and Stopping Virtual Machines in a KVM Deployment
  Use ODACLI commands or the Browser User Interface to start or stop virtual machines in a KVM deployment.
- Deleting a Virtual Machine in a KVM Deployment
  Use ODACLI commands or the Browser User Interface to delete a virtual machine in a KVM deployment.

Creating a Virtual Machine in a KVM Deployment

Use ODACLI commands or the Browser User Interface to create a virtual machine in a KVM deployment.

Ensure that a VM storage exists before you create a VM instance.

Using ODACLI to Create Virtual Machine Instance

Use the command `odacli create-vm` to create a VM instance. Specify the preferred node on which to start the virtual machine after creation (`-pn` option).

Following is an example command to create a VM named `vm1` with 8 vcpus and 8 GB memory. The VM is stored in the VM Storage `vms1`. The source used for the installation is located on `/u01/OL7.iso`.

```
# odacli create-vm -n vm1 -c 8 -m 8G -vms vms1 -src /u01/OL7.iso
```

To use a kickstart configuration file to create the VM instance, include the file in the `--extra-args` parameter. Create a kickstart configuration file, including the network configuration for the guest VM. Ensure that the kickstart configuration file is available over the network that guest VM can access.

For example:

```
odacli create-vm --name odaksvm --memory 4G --source /u01/kvm/images/
OL77_x86_64.iso --vmstorage myvms --size 10G --vcpus 2 --extra-args
"console=tty0 console=ttyS0,115200 ks=http://test:portnumber/ks.txt"
```

If you do not use a kickstart configuration file to create the VM instance, then complete the VM instance creation as follows:

1. Run the `odacli create-vm` command and check that it completes successfully.
2. Use the `odacli describe-vm` command to check the VNC port.
3. Log in to the VM instance using the VNC port: *`host:vncport`*.
4. Complete the installation process by providing your values for the installation screens.
5. Log in again to the VM instance using the VNC port: *`host:vncport`*.
6. If you specified `--vnetwork` in the `odacli create-vm` command, then you can run `ifconfig -a` to view the network interface in the VM. Configure the network as you would on a Linux system.
7. After the network is configured, log into the VM using the network and customize the VM instance.
8. If you did not specify `--vnetwork` in the `odacli create-vm` command, then the VM network is created using the default Network Address Translation (NAT) based KVM bridge `virbr0`. eth0 is configured as DHCP inside the VM.

Using Browser User Interface to Create Virtual Machine Instance

Follow these steps:

1. Log into the Browser User Interface:

   ```
   https://host-ip-address:7093/mgmt/index.html
   ```

2. Click the **Appliance** tab.
3. Click **Show VM Instances** to display the VM Instances page.
4. In the page, select the **Create VM Instance** option and click **Next**.
5. In the Create Virtual VM page, specify the following:
   - VM Name: Name assigned to the VM instance that is unique within the name repository
   - VM Storage Name: Name of the VM storage where the VM instance will be created
   - Source Installation: The source from which you want to create the VM
   - Preferred Node: Node where you want to run the VM instance
   - Memory Size: Size of the memory to be allocated
   - CPU Pool Name: Select the CPU Pool
   - Number of vCPUs to Use: Number of virtual CPUs to be allocated
6. Click **Create**.

7. When you submit the job, the job ID and a link to the job appears. Click the link to display the job status and details.
8. Validate that the job completed. You can track the job in the **Activity** tab in the Browser User Interface, or run the command `odacli describe-job` with the job ID.

Cloning a Virtual Machine in a KVM Deployment

Use ODACLI commands or the Browser User Interface to clone a virtual machine instance in a KVM deployment.

Using ODACLI to Clone Virtual Machine Instance

Use the command `odacli clone-vm` to clone an existing virtual machine.

The name of the VM you create is defined by the command `odacli clone-vm -cn` *`name`*. Specify the source VM from which you want to clone.

Create a clone of a virtual machine named `vm1`, with the name `vm1_clone`. The cloned VM is created on the same storage as `vm1`.

```
# odacli clone-vm -n vm1 -cn vm1_clone
```

Using Browser User Interface to Clone Virtual Machine Instance

Follow these steps:

1. Log into the Browser User Interface:

   ```
   https://host-ip-address:7093/mgmt/index.html
   ```

2. Click the **Appliance** tab.
3. Click **VM Instances** to display the VM Instance page.
4. Click **Create VM Instance**.
5. In the page, select the **Clone VM Instance** option and click **Next**.
6. In the Clone VM Instance page, specify the following:
   - Select the Source VM you want to clone
   - Specify the name and description of the cloned VM instance
7. Click **Create**.
8. When you submit the job, the job ID and a link to the job appears. Click the link to display the job status and details.
9. Validate that the job completed. You can track the job in the **Activity** tab in the Browser User Interface, or run the command `odacli describe-job` with the job ID.

Modifying a Virtual Machine in a KVM Deployment

Use ODACLI commands or the Browser User Interface to modify a virtual machine in a KVM deployment.

Using ODACLI to Modify Virtual Machines

Use the command `odacli modify-vm` to modify a virtual machine.

Update the configuration of a VM named `vm1`, setting the CPU count to 6 and the maximum memory to 6 gigabytes on both the running VM and subsequent boots.

```
# odacli modify-vm -n vm1 -c 6 -mm 6G --live --config
```

Using Browser User Interface to Modify Virtual Machines

Follow these steps:

1. Log into the Browser User Interface:

   ```
   https://host-ip-address:7093/mgmt/index.html
   ```

2. Click the **Appliance** tab.
3. Click **VM Instances** to display the VM Details page.
4. Click the **Show VM Instances** tab.
5. In the page, select a Virtual Machine, select the **Modify** option and click **Next.**
6. In the Modify VM page, specify Increment in size and if you want to Auto Start or Set Failover.
7. You can also modify the CPU Pool, Number of vCPUs to use, Memory Size, and attach and detach virtual disks and virtual networks.
8. Select if you want to save the configuration or apply the configuration to a running VM.
9. Click **Modify**.
10. When you submit the job, the job ID and a link to the job appears. Click the link to display the job status and details.
11. Validate that the job completed. You can track the job in the **Activity** tab in the Browser User Interface, or run the command `odacli describe-job` with the job ID.

Viewing Virtual Machines in a KVM Deployment

Use ODACLI commands or the Browser User Interface to view all virtual machines or details about a virtual machine in a KVM deployment.

Using ODACLI to View Virtual Machines

The command `odacli describe-vm` displays details about a virtual machine. Use the command `odacli list-vms` to view all virtual machines in the deployment.

```
# odacli list-vms
```

```
# odacli describe-vm -n vm_name
```

Using Browser User Interface to Create Virtual Machines

Follow these steps:

1. Log into the Browser User Interface:

   ```
   https://host-ip-address:7093/mgmt/index.html
   ```

2. Click the **Appliance** tab.
3. Click **VM Instances** to display the VM Details page.
4. Click the **Show VM Instances** tab to view the list of all configured virtual machines.
5. Click on a VM Instance to view the details of the virtual machine.

Starting and Stopping Virtual Machines in a KVM Deployment

Use ODACLI commands or the Browser User Interface to start or stop virtual machines in a KVM deployment.

Using ODACLI to Start and Stop Virtual Machines

The command `odacli start-vm` starts a virtual machine. Use the command `odacli stop-vm` to stop a virtual machine in the deployment.

If `pref-node` is defined for the VM, then the VM starts on the `pref-node`. If `pref-node` is not defined for the VM, then the VM can start on any node, in a high-availability deployment. However, if you specify the node name `-n`, then the VM starts on the specified node, even if the preferred node is defined.

```
# odacli start-vm -n vm1
```

```
# odacli stop-vm -n vm1
```

Using Browser User Interface to Start and Stop Virtual Machines

Follow these steps:

1. Log into the Browser User Interface:

   ```
   https://host-ip-address:7093/mgmt/index.html
   ```

2. Click the **Appliance** tab.
3. Click **VM Instances** to display the VM Details page.
4. Click the **Show VM Instances** tab to view the list of all configured virtual machines.
5. To start a virtual machine, click on a VM Instance, and then click **Start** and select the node to start the virtual machine.
6. To stop a virtual machine, click on a VM Instance, and then click **Stop** to stop the virtual machine. Click **Force Stop** to close all running processes and stop the virtual machine.

Deleting a Virtual Machine in a KVM Deployment

Use ODACLI commands or the Browser User Interface to delete a virtual machine in a KVM deployment.

Using ODACLI to Delete Virtual Machines

Use the command `odacli delete-vm` to delete a virtual machine.

Delete a virtual machine named `vm1`.

```
# odacli delete-vm -n vm1
```

Using Browser User Interface to Modify Virtual Machines

Follow these steps:

1. Log into the Browser User Interface:

   ```
   https://host-ip-address:7093/mgmt/index.html
   ```

2. Click the **Appliance** tab.
3. Click **VM Instances** to display the VM Details page.
4. Click the **Show VM Instances** tab.
5. In the page, select a VM Instance, select the **Delete** option.
6. Click Yes to confirm your choice.
7. When you submit the job, the job ID and a link to the job appears. Click the link to display the job status and details.
8. Validate that the job completed. You can track the job in the **Activity** tab in the Browser User Interface, or run the command `odacli describe-job` with the job ID.

16
Oracle Database Appliance Command-Line Interface

The command-line interface has different classes of tools to manage Oracle Database Appliance.

- About Oracle Database Appliance Command-Line Interface
  Three classes of tools are available to perform deployment, lifecycle management, and system administration on Oracle Database Appliance.
- Managing ODACLI Privileges and Security with SUDO
  Oracle Appliance Manager command-line utility requires `root` system privileges for most administration actions. You may want to use SUDO as part of your system auditing and security policy.
- odacli Network Commands
  Use the `odacli network` commands to list and describe network interfaces.
- odacli Apply Patch and Update Commands
  Use the commands `odacli update` and `apply patch` to apply patches and update the appliance.
- odacli Appliance Commands
  Use the `odacli appliance` commands to perform lifecycle activities for the appliance.
- odacli Backup and Recovery Commands
  Use the odacli backup and recover commands to backup to and restore from Oracle Cloud Infrastructure Object Storage or disk.
- Oracle Data Guard odacli Commands
  Use ODACLI commands to configure and manage Oracle Data Guard in your Oracle Database Appliance deployment.
- odacli CPU Core Commands
  Use the CPU Core commands to enable CPU cores and display current and historical CPU core configurations.
- odacli CPU Pool Commands for Bare Metal and KVM
  Use odacli commands to manage resource allocations on Oracle Database Appliance for bare metal and KVM deployments.
- odacli Database Commands
  Use the `odacli database` commands to perform database lifecycle operations.
- odacli DBHome Commands
  Use the `odacli DBHome` commands to manage database Home operations.
- odacli Database Storage Commands
  Use the Database Storage commands to list, describe, create, and delete Oracle database storage.
- odacli Job Commands
  Use the `odacli list-jobs` and `odacli describe-job` commands to display job details.

- Log Commands
  Use the `odacli` log commands to specify the options to collect and delete logs.
- odacli Oracle Auto Service Request Commands
  Use the Oracle Auto Service Request (Oracle ASR) commands to configure, update, test, and delete Oracle ASR on the system.
- odacli OS Commands
  Use the `odacli OS` commands to list and update operating system (OS) parameters.
- odaadmcli Hardware Monitoring Commands
  Use the `hardware monitoring` commands to display hardware configurations.
- Storage Commands
  Understand the commands to perform storage operations and diagnostics.

About Oracle Database Appliance Command-Line Interface

Three classes of tools are available to perform deployment, lifecycle management, and system administration on Oracle Database Appliance.

The command-line interface (CLI) is an alternative to Oracle Database Appliance Browser User Interface for some appliance configuration and patching tasks, database management, and job activity.

Oracle Database Appliance uses a role-based command-line interface. Use the `odacli` commands to perform lifecycle management tasks and the `odaadmcli` commands to perform storage and hardware monitoring maintenance. Many tasks related to managing Oracle Databases are also required with databases on Oracle Database Appliance. Tasks common to Oracle Database generally are described in the Oracle Database documentation library. However, to simplify tasks, use the Oracle Database Appliance command-line interface. The `odacli` and `odaadmcli`utilities combine the capabilities of the `SYS` database administrator role and the operating system Superuser (`root` user). Always perform administrative tasks using the Oracle Database Appliance Browser User Interface or CLI utilities.

The following classes of commands are available:

- Deployment and Configuration: Use the deployment and configuration commands as part of the initial deployment of the appliance and to configure CPU cores.
- Lifecycle management: Use `odacli` commands to perform database and system administration tasks for the appliance. The `odacli` commands are the primary interface to perform life cycle activities for the appliance.
- Administration: Use `odaadmcli` commands to perform hardware administration tasks for the appliance. The `odaadmcli` commands are the interface for infrequent administration activities needed to manage appliance hardware components, storage, and VLAN.

You can perform the following deployment and configuration tasks:

- Configure the first network in the appliance
- Unzip and copy the Oracle Database Appliance software to the correct locations
- Set the number of CPU Cores for the system

You can perform the following appliance lifecycle tasks with `odacli` commands:

- Create and describe the appliance
- Create, list, describe, and delete databases
- Create, list, describe, and delete Oracle Database Homes
- Create, list, and describe the networks
- List and describe the jobs

You can perform the following appliance administration tasks with `odaadmcli` commands:

- Show storage, disks, diskgroups, and controllers
- Display storage diagnostics for disks and NVM Express (NVMes)
- Show server, memory, processor, power, cooling, and network details

Depending on your version of Oracle Appliance Manager and your hardware, some of the `odacli` commands may not be available to you. To see which commands are supported on your version of Oracle Appliance Manager and your hardware, run the `odacli` help command: `odacli -h`.

Command-Line Interface Syntax

The command-line interface commands and parameters are case-sensitive.

An `odacli` or `odaadmcli`command uses the following command syntax:

```
odacli command [options]
```

- *command* is an action you want to perform on the appliance. For example: `odacli list-networks` or `odacli describe-jobs`.
- *options* are optional parts of the `odacli` command. Options can consist of one or more options that extend the use of the `odacli` command carried out on an object. Options include additional information about the action that you want to perform on the object. Option names are preceded with a dash. Some options require the name of an object for the command to perform the action that you want to carry out. If an option is preceded with an * (asterisk), this information is required to submit the command. When appending `-j` to the odacli command, the output is returned in JSON format. The help option (`-h`) is an option that is available with almost all commands. When you include the `-h` option, you can obtain additional information about the command that you want to perform.

Example 16-1 Command-Line Interface Syntax

```
# odacli create-database -h

Usage: create-database [options]
Options:
 * --adminpassword, -m
       Password for SYS,SYSTEM and PDB Admin
  --backupconfigid, -bi
       Backup Config ID
  --cdb, -c
       Create Container Database (Inverse option: --no-cdb/-no-c)
  --characterset, -cs
       Character Set (default:AL32UTF8)        Default: AL32UTF8
  --databaseUniqueName, -u
       database unique name
  --dbclass, -cl
       Database Class EE: OLTP/DSS/IMDB, SE: OLTP     Default: OLTP
  --dbconsole, -co
       Enable Database Console (Inverse option: --no-dbconsole/-no-co)

  --dbhomeid, -dh
       Database Home ID (Use Existing DB Home)
  --dblanguage, -l
       Datbase Language (default:AMERICAN)        Default: AMERICAN
* --dbname, -n
       Database Name
  --dbshape, -s
       Database Shape{odb1s,odb1,odb2,etc.}        Default: odb1
  --dbstorage, -r
       Database Storage {ACFS|ASM}        Default: ACFS
  --dbterritory, -dt
       Database Territory (default:AMERICA)        Default: AMERICA
  --dbtype, -y
       Database Type: SI        Default: SI
  --help, -h
       get help
  --instanceonly, -io
       Create Instance Only (For Standby)
  --json, -j
       json output
  --nlscharacterset, -ns
       NLS Character Set (default:AL16UTF16)        Default: AL16UTF16
   --no-cdb, -no-c
    Won't create Container Database (Inverse option: --cdb/-c)
    --no-dbconsole, -no-co
    Disable Database Console (Inverse option: --dbconsole/-co)
  --pdbadmin, -d
       Pluggable Database Admin User
  --pdbname, -p
       Pluggable Database Name
  --version, -v
       Database Version
```

Oracle Database Appliance Manager Command-Line Interface Help

Run the `-h` command to see the usage information for all commands available for your Oracle Database Appliance. For example:

```
odacli -h
```

Run `odacli` *`command`* `-h` or `odacliadm` *`command`* `-h` to see detailed help about a specific command. For example, to see detailed help for the `odacli describe-dbhome` command, use the following:

```
odacli describe-dbhome -h
```

Managing ODACLI Privileges and Security with SUDO

Oracle Appliance Manager command-line utility requires `root` system privileges for most administration actions. You may want to use SUDO as part of your system auditing and security policy.

For most tasks, Oracle recommends that you log in as `root` to use the Oracle Appliance Manager command-line interface on Oracle Database Appliance. If you are not logged in as `root`, then you cannot carry out most actions on the appliance. For example, if you are not logged in as `root`, then you can view storage information, but you cannot modify the storage.

Allowing Root User Access Using SUDO

In environments where system administration is handled by a different group than database administration, or where security is a significant concern, you may want to limit access to the `root` user account and password. SUDO enables system administrators to grant certain users (or groups of users) the ability to run commands as `root`, while logging all commands and arguments as part of your security and compliance protocol.

A SUDO security policy is configured by using the file `/etc/sudoers`. Within the `sudoers` file, you can configure groups of users and sets of commands to simplify and audit server administration with SUDO commands.

> **Caution:**
>
> Configuring SUDO to allow a user to perform any operation is equivalent to giving that user `root` privileges. Consider carefully if this is appropriate for your security needs.

Example 16-2 SUDO Example 1: Allow a User to Perform Any ODACLI Operation

This example shows how to configure SUDO to enable a user to perform any ODACLI operation. You do this by adding lines to the commands section in the `/etc/sudoers` file:

```
## The commands section may have other options added to it.
##
Cmnd_Alias ODACLI_CMDS=/opt/oracle/dcs/bin/odacli *
jdoe ALL = ODACLI_CMDS
```

In this example, the user name is `jdoe`. The file parameter setting `ALL= ODACLI_CMDS` grants the user `jdoe` permission to run all `odacli` commands that are defined by the command alias `ODACLI_CMDS`. After configuration, you can copy one `sudoers` file to multiple hosts. You can also create different rules on each host.

Note:

Before database creation, you must set up user equivalency with SSH for the root user on each server. If you do not set up user equivalency and configure SSH on each server, then you are prompted to provide the root password for each server during database creation.

After you configure the `sudoer` file with the user, the user `jdoe` can run the set of `odacli` commands configured with the command alias `ODACLI_CMDS`. For example:

```
odacli create-database --dbname newdb -m
Password for SYS,SYSTEM and PDB Admin:

Job details
----------------------------------------------------------------
                     ID: 1bc31577-f910-4d3f-b6ff-8e3fccd30141
            Description: Database service creation with db name: newdb
                 Status: Created
                Created: November 30, 2018 9:23:57 AM PST
                Message:

Task Name Start Time End Time Status
-----------------------------------------------------------
```

Example 16-3 SUDO Example 2: Allow a User to Perform Only Selected ODACLI Operations

To configure SUDO to allow a user to perform only selected ODACLI operations, add lines to the commands section in the `/etc/sudoers` file as follows:

```
## DCS commands for oracle user
Cmnd_Alias DCSCMDS = /opt/oracle/dcs/bin/odacli describe-appliance
oracle  ALL=       DCSCMDS


$ sudo /opt/oracle/dcs/bin/odacli describe-appliance

Appliance Information
----------------------------------------------------------------
                     ID: a977bb04-6cf0-4c07-8e0c-91a8c7e7ebb8
               Platform: OdaliteL
        Data Disk Count: 6
         CPU Core Count: 20
                Created: October 24, 2017 6:51:52 AM HDT

System Information
----------------------------------------------------------------
                   Name: rwsodal001
            Domain Name: example.com
              Time Zone: America/Adak
             DB Edition: EE
            DNS Servers: 10.200.76.198 10.200.76.199 192.0.2.254
            NTP Servers: 10.200.0.1 10.200.0.2

Disk Group Information
----------------------------------------------------------------
DG Name                   Redundancy                Percentage
------------------------- ------------------------- ------------
Data                      Normal                    90
Reco                      Normal                    10
```

In this example, the user `jdoe2` tries to run the `sudo odacli list-databases` command, which is not part of the set of commands that is configured for that user. SUDO prevents `jdoe2` from running the command.

```
[jdoe2@servernode1 ~]$ sudo /opt/oracle/dcs/bin/odacli list-databases

Sorry, user jdoe2 is not allowed to execute '/opt/oracle/dcs/bin/odacli
list-databases' as root on servernode1.
```

odacli Network Commands

Use the `odacli network` commands to list and describe network interfaces.

- odacli configure-firstnet
  Use the command `configure-firstnet` to configure the first network in the appliance after racking and connecting the power and network cables.
- odacli create-network
  Use the `odacli create-network` command to create a network.
- odacli delete-network
  Use the command `odacli delete-network` to delete a network.
- odacli delete-networkinterface
  Use the command `odacli delete-networkinterface` to delete a network interface on Oracle Database Appliance X8-2 hardware models.
- odacli describe-network
  Use the `odacli describe-network` command to display the details of a specific network.
- odacli describe-networkinterface
  Use the `odacli describe-networkinterface` command to display the details of any network interface.
- odacli list-networks
  Use the `odacli list-networks` command to display networks.
- odacli list-networkinterfaces
  Use the `odacli list-networkinterfaces` command to display network interfaces.
- odacli update-network
  Use the `odacli update-network` command to update an existing network configuration.

odacli configure-firstnet

Use the command `configure-firstnet` to configure the first network in the appliance after racking and connecting the power and network cables.

File Path

`/opt/oracle/dcs/bin/odacli`

Syntax

```
  # /opt/oracle/dcs/bin/odacli configure-firstnet
```

Usage Notes

This command ensures that the system is available in the network, enabling you to manage the deployment through the Oracle Appliance Manager Browser User Interface.

- Bonded network configuration: Bonded dual-ported interface. With the bonded configuration, you can only enable one of the interfaces. The bonded configuration supports VLANs. The bonded network configuration uses `btbond1` on Oracle Database Appliance hardware models other than X8-2. On Oracle Database Appliance X8-2, the bonded network configuration uses `btbond1` to `btbond6`. This is the default setting.
- Non-bonded network configuration (on Oracle Database Appliance hardware models other than X8-2): Two separate physical network interfaces, this configuration does not support VLANs. The non-bonded network configuration uses `em2` and `em3` as public interfaces. Note that Oracle Database Appliance X8-2 does not support non-bonded network configuration.
- To change a non-bonded network configuration to a bonded configuration, run the Oracle Database Appliance Cleanup Script and redeploy the appliance.

Example 16-4 Configuring the First Network as a Bonded Network

Configure the first network to use a `btbond1` interface without configuring DHCP. Complete the IP address, netmask address, and gateway address.

Values that you need to provide are shown in *italic font*, with the exception of the net1 gateway address; the program obtains the gateway IP address. The program derives this gateway address using the network information you provided for the other IP addresses. Accept this value, unless your network administrator provides an alternative gateway address that is different from the default that the appliance command-line interface detects.

The following is an example of the command on a single node platform:

```
# /opt/oracle/dcs/bin/odacli configure-firstnet

Select the Interface to configure the network on (btbond1): btbond1
Configure DHCP on btbond1 (yes/no): no
INFO: You have chosen Static configuration
Enter the IP address to configure: 10.1.10.2
Enter the Netmask address to configure: 255.255.255.0
Enter the Gateway address to configure: 10.1.10.1
INFO: Plumbing the IPs now
INFO: Restarting the network
Shutting down interface btbond1: bonding: btbond1: Removing slave em2.
bonding: btbond1: releasing active interface em2
bonding: btbond1: making interface em3 the new active one.
bonding: btbond1: Removing slave em3.
bonding: btbond1: releasing active interface em3
::::::::::
```

Example 16-5   Configuring the First Network as a Non-Bonded Network

The following is an example of a non-bonded configuration. For a non-bonded configuration, answer no to using a bonding public interface. Note that Oracle Database Appliance X8-2 does not support non-bonded network configuration.

```
# /opt/oracle/dcs/bin/odacli configure-firstnet
Using bonding public interface (yes/no) [yes]: no
INFO: Breaking the bonding on btbond1
INFO: remove bonding module: rmmod bonding
INFO: remove slave setup in /etc/sysconfig/network-scripts/ifcfg-em2
INFO: remove slave setup in /etc/sysconfig/network-scripts/ifcfg-em3
INFO: Restarting the network
Shutting down interface em1: [ OK ]
Shutting down loopback interface: [ OK ]
Bringing up loopback interface: [ OK ]
Bringing up interface em1: [ OK ]
Bringing up interface em2: [ OK ]
Bringing up interface em3: [ OK ]
INFO: Restarting the DCS agent
initdcsagent stop/waiting
initdcsagent start/running, process 57629
Select the Interface to configure the network on (em2 em3) [em2]:
Configure DHCP on em2 (yes/no) [no]:
INFO: You have chosen Static configuration
Enter the IP address to configure : 10.31.102.101
Enter the Netmask address to configure : 255.255.240.0
Enter the Gateway address to configure[10.31.96.1] :
INFO: Plumbing the IPs now
INFO: Restarting the network
Shutting down interface em1: [ OK ]
Shutting down interface em2: [ OK ]
Shutting down interface em3: [ OK ]
Shutting down loopback interface: [ OK ]
Bringing up loopback interface: [ OK ]
Bringing up interface em1: [ OK ]
Bringing up interface em2: Determining if ip address 10.31.102.101 is 
already in use for device em2...
[ OK ]
Bringing up interface em3: [ OK ]
```

odacli create-network

Use the `odacli create-network` command to create a network.

File Path

```
/opt/oracle/dcs/bin/odacli
```

Syntax

```
odacli create-network [-d|-no-d] -n interface -p ipaddress  -w {Public|
Dataguard|Database|Management|Backup|Other} -s subnetmask -g
gateway[-h] [-sip] [-sn] [-vs] [-j]
```

Parameters

Parameter	Description
`--defaultnetwork, -d`	Identifies the default network.
`--gateway, -g`	Defines the network gateway. The gateway is required for the default network.
`--help, -h`	(Optional) Displays help for using the command.
`--interface, -n`	Defines the name of the network interface.
`--interfacetype, -t`	Defines the network interface type {BOND|PHYSICAL|VLAN|INTERNAL} (non case-sensitive).
`--ipaddress, -p`	Defines the network IP address. This can be specified in the format IPAddress or nodeNumber0:IPAddress0,nodeNumber1:IPAddress1,...
`--json, -j`	(Optional) Displays JSON output.
`--networktype, -w`	Defines the type of network. Options are: {Public|Dataguard|Database|Management|Backup|Other}. The default is Other.
`--name, -m`	Name of the network.
`--no-defaultnetwork, no-d`	Identifies a network as not the default network. Use `--defaultnetwork -d` to identify a default network.
`--subnetmask, -s`	Defines the Network Subnet Mask.
`--scanips, -sip`	Defines the SCAN IP addresses (in the format scanip0,scanip1,...)
`--scanname, -sn`	Defines the SCAN name.
`--nodeNumber, -u`	Defines the node number for High-Availability deployments. **Note:** This option is deprecated and will be desupported in a future release.
`--vips, -vs`	List of virtual IP addresses. They can be specified in the format vipname0:nodeNumber0:vip0,vipname1:nodenumber1:vip1,...
`--vlanid, -v`	Add VLAN as a new network. This option is available for for High-Availability deployments.

Usage Notes

- Network of `public` type can only be defined when deploying the appliance or when running `odacli configure-firstnet` during initial provisioning.
- Use this command to create an additional network not done in `create-appliance`.
- You are only allowed to create a network on the bond interface.
- On Oracle Database Appliance non-High Availability systems, you cannot specify Virtual IP addresses. The Virtual IP address is set to the same value as the IP address.
- Single Client Access Name (SCAN) cannot be set up on Oracle Database Appliance non-High Availability systems.

Example 16-6 Creating a Network

The following example creates a new network, `sfpbond1`, with IP address `192.0.2.15`. The network is an additional network that uses subnet mask `255.255.255.0` and is not a default network.

```
# odacli create-network -n sfpbond1 -p 192.0.2.15 -w Backup -s
255.255.255.0 -no-d
```

Example 16-7 Creating a VLAN Network

```
odacli create-network -g 10.31.131.129 -n btbond1 -t
VLAN -p 0:10.31.131.132,1:10.31.131.133 -m vlan150 -w
Database -no-d -sip 10.31.131.134,10.31.131.135 -sn scaoda702c1-
vlan150-scan -s 255.255.255.128 -vs scaoda702c1n1-vlan150-
vip:0:10.31.131.136,scaoda702c1n2-vlan150-vip:1:10.31.131.137 -v 150
```

odacli delete-network

Use the command `odacli delete-network` to delete a network.

File Path

`/opt/oracle/dcs/bin/odacli`

Syntax

To delete a network:

```
odacli  delete-network -i id [-m] [-h] [-j]
```

Parameters

Parameter	Description
`--id, -i`	Defines the network identity.
`--name, -m`	Specifies the network name.
`--json, -j`	(Optional) Displays JSON output.

Parameter	Description
`--help`, `-h`	(Optional) Displays help for using the command.

Usage Notes

You cannot delete the Public-network or Private-network after the system is deployed.

On High-Availability systems, if the node number is not specified in the `odacli delete-network` command, then the network on both nodes is deleted.

Example 16-8 Deleting a Network

The following example deletes a backup network with a network ID of 55db39db-d95c-42c5-abbd-b88eb99b83ec.

```
# odacli delete-network -i 55db39db-d95c-42c5-abbd-b88eb99b83ec
```

```
"jobId" : "c26d217e-419b-4a91-8680-7b06bcfe9828",
"status" : "Running",
"message" : null,
"reports" : [ {
     "taskId" : "TaskSequential_137",
     "taskName" : "deleting network",
     "taskResult" : "Running",
     "startTime" : "August 18, 2020 23:14:32 PM EDT",
     "endTime" : "August 18, 2020 23:14:32 PM EDT",
     "status" : "Running",
     "taskDescription" : null,
     "parentTaskId" : "TaskSequential_135",
     "jobId" : "c26d217e-419b-4a91-8680-7b06bcfe9828",
     "tags" : [ ],
     "reportLevel" : "Info",
     "updatedTime" : "August 18, 2020 23:14:32 PM EDT"
   },{
   "taskId" : "TaskZJsonRpcExt_142",
     "taskName" : "Setting up Network",
     "taskResult" : "Network setup success",
     "startTime" : "August 18, 2020 23:14:32 PM EDT",
     "endTime" : "August 18, 2020 23:14:32 PM EDT",
     "status" : "Success",
     "taskDescription" : null,
     "parentTaskId" : "TaskParallel_141",
     "jobId" : "c26d217e-419b-4a91-8680-7b06bcfe9828",
     "tags" : [ ],
     "reportLevel" : "Info",
     "updatedTime" : "August 18, 2020 23:14:32 PM EDT"   } ],
   "createTimestamp" : "August 18, 2020 23:14:32 PM EDT",
   "description" : "Network service delete",
   "updatedTime" : "August 18, 2020 23:14:32 PM EDT"
 }
```

odacli delete-networkinterface

Use the command `odacli delete-networkinterface` to delete a network interface on Oracle Database Appliance X8-2 hardware models.

File Path

`/opt/oracle/dcs/bin/odacli`

Syntax

To delete a network interface:

```
odacli  delete-networkinterface id [-h]
```

Parameters

Parameter	Description
`-`*`id`*	Defines the network interface name.
`--help`, `-h`	(Optional) Displays help for using the command.

Usage Notes

You cannot delete the network interface card in slot 7.

Example 16-9 Deleting a Network Interface

```
[root@oak ~]/opt/oracle/dcs/bin/odacli delete-networkinterface -m
btbond4
{
"jobId" : "a81066e2-417e-4df6-b810-08df24c646c1",
"status" : "Running",
"message" : null,
"reports" : ,
"createTimestamp" : "August 18, 2020 00:01:09 AM UTC",
"resourceList" : ,
"description" : "Network Interface Deletion with name btbond4",
"updatedTime" : "August 18, 2020 00:01:09 AM UTC"
}
```

Example 16-10 Deleting btbond1 Network Interface is Not Allowed

```
[root@oak ~]# /opt/oracle/dcs/bin/odacli delete-networkinterface -m
btbond1
DCS-10001:Internal error encountered: Delete operation is not allowed
on network interface : btbond1.
```

Example 16-11 Deleting Network Interface When Network Exists is Not Allowed

```
[root@oak ~]# opt/oracle/dcs/bin/odacli delete-networkinterface -m
btbond3
```

```
DCS-10001:Internal error encountered: Delete operation is not allowed
– networks {[Public-network]} found on interface btbond3. Pleae delete
the network first.
```

odacli describe-network

Use the `odacli describe-network` command to display the details of a specific network.

File Path

`/opt/oracle/dcs/bin/odacli`

Syntax

To display the details of a specific network:

```
 odacli  describe-network -i id [-j][-u][-h]
```

Parameters

Parameter	Description
`--id`, `-i`	Identifies the network ID. Use the `odacli list-networks` command to obtain the `id`.
`--json`, `-j`	(Optional) Displays JSON output.
`--help`, `-h`	(Optional) Displays help for using the command.
`--name`, `-m`	Specifies the network name.
`--nodeNumber`, `-u`	(Optional) Displays the network interface information for the specified node. **Note:** This option is deprecated and will be desupported in a future release.

Example 16-12 Displaying Network Details

Enter the following command to display the details of the public network:

```
# odacli describe-network -m Public-network

Network details
----------------------------------------------------------------
                     ID:  a11573f1-cad4-41fc-9dd0-3ba958b605f8
                   Name:  Public-network
                    NIC:  btbond1
         Interface Type:  BOND
            Subnet Mask:  255.255.255.0
                Gateway:  10.31.116.1
                VLAN ID:
                   Type:  Public
                Default:  true
                Created:  March 30, 2020 8:37:00 AM PDT
                Updated:  March 30, 2020 10:25:27 AM PDT
                 Status:  Configured
          Node Networks:  [IP Address on node0: 10.31.117.60, IP
Address on node1: 10.31.117.62]
              Scan Name:  scaoda1-scan
               Scan Ips:  10.31.117.64 10.31.117.65
                   Vips:  [scaoda1-vip on node0: 10.31.116.61, scaoda2-
vip on node1: 10.31.116.63]
   Associated Databases: odacn db122a db122b db122c db122d
```

Example 16-13 Displaying Network Details

Enter the following command to display the details of network ID 93c07043-3002-494a-8fa0-f3ae932fb4c5:

```
# odacli describe-network -i 93c07043-3002-494a-8fa0-f3ae932fb4c5 -u 1

Network details
----------------------------------------------------------------
                     ID:  93c07043-3002-494a-8fa0-f3ae932fb4c5
                   Name:  Private-network
                    NIC:  ibbond0
          InterfaceType:  BOND
             IP Address:  192.168.16.25
            Subnet Mask:  255.255.255.0
                Gateway:
                 VlanId:
                   Type:  Private
                Default:  false
                Created:  November 18, 2018 10:54:16 PM PST
```

odacli describe-networkinterface

Use the `odacli describe-networkinterface` command to display the details of any network interface.

File Path

`/opt/oracle/dcs/bin/odacli`

Syntax

To display the details of a specific network interface:

```
 odacli describe-networkinterface -i id [-j][-h][-u]
```

Parameters

Parameter	Description
`--id`, `-i`	Identifies the network interface ID. Use the `odacli list-networks` command to obtain the `id`.
`--json`, `-j`	(Optional) Displays JSON output.
`--help`, `-h`	(Optional) Displays help for using the command.

Parameter	Description
`--nodeNumber`, `-u`	(Optional) Displays the network interface information for the specified node. **Note:** This option is deprecated and will be desupported in a future release.

Usage Notes

By default, this command always displays the network interface description of the local node. To display the description of another node, specify the node number option (`-u`).

Example 16-14 Displaying Network Details

Enter the following command to display the details of network interface with ID fe1bf0a7-f56e-44cd-9a84-f374c0aa4b61:

```
# /opt/oracle/dcs/bin/odacli describe-networkinterface
-i fe1bf0a7-f56e-44cd-9a84-f374c0aa4b61 -u 1

Network Interface details
----------------------------------------------------------------
                    ID:  fe1bf0a7-f56e-44cd-9a84-f374c0aa4b61
                  Name:  eth2
                   NIC:  eth2
                  Type:  PHYSICAL
               Members:  eth2
       Slave Interface:  true
               Created:  October 16, 2018 1:16:59 PM PDT
```

odacli list-networks

Use the `odacli list-networks` command to display networks.

File Path

`/opt/oracle/dcs/bin/odacli`

Syntax

```
 odacli list-networks  [-j] [-h]
```

Parameters

Parameter	Description
`--json`, `-j`	(Optional) Displays JSON output.
`--help`, `-h`	(Optional) Displays help for using the command.
`--nodeNumber`, `-u`	(Optional) Displays the network interface information for the specified node. **Note:** This option is deprecated and will be desupported in a future release.

Example 16-15 Displaying a List of Networks

Use the `odacli list-networks` command to display a list of networks:

```
# odacli list-networks
ID Name NIC Interface Type Subnet Mask Gateway VLAN ID Node Networks
-------------------------------------- --------------------
------------ -------------- ------------------ ------------------
-------- ----------------------
30012eeb-1205-4cb6-9fc0-488972b2e420 Private-network priv0 INTERNAL
255.255.255.240 [IP Address on node0: 192.168.16.24]
75d01d4f-e940-4d0f-a4fe-ee04f5a90c73 Public-network btbond1.370 VLAN
255.255.255.0 10.209.10.241 370 [IP Address on node0: 10.209.10.244]
```

odacli list-networkinterfaces

Use the `odacli list-networkinterfaces` command to display network interfaces.

File Path

`/opt/oracle/dcs/bin/odacli`

Syntax

```
odacli list-networkinterfaces  [-j] [-h] [-u]
```

Parameters

Parameter	Description
`--json`, `-j`	(Optional) Displays JSON output.
`--help`, `-h`	(Optional) Displays help for using the command.
`--nodeNumber`, `-u`	(Optional) Displays the network interface information for the specified node. **Note:** This option is deprecated and will be desupported in a future release.

Example 16-16 Displaying a List of Network Interfaces

Use the `odacli list-networkinterfaces` command to display a list of network interfaces:

```
# odacli list-networkinterfaces -u 1
ID                                        Name
NIC            Type
---------------------------------------- --------------------
d5907a23-1c5d-48c7-8d47-2c188ed43ddd     bond0
bond0          BOND
4f7ea558-9a43-42a9-8e08-6bfdf3a33229     bond1
bond1          BOND
743ced8d-bbe5-4987-b316-5fdf95d5e60b     eth0
eth0           PHYSICAL
a4121f9e-e694-4852-a521-44efc6ef3fde     eth1
```

```
eth1          PHYSICAL
c62c5f04-aa93-4783-a3a7-275bf9fab2d9     eth2
eth2          PHYSICAL
bda21dad-5c1c-4073-89e5-798b8fce8533     eth3
eth3          PHYSICAL
0141f1ac-5c34-4393-8b99-76094b6f795c     ib0
ib0           PHYSICAL
e8cb138a-087f-4739-bb8d-90b1d903aeb6     ib1
ib1           PHYSICAL
a31cfd63-fb90-4cbb-a2fb-382c5e33983b     ibbond0
ibbond0       BOND
```

odacli update-network

Use the `odacli update-network` command to update an existing network configuration.

File Path

`$ORACLE_HOME/opt/oracle/dcs/bin/odacli`

Syntax

To update a network:

```
odacli  update-network -i id [-p IP address] [-w [Public|Dataguard|
Backup|Other]] [-s  network subnet mask] [-g network gateway] [-sip]
[-sn] [-vs]
[-j] [-h]
```

Parameters

Parameter	Description
`--id`, `-i`	Defines the network identity.
`--gateway`, `-g`	(Optional) Defines the network gateway.
`--ipaddress`, `-p`	(Optional) Defines the network IP address. This can be specified in the format IPAddress or nodeNumber0:IPAddress0,nodeNumber1:IPAddress1,...
`--json`, `-j`	(Optional) Displays JSON output.
`--networktype`, `-w` [Public|Dataguard|Backup|Other]	(Optional) Defines the type of network.
`--scanips`, `-sip`	Defines the SCAN IP addresses (in the format scanip0,scanip1,...)
`--scanname`, `-sn`	Defines the SCAN name.
`--subnetmask`, `-s`	(Optional) Defines the Network Subnet Mask.
`--vips`, `-vs`	List of virtual IP addresses. They can be specified in the format vipname0:nodeNumber0:vip0,vipname1:nodenumber1:vip1,...
`--help`,`-h`	(Optional) Displays help for using the command.

Usage Notes

- You cannot modify the Public and Private-interfaces after the system is deployed.
- On Oracle Database Appliance non-High Availability systems, you cannot update Virtual IP addresses. The Virtual IP address is set to the same value as the IP address.
- Single Client Access Name (SCAN) cannot be set up on Oracle Database Appliance non-High Availability systems.
- On Oracle Database Appliance High Availability systems, you cannot update network of type Database to other types of network (such as backup, management and so on). You can, however, update IP address, Virtual IP address, Gateway, and Subnet mask for all network types.
- The system has both SFP+ and 10GBaseT bonded pairs, which means that one of them is used for the public, and you can configure the other after deployment if you want additional connectivity. For example, if you want a backup network.

Example 16-17 Updating a Network

The following example updates network ID `192.0.0.2` and designates the network as a backup network:

```
# odacli update-network -i 192.0.0.2 -w Backup
```

odacli Apply Patch and Update Commands

Use the commands `odacli update` and `apply patch` to apply patches and update the appliance.

- odacli cleanup-patchrepo
  Use the `odacli cleanup-patchrepo` command to delete obsolete or old patches from the repository.
- odacli create-prepatchreport
  Use the `odacli create-prepatchreport` command to run pre-checks for patching.
- odacli delete-agentconfig-parameters
  Use the `odacli delete-agentconfig-parameters` command to delete configuration variables used by the appliance.
- odacli delete-prepatchreport
  Use the `odacli delete-prepatchreport` command to delete any pre-check report.
- odacli describe-component
  Use the `odacli describe-component` command to display the installed version and the latest available version for each component.
- odacli describe-latestpatch
  Use the `odacli describe-latestpatch` command to display a list of the latest supported patch versions for each component.
- odacli describe-prepatchreport
  Use the `odacli describe-prepatchreport` command to display the pre-check report, with a list of pre-checks run with status and comments.

- odacli list-agentconfig-parameters
  Use the `odacli list-agentconfig-parameters` command to list configuration variables used by the appliance.
- odacli list-availablepatches
  Use the `odacli list-availablepatches` command to display all available patches for Oracle Database Appliance.
- odacli list-prepatchreports
  Use the `odacli list-prepatchreports` command to display all pre-check reports, with a list of pre-checks run with status and comments.
- odacli update-agentconfig-parameters
  Use the `odacli update-agentconfig-parameters` command to modify configuration variables used by the appliance.
- odacli update-dbhome
  Use the `odacli update-dbhome` command to update a specific RDBMS Home to the latest patch bundle version.
- odacli update-dcsadmin
  Use the `odacli update-dcsadmin` command to update the DCS admin components for Zookeeper upgrade.
- odacli update-dcsagent
  Use the `odacli update-dcsagent` command to update the agent.
- odacli update-dcscomponents
  Use the `odacli update-dcscomponents` command to update the DCS components such as the DCS agent and Zookeeper.
- odacli update-registry
  Use the `odacli update-registry` command to update the registry of components when you apply patches manually.
- odacli update-repository
  Use the `odacli update-repository` command to update the repository with the new Oracle Database Appliance software.
- odacli update-server
  Use the `odacli update-server` command to update the operating system, firmware, Oracle Appliance Kit, Oracle Clusterware, and all other infrastructure components.
- odacli update-storage
  Use the `odacli update-storage` command to update the storage.
- odaadmcli orachk
  Use the `odaadmcli orachk` command to check configuration settings for Oracle Database Appliance components.

odacli cleanup-patchrepo

Use the `odacli cleanup-patchrepo` command to delete obsolete or old patches from the repository.

File Path

```
$ORACLE_HOME/opt/oracle/dcs/bin/odacli
```

Syntax

```
odacli cleanup-patchrepo [-cl clones] | [-v version [-comp component]]|
[-l local|-n NodeID]
```

Parameters

Parameter	Description
`--clones, -cl`	Specifies the option to clean up clone files (DB and GI) from the repository `/opt/oracle/oak/pkgrepos/orapkgs/clones/`.
`--version, -v`	Defines the Oracle Database Appliance release you want to delete. For example, 12.2.1.4.0.
`--component, -comp`	A comma-separated list of components as `{DB,GI}` to cleanup for a specific Oracle Database Appliance patch version. The default is both `{DB,GI}`.
`--local, -l`	(Optional) Cleans up the repository on the local node.
`--node, -n`	(Optional) Cleans up the repository on the specified nodes.
`--help, -h`	(Optional) Displays help for using the command.
`--json, -j`	(Optional) Displays JSON output.

Usage Notes

- Use the command to free up space in the patch repository.
- This command does not delete the current patches or latest installed patch repository.

Example 16-18 Deleting RDBMS and GI components for a specific release

```
# odacli cleanup-patchrepo -cl -comp db,gi -v 12.2.1.4.0
{
"jobId" : "d915ffc0-c7f6-49cf-8ddd-ab5d2ad9072f",
"status" : "Created",
"message" : null,
"reports" : ,
"createTimestamp" : "April 17, 2019 06:44:28 AM UTC",
"resourceList" : ,
"description" : "Cleanup patchrepos",
"updatedTime" : "April 17, 2019 06:44:28 AM UTC"
```

Example 16-19 Deleting Clone Files

```
# odacli cleanup-patchrepo -cl
{
"jobId" : "5d8549a2-1a5e-4b4f-9867-c1f671c659c4",
"status" : "Created",
"message" : null,
"reports" : ,
"createTimestamp" : "April 17, 2019 06:43:45 AM UTC",
"resourceList" : ,
"description" : "Cleanup patchrepos",
"updatedTime" : "April 17, 2019 06:43:45 AM UTC"
}
```

odacli create-prepatchreport

Use the `odacli create-prepatchreport` command to run pre-checks for patching.

Patching pre-checks help identify and remedy any problems before patching is attempted, and ensure all components are ready for updates.

File Path

`/opt/oracle/dcs/bin/odacli`

Syntax

```
odacli create-prepatchreport [-d] [-i] [-f] [-l] [-n] [-v] [-h] [-s]
[-r] [-st] [-sko] [-c os [-local]]
```

Parameters

Parameter	Description
`--dbhome`, `–d`	(Optional) Specifies the database home component for running the pre-checks.
`--dbhomeid`, `–i`	(Optional) Specifies the IDs of the database homes for running the pre-checks.
`--files`, `-f`	(Optional) Specifies files required to update repository, comma-separated if multiple files are required.
`--help`, `-h`	(Optional) Displays help for using the command.
`--json`, `-j`	(Optional) Displays JSON output. The default is false.
`--local`, `-l`	(Optional) Runs patch pre-checks only on the local node.
`--operating-system`, `-os`	(Optional) Specifies the operating system components. Use this option to run operating system upgrade. If you specify `-c`, then the only option is `os`. If you specify `-c os`, then you can also specify `-local` (optional).
`--node`, `–n`	(Optional) Runs patch pre-checks on specified nodes.
`--repo`, `–r`	(Optional) Specify this option to run the patch pre-checks for the repository components.
`--server`, `–s`	(Optional) Specify this option to run the patch pre-checks for the server components.
`--storage`, `–st`	(Optional) Specify this option to run the patch pre-checks for the storage components.
`--version`, `–v`	(Optional) Specifies the version for running the pre-checks.
`--skip-orachk`, `–sko`	(Optional) Specifies whether you want to skip ORAchk validations.

Usage Notes

Use the `odacli create-prepatchreport` command to generate a pre-check report. Use the `--node` or `--local` option to run the patch pre-checks on specific nodes or the local node.

Example 16-20 Creating Pre-Check Report

```
# odacli create-prepatchreport -v 19.9.0.0.0 -s

Job details
----------------------------------------------------------------
                     ID: e07993d5-0a06-44e7-819a-36d708c52bb6
            Description: Patch pre-checks for [OS, ILOM, GI,
ORACHKSERVER]
                 Status: Created
                Created: April 20, 2020 1:01:59 AM PDT
                Message: Use 'odacli describe-prepatchreport -i
e07993d5-0a06-44e7-819a-36d708c52bb6' to check details of results

Task Name Start Time End Time Status
----------------------------------------
----------------------------------- -----------------------------
```

odacli delete-agentconfig-parameters

Use the `odacli delete-agentconfig-parameters` command to delete configuration variables used by the appliance.

File Path

`/opt/oracle/dcs/bin/odacli`

Syntax

```
odacli delete-agentconfig-parameters
```

Parameters

Parameter	Description
`--help`, `-h`	(Optional) Displays help for using the command.
`--json`, `-j`	(Optional) Displays JSON output. The default is false.
`--name`, `-n`	Specifies the name of the parameter.
`--type`, `-t`	(Optional) Deletes the configuration value for the given type. The default value is PUBLIC.

Usage Notes

Use the `odacli delete-agentconfig-parameters` command to delete configuration values. For High-Availability models, the command deletes the parameter values on both nodes in the cluster.

Example 16-21   Deleting configuration parameters

```
# odacli delete-agentconfig-parameters -n HttpProxyHost

Job details
----------------------------------------------------------------
                     ID:  c6e123c6-1b76-48f8-973d-63c8dab65545
            Description:  delete configuration parameter HttpProxyHost
                 Status:  Running
                Created:  August 18, 2020 9:45:39 AM PDT
                Message:
Task Name                                 Start
Time                           End Time
Status
----------------------------------------
----------------------------------- -----------------------------------
----------
```

odacli delete-prepatchreport

Use the `odacli delete-prepatchreport` command to delete any pre-check report.

File Path

`/opt/oracle/dcs/bin/odacli`

Syntax

```
odacli delete-prepatchreport -i Report ID
```

Parameters

Parameter	Description
Report ID	Describes the ID of the report to be deleted.
`--help`, `-h`	(Optional) Displays help for using the command.

Usage Notes

Use the `odacli delete-prepatchreport` command to delete pre-check reports.

Example 16-22   Deleting A Patch Pre-Checks Report

```
# odacli delete-prepatchreport -i 741f635b-7c75-4832-8813-782367f1e6fd
```

odacli describe-component

Use the `odacli describe-component` command to display the installed version and the latest available version for each component.

If there are multiple DB Homes installed in Oracle Database Appliance, then the output displays the version details for each of the installed homes. You can use this command to check the component version after applying a patch.

File Path

```
/opt/oracle/dcs/bin/odacli
```

Syntax

```
odacli describe-component [-d][-j][-h][-s][-v][-l][-n]
```

Parameters

Parameter	Description
`--dbhomes, –d`	(Optional) Lists the database home versions and available versions.
`--help, -h`	(Optional) Displays help for using the command.
`--json, -j`	(Optional) Displays JSON output. The default is false.
`--local, -l`	(Optional) Describes the components for the local node. Use to display details on the local node of multi-node high availability (HA) systems. This option is not needed to display component details on single-node systems.
`--node, –n`	(Optional) Describes the components for a specific node on high availability (HA) systems. This option is not needed to display component details on single node systems. {0|1}
`--server, –s`	(Optional) Lists the server components and versions and the available versions to which you can patch them.
`--systemversion, –v`	(Optional) Displays only the system version. This option is available only on high-availability systems.

Usage Notes

Use the `odacli describe-component` command to get component details. On a multi-node environment, the command provides details across all nodes. Use the `--node` or `--local` option to get component details for a specific node.

Example 16-23 Displaying Patch Details for Components for High-Availability Oracle Database Appliance Systems for a Release

```
# /opt/oracle/dcs/bin/odacli describe-component -v
System Version
---------------
18.8.0.0.0

System node Name
---------------
```

```
node1

Local System Version
---------------
18.8.0.0.0

Component                                Installed Version    Available
Version
---------------------------------------- --------------------
--------------------
OAK                                       18.8.0.0.0            up-to-
date

GI                                        18.8.0.0.191015       up-to-
date

DB                                        18.8.0.0.191015       up-to-
date

DCSAGENT                                  18.8.0.0.0            up-to-
date

ILOM                                      4.0.4.41.r130359      up-to-
date

BIOS                                      25080100              up-to-
date

OS                                        6.10                  up-to-
date

FIRMWARECONTROLLER                        11.05.03.00           up-to-
date

FIRMWAREEXPANDER                          0018                  001e

FIRMWAREDISK {
[ c0d0,c0d1 ]                             A7E0                  up-to-
date
[ c1d0,c1d1,c1d2,c1d3,c1d4,c1d5,c1d6,     A72A                  a7e0
c1d7,c1d8,c1d9,c1d10,c1d11,c1d12,c1d13,
c1d14,c1d15,c1d16,c1d17,c1d18,c1d19,
c2d0,c2d1,c2d2,c2d3,c2d4,c2d5,c2d6,c2d7,
c2d8,c2d9,c2d10,c2d11,c2d12,c2d13,c2d14,
c2d15,c2d16,c2d17,c2d18,c2d19 ]
[ c1d20,c1d21,c1d22,c2d20,c2d21,c2d22 ]   944A                  up-to-
date
}

System node Name
---------------
node2

Local System Version
---------------
```

```
18.8.0.0.0

Component                                Installed Version    Available
Version
---------------------------------------- --------------------
--------------------
OAK                                       18.8.0.0.0            up-to-
date

GI                                        18.8.0.0.191015       up-to-
date

DB                                        18.8.0.0.191015       up-to-
date

DCSAGENT                                  18.8.0.0.0            up-to-
date

ILOM                                      4.0.2.27.b.r125869
4.0.4.41.r130359

BIOS                                      25060400              25080100

OS                                        6.10                  up-to-
date

FIRMWARECONTROLLER                        11.05.03.00           up-to-
date

FIRMWAREEXPANDER                          0018                  001e

FIRMWAREDISK {
[ c0d0,c0d1 ]                             A7E0                  up-to-
date
[ c1d0,c1d1,c1d2,c1d3,c1d4,c1d5,c1d6,     A72A                  a7e0
c1d7,c1d8,c1d9,c1d10,c1d11,c1d12,c1d13,
c1d14,c1d15,c1d16,c1d17,c1d18,c1d19,
c2d0,c2d1,c2d2,c2d3,c2d4,c2d5,c2d6,c2d7,
c2d8,c2d9,c2d10,c2d11,c2d12,c2d13,c2d14,
c2d15,c2d16,c2d17,c2d18,c2d19 ]
[ c1d20,c1d21,c1d22,c2d20,c2d21,c2d22 ]   944A                  up-to-
date
}
```

Example 16-24   List DB Home Details

```
# odacli describe-component -d

System Version
---------------
18.7.0.0.0

System node Name
---------------
```

```
node1

Local System Version
---------------
18.7.0.0.0

Component                                Installed Version    Available
Version
---------------------------------------- --------------------
--------------------
DB                                        12.2.0.1.190716       up-to-
date

System node Name
---------------
node2

Local System Version
---------------
18.7.0.0.0

Component                                Installed Version    Available
Version
---------------------------------------- --------------------
--------------------
DB                                        12.2.0.1.190716       up-to-
date
```

Example 16-25   List the Server Components and Versions

```
# odacli describe-component -s
System Version
---------------
18.7.0.0.0

System node Name
---------------
node1

Local System Version
---------------
18.7.0.0.0

Component                                Installed Version    Available
Version
---------------------------------------- --------------------
--------------------
OAK                                       18.7.0.0.0            up-to-
date

GI                                        18.7.0.0.190716       up-to-
date

ILOM                                      4.0.4.38.r130206      up-to-
```

```
date

BIOS                                      52010400              up-to-
date

OS                                        6.10                  up-to-
date

System node Name
---------------
node2

Local System Version
---------------
18.7.0.0.0

Component                                Installed Version    Available
Version
---------------------------------------- --------------------
--------------------
OAK                                       18.7.0.0.0            up-to-
date

GI                                        18.7.0.0.190716       up-to-
date

ILOM                                      4.0.4.38.r130206      up-to-
date

BIOS                                      52010400              up-to-
date

OS                                        6.10                  up-to-
date
```

odacli describe-latestpatch

Use the `odacli describe-latestpatch` command to display a list of the latest supported patch versions for each component.

File Path

$ORACLE_HOME`/opt/oracle/dcs/bin/odacli`

Syntax

```
odacli describe-latestpatch [-h]
```

Parameters

Parameter	Description
`--help`, `-h`	(Optional) Displays help for using the command.

Parameter	Description
`--json, -j`	(Optional) Displays JSON output. The default is false.

Example 16-26   Listing the Latest Supported Versions

```
#  odacli describe-latestpatch

omponentType   availableVersion
--------------- --------------------
gi              18.7.0.0.190716
db              18.7.0.0.190716
db              12.2.0.1.190716
db              12.1.0.2.190716
db              11.2.0.4.190716
oak             18.7.0.0.0
asr             18.3.1
ilom            3.0.16.22.f.r100119
ilom            4.0.2.31.r126282
ilom            4.0.4.41.r130359
ilom            4.0.4.37.r130617
ilom            4.0.0.24.r121140
ilom            4.0.4.40.r130348
ilom            4.0.4.38.r130206
os              6.10
bios            17140300
bios            30150300
bios            25080100
bios            41060300
bios            38130200
bios            39090000
bios            52010400
firmwareexpander 0342
firmwareexpander 001e
firmwareexpander 0306
firmwaredisk    a901
firmwaredisk    0r3q
firmwaredisk    a29a
firmwarecontroller 11.05.03.00
firmwarecontroller qdv1rf30
firmwarecontroller vdv1ry03
firmwarecontroller 20.08.01.14
firmwarecontroller 2.11.1280
firmwarecontroller 13.00.00.00
firmwarecontroller 4.650.00-7176
firmwarecontroller kpyair3q
dcsagent        18.7.0.0.0
firmwaredisk    a7e0
firmwaredisk    a4c0
firmwaredisk    a72a
firmwaredisk    a880
firmwaredisk    a122
firmwaredisk    a38k
firmwaredisk    c122
firmwaredisk    944a
firmwaredisk    9440
firmwaredisk    e12b
firmwaredisk    5g08
firmwaredisk    a902
firmwaredisk    a140
firmwaredisk    sa03
firmwaredisk    0b25
firmwaredisk    sf04
firmwaredisk    c38k
firmwaredisk    a3a0
firmwaredisk    pd51
firmwaredisk    m554
firmwaredisk    0121
firmwaredisk    xc311102
```

odacli describe-prepatchreport

Use the `odacli describe-prepatchreport` command to display the pre-check report, with a list of pre-checks run with status and comments.

Patching pre-checks help identify and remedy any problems before attempting to patch, and ensure all components are ready for updates.

File Path

$ORACLE_HOME`/opt/oracle/dcs/bin/odacli`

Syntax

```
odacli describe-prepatchreport -i
```

Parameters

Parameter	Description
`--help`, `-h`	(Optional) Displays help for using the command.
`--json`, `-j`	(Optional) Displays JSON output. The default is false.
`--jobid`, `-i`	Specifies the Job ID for the pre-check report.

Usage Notes

Use the `odacli describe-prepatchreport` command to display the pre-check report.

Example 16-27   Displaying the Patch Pre-Checks Report

```
# odacli describe-prepatchreport -i e07993d5-0a06-44e7-819a-36d708c52bb6

Patch pre-check report
------------------------------------------------------------------------
                 Job ID:  e07993d5-0a06-44e7-819a-36d708c52bb6
            Description:  Patch pre-checks for [OS, ILOM, GI,
ORACHKSERVER]
                 Status:  FAILED
                Created:  April 20, 2020 1:01:59 AM PDT
                 Result:  One or more pre-checks failed for [OS, ORACHK]

Node Name
---------------
node1

Pre-Check                      Status
Comments
------------------------------ --------
--------------------------------------
__OS__
Validate supported versions     Success   Validated minimum supported
versions.
Validate patching tag           Success   Validated patching tag:
19.6.0.0.0.
Is patch location available     Success   Patch location is
available.
Validate if ODABR is installed  Failed    ODABR utility is not
installed on
                                          node:
scaoda8m004.
Space checks for OS upgrade     Success   Validated space
checks.
Install OS upgrade software     Success   Extracted OS upgrade patches
into
                                          /root/oda-upgrade. Do not
remove this
                                          directory untill OS upgrade
completes.
Verify OS upgrade by running    Success   Results stored
in:
preupgrade checks                         '/root/preupgrade-
results/

preupg_results-200420010731.tar.gz' .
                                          Read complete report
file
                                          '/root/preupgrade/
result.html' before
                                          attempting OS
upgrade.
Validate custom rpms installed  Success   No additional RPMs found
installed on

node:scaoda8m004.
Scheduled jobs check            Failed    Scheduled jobs found.
Disable
                                          scheduled jobs before
attempting OS
                                          upgrade.
__ILOM__
Validate supported versions     Success   Validated minimum supported
```

```
versions.
Validate patching tag           Success   Validated patching tag:
19.6.0.0.0.
Is patch location available     Success   Patch location is
available.
Checking Ilom patch Version     Success   Successfully verified the
versions
Patch location validation       Success   Successfully validated
location

__GI__
Validate supported GI versions  Success   Validated minimum supported
versions.
Validate available space        Success   Validated free space
under /u01
Verify DB Home versions         Success   Verified DB Home
versions
Validate patching locks         Success   Validated patching
locks
Validate clones location exist  Success   Validated clones
location
Validate ODABR snapshots exist  Success   No ODABR snaps found on the
node.

__ORACHK__
Running orachk                  Failed    Orachk validation
failed: .
Verify diagsnap configuration   Failed    diagsnap or pstack are
configured to
                                          collect first failure
diagnostic
Software home                   Failed    Software home check
failed
```

Example 16-28 Example of a Successful Patch Pre-Checks Report

```
# odacli describe-prepatchreport -i aec9373c-96aa-43ce-9aae-8091ec9cd4eb
Patch pre-check report
----------------------------------------------------------------
                 Job ID:  aec9373c-96aa-43ce-9aae-8091ec9cd4eb
            Description:  Pre-Check report for patching [DB]
                 Status:  COMPLETED
                 Result:  All pre-checks succeeded
Node Name
---------------
node1
Pre-Check                      Status
Comments
------------------------------ ----------
-----------------------------------
__DB__
Validate patching tag           Success     Validated patching tag:
12.2.1.2.0
```

```
Validate available space        Success     Validated free space
required

under /u01
Is system provisioned           Success     Verified system is
provisioned
Is patch location available     Success     Patch location is
available
Validate minimum agent version  Success     Validated minimum agent
version
Verify DBHome patch tag         Success     Verified DB Home patch
tag
Is GI upgraded                  Success     Validated GI is
upgraded
Patch location validation       Success     Successfully validated
location
Patch verification              Success     Patch 26710464 not applied
on DB

home
Is patch rollback required      Success     No DB patch is required to
rollback
Opatch updation                 Success     Successfully updated the
opatch in

DbHome
Patch conflict check            Success     No patch conflicts found on
DBHome
```

odacli list-agentconfig-parameters

Use the `odacli list-agentconfig-parameters` command to list configuration variables used by the appliance.

File Path

`/opt/oracle/dcs/bin/odacli`

Syntax

```
odacli list-agentconfig-parameters [-h] [-j] [-n] [-t]
```

Parameters

Parameter	Description
`--help`, `-h`	(Optional) Displays help for using the command.
`--json`, `-j`	(Optional) Displays JSON output. The default is false.
`--name`, `-n`	Specifies the name of the parameter.

Parameter	Description
--type, -t	(Optional) Specifies the configuration value for the given type. The default value is PUBLIC.

Usage Notes

Use the `odacli list-agentconfig-parameters` command to list configuration variables used by the appliance.

Example 16-29 Displaying the HttpProxyPort

```
./odacli list-agentconfig-parameters -n HttpProxyPort

Name       Value      Description
Updated
------------------------------------------------------
HttpProxyPort  Http proxy server port    August 18, 2020 4:14:10 AM
UTC
```

Example 16-30 Displaying the agent configuration

```
# odacli list-agentconfig-parameters

Name           Value     Description
Updated
------------------------------
-----------------------------------------------------------------
HttpProxyHost   Http proxy server host  August 18, 2020 4:14:10 AM
UTC
HttpProxyPort   Http proxy server port   August 18, 2020 4:14:10 AM
UTC
HttpsProxyHost   Https proxy server host  August 18, 2020 4:14:10 AM
UTC
HttpsProxyPort  Https proxy server port  August 18, 2020 4:14:10 AM
UTC
```

Related Topics

- Configuring Agent Proxy Settings for Object Store Access
  If the Object Store IP address is accessible only through proxy setup by the Oracle Database Appliance server, then define the proxy setting for the agent, so that the agent can access the Object Store.

odacli list-availablepatches

Use the `odacli list-availablepatches` command to display all available patches for Oracle Database Appliance.

File Path

$ORACLE_HOME/opt/oracle/dcs/bin/odacli

Syntax

```
odacli list-availablepatches [-h] [-j]
```

Parameters

Parameter	Description
`--help`, `-h`	(Optional) Displays help for using the command.
`--json`, `-j`	(Optional) Displays JSON output. The default is false.

Usage Notes

Use the `odacli list-availablepatches` command to display all available patches for Oracle Database Appliance.

Example 16-31 Displaying All Patch Pre-Checks Reports

```
# odacli list-availablepatches
latest Patch Version
--------------------
18.3.0.0.0

Available Patches    Db Version
-------------------- --------------------
18.3.0.0.0           12.2.0.1.180717, 12.1.0.2.180717, 11.2.0.4.180717
```

odacli list-prepatchreports

Use the `odacli list-prepatchreports` command to display all pre-check reports, with a list of pre-checks run with status and comments.

Patching pre-checks help identify and remedy any problems before attempting to patch, and ensure all components are ready for updates.

File Path

/opt/oracle/dcs/bin/odacli

Syntax

```
odacli list-prepatchreports [-h] [-j]
```

Parameters

Parameter	Description
`--help`, `-h`	(Optional) Displays help for using the command.

Parameter	Description
`--json`, `-j`	(Optional) Displays JSON output. The default is false.

Usage Notes

Use the `odacli list-prepatchreports` command to display all pre-check reports.

Example 16-32 Displaying All Patch Pre-Checks Reports

```
# odacli list-prepatchreports
ID   Description  Created                            Status

------------- ----------------------------------- ----------

8a8a14b5-1b5e-4eeb-8ba9-c8136fb4eea1     Patch pre-checks for [DB]: 
DbHome is OraDB12102_home1 
May 16, 2018 7:00:56 PM PDT         Running

2c9a747d-a452-4e48-bcab-9c7cd9f5f35b     Patch pre-checks for 
[STORAGE]
May 16, 2018 6:53:23 PM PDT         Success

f3b9c7c1-3061-4577-848d-645669d71f72     Patch pre-checks for [OS, 
ILOM, GI]
May 16, 2018 7:00:56 PM PDT         Running
```

odacli update-agentconfig-parameters

Use the `odacli update-agentconfig-parameters` command to modify configuration variables used by the appliance.

File Path

`/opt/oracle/dcs/bin/odacli`

Syntax

```
odacli update-agentconfig-parameters
```

Parameters

Parameter	Description
`--help`, `-h`	(Optional) Displays help for using the command.
`--append`, `-a`	(Optional) Appends the parameter values. For example, `-n p1 -v v1 -n p2 -v v2 -a`.
`--comment`, `-c`	(Optional) Specifies the comment for the parameter.

Parameter	Description
`--description`, `-d`	(Optional) Specifies the description of the parameter.
`--json`, `-j`	(Optional) Displays JSON output. The default is false.
`--name`, `-n`	Specifies the name of the parameter. Provide multiple parameter values in the format `-n p1 -v v1 -n p2 -v v2`.
`--reset`, `-r`	Resets the parameter to the default value. For example: `-n p1 -n p2 -r`.
`--update`, `-u`	Replaces the parameter with the specified value. For example: `-n p1 -v v1 -n p2 -v v2 -u`.
`--value`, `-v`	Specifies the value of the parameter. Provide multiple parameter values in the format `-n p1 -v v1 -n p2 -v v2`.
`--type`, `-t`	(Optiona) Specifies the type of the parameter. The default is `PUBLIC`.

Usage Notes

Use the `odacli update-agentconfig-parameters` command to modify configuration variables used by the appliance. The supported configuration parameters are `HttpsProxyHost` and `HttpsProxyPort`.

Multiple values can be specified. For High-Availability models, the command sets the parameter values on both nodes in the cluster.

Example 16-33 Setting Multiple Parameters

```
# odacli update-agentconfig-parameters -n HttpsProxyPort -v 80 -d "Http
proxy port"
-n HttpsProxyPort -v 80 -d "Https proxy port" -u

update-agentconfig-parameters -n HttpsProxyPort -n HttpProxyPort -r

update-agentconfig-parameters -n HttpsProxyHost -v 90 -a

update-agentconfig-parameters -n OSPatchRepos -v
```

Related Topics

- Configuring Agent Proxy Settings for Object Store Access
  If the Object Store IP address is accessible only through proxy setup by the Oracle Database Appliance server, then define the proxy setting for the agent, so that the agent can access the Object Store.

odacli update-dbhome

Use the `odacli update-dbhome` command to update a specific RDBMS Home to the latest patch bundle version.

File Path

```
/opt/oracle/dcs/bin/odacli
```

Syntax

```
odacli update-dbhome -i dbhomeid -v version [-j] [-h] [-v]
```

Parameters

Parameter	Description
`--dbhomeid`, `-i`	Defines the Oracle Database Home to update.
`--help-h`	(Optional) Displays help for using the command.
`--json`, `-j`	(Optional) Displays JSON output. The default is false.
`--precheck`, `–p`	Analyzes the patch.
`--version`, `-v`	Defines the Oracle Database Appliance version to update. For example, 12.2.1.1.

Usage Notes

- The `update-dbhome` command applies the latest release update (RU) for Oracle Database home.
- To be updated with the latest patches, the database must be running.
- Only databases in the `Configured` status are updated. Use the `odacli list-database` command to see a list of configured databases. Databases in any other status are skipped during the update.

Example 16-34 Updating an Oracle Database Home

To apply the latest patch bundle to update an Oracle Database:

```
# odacli update-dbhome -i ad6c7326-e460-411e-94df-230dedbef743 -v
19.9.0.0.0
```

odacli update-dcsadmin

Use the `odacli update-dcsadmin` command to update the DCS admin components for Zookeeper upgrade.

File Path

```
$ORACLE_HOME/opt/oracle/dcs/bin/odacli
```

Syntax

```
odacli update-dcsadmin  -v version  [-j] [-h]
```

Parameters

Parameter	Description
`--version, -v`	Defines the Oracle Database Appliance version after update.
`--help, -h`	(Optional) Displays help for using the command.
`--json, -j`	(Optional) Displays JSON output.

Usage Notes

The `update-dcsadmin` command sets up the `dcsadmin` and other components. Run the `update-dcsadmin` command only after you update the DCS agent.

Example 16-35 Updating DCS Admin

```
# odacli update-dcsadmin -v 18.7.0.0.0
{
  "jobId" : "4c238b93-e641-4f9d-9f86-93d0574dd234",
  "status" : "Created",
  "message" : null,
  "reports" : [ ],
  "createTimestamp" : "July 12, 2019 03:11:53 AM UTC",
  "resourceList" : [ ],
  "description" : "DcsAdmin patching",
  "updatedTime" : "July 12, 2019 03:11:53 AM UTC"
}
```

odacli update-dcsagent

Use the `odacli update-dcsagent` command to update the agent.

File Path

$ORACLE_HOME`/opt/oracle/dcs/bin/odacli`

Syntax

```
odacli update-dcsagent  -v version  [-j] [-h]
```

Parameters

Parameter	Description
`--version, -v`	Defines the Oracle Database Appliance version after update.
`--help, -h`	(Optional) Displays help for using the command.

Parameter	Description
`--json, -j`	(Optional) Displays JSON output.

Usage Notes

The `update dcsagent` command updates the `dcs-agent` to the RPM package that is located in the *location* and restarts the `dcs-agent`. After the update is applied, the agent automatically restarts. It will take a few minutes to reconnect to the `dcs-agent`. Wait until the agent shuts down and completes restarting before performing any tasks.

> **Note:**
>
> Before updating the agent, ensure that you do not have any jobs running or pending during the update window.

Example 16-36 Updating the Agent

To update the `dcs-agent` to version 19.9:

```
# odacli update-dcsagent -v 19.9
{
  "jobId" : "77e454d3-eb68-4130-a247-7633f8d6192b",
  "status" : "Created",
  "message" : null,
  "reports" : [ ],
  "createTimestamp" : "August 18, 2020 14:09:24 PM CST",
  "description" : "DcsAgent patching",
  "updatedTime" : "August 18, 2020 14:09:24 PM CST"
}
```

odacli update-dcscomponents

Use the `odacli update-dcscomponents` command to update the DCS components such as the DCS agent and Zookeeper.

File Path

$ORACLE_HOME`/opt/oracle/dcs/bin/odacli`

Syntax

```
  odacli update-dcscomponents  -v version  [-j] [-h]
```

Parameters

Parameter	Description
`--version, -v`	Defines the Oracle Database Appliance version after update.

Parameter	Description
`--help`, `-h`	(Optional) Displays help for using the command.
`--json`, `-j`	(Optional) Displays JSON output.

Usage Notes

The `update-dcscomponents` command sets up the `dcscomponents` such as Zookeeper.

Example 16-37 Updating DCS Components

```
# odacli update-dcscomponents -v 18.7.0.0.0
{
  "jobId" : "4c238b93-e641-4f9d-9f86-93d0574dd234",
  "status" : "Created",
  "message" : null,
  "reports" : [ ],
  "createTimestamp" : "July 12, 2019 03:11:53 AM UTC",
  "resourceList" : [ ],
  "description" : "DcsComponents patching",
  "updatedTime" : "July 12, 2019 03:11:53 AM UTC"
}
```

odacli update-registry

Use the `odacli update-registry` command to update the registry of components when you apply patches manually.

File Path

$ORACLE_HOME`/opt/oracle/dcs/bin/odacli`

Syntax

```
  odacli update-registry  -n component  [-f] [-j] [-h]
```

Parameters

Parameter	Description
`--component`, `-n`	Defines the Oracle Database Appliance component for the registry update. The values can be `system {gihome, dbnode, sysinstance}` or `all {dbhome, db, dbstorage, asr}`. You can also specify the individual component to be refreshed. **Note:** Refresh system components before you refresh all components.
`-f`	(Optional) Forces the refresh of the specified component even if it already exists in the appliance registry metadata.
`--help`, `-h`	(Optional) Displays help for using the command.

Parameter	Description
`--json, -j`	(Optional) Displays JSON output.

Usage Notes

The `update-registry` command updates the registry of components when you apply patches manually..

Example 16-38 Updating the Registry with the -force option

```
# odacli update-registry -n system
DCS-10112:Specified components are already discovered.

Using force flag option to rediscover and update the sytem components
though it already exists in appliance registry
# odacli update-registry -n system -f

Job details
----------------------------------------------------------------
                     ID: 752b56d8-2bcd-4a29-ab96-196925fc5c13
            Description: Discover System Components : system
                 Status: Created
                Created: July 31, 2019 1:02:51 PM UTC
                Message:

Task Name Start Time End Time Status
----------------------------------------
----------------------------------- -----------------------------------
----------

# odacli describe-job -i 752b56d8-2bcd-4a29-ab96-196925fc5c13

Job details
----------------------------------------------------------------
                     ID: 752b56d8-2bcd-4a29-ab96-196925fc5c13
            Description: Discover System Components : system
                 Status: Success
                Created: July 31, 2019 1:02:51 PM UTC
                Message:

Task Name Start Time End Time Status
----------------------------------------
----------------------------------- -----------------------------------
----------
Rediscover SysInstance July 31, 2019 1:02:51 PM UTC July 31, 2019
1:03:24 PM UTC Success
Rediscover DBNode July 31, 2019 1:03:24 PM UTC July 31, 2019 1:03:24 PM
UTC Success
Rediscover GiHome July 31, 2019 1:03:24 PM UTC July 31, 2019 1:03:26 PM
UTC Success
```

odacli update-repository

Use the `odacli update-repository` command to update the repository with the new Oracle Database Appliance software.

Prerequisites

Before updating the repository, you must upload the Oracle Database Appliance software to the appliance. If the patch contains more than one zip file, then extract and concatenate the zip files before updating the repository.

File Path

`/opt/oracle/dcs/bin/odacli`

Syntax

To unpack and copy the patch bundle to the correct locations in the file system:

```
odacli update-repository  -f filename [-j] [-h]
```

Parameters

Parameter	Description
`--filename, –f`	Defines the zip filename of patch bundle or RDBMS clones downloaded from My Oracle Support. Provide a comma-separated list of absolute file paths of the end user and patch bundles.
`--json, -j`	(Optional) Displays JSON output. The default is false.
`--help,-h`	(Optional) Displays help for using the command.

Usage Notes

- Before updating the repository, ensure that you do not have any jobs running or pending during the update window.
- Upload the patches to `dom0` on Node0. On multi-node systems, the DCS-Agent copies the patch to Node1 and updates the patch repository on both nodes.

Example 16-39 Updating the Repository

The server patch zip file is located in the `/u01/tmpdir` directory. The following example updates the repository with the latest server patch and then lists the job to verify that the update is successful:

```
# /opt/oracle/dcs/bin/odacli update-
repository -f /tmp/oda-sm-19.9.0.0.0-201020.2-server1of2.zip,/tmp/oda-
sm-19.9.0.0.0-201020.2-server2of2.zip
{
  "jobId" : "d3510276-da05-447b-990e-6d30964f8f79",
  "status" : "Created",
  "message" : "/u01/tmpdir/oda-sm-12.2.1.1.0-171031-server.zip",
  "reports" : [ ],
  "createTimestamp" : "August 18, 2020 14:13:45 AM CST",
  "description" : "Repository Update",
  "updatedTime" : "August 18, 2020 14:13:45 AM CST"
}
[root@oak1 tmpdir]# ./odacli list-jobs
# odacli list-jobs
ID                                    Description
Created                             Status
----------------------------          ----------------
----------------------------        -------
6f27a29a-959f-44e1-b984-7473e3c918ad  Server Patching   August 18, 2020
14:19:05 AM CST    Success
```

odacli update-server

Use the `odacli update-server` command to update the operating system, firmware, Oracle Appliance Kit, Oracle Clusterware, and all other infrastructure components.

File Path

`/opt/oracle/dcs/bin/odacli`

Syntax

```
  odacli update-server [-p] [-l] -v version [-j] [-h]
```

Parameters

Parameter	Description
`--precheck, –p`	(Optional) Analyzes the patch.
`--version, –v`	Defines the version to update.
`--local,–l`	(Optional) Updates the server on the local node of multi-node high availability (HA) systems. This option is not needed for single-node systems.
`--json, -j`	(Optional) Displays JSON output. The default is false.
`--help, -h`	(Optional) Displays help for using the command.

Usage Notes

The `update-server` command applies the patches to various infrastructure components and Oracle Clusterware.

After the update is applied, the agent automatically restarts. It will take a few minutes to reconnect to the server. Wait until the agent shuts down and completes restarting before performing any tasks. Allow at least two (2) minutes before running the next command.

Note:

Before updating the server, ensure that you do not have any jobs running or pending during the update window.

Example 16-40 Updating the Server

Run the odacli update-server command to update the server to 19.9.0.0.0. On a multi-node HA system, you must run the command on both nodes to update the server version.

```
# odacli update-server -v 19.9.0.0.0
{
  "jobId" : "6f27a29a-959f-44e1-b984-7473e3c918ad",
  "status" : "Created",
  "message" : "Success of Server Update may trigger reboot of node
after 4-5 minutes.
Please wait till node restart",
  "reports" : [ ],
  "createTimestamp" : "August 18, 2020 14:13:45 PM CST",
  "resourceList" : [ ],
  "description" : "Server Patching",
  "updatedTime" : "August 18, 2020 14:13:45 PM CST"
}
```

odacli update-storage

Use the `odacli update-storage` command to update the storage.

File Path

`/opt/oracle/dcs/bin/odacli`

Syntax

```
  odacli update-storage  -v version [-h] [-j] [-r]
```

Parameters

Parameter	Description
`--version, –v`	Defines the version to update.
`--json, -j`	(Optional) Displays JSON output. The default is false.
`--help, -h`	(Optional) Displays help for using the command.
`--rolling, -r`	(Optional) Enables to patch shared disks in rolling fashion without stopping Oracle Clusterware. The shared disks must be online.

Usage Notes

- If the FIRMWAREEXPANDER Installed Version is lower than or equal to the Available Version, then you cannot use rolling mode to update the storage.

Example 16-41 Updating the Storage

```
# odacli update-storage -v 19.9.0.0.0
```

odaadmcli orachk

Use the `odaadmcli orachk` command to check configuration settings for Oracle Database Appliance components.

File Path

`/opt/oracle/dcs/bin/odaadmcli`

Syntax

To perform diagnostic checks of components:

```
odaadmcli orachk [-h]
```

Parameters

Parameter	Description
`--help`, `-h`	(Optional) Displays help for using the command.
Components such as `-a, -acchk, -applypatch, -autostop`	(Optional) Specifies the comma-separated list of components for which you want to collect data. Specify the component to be checked in the command. For example: `# odaadmcli orachk -a`
`--verbose`	Displays detailed message.

Usage Notes

The `odaadmcli orachk` command invokes `orachk` from the directory `opt/oracle.SupportTools/orachk`.

Example 16-42 Running odaadmcli orachk

```
[root@oak bin] # ./odaadmcli orachk
INFO: 2019-09-04 16:41:26: Running orachk under /opt/
oracle.SupportTools/orachk
```

Example 16-43 Running odaadmcli orachk for a component

```
[root@oak bin] # ./odaadmcli orachk -a
INFO: 2019-09-19 10:45:16: Running orachk under /usr/bin/orachk
Checking ssh user equivalency settings on all nodes in cluster for root
```

odacli Appliance Commands

Use the `odacli appliance` commands to perform lifecycle activities for the appliance.

- odacli-adm set-credential
  Use the `odacli-adm set-credential` command to change the `oda-admin` user credentials.
- odacli create-appliance
  Use the `odacli create-appliance` command in a JSON file format to provision Oracle Database Appliance.
- odacli describe-system
  Use the `odacli describe-system` command to display details about components installed on the system.
- odacli list-featuretracking
  Use the `odacli list-featuretracking` command to display the latest feature tracking report.

odacli-adm set-credential

Use the `odacli-adm set-credential` command to change the `oda-admin` user credentials.

Syntax

To reset the `oda-admin` user credentials in interactive mode:

```
odacli-adm set-credential --password --username username [-j] [-h]
```

Parameters

Parameter	Description
`--password`, `-p`	Agent password. The Agent password is needed to access the Oracle Appliance Manager Browser User Interface.
`--username`, `-u`	User name required to access the Oracle Appliance Manager Browser User Interface. The default user name is `oda-admin`.
`--json`, `-j`	(Optional) Displays JSON output.
`--help`, `-h`	(Optional) Displays help for using the command.

Usage Notes

Only `root` user can reset the `oda-admin` user credentials.

Example 16-44 Resetting the oda-admin Password in Interactive Mode

To reset the `oda-admin` user password to a new password in interactive mode:

```
# odacli-adm set-credential --password --username oda-admin
  Agent password: password
```

odacli create-appliance

Use the `odacli create-appliance` command in a JSON file format to provision Oracle Database Appliance.

File Path

$ORACLE_HOME/opt/oracle/dcs/bin/odacli

Syntax

To view help for the `odacli create-appliance` command:

```
   odacli create-appliance  -r requestjson [-j] [-h]
```

> **Note:**
>
> The `odacli create-appliance` command only supports a JavaScript Object Notation (JSON) file format. An example JSON files and a readme are available in an appendix in this document and in the `/opt/oracle/dcs/sample` directory.

Parameters

Parameter	Description
`--requestjson, -r`	JSON input for appliance creation.
`--json, -j`	(Optional) Displays JSON output.
`--help, -h`	(Optional) Displays help for using the command.

odacli describe-system

Use the `odacli describe-system` command to display details about components installed on the system.

File Path

$ORACLE_HOME/opt/oracle/dcs/bin/odacli

Syntax

To list jobs and view job details and status:

```
odacli describe-system [-h] [-b] [-d] [-j]
```

Parameters

Parameter	Description
`--json`, `-j`	(Optional) Displays JSON output.
`--help`, `-h`	(Optional) Displays help for using the command.
`--bom`, `-b`	(Optional) Displays the bill of materials for the installed components on the appliance.
`--details`, `-d`	(Optional) Display on the command-line, the details of all installed components on the appliance.

Usage Notes

Do not provide both options `-b` and `-d` at the same time, in the command.

Example 16-45 Example Command to View the Bill of Materials from the Command Line for Bare Metal Deployments

```
# odacli describe-system -b
ODA Components Information
------------------------------
Component Name                Component
Details
---------------
------------------------------------------------------------------------
-----------------------
NODE                          Name : oda1
                              Domain Name :
                              Time Stamp : April 29, 2020 7:00:12 PM
UTC


RPMS                          Installed RPMS :
acl-2.2.49-7.el6_9.1.x86_64,
                                               aide-0.14-11.el6.x86_64,
                                               alsa-
lib-1.1.0-4.el6.x86_64,
                                               at-3.1.10-49.el6.x86_64,
                                               atk-1.30.0-1.el6.x86_64,
                                               attr-2.4.44-7.el6.x86_64,
                                               audit-2.4.5-6.el6.x86_64,
                                               audit-
libs-2.4.5-6.el6.x86_64,
                                               audit-libs-
python-2.4.5-6.el6.x86_64,
                                               augeas-
libs-1.0.0-10.el6.x86_64,

authconfig-6.1.12-23.el6.x86_64,
                                               avahi-
libs-0.6.25-17.el6.x86_64,
                                               b43-
openfwwf-5.2-10.el6.noarch,

basesystem-10.0-4.0.1.el6.noarch,
                                               bash-4.1.2-48.el6.x86_64,
                                               bc-1.06.95-1.el6.x86_64,
                                               bind-
libs-9.8.2-0.62.rc1.el6_9.5.x86_64,
                                               bind-
utils-9.8.2-0.62.rc1.el6_9.5.x86_64,

binutils-2.20.51.0.2-5.47.el6_9.1.x86_64,

biosdevname-0.7.2-1.el6.x86_64,
                                               bridge-
utils-1.2-10.el6.x86_64,

busybox-1.15.1-21.el6_6.x86_64,

bzip2-1.0.5-7.el6_0.x86_64,
                                               bzip2-
libs-1.0.5-7.el6_0.x86_64,
                                               ca-
certificates-2017.2.14-65.0.1.el6_9.noarch,

cairo-1.8.8-6.el6_6.x86_64,

celt051-0.5.1.3-0.el6.x86_64,

checkpolicy-2.0.22-1.el6.x86_64,

chkconfig-1.3.49.5-1.el6.x86_64,
                                               cloog-
ppl-0.15.7-1.2.el6.x86_64,
                                               compat-
libcap1-1.10-1.x86_64,
                                               compat-libstdc+
+-33-3.2.3-69.el6.x86_64,
                                               compat-
readline5-5.2-17.1.el6.x86_64,
                                               compat-sap-c+
+-4.8.2-16.el6.x86_64,

ConsoleKit-0.4.1-6.el6.x86_64,
                                               ConsoleKit-
libs-0.4.1-6.el6.x86_64,
                                               ConsoleKit-
x11-0.4.1-6.el6.x86_64,
coreutils-8.4-46.0.1.el6.x86_64,
                                               coreutils-
libs-8.4-46.0.1.el6.x86_64,
                                               cpio-2.10-13.el6.x86_64,
                                               cpp-4.4.7-18.el6.x86_64,

cpupowerutils-1.3-2.el6.x86_64,

cpuspeed-1.5-22.0.1.el6.x86_64,

cracklib-2.8.16-4.el6.x86_64,
                                               cracklib-
dicts-2.8.16-4.el6.x86_64,

crash-7.1.4-1.0.1.el6_7.x86_64,

crda-3.13_2015.10.22-3.el6.x86_64,

createrepo-0.9.9-27.el6_9.noarch,

cronie-1.4.4-16.el6_8.2.x86_64,
                                               cronie-
anacron-1.4.4-16.el6_8.2.x86_64,

crontabs-1.10-33.el6.noarch,
                                               cryptsetup-
luks-1.2.0-11.el6.x86_64,
                                               cryptsetup-luks-
libs-1.2.0-11.el6.x86_64,
                                               cups-
libs-1.4.2-78.el6_9.x86_64,

....
....
....
```

odacli list-featuretracking

Use the `odacli list-featuretracking` command to display the latest feature tracking report.

File Path

$ORACLE_HOME/opt/oracle/dcs/bin/odacli

Syntax

Use the `odacli list-featuretracking` command to display the latest feature tracking report.

```
odacli list-featuretracking [-h] [-j]
```

Parameters

Parameter	Description
`--json, -j`	(Optional) Displays JSON output.
`--help, -h`	(Optional) Displays help for using the command.

Example 16-46 Example Command to View the Features Report from the Command Line

```
# odacli list-featuretracking
                                    DCS Feature Tracking Report

Last collection date:   10/26/18 15:35
Report version:         1.0

-------------------------------------------------------------------
DCS Feature Usage Summary

                                                          Currently
Detected    Total     Last Usage
Feature Name                                              Used
Usages  Samples           Time
--------------------------------------------------------- ---------
Object Store
TRUE            12        12 10/26/18 15:35
Automatic Service Request (ASR)
FALSE            0        12
Storage Expansion Shelf
FALSE            0        12


-------------------------------------------------------------------
DCS High Water Mark Statistics

Measured Feature Name                                        High Water
Mark      Category
------------------------------------------------------------
Maximum usage of CPU                                         8.12
%                DCS Agent
Maximum usage of Memory                                      437.12
MB             DCS Agent
Maximum number of threads
150                   DCS Agent
Maximum number of open file descriptors
257                   DCS Agent
Maximum number of Databases
1                     Database
Maximum number of EE Databases
1                     Database
Maximum number of SE Databases
0                     Database
```

```
Maximum number of CDBs
1                     Database
Maximum number of non-CDBs
0                     Database
Maximum number of RAC Databases
1                     Database
Maximum number of RAC One Databases
0                     Database
Maximum number of Single Instance Databases
0                     Database
Maximum number of PDBs
0                     Database
Maximum number of Datafiles
7                     Database
Maximum number of Database Homes
1                     Database
Maximum number of Flashback Databases
0                     Database
Maximum size of a Database                                   6.40
GB               Database
Minimum Database version
18.0.0.0.0            Database
Maximum Database version
18.0.0.0.0            Database
Maximum number of Backups
12                    Database
Maximum number of NFS Backups
0                     Database
Maximum number of Object Store Backups
12                    Database
Maximum number of Disk Backups
0                     Database
Maximum number of Regular-L0 Backups
0                     Database
Maximum number of Regular-L1 Backups
1                     Database
Maximum number of ArchiveLog Backups
9                     Database
Maximum number of Longterm Backups
2                     Database
Maximum interval between Database Backups                    0 Day(s),
01:01:06    Database
Maximum number of Object Store tenants
1                     Object Store
Maximum number of enabled CPU cores
12                    Server
Maximum number of disks
24                    Storage
Maximum number of ASM Disks Groups
3                     Storage
Maximum size of ASM Disk Groups                              11.46
TB              Storage
Maximum usage of ASM Disk Groups                             1.70
%                Storage
Maximum number of ASM Disks Groups with redundancy 'NORMAL'
```

```
0                      Storage
Maximum number of ASM Disks Groups with redundancy 'HIGH'
3                      Storage
Maximum number of ASM Disks Groups with redundancy 'EXTERN'
0                      Storage
Maximum number of ASM Disks Groups with redundancy 'FLEX'
0                      Storage
Maximum ASM Disk Groups compatibility
18.0.0.0.0             Storage
Minimum ASM Disk Groups compatibility
18.0.0.0.0             Storage
Maximum number of non-ACFS file systems
4                      Storage
Maximum size of non-ACFS file systems                        98.31
GB              Storage
Maximum usage of non-ACFS file systems                       82.71
%               Storage
Maximum number of ACFS file systems
1                      Storage
Maximum size of ACFS file systems                            5.00
GB               Storage
Maximum usage of ACFS file systems                           12.19
%               Storage
```

odacli Backup and Recovery Commands

Use the odacli backup and recover commands to backup to and restore from Oracle Cloud Infrastructure Object Storage or disk.

Topics:

- odacli create-backup
  Use the command `odacli create-backup` to create a Level 0, Level 1, archivelog, or Longterm backup.
- odacli create-backupconfig
  Use the command `odacli create-backupconfig` to create a backup configuration.
- odacli create-objectstoreswift
  Use the command `odacli create-objectstoreswift` to create and store the Oracle credential details required to backup to Oracle Object Store.
- odacli delete-backup
  Use the command `odacli delete-backup` to delete backups.
- odacli delete-backupconfig
  Use the command `odacli delete-backupconfig` to delete a backup configuration.
- odacli describe-backupreport
  Use the command `odacli describe-backupreport` to display details of a specific backup report.
- odacli delete-objectstoreswift
  Use the command `odacli delete-objectstoreswift` to delete the credentials for the ObjectStore account.

- odacli describe-schedule
  Use the command `odacli describe-schedule` to display details for a specific schedule.
- odacli irestore-database
  Use the command `odacli irestore-database` to restore a database from one system to other system from an external FRA (NFS) or Object Store location based on a BackupReport.
- odacli list-backupconfigs
  Use the command `odacli list-backupconfigs` to list all backup configurations.
- odacli list-backupreports
  Use the command `odacli list-backupreports` to display a list of all backup reports.
- odacli list-objectstoreswifts
  Use the command `odacli list-objectstoreswifts` to display a list of credentials for the ObjectStore account.
- odacli list-schedules
  Use the command `odacli list-schedules` to display all of the schedules in the system, including database backup schedules and some internal maintenance schedules.
- odacli list-tdebackupreports
  Use the `odacli list-tdebackupreports` command to view TDE Wallet backup reports.
- odacli recover-database
  Use the `odacli recover-database` command to recover or restore a database from backup.
- odacli restore-tdewallet
  Use the `odacli restore-tdewallet` command to recover or restore TDE wallet from the backup location.
- odacli update-backupconfig
  Use the command `odacli update-backupconfig` to update a backup configuration.
- odacli update-objectstoreswift
  Use the command `odacli update-objectstoreswift` to change the credentials for the ObjectStore account.
- odacli update-schedule
  Use the command `odacli update-schedule` to update the schedule for a database, or to disable the database backup schedule.

odacli create-backup

Use the command `odacli create-backup` to create a Level 0, Level 1, archivelog, or Longterm backup.

File Path

```
/opt/oracle/dcs/bin/odacli
```

Syntax

```
  odacli  create-backup -i Database Resource ID [-bt] [-c] [-h] [-j]
[-k] [-t]
```

Parameters

Parameter	Description
`--backupType, -bt {Regular-L0|Regular-L1|Longterm|archivelog}`	Defines the type of backup. The options are not case sensitive.
`--component, -c {Database|TDEWallet}`	(Optional) Defines the component. The supported options are Database and TDE Wallet. The options are not case-sensitive. The default value is Database. If you specify the value as Database, then a backup of both the database and TDE Wallet is taken.
`--dbName, -in`	Defines the Database name (required for database components backup).
`--dbid, -i`	Defines the Database Resource ID (required for database components backup).
`--help, -h`	(Optional) Displays help for using the command.
`--json, -j`	(Optional) Displays JSON output. The default is false.
`--keep-archivelog, -ka`	Keeps archive logs.
`--keepDays, -k`	Defines the Keep Days. For Longterm Backup Type only.
`--tag, -t`	Defines the name of the backup. A tag is alphanumeric, up to 30 characters. Required for Longterm Backup Type. The tag must be wrapped in single quotes when special characters are used.

Usage Notes

- Use the command `odacli create-backup` for a specified Database Resource ID and provide a tag for the backup name. Use up to 30 alphanumeric characters for the backup name tag. Three types of backups are available:
  - Level 0: An RMAN incremental backup that backs up all data blocks in the data files being backed up. An incremental backup at level 0 is identical in content to a full backup, but unlike a full backup, the level 0 backup is part of an incremental backup strategy.
  - Level 1: An RMAN incremental backup that includes only those blocks that have been changed since the "parent" backup was taken. A parent backup can be either a level 0 or a level 1 backup. If you do not select a backup type (level 0, level 1, or LongTerm), a level 1 backup is performed.
  - Longterm: Longterm backups are only available when backing up to Oracle Cloud Infrastructure Object Storage (Oracle Object Storage).

  - Archivelog: This option is used to perform backup of all archivelogs not yet backed up to the backup destination, such as Internal FRA, External FRA (NFS location), or Object Store.

- This command creates a Backup Report with a Resource ID. To get the ID, use the command `odacli describe-job -i job_id -j` and look for the `resourceId` attribute in `resourceList`.

Example 16-47 Create a Manual Database Backup

Create a long term backup that is kept for 90 days and named q12018HR.

```
  # odacli  create-backup -i Database Resource ID -bt Longterm -c 
database -k 90 -t q12018HR
```

Example 16-48 Create a Level 0 Database Backup

Create a Level 0 backup named `2017Dec22ProductionLevel0` for resource ID `20576eb1-bc32-4e34-bf97-fda0b60ca15b`

```
# odacli  create-backup -i 20576eb1-bc32-4e34-bf97-fda0b60ca15b -bt 
Regular-L0 -t 2017Dec22ProductionLevel0
```

Example 16-49 Create a Backup of only the TDE Wallet

```
# odacli create-backup -n testdb -c TDEWallet
```

Example 16-50 Create a Backup of the database and TDE Wallet

```
# odacli create-backup -n testdb -bt regular-l0
```

odacli create-backupconfig

Use the command `odacli create-backupconfig` to create a backup configuration.

File Path

`/opt/oracle/dcs/bin/odacli`

Syntax

```
  odacli  create-backupconfig  -n backup configuration name -d backup
destination{Disk|ObjectStore|NFS|None} [-c] [-cr] [-h] [-j] [-no-cr] [-
o] [-w] [-f]
```

Parameters

Parameter	Description
`--backupdestination, –d {Disk|ObjectStore|NFS|None}`	Defines the backup destination. The options are not case sensitive.
`--container, -c`	(Optional) Defines the object store container.

Parameter	Description
`--crosscheck, -cr`	(Optional) Enable crosscheck.
`--help, -h`	(Optional) Displays help for using the command.
`--json, -j`	(Optional) Displays JSON output. The default is false.
`--name, -n`	Defines the backup configuration name.
`--no-crosscheck, -no-cr`	(Optional) Disable crosscheck.
`--objectstoreswiftId, -o`	(Optional) Defines the swift object store credential ID.
`--tde-container, -f`	(Optional) Defines the container or backup location to backup the TDE Wallet. Must be the absolute path to the parent directory when the backup target is NFS, and must be the container name when the backup target is Objectstore.
`--recoverywindow, -wDisk: {1-14} | ObjectStore: {1-31}`	(Optional) Defines the Recovery Window in days. {1-14} days for Disk and {1-31} days for Object Storage in the cloud.

Usage Notes

- To backup a TDE-enabled database, backup configuration with separate TDE Wallet backup location and Database backup location is mandatory.
- To backup a non-TDE database, backup configuration with either single database backup location or backup configuration with both database backup location and TDE Wallet backup location can be used.
- For Disk backup configuration, TDE Wallet backup locaton is by default, Fast Recovery Area (FRA), but in a separate path from the Database backup path within FRA. Hence, TDE Wallet backup location need not be specified when creating the Disk backup configuration.
- The recovery window that is defined in the backup configuration determines when backups are considered obsolete. The following are guidelines:
  - Disk: 1-14 days
  - Object Storage: 1-31 days

Example 16-51 Create a Backup Configuration for disk

Create a backup configuration named `production` that backs up to disk with a 14 day recovery window.

```
# odacli create-backupconfig -d Disk -n production -w 14
```

Example 16-52 Create a Backup Configuration for NFS location

Create a backup configuration that backs up to NFS with a 2 day recovery window.

```
# odacli create-backupconfig -d NFS -n NfsPolicy1 -c /tmp/Nfsbackps -w 2
```

Example 16-53 Create a Backup Configuration with separate backup locations for database backup and TDE Wallet backup

```
# odacli create-backupconfig -n bcfg1 -d Objectstore -w 1 -c location1-
on oss1 -f location2
```

Example 16-54 Create a Backup Configuration with single backup location for database backup

```
# odacli create-backupconfig -n bcfg2 -d Objectstore -w 1 -c testb2 -on
oss2
```

odacli create-objectstoreswift

Use the command `odacli create-objectstoreswift` to create and store the Oracle credential details required to backup to Oracle Object Store.

File Path

`/opt/oracle/dcs/bin/odacli`

Syntax

```
# odacli create-objectstoreswift -e swift end point URL [-h] [-j] -n
Object Store Swift name -t Object Store tenant name -u Object Store
user name
```

Parameters

Parameter	Description
`--endpointurl`, `–e`	Defines the swift end point URL.
`--help`, `-h`	(Optional) Displays help for using the command.
`--json`, `-j`	(Optional) Displays JSON output. The default is false.
`--name`, `-n`	Defines the Object Store Swift name.
`--tenantname`, `-t`	Defines the Object Store Swift tenant name.
`--username`, `-u`	Defines the Object Store Swift user name.

Usage Notes

The command creates and stores the Oracle Cloud Infrastructure Object Storage credential details in the system and stores the password in an encrypted Oracle wallet. You can attach the credentials to one or more backup configurations.

The credentials are validated during the command `odacli create-backupconfig` with `objectstore` as the destination. The credentials are not validated against endpoint URL and tenancy.

odacli delete-backup

Use the command `odacli delete-backup` to delete backups.

File Path

$ORACLE_HOME`/opt/oracle/dcs/bin/odacli`

Syntax

```
  odacli  delete-backup -iDatabase Resource ID [-br] [-h] [-j]
```

Parameters

Parameter	Description
`--backupreport`, `-br`	(Optional) Defines the backup report. To delete a Long Term backup, use a JSON input file for the backupreport.
`--dbid`, `-i`	Defines the Database Resource Identifier (ID). To delete a level 0 or level 1 backup, use the database resource ID.
`--help`, `-h`	(Optional) Displays help for using the command.
`--json`, `-j`	(Optional) Displays JSON output. The default is false.

Usage Notes

- Delete older, obsolete level 0 and level 1 backups with the Database Resource ID. The recovery window that is defined in the backup configuration determines when backups are considered obsolete.
- Delete long term backups from Oracle Object Storage by using a JSON file with the `--backupreport` option.
- To locate the database ID, view the databases in the Browser User Interface or use the command `odacli list-databases`.

Example 16-55 Delete a Level 0 or Level 1 Backup

```
# odacli delete-backup -i20576eb1-bc32-4e34-bf97-fda0b60ca15b
```

Example 16-56 Delete a Long Term Backup Report

Delete a Long Term backup using a JSON input file for the Backup Report. In this example, backupreport.json is the JSON input for the backupreport.

```
# odacli delete-backup -i 20576eb1-bc32-4e34-bf97-fda0b60ca15b -br
backupreport.json
```

odacli delete-backupconfig

Use the command `odacli delete-backupconfig` to delete a backup configuration.

File Path

$ORACLE_HOME/opt/oracle/dcs/bin/odacli

Syntax

```
  odacli  delete-backupconfig  -i backup configuration id [-h] [-j]
```

Parameters

Parameter	Description
`--help`, `-h`	(Optional) Displays help for using the command.
`--id`, `-i`	Defines the Backup Config identifier (ID).
`--json`, `-j`	(Optional) Displays JSON output. The default is false.

Usage Notes

You cannot delete a backup configuration if it is attached to a database.

Example 16-57 Deleting a Backup Configuration

Delete a backup configuration named `production` that backs up to disk with a 14 day recovery window.

```
# odacli delete-backupconfig -d Disk -n production -w 14
```

odacli describe-backupreport

Use the command `odacli describe-backupreport` to display details of a specific backup report.

File Path

$ORACLE_HOME/opt/oracle/dcs/bin/odacli

Syntax

```
odacli  describe-backupreport  [-h] [-j] [-i]
```

Parameters

Parameter	Description
`--help`, `-h`	(Optional) Displays help for using the command.

Parameter	Description
`--json`, `-j`	(Optional) Displays JSON output. The default is false.
`--id`, `-i`	Defines the backup report ID.

Example 16-58 Display Details of a Specific Backup Report

```
#  odacli  describe-backupreport -i 2d82460c-d648-4e75-8c7d-72cc90bc442a
{
  "id" : "2d82460c-d648-4e75-8c7d-72cc90bc442a",
  "dbResId" : "b5fc646e-01a6-4c8b-8286-7633346c4329",
  "tag" : null,
  "dbId" : "2717054291",
  "dbName" : "ExampleDB",
  "dbUniqueName" : "ExampleDBu",
  "backupType" : "REGULAR-L1",
  "keepDays" : null,
  "backupLocation" : "https://swiftobjectstorage.example.com/v1/
dbaasimage/backupbucket",
  "cfBackupHandle" : "c-2717054291-20180108-04",
  "spfBackupHandle" : "c-2717054291-20180108-04",
  "pitrTimeStamp" : "January 08, 2018 12:43:14 PM UTC",
  "pitrSCN" : "1175058",
  "resetLogsTimeStamp" : "January 08, 2018 09:55:34 AM UTC",
  "resetLogsSCN" : "1112268",
  "oraHomeVersion" : "12.2.0.1.170814 (26723265, 26609817)",
  "sqlPatches" : "25811364,26609817",

"backupLogLoc" : "https://swiftobjectstorage.example.com/v1/dbaasimage/
backupbucket/scaoda702c1n1/rmanlog/ExampleDBu/2717054291/2018-01-08/
rman_backup_2018-01-08_12-42-41.0545.log",
  "tdeWalletLoc" : null,
  "dbConfigLoc" : "https://swiftobjectstorage.example.com/v1/dbaasimage/
backupbucket/scaoda702c1n1/dbconfig/ExampleDBu/2717054291/2018-01-08/
DBCONFIG_TAG20180108T124407_2018-01-08_12-44-07.0533.tar.gz",
  "name" : "Backup_Report_ExampleDB",
  "createTime" : "January 08, 2018 12:42:08 PM UTC",
  "state" : {
    "status" : "CONFIGURED"
  },
  "updatedTime" : "January 08, 2018 12:44:12 PM UTC",
  "backupReportLogDetail" :
"https://swiftobjectstorage.example.com/v1/dbaasimage/backupbucket/
scaoda702c1n1/rmandetaillogreport/ExampleDBu/2717054291/2018-01-08/
rman_list_backup_detail_2018-01-08_12-44-04.0362.log",
  "dbInfo" : {
    "dbClass" : "OLTP",
    "dbType" : "RAC",
    "dbShape" : "odb1",
    "dbEdition" : "EE",
    "dbStorage" : "ASM"
  },
  "dbDataSize" : "1542M",
  "dbRedoSize" : "16403M"
}
```

odacli delete-objectstoreswift

Use the command `odacli delete-objectstoreswift` to delete the credentials for the ObjectStore account.

File Path

$ORACLE_HOME`/opt/oracle/dcs/bin/odacli`

Syntax

```
# odacli  delete-objectstoreswift [-h] [-j] -i Object Store Swift id
```

Parameters

Parameter	Description
`--help`, `-h`	(Optional) Displays help for using the command.
`--json`, `-j`	(Optional) Displays JSON output. The default is false.
`--objectstoreswiftid`, `-i`	Defines the Object Store Swift identifier (ID).

Usage Notes

You cannot delete the Object Store credentials if they are attached to a backup configuration.

Example 16-59 Deleting the Oracle Object Store Credentials

```
# odacli  delete-objectstoreswift -i Object Store Swift id
```

odacli describe-schedule

Use the command `odacli describe-schedule` to display details for a specific schedule.

File Path

$ORACLE_HOME`/opt/oracle/dcs/bin/odacli`

Syntax

```
#  odacli  describe-schedule  [-h] [-j] [-i]
```

Parameters

Parameter	Description
`--help`, `-h`	(Optional) Displays help for using the command.
`--json`, `-j`	(Optional) Displays JSON output. The default is false.
`--scheduleid`, `-id`	Defines the schedule with an identifier (ID).

Example 16-60   Display Schedule Details

```
#  odacli  describe-schedule -i scheduleid
```

odacli irestore-database

Use the command `odacli irestore-database` to restore a database from one system to other system from an external FRA (NFS) or Object Store location based on a BackupReport.

File Path

`/opt/oracle/dcs/bin/odacli`

Syntax

```
 odacli irestore-database [-n] [-bp] [-r] [-cl] [-nn] [-co] [-s] [-ro]
[-dr] [-y] [-h] [-j] [-c] [-oid] [-tf] [-bl] [-rDBID] [-sh|-no-sh] [-t]
[-tl] [-cp]
```

Parameters

Parameter	Description
`--backupPassword(s)`, `-bp`	(Optional) Defines the RMAN password for recovery. You can provide more than one password, but the passwords must be separated by a comma(,).
`--backupReport`, `-r`	JSON input for a backup report.
`--dbClass`, `-cl {EE: OLTP/DSS/IMDB, SE: OLTP}`	(Optional) Defines the Database class.
`--dbConsoleEnable`, `-co`	(Optional) Enables the Database Console.
`--dbShape`, `-s` {odb1,odb2, and so on}	(Optional) Defines the database shape.
`--dbStorage`, `-dr` {ACFS|ASM}	(Optional) Defines the database storage. Database Storage {ACFS|ASM} (non case-sensitive). The default is ASM.
`--dbType`, `-y`	(Optional) Defines the type of database. The default is single instance (SI).
`--dbEdition`, `-de`	(Optional) Defines the Database Edition (SE or EE).
`--databaseHome`, `-dh`	(Optional) Defines the database home.
`--dbName`, `-n`	(Optional) Defines the database name.

Parameter	Description
--dbUniqueName, -u	(Optional) Defines the database unique name.
--dbDomainName, -dn	Defines the database domain name.
--dbrole, -ro	Defines the database role for Oracle Data Guard operations. The options are PRIMARY|STANDBY.
--help, -h	(Optional) Displays help for using the command.
--json, -j	(Optional) Displays JSON output. The default is false.
--enable-tde, -t	(Optional) Specifies whether you want to enable TDE on the target database.
--tde-backup-location, -tl	(Optional) Specifies the backup location for TDE wallet.
--noOfRmanChannels, -c	(Optional) Defines the number of RMAN channels (parallelism) Default: SE Edition: 1, Other Enterprise Editions: 5
--objectStoreId, -oid	Defines the Swift Object Store credential ID.
--objectStoreName, -on	Defines the Swift Object Store resource name.
--backuplocation, -bl	(Optional) Specifies the NFS or local directory path where backups are available.
--dbRedundancy, -rd	Specifies the database redundancy value, that is, {HIGH|MIRROR}. To specify the dbRedundancy option for an Oracle ASM or ACFS storage-based database, at least one disk group of FLEX redundancy must exist. To specify the dbRedundancy option for an Oracle ASM storage database, the dbVersion or dbHomeVersion must be 12.2 or later. The precedence logic for setting the dbRedundancy is: 1. dbRedundancy that is specified in the irestore-database command. 2. dbRedundancy in the backup report. 3. If the disk group redundancy is FLEX, then the default dbRedundancy value is MIRROR.
--resetDBID,-rDBID	Resets the DB ID. The default is TRUE.
--associated-networks, -nn	Specifies the associated network names (in the format networkName1,networkName2,...).
--disable-seha, -no-sh	(Optional) Specifies whether you want to disable Standard Edition High-Availability for Oracle Database Standard Edition 19c and later single-instance databases.
--enable-seha, -sh	(Optional) Specifies whether you want to enable Standard Edition High-Availability for Oracle Database Standard Edition 19c and later single-instance databases.
--dbOnFlashStorage, -f	(Optional) Specifies whether to enable data on Flash storage.
--no-dbOnFlashStorage, -no-f	(Optional) Specifies whether to disable data on Flash storage.
--cpupool, -cp	(Optional) Specifies the CPU pool name.

Usage Notes

> **Caution:**
>
> When you create a database with Transparent Data Encryption (TDE) enabled, you are prompted to set a password for the TDE wallet. Provide a strong password for security compliance. Set the password carefully, and ensure that this password is available to you at all times for database management operations. Failure to provide the TDE wallet password when prompted, will cause an error in accessing encrypted data.

- The command `odacli irestore-database` restores a database to a system using the Backup Report that is in the Oracle Object Store or External FRA (NFS) location. You can restore a database from one appliance to another appliance, or to the same appliance after the source database is deleted.
- An Oracle wallet (ObjectStoreSwift credentials) must be created to access the backups in Oracle Object Store. This command performs the environment checks, validation checks, and tasks needed to restore a database to an Oracle Database Appliance system.
- If `-cp` parameter is provided as part of the command, the database is associated with the particular CPU pool.
- If `-cp` parameter is not provided as part of the command, and if the backup report has information about the associated CPU pool, then the command validates the CPU pool specified in the backup report. If the validation fails, then an error message is displayed.
- If the backup report does not have information about any associated CPU pool, then the database is created without being associated with any CPU pool.
- To restore a TDE-enabled database, the TDE wallet password must be provided.
- If source database is TDE enabled, then the target database which was restored will also have TDE enabled.
- Specify the TDE wallet location if the backup report does not have TDE wallet location or if the backup report is inaccessible or unavailable.

Example 16-61 Restoring a Database to the Same System

Run the command `odacli irestore-database` with the backup report. Enter the SYS user password when prompted.

```
# odacli irestore-database -r backupreport.json -oid Object Store ID
```

Example 16-62 Restoring a Database to a Different System

To restore to a different system, copy the backup report to the other machine's `\bin` folder (or provide the complete path to the backup report), then run the command `odacli irestore-database` with the backup report. Enter the SYS user password when prompted.

```
# odacli irestore-database -r backupreport.json -oid Object Store ID -m
```

Example 16-63 Restoring a Database with TDE Wallet backup from a backup report

```
# odacli irestore-database -r backupreport.json -on oss1 -t
Password for SYS user:
Password for TDE Wallet:
```

Example 16-64 Restoring a Database with TDE Wallet backup specified on the CLI

```
# odacli irestore-database -r
backupreport.json -tl https://swiftobjectstorage.us-
ashburn-1.oraclecloud.com/v1/paas_test/tde_Backups/test2-c/database/
91276171/tdbacf2/tdewallet/ewallet_2020021714442745.p12 -on oss2 -p -m
Password for SYS user:
Password for TDE Wallet:
```

Example 16-65 Restoring to a standby database when Oracle Data Guard is configured

```
# odacli irestore-database -r backup_report.json -u dbUniqueName -ro
STANDBY -ro STANDBY
```

Example 16-66 Recovering a Database that was associated with a CPU Pool

```
# odacli irestore-database -n irmendb3 -r dbcpupllong.json -on ostore
-bp -dh 45156cc5-e768-4817-8b52-2a0a482be18f
Rman Backup Encryption Password(s). Multiple passwords needs to be
comma separated:
Password for SYS user:
{
  "jobId" : "31af6cc8-5e04-459b-8017-271c55b8c99b",
  "status" : "Created",
  "message" : null,
  "reports" : [ ],
  "createTimestamp" : "August 10, 2020 11:20:08 AM UTC",
  "resourceList" : [ ],
  "description" : "Database service recovery with db name: irmendb3",
  "updatedTime" : "August 10, 2020 11:20:08 AM UTC"
}
```

odacli list-backupconfigs

Use the command `odacli list-backupconfigs` to list all backup configurations.

File Path

`/opt/oracle/dcs/bin/odacli`

Syntax

```
  odacli  list-backupconfigs  [-h] [-j]
```

Parameters

Parameter	Description
`--help`, `-h`	(Optional) Displays help for using the command.
`--json`, `-j`	(Optional) Displays JSON output. The default is false.

Example 16-67 Displaying a List of Backup Configuration

Display a list of backup configurations.

```
# odacli list-backupconfigs -d Disk -n production -w 14
```

odacli list-backupreports

Use the command `odacli list-backupreports` to display a list of all backup reports.

File Path

$ORACLE_HOME`/opt/oracle/dcs/bin/odacli`

Syntax

```
#  odacli  list-backupreports  [-h] [-j]
```

Parameters

Parameter	Description
`--help`, `-h`	(Optional) Displays help for using the command.
`--json`, `-j`	(Optional) Displays JSON output. The default is false.

Usage Notes

Displays a list of all database backup reports generated from the command `odacli create-backup`.

Example 16-68 Display a List of all Backup Reports

```
#  odacli  list-backupreports
```

odacli list-objectstoreswifts

Use the command `odacli list-objectstoreswifts` to display a list of credentials for the ObjectStore account.

File Path

$ORACLE_HOME`/opt/oracle/dcs/bin/odacli`

Syntax

```
# odacli list-objectstoreswifts [-h] [-j]
```

Parameters

Parameter	Description
`--help`, `-h`	(Optional) Displays help for using the command.
`--json`, `-j`	(Optional) Displays JSON output. The default is false.

Example 16-69 Displaying a List of ObjectStore Swift Credentials

```
# odacli list-objectstoreswifts
```

odacli list-schedules

Use the command `odacli list-schedules` to display all of the schedules in the system, including database backup schedules and some internal maintenance schedules.

File Path

$ORACLE_HOME/opt/oracle/dcs/bin/odacli

Syntax

```
#  odacli  list-schedules  [-h] [-j]
```

Parameters

Parameter	Description
`--help`, `-h`	(Optional) Displays help for using the command.
`--json`, `-j`	(Optional) Displays JSON output. The default is false.

Usage Notes

The command lists all of the schedules in the system, including database backup schedules and some internal maintenance schedules.

Example 16-70 Display a List of Scheduled Database Backups

Display a list of all scheduled database backups and details.

```
#  odacli  list-schedules
ID                                      Name
Description
```

```
CronExpression                 Disabled
--------------------------------------- ------------------------
--------------------------------------------------
------------------------------ --------
201672f6-c80c-4ff9-99be-2bc8be480e66     metastore maintenance
internal metastore maintenance                    0 0 0 1/1 * ?
*                true
e86ff1e9-8607-41f8-8d0a-cf59dc1e52a9     AgentState metastore cleanup
internal agentstateentry metastore maintenance     0 0 0 1/1 * ?
*                true
17640773-aa8b-4b4f-b170-3a68d5329cbb     bom maintenance            bom
reports generation                             0 0 1 ? * SUN
*                true
cae98cb1-e8ab-48c6-aaf9-22d9ab4097b1     Big File Upload Cleanup
clean up expired big file uploads.                0 0 1 ? * SUN
*                true
745333ad-8845-4444-b591-7ca7d19a4d91     feature_tracking_job
Feature tracking job                              0 0 20 ? * WED
*               true
42b6894f-f680-4316-9958-f4ecf501d781     Log files Cleanup          Auto
log file purge bases on policy                0 0 3 1/1 * ?
*                true
```

odacli list-tdebackupreports

Use the `odacli list-tdebackupreports` command to view TDE Wallet backup reports.

File Path

`/opt/oracle/dcs/bin/odacli`

Syntax

```
  odacli list-tdebackupreports [-h] [-j]
```

Parameters

Parameter	Description
`--help`, `-h`	(Optional) Displays help for using the command.
`--json`, `-j`	(Optional) Displays JSON output. The default is false.

Usage Notes

The TDE backup report saves the latest TDE Wallet backup location of a TDE-enabled database, when a database backup or a TDE Wallet backup is taken for that database.

Example 16-71 Viewing the TDE backup report

```
# odacli list-tdebackupreports
DbResID                                  OraDbId
BackupLocation
---------------------------------------- --------------------
```

```
----------------------------------------
49772c1b-e4e4-401b-a5f0-16c7992d6766
1080131389           https://swiftobjectstorage.us-
ashburn-1.oraclecloud.com/v1/paastest/TestLtBackupFailur/test2-c/
database/1080131389/tddb3/tdewallet/ewallet_2020053120350968.p12
f1043fa4-b1ee-461b-84d6-8541e4f6f053     1052183392           /u01/
NFS_TDE/orabackups/test2-c/database/1052183392/tddb4/tdewallet/
ewallet_2020060102471941.p12
944a5613-2a1f-41fb-b7b1-91d35e3e8530     1002460890           /u03/app/
oracle/fast_recovery_area/TDDB5/tdewallet/ewallet_2020060103125231.
```

odacli recover-database

Use the `odacli recover-database` command to recover or restore a database from backup.

File Path

`/opt/oracle/dcs/bin/odacli`

Syntax

```
  odacli  recover-database -i Database Resource ID [-br] [-i] [-h] [-j]
[-r] [-t] [-p] [-s] [-in] [-tp] [-tl] [-cp]
```

Parameters

Parameter	Description
`--backupReport`, `-br`{Regular-L0|Regular-L1|Longterm}	(Optional) JSON input for a backup report.
`--dbName`, `-in`	Defines the Database Name.
`--dbid`, `-i`	Defines the Database Resource ID.
`--help`, `-h`	(Optional) Displays help for using the command.
`--json`, `-j`	(Optional) Displays JSON output. The default is false.
`--tde-backup-location`, `-tl`	(Optional) Specifies the backup location for TDE wallet. If not specified, the latest known TDE backup location is used.
`--recoveryTimeStamp`, `-r`	(Optional) Defines the date and time of the backup. The Recovery Timestamp (in format mm/dd/yyyy hh:mm:ss) is required when the recovery is a point in time recovery (PITR).
`--recoverytype`, `-t` {Latest|PITR|SCN}	(Optional) Defines the recovery type. Do not provide the recovery type if you define the Backup Report.
`--rmanrecoverypassword(s)`, `-p`	(Optional) Defines the password for recovery. You can provide more than one password, but the passwords must be within single quote separated by comma(,).
`--scn`, `-s`	(Optional) Defines the SCN recovery type. Required when the RecoveryType is SCN.
`--cpupool`, `-cp`	(Optional) Specifies the CPU pool name.

Usage Notes

Recovers a database to the latest, a point in time recovery (PITR), or System Change Number (SCN) as input. You can also recover a database from a Backup Report provided as JSON input file.

This command performs various environment and validation checks in order to attempt to ensure that recovery of database is successful. If backups are in ObjectStore, the RMAN recovery passwords are needed to recover the database. This includes RMAN restore and recovery.

This command always performs a full RMAN database restore and recovery. This command is most useful when there is a complete database loss or when the majority of the database files are lost. If you do not require a full RMAN restore, you can perform a manual recovery. For example, a single data file loss or control file loss.

- If `-cp` parameter is provided as part of the command, recovered database is associated with the particular CPU pool.
- If `-cp` parameter is not provided as part of the command, and if the backup report has information about the associated CPU pool, then the recovered database is also associated with the same CPU pool.
- If the original database does not have any associated CPU pool, then the recovered database is also not associated with any CPU pool.

Example 16-72 Recovering a Database to a Point-in-Time

```
# odacli recover-database -i b5fc646e-01a6-4c8b-8286-7633346c4 -t PITR
-r 11/08/2017 12:57:33 –p
```

Example 16-73 Recovering a Database to the latest

```
# odacli recover-database -i b5fc646e-01a6-4c8b-8286-7633346c4 -t
Latest -p
```

Example 16-74 Recovering a Database to an SCN

```
# odacli recover-database -i b5fc646e-01a6-4c8b-8286-7633346c4 -t SCN
-s 392375947
```

Example 16-75 Restoring the TDE Wallet while performing database recovery, if TDE wallets are lost

```
# odacli recover-database -in db1 -t latest -tp -
tl /u01/NFS_TDE/testbackups/test2-c/database/91276171/tdbacf2/tdewallet/
ewallet_2020021714442745.p12
Password for TDE wallet:
```

Example 16-76 Recovering a Database that was associated with a CPU Pool

```
# odacli recover-database -t latest -in irmendb4  -cp testcpupool3
{
  "jobId" : "b09f2d3f-2b01-4dbb-9797-122ba786e0e4",
  "status" : "Created",
  "message" : null,
  "reports" : [ ],
  "createTimestamp" : "August 10, 2020 14:56:57 PM UTC",
  "resourceList" : [ ],
  "description" : "Create recovery-latest for db : irmendb4",
  "updatedTime" : "August 10, 2020 14:56:57 PM UTC"
}
```

odacli restore-tdewallet

Use the `odacli restore-tdewallet` command to recover or restore TDE wallet from the backup location.

File Path

`/opt/oracle/dcs/bin/odacli`

Syntax

```
  odacli  restore-tdewallet [-in] [-tl] [-h] [-j]
```

Parameters

Parameter	Description
`--dbname`, `-in`	Specifies the Database Name.
`--tde-backup-location`, `-tl`	(Optional) Specifies the backup location for TDE wallet.
`--help`, `-h`	(Optional) Displays help for using the command.
`--json`, `-j`	(Optional) Displays JSON output. The default is false.

Usage Notes

> **Caution:**
>
> When you create a database with Transparent Data Encryption (TDE) enabled, you are prompted to set a password for the TDE wallet. Provide a strong password for security compliance. Set the password carefully, and ensure that this password is available to you at all times for database management operations. Failure to provide the TDE wallet password when prompted, will cause an error in accessing encrypted data.

- This command prompts for TDE wallet password. When prompted, enter the password of the TDE wallet. This password is the one you created or last updated using the modify-database command.
- TDE Wallet backup location is optional. If no TDE Wallet backup location is provided, then the latest TDE Wallet backup of the database known to the system is used for restoring the TDE Wallet.

Example 16-77 Restoring TDE wallet for a database from a backup location

```
# odacli restore-tdewallet -in testdb -tl /u01/NFS_TDE/testbackups/
test2-c/database/91276171/tdbacf2/tdewallet/ewallet_2020021714442745.p12
Password for TDE Wallet:
```

odacli update-backupconfig

Use the command `odacli update-backupconfig` to update a backup configuration.

File Path

$ORACLE_HOME`/opt/oracle/dcs/bin/odacli`

Syntax

```
  odacli  update-backupconfig  -n backup configuration name [-i] [-in]
[-ca] -d backup destination{Disk|ObjectStore|None} [-c] [-cr] [-h] [-j]
[-no-cr] [-o][-w]
```

Parameters

Parameter	Description
`--backupconfigid`, `-i`	Defines the Backup Config ID.
`--backupconfigname`, `-in`	Defines the Backup Config name.
`--backupdestination`, –d{Disk|ObjectStore|None}	Defines the backup destination. The options are not case sensitive. Applicable to System type backup config.
`--compression-algo`, –ca{BASIC|LOW|MEDIUM|HIGH}	Defines the Compression Algorithm that RMAN must use. The default is BASIC for Disk and NFS backup and MEDIUM for ObjectStore backup.
`--container`, `-c`	(Optional) Defines the object store container or absolute path to the parent directory of NFS destination for backups.
`--crosscheck`, `-cr`	(Optional) Enable Crosscheck. Applicable to Database type backup config.
`--help`, `-h`	(Optional) Displays help for using the command.
`--json`, `-j`	(Optional) Displays JSON output. The default is false.
`--name`, `-n`	Defines the backup configuration name.
`--no-crosscheck`, `-no-cr`	(Optional) Disable crosscheck.
`--objectstoreswiftId`, `-o`	(Optional) Defines the swift object store credential ID.

`--recoverywindow`, `-w`
Disk: {1-14}
ObjectStore: {1-30}
	(Optional) Defines the Recovery Window in days. {1-14} days for Disk and {1-30} days for Object store. Applicable to Database type backup config.

Usage Notes

- The recovery window that is defined in the backup configuration determines when backups are considered obsolete. The following are guidelines:
  - Disk: 1-14 days
  - ObjectStore in Casper: 1-30 days

Example 16-78 Revise a Backup Configuration for Disk

Create a backup configuration named `production` that backs up to disk with a 14 day recovery window.

```
# odacli update-backupconfig -d Disk -n production -w 14
```

odacli update-objectstoreswift

Use the command `odacli update-objectstoreswift` to change the credentials for the ObjectStore account.

File Path

$ORACLE_HOME`/opt/oracle/dcs/bin/odacli`

Syntax

```
# odacli  update-objectstoreswift [-h] [-j] -i Object Store Swift id
[-p] swift password  [-u] Object Store user name
```

Parameters

Parameter	Description
`--help`, `-h`	(Optional) Displays help for using the command.
`--json`, `-j`	(Optional) Displays JSON output. The default is false.
`--objectstoreswiftid`, `-i`	Defines the Object Store Swift identifier (ID).
`--swiftpassword`, `-p`	(Optional) Defines the Object Store Swift password.
`--username`, `-u`	(Optional) Defines the Object Store Swift user name.

Usage Notes

Use this command to update the password when it is changed for an ObjectStore account. The command updates the Oracle ObjectStore credential details in the system and stores the password in an encrypted Oracle wallet.

The credentials are validated during the command `odacli update-backupconfig` with `objectstore` as the destination. The credentials are not validated against endpoint URL and tenancy.

Example 16-79 Changing the Oracle Casper ObjectStore Password

```
# odacli  update-objectstoreswift -i Object Store Swift id -p swift
password
```

Example 16-80 Changing the Oracle ObjectStore User Name

```
# odacli  update-objectstoreswift -i Object Store Swift id -u Object
Store user name
```

odacli update-schedule

Use the command `odacli update-schedule` to update the schedule for a database, or to disable the database backup schedule.

File Path

$ORACLE_HOME`/opt/oracle/dcs/bin/odacli`

Syntax

```
#  odacli  update-schedule  [-x] [-t] [-d] [-e] [-h] [-j] [-id]
```

Parameters

Parameter	Description
`--cronExpression`, `-x`	(Optional) Defines the date and time for the update.
`--description`, `-t`	(Optional) Provides a description for the update schedule.
`--disable`, `-d`	(Optional) Disables the schedule.
`--enable`, `-e`	(Optional) Enables a disabled schedule.
`--help`, `-h`	(Optional) Displays help for using the command.
`--json`, `-j`	(Optional) Displays JSON output. The default is false.
`--scheduleid`, `-id`	Defines the schedule with an identifier (ID).

Usage Notes

Backups incur overhead on the system. When possible, do not schedule backups to run when users are trying to access data.

Use a utility, such as www.croncronmaker.com, to generate a valid cron expression.

Example 16-81 Change What Time the Backup Occurs

Edit the cron expression to change the time of scheduled backups for a given schedule ID.

```
#  odacli  update-schedule -i scheduleid  -x "0 0 13 1/1 * ? *" -e
```

Example 16-82 Disable Scheduled Database Backups

```
#  odacli  update-schedule -i scheduleid  -d
```

Oracle Data Guard odacli Commands

Use ODACLI commands to configure and manage Oracle Data Guard in your Oracle Database Appliance deployment.

- odacli configure-dataguard
  Use the command `odacli configure-dataguard` to configure Oracle Data Guard on Oracle Database Appliance.
- odacli deconfigure-dataguard
  Use the command `odacli deconfigure-dataguard` to deconfigure Oracle Data Guard on Oracle Database Appliance.
- odacli describe-dataguardstatus
  Use the command `odacli describe-dataguardstatus` to view Oracle Data Guard status on Oracle Database Appliance.
- odacli failover-dataguard
  Use the command `odacli failover-dataguard` on the standby system to failover the Oracle Data Guard primary database to the standby database.
- odacli list-dataguardstatus
  Use the command `odacli list-dataguardstatus` to verify Oracle Data Guard status on both primary and standby databases.
- odacli reinstate-dataguard
  Use the command `odacli reinstate-dataguard` on the new primary system to reinstate a failed primary database after a failover and convert it to a new standby database.
- odacli switchover-dataguard
  Use the command `odacli switchover-dataguard` on the primary system to reverse the Oracle Data Guard primary and standby database roles on Oracle Database Appliance.

odacli configure-dataguard

Use the command `odacli configure-dataguard` to configure Oracle Data Guard on Oracle Database Appliance.

File Path

`/opt/oracle/dcs/bin/odacli`

Syntax

```
# odacli configure-dataguard [-h] [-j] [-i] [-r] [-s]
```

Parameters

Parameter	Description
`--help, -h`	(Optional) Displays help for using the command.
`--json, -j`	(Optional) Displays JSON output. The default is false.
`--requestjson, -r`	(Optional) Specifies the JSON file for creating the appliance.
`--skip-password-copy, -s`	(Optional) Specifies that step to copy the password from primary database to standby database can be skipped.

Usage Notes

If the database orapwd file is not in the typical location, then an error may occur in the configuration process. In such a case, manually copy the orapwd file from the primary database to the standby database in advance, and configure Oracle Data Guard with the `--skip-password-copy` option.

Example 16-83 Configuring Oracle Data Guard interactively on the commad line

```
# odacli configure-dataguard
Standby site address: test_domain
BUI username for Standby site (default: oda-admin):
BUI password for Standby site:
TrustStore path for Standby DCS server: /cacerts.a
TrustStore password for Standby DCS server: <TrustStore_Password>
Database name for Data Guard configuration: cpub
Primary database syspassword:
************************************************************************
***********
Data Guard default settings
Primary site network for Data Guard configuration: Public-network
Standby site network for Data Guard configuration: Public-network
Primary database listener port: 1521
Standby database listener port: 1521
Transport type: ASYNC
Protection mode: MAX_PERFORMANCE
Data Guard configuration name: pcpub_scpub
Active Data Guard: disabled
Do you want to edit this Data Guard configuration? (Y/N, default:N):
The TrustStore of the Standby site should be removed unless it is
necessary for some other purpose. Do you want to delete it? (Y/N,
default:Y): n
As a requirement, Standby database's SYS password will be set to
Primary database's after Data Guard configuration. Are you sure you
```

```
want to proceed with Data Guard configuration? (Y/N): y
************************************************************************
*******************
Configure Data Guard pcpub_scpub started
************************************************************************
*******************
Step 1: Validate Data Guard configuration request (Primary site)
Description: Validate DG Config Creation
Job ID: bafb8ef4-d3c9-4421-84a1-4c75d73e71a0
Started August 25, 2020 05:51:20 UTC
Validate create Data Guard configuration request
Finished August 25, 2020 05:51:27 UTC
************************************************************************
*******************
Step 2: Validate Data Guard configuration request (Standby site)
Description: Validate DG Config Creation
Job ID: a7b80880-40ab-4dbf-b8be-22717ae87711
Started August 25, 2020 05:51:27 UTC
Validate create Data Guard configuration request
Finished August 25, 2020 05:51:33 UTC
************************************************************************
*******************
Step 3: Download password file from Primary database (Primary site)
Description: Download orapwd file from Primary database
Started August 25, 2020 05:51:33 UTC
Prepare orapwd file for Primary database cpub
Finished August 25, 2020 05:51:38 UTC
************************************************************************
*******************
Step 4: Upload password file to Standby database (Standby site)
Description: Upload orapwd file to Standby database
Started August 25, 2020 05:51:38 UTC
Write orapwd file to Standby database cpub
Finished August 25, 2020 05:51:47 UTC
************************************************************************
*******************
Step 5: Configure Primary database (Primary site)
Description: DG Config service creation - ConfigurePrimary
Job ID: b6726f76-0a3a-4bb1-8fec-a3eb311531cf
Started August 25, 2020 05:51:47 UTC
Configure host DNS on primary env
Configure Data Guard Tns on primary env
Enable Data Guard related Db parameters for primary env
Enable force logging and archivelog mode in primary env
Enable FlashBac
Configure network parameters for local listener on primary env
Restart listener on primary env
Create services for primary db
Finished August 25, 2020 05:52:10 UTC
************************************************************************
*******************
Step 6: Configure Standby database (Standby site)
Description: DG Config service creation - ConfigureStandby
Job ID: e6b552be-fef0-4cd6-a61d-81292f957a6e
Started August 25, 2020 05:52:10 UTC
```

```
Configure Data Guard Tns on standby env
Configure host DNS on standby env
Clear Data Guard related Db parameters for standby env
Enable Data Guard related Db parameters for standby env
Enable force logging and archivelog mode in standby env
Populate standby database metadata
Configure network parameters for local listener on standby env
Reset Db sizing and hidden parameters for ODA best practice
Restart Listener on standby env
Create services for standby db
Finished August 25, 2020 05:53:40 UTC
************************************************************************
*******************
Step 7: Configure and enable Data Guard (Primary site)
Description: DG Config service creation - ConfigureDg
Job ID: 0b79511f-794a-4bc2-936d-5c651110467f
Started August 25, 2020 05:53:40 UTC
Config and enable Data Guard
Post check Data Guard configuration
Finished August 25, 2020 05:55:06 UTC
************************************************************************
*******************
Step 8: Enable Flashback (Standby site)
Description: DG Config service creation - EnableFlashback
Job ID: b526445e-67df-4c35-a7ca-8420298b8bd2
Started August 25, 2020 05:55:06 UTC
Enable FlashBack
Finished August 25, 2020 05:55:17 UTC
************************************************************************
*******************
Step 9: Re-enable Data Guard (Primary site)
Description: DG Config service creation - ReenableDg
Job ID: 4833133f-da65-44a9-beb7-2c4d347c9120
Started August 25, 2020 05:55:23 UTC
Re-enable Data Guard if inconsistent properties found
Post check Data Guard configuration
Finished August 25, 2020 05:55:29 UTC
************************************************************************
*******************
Step 10: Create Data Guard status (Primary site)
Description: DG Status service creation - NewDgconfig
Job ID: 430d0613-bcd3-4e34-9418-c5f4dfddc052
Started August 25, 2020 05:55:33 UTC
Create Data Guard status
Finished August 25, 2020 05:55:37 UTC
************************************************************************
*******************
Step 11: Create Data Guard status (Standby site)
Description: DG Status service creation - NewDgconfig
Job ID: 93bcdd39-657f-4d7c-b893-c50dc5e708c4
Started August 25, 2020 05:55:40 UTC
Create Data Guard status
Finished August 25, 2020 05:55:43 UTC
************************************************************************
*******************
```

```
Configure Data Guard pcpub_scpub completed
************************************************************************
*******************
```

Example 16-84 Configuring Oracle Data Guard using JSON file

```
# odacli configure-dataguard -r configdg_ODA_HA.json
Standby machine address: 192.214.108.19
BUI username for Standby machine (default: oda-admin):
BUI password for Standby machine:
TrustStore path for Standby DCS server (copy from /opt/oracle/dcs/
dcscli/cacerts on Standby machine to this machine and set file
permissions to 400): /cacerts.a
TrustStore password for Standby DCS server: (can be found in /opt/
oracle/dcs/dcscli/dcscli.conf)
Primary database syspassword:
Standby database syspassword (default: same as primary):
The TrustStore of the Standby machine should be removed unless it is
necessary for some other purpose. Do you want to delete it? (Y/N,
default:Y): n
As a requirement, Standby database's SYS password will be set to
Primary database's after Data Guard configuration. Are you sure you
want to proceed? (Y/N): y
Data Guard configuration for database 'test' started
************************************************************************
*******************
Step 1: Validate Data Guard configuration request (Primary machine)
.....
```

Example 16-85 Sample JSON for configuring Oracle Data Guard on Oracle Database Appliance High-Availability Deployments

```
{
  "name": "pink1_pink7",
  "protectionMode": "MAX_PERFORMANCE",
  "enableFlashback": true,
  "enableActiveDg": false,
  "replicationGroups": [
    {
      "sourceEndPoints": [
        {
          "endpointType": "PRIMARY",
          "hostName": "test_domain1",
          "listenerPort": 1521,
          "databaseUniqueName": "pink1",
          "ipAddress": "192.214.96.214"
        },
    {
      "endpointType": "PRIMARY",
      "hostName": "test_domain2",
      "listenerPort": 1521,
      "databaseUniqueName": "pink1",
      "ipAddress": "192.214.96.215"
    }
```

```
      ],
      "targetEndPoints": [
        {
          "endpointType": "STANDBY",
          "hostName": "test_domain1",
          "listenerPort": 1521,
          "databaseUniqueName": "pink7",
          "ipAddress": "192.214.108.19"
        },
        {
          "endpointType": "STANDBY",
          "hostName": "test_domain2",
          "listenerPort": 1521,
          "databaseUniqueName": "pink7",
          "ipAddress": "192.214.108.20"
        }
      ],
      "transportType": "ASYNC"
    }
  ]
}
```

odacli deconfigure-dataguard

Use the command `odacli deconfigure-dataguard` to deconfigure Oracle Data Guard on Oracle Database Appliance.

File Path

```
/opt/oracle/dcs/bin/odacli
```

Syntax

```
# odacli deconfigure-dataguard [-h] [-j] [-i]
```

Parameters

Parameter	Description
`--help`, `-h`	(Optional) Displays help for using the command.
`--json`, `-j`	(Optional) Displays JSON output. The default is false.
`--dgconfigid`, `-i`	Specifies the Oracle Data Guard Configuration ID.

Usage Notes

For deconfiguring Oracle Data Guard, you must specify the Oracle Data Guard Configuration ID. Run the `odacli list-dataguardstatus` command to find the Oracle Data Guard Configuration ID.

Example 16-86 Deconfiguring Oracle Data Guard on the Primary Machine

```
# odacli deconfigure-dataguard -i 8396aac4-f7e7-42e4-a2e8-0cbbc89ce31b
Standby site address: test_domain
BUI username for Standby site (default: oda-admin):
BUI password for Standby site:
TrustStore path for Standby DCS server : /cacerts.a
TrustStore password for Standby DCS server: TrustStore_Password
The TrustStore of the Standby site should be removed unless it is
necessary for some other purpose. Do you want to delete it? (Y/N,
default:Y): n
Standby database will be deleted after Data Guard configuration is
removed. Are you sure you want to proceed? (Y/N): y
Deconfigure Dataguard Started
************************************************************************
*******************
Step 1: Deconfigure Data Guard (Primary site)
Description: Deconfigure DG service
Job ID: 8deb3e4c-09cd-4593-8184-f7706dd2ec8a
Started
Deconfigure Data Guard service
Cleanup broker resources
Finished
************************************************************************
*******************
Step 2: Delete Data Guard status (Primary site)
Description: DG Status service creation - UpdateDgconfig
Job ID: 59c61629-6c7d-474c-8c29-c0a9565d91a3
Started
Update Data Guard status
Finished
************************************************************************
*******************
Step 3: Delete Data Guard status (Standby site)
Description: DG Status service creation - UpdateDgconfig
Job ID: 93dcf4cd-1019-4bcd-984a-d3efeb3fae6e
Started
Update Data Guard status
Finished
************************************************************************
*******************
Step 4: Delete Standby database (Standby site)
Description: Database service deletion with db name: panda with id :
30dd49da-a54f-4a9a-abbf-d3a4e39abee5
Job ID: 0b1cb921-fd41-4e01-86df-beff3adb6de0
Started
Validate db 30dd49da-a54f-4a9a-abbf-d3a4e39abee5 for deletion
Database Deletion
Unregister Db From Cluster
Kill Pmon Process
Database Files Deletion
Deleting Volume
Delete File Groups of Database panda
Finished
************************************************************************
```

```
*******************
Data Guard configuration is removed
```

odacli describe-dataguardstatus

Use the command `odacli describe-dataguardstatus` to view Oracle Data Guard status on Oracle Database Appliance.

File Path

`/opt/oracle/dcs/bin/odacli`

Syntax

```
# odacli describe-dataguardstatus [-h] [-j] [-i]
```

Parameters

Parameter	Description
`--help`, `-h`	(Optional) Displays help for using the command.
`--json`, `-j`	(Optional) Displays JSON output. The default is false.
`--dgid`, `-i`	Specifies the Oracle Data Guard Status ID.

Usage Notes

Example 16-87 Viewing Oracle Data Guard configuration status

```
# odacli describe-dataguardstatus -i 5f0ed48a-366d-454c-a389-
fe367772dbb7
```

odacli failover-dataguard

Use the command `odacli failover-dataguard` on the standby system to failover the Oracle Data Guard primary database to the standby database.

File Path

`/opt/oracle/dcs/bin/odacli`

Syntax

```
# odacli failover-dataguard [-h] [-j] [-i] [-u]
```

Parameters

Parameter	Description
`--help`, `-h`	(Optional) Displays help for using the command.
`--json`, `-j`	(Optional) Displays JSON output. The default is false.
`--dgid`, `-i`	Specifies the Oracle Data Guard Status ID.
`--databaseUniqueName`, `-u`	Specifies the unique name of the database to failover to.

Usage Notes

After performing the failover, view the status with the `odacli list-dataguardstatus` command.

Example 16-88 Performing Failover Oracle Data Guard

```
# odacli failover-dataguard -i 75f23ce0-006a-4aeb-ba6d-b4b60275c19 -u
houdg02
```

odacli list-dataguardstatus

Use the command `odacli list-dataguardstatus` to verify Oracle Data Guard status on both primary and standby databases.

File Path

`/opt/oracle/dcs/bin/odacli`

Syntax

```
# odacli list-dataguardstatus [-h] [-j]
```

Parameters

Parameter	Description
`--help`, `-h`	(Optional) Displays help for using the command.
`--json`, `-j`	(Optional) Displays JSON output. The default is false.

Usage Notes

Example 16-89 Viewing Oracle Data Guard status on primary and standby databases

```
# odacli list-dataguardstatus
```

odacli reinstate-dataguard

Use the command `odacli reinstate-dataguard` on the new primary system to reinstate a failed primary database after a failover and convert it to a new standby database.

File Path

`/opt/oracle/dcs/bin/odacli`

Syntax

```
# odacli reinstate-dataguard [-h] [-j] [-i] [-u]
```

Parameters

Parameter	Description
`--help`, `-h`	(Optional) Displays help for using the command.
`--json`, `-j`	(Optional) Displays JSON output. The default is false.
`--dgid`, `-i`	Specifies the Oracle Data Guard Status ID.
`--databaseUniqueName`, `-u`	(Optional) Specifies the unique name of the database to reinstate.

Usage Notes

After completing the reinstate operation, view the status with the `odacli list-dataguardstatus` command.

Example 16-90 Performing reinstate operation on Oracle Data Guard

```
# odacli reinstate-dataguard -i 75f23ce0-006a-4aeb-ba6d-b4b60275c19 -u
houdg02
```

odacli switchover-dataguard

Use the command `odacli switchover-dataguard` on the primary system to reverse the Oracle Data Guard primary and standby database roles on Oracle Database Appliance.

File Path

`/opt/oracle/dcs/bin/odacli`

Syntax

```
# odacli switchover-dataguard [-h] [-j] [-i] [-u]
```

Parameters

Parameter	Description
`--help`, `-h`	(Optional) Displays help for using the command.
`--json`, `-j`	(Optional) Displays JSON output. The default is false.
`--dgid`, `-i`	Specifies the Oracle Data Guard Status ID.
`--databaseUniqueName`, `-u`	(Optional) Specifies the unique name of the database to switchover to.

Usage Notes

After performing the switchover, view the status with the `odacli list-dataguardstatus` command.

Example 16-91 Switching over Oracle Data Guard

```
# odacli switchover-dataguard -i 75f23ce0-006a-4aeb-ba6d-b4b60275c19 -u
houdg02
```

odacli CPU Core Commands

Use the CPU Core commands to enable CPU cores and display current and historical CPU core configurations.

- odacli list-cpucores
  Use the `odacli list-cpucores` command lists the history of core configuration changes in the system.
- odacli describe-cpucore
  Use the `odacli describe-cpucore` command to display the current core configuration and the modification date and time.
- update-cpucore
  Use the `odacli update-cpucore` command to enable the number of CPU cores in the system.

odacli list-cpucores

Use the `odacli list-cpucores` command lists the history of core configuration changes in the system.

File Path

$ORACLE_HOME`/opt/oracle/dcs/bin/odacli`

Syntax

```
odacli list-cpucores  [-h]
```

Parameters

Parameter	Description
`--help, -h`	(Optional) Displays help for using the command.

Example 16-92 Displaying a List of Cores

```
# odacli list-cpucores

Node  Cores  Modified                       Job Status
----- ------ ------------------------------ ---------------
0     10     July 22, 2016 12:06:08 PM SGT  Configured
0     8      July 25, 2016 9:39:59 AM SGT   Configured
```

odacli describe-cpucore

Use the `odacli describe-cpucore` command to display the current core configuration and the modification date and time.

File Path

`/opt/oracle/dcs/bin/odacli`

Syntax

```
 odacli describe-cpucore  [-h]
```

Parameters

Parameter	Description
`--help, -h`	(Optional) Displays help for using the command.

Example 16-93 Displaying the Current Core Configuration

```
# odacli describe-cpucore

Node  Cores  Modified                       Job Status
----- ------ ------------------------------ ---------------
0      8     July 25, 2016 9:39:59 AM SGT   Configured
```

update-cpucore

Use the `odacli update-cpucore` command to enable the number of CPU cores in the system.

File Path

`/opt/oracle/dcs/bin/odacli`

Syntax

```
odacli update-cpucore  -c cores [-h]
```

Parameters

Parameter	Description
`--cores`, `-c`	Defines the number of cores to be enabled in the system.
`--help`, `-h`	(Optional) Displays help for using the command.

Usage Notes

- The number of cores you enable must be a multiple of 2.
- After the initial configuration, you cannot reduce the number of cores. You can only increase the number of cores.

Example 16-94 Enabling CPU Cores

The following command enables 8 CPU cores.

```
# odacli update-cpucore -c 8

{
"jobId" : "2807f6ae-3ba5-48a5-8941-b8b365d89d24",
"status" : "Created",
"message" : null,
"reports" : [ ],
"createTimestamp" : 1469410799194,
"description" : "CPU cores service update",
"updatedTime" : 1469410799194
}
```

odacli CPU Pool Commands for Bare Metal and KVM

Use odacli commands to manage resource allocations on Oracle Database Appliance for bare metal and KVM deployments.

CPU pools enable management of CPU resources in both bare metal and KVM environments. There are two types of CPU pools, that is, BM and VM.

Use the BM CPU pool to ensure that the database on a bare metal host runs exclusively on the CPUs specified in the CPU pool.

Use the VM CPU pools to cage and manage CPU resource allocations to workloads for virtual machines. Workloads are isolated by creating CPU pools and assigning or pinning virtual machines to a specific CPU pool. When you pin a virtual machine to a CPU pool, you ensure that the virtual machine uses CPUs in only that CPU pool.

Resources in CPU pools cannot overlap, that is, CPU pools cannot share CPUs.

- odacli create-cpupool
  Use the `odacli create-cpupool` command to create a new CPU pool on Oracle Database Appliance Bare Metal or Kernel-based Virtual Machine (KVM) deployment.
- odacli list-cpupools
  Use the `odacli list-cpupools` command to list all CPU Pools on Oracle Database Appliance Bare Metal or Kernel-based Virtual Machine (KVM) deployment.
- odacli describe-cpupool
  Use the `odacli describe-cpupool` command to describe CPU Pools on Oracle Database Appliance Bare Metal or Kernel-based Virtual Machine (KVM) deployment.
- odacli modify-cpupool
  Use the `odacli modify-cpupool` command to modify a CPU Pool configuration on Oracle Database Appliance Bare Metal or Kernel-based Virtual Machine (KVM) deployment.
- odacli delete-cpupool
  Use the `odacli delete-cpupool` command to delete a CPU Pool configuration on Oracle Database Appliance Kernel-based Virtual Machine (KVM).
- odacli list-auditrecords
  Use the `odacli list-auditrecords` command to list the audit records for a CPU Pool on Oracle Database Appliance Bare Metal or Kernel-based Virtual Machine (KVM) deployment.
- odacli describe-auditrecord
  Use the `odacli describe-auditrecord` command to describe the audit record for a CPU Pool on Oracle Database Appliance Bare Metal or Kernel-based Virtual Machine (KVM) deployment.

odacli create-cpupool

Use the `odacli create-cpupool` command to create a new CPU pool on Oracle Database Appliance Bare Metal or Kernel-based Virtual Machine (KVM) deployment.

Syntax

```
odacli create-cpupool -n name -c {-bm|-vm} -nn node_name [-j] [-h]
```

Parameters

Parameter	Description
`--name, -n`	Specifies the CPU Pool name.
`--cores, -c`	Specifies the CPU Pool cores
`--bm, -bm`	Specifies the CPU Pool as Bare Metal
`--vm, -vm`	Specifies the CPU Pool as Virtual Machine.
`--node-name, -nn`	(Optional) Specifies the node where the CPU Pool will be created. On High-Availability deployment, if this option is not specified, then the CPU pool is created on both nodes.
`--json, -j`	(Optional) Displays output in JSON format.
`--help, -h`	(Optional) Displays help for using the command.

Usage Notes

- Attach the BM CPU pool to databases. Bare metal CPU pools can be assigned to multiple databases.
- Attach VM CPU pool VM guest machines. VM CPU pools can be assigned to multiple VMs.
- Resources in CPU pools cannot overlap, that is, CPU pools cannot share CPUs.
- After you create a BM CPU pool, you can associate this CPU pool to a database using the `create-database` or `modify-database` command.
- After you create a VM CPU pool, you can associate this CPU pool to a VM using the `create-vm` or `modify-vm` command.
- Number of cores mustbe an even number between 2 and the total number of available cores on the system.

Example

Create a BM CPU pool named `cpupool1` with 6 cores associated to it.

```
# odacli create-cpupool -n cpupool1 -c 6 -bm
```

Create a VM CPU pool named `cpupool2` with 6 cores associated to it.

```
# odacli create-cpupool -n cpupool2 -c 6 -vm
```

odacli list-cpupools

Use the `odacli list-cpupools` command to list all CPU Pools on Oracle Database Appliance Bare Metal or Kernel-based Virtual Machine (KVM) deployment.

Syntax

```
 odacli list-cpupools [-j] [-h]
```

Parameters

Parameter	Description
`--json, -j`	(Optional) Displays output in JSON format.
`--help, -h`	(Optional) Displays help for using the command.

Example

```
# odacli list-cpupools
```

odacli describe-cpupool

Use the `odacli describe-cpupool` command to describe CPU Pools on Oracle Database Appliance Bare Metal or Kernel-based Virtual Machine (KVM) deployment.

Syntax

```
odacli describe-cpupool -n name [-j] [-h]
```

Parameters

Parameter	Description
`--name`, `-n`	Specifies the name of the CPU Pool.
`--json`, `-j`	(Optional) Displays output in JSON format.
`--help`, `-h`	(Optional) Displays help for using the command.

Example: Describing a CPU pool named `cpupool1`

```
# odacli describe-cpupool -n cpupool1
```

odacli modify-cpupool

Use the `odacli modify-cpupool` command to modify a CPU Pool configuration on Oracle Database Appliance Bare Metal or Kernel-based Virtual Machine (KVM) deployment.

Syntax

```
odacli modify-cpupool -n name -c cores -f -l [-j] [-h]
```

Parameters

Parameter	Description
`--name`, `-n`	Specifies the CPU Pool name
`--cores`, `-c`	Specifies the new number of CPU cores
`--force`, `-f`	(Optional) Forces the operation
`--live`, `-l`	(Optional) Applies the changes to running VMs
`--json`, `-j`	(Optional) Displays output in JSON format.
`--help`, `-h`	(Optional) Displays help for using the command.

Usage Notes

For VM CPU pool, if `--live` is not specified, then the changes are applied to the VM configuration file and will be activated next time the VM is started. If `--live` is specified, then the changes will be applied to both VM configuration file and to the running VM.

Example

Set the size of a CPU Pool `cpupool1` to 10. If --live is not specified, the change is applied to the VM configuration file and will be activated next time the VM is started.

```
# odacli modify-cpupool -n cpupool1 -c 10
```

odacli delete-cpupool

Use the `odacli delete-cpupool` command to delete a CPU Pool configuration on Oracle Database Appliance Kernel-based Virtual Machine (KVM).

Syntax

```
 odacli delete-cpupool -n name -f [-j] [-h]
```

Parameters

Parameter	Description
`--name`, `-n`	Specifies the CPU Pool name to be deleted
`--force`, `-f`	(Optional) Forces deletion.
`--json`, `-j`	(Optional) Displays output in JSON format.
`--help`, `-h`	(Optional) Displays help for using the command.

Example

Delete a CPU pool named `cpupool1`.

```
# odacli delete-cpupool -n cpupool1
```

odacli list-auditrecords

Use the `odacli list-auditrecords` command to list the audit records for a CPU Pool on Oracle Database Appliance Bare Metal or Kernel-based Virtual Machine (KVM) deployment.

Syntax

```
 odacli list-auditrecords -du dcs-username -f from_date-range -l latest -n
node_ID -ot operation_type -ou OS_username -rn resource_name -rt resource_type
-t to_date-range [-j] [-h]
```

Parameters

Parameter	Description
`--dcs-user`, `-du`	(Optional) Specifies the DCS user name.
`--from`, `-f`	(Optional) Specfies the *from* date in the date range for the CPU pool audit records.
`--latest`, `-l`	(Optional) Specifies the latest number of CPU pool audit records.
`--node-id`, `-n`	(Optional) Specifies the node ID.
`--op-type`, `-ot`	(Optional) Specifies the type of operation.

Parameter	Description
`--os-user, -ou`	(Optional) Specifies the operating system user.
`--rsc-name, -rn`	(Optional) Specifies the resource name.
`--rsc-type, -rt`	(Optional) Specifies the resource type.
`--to, -t`	(Optional) Specfies the *to* date in the date range for the CPU pool audit records.
`--json, -j`	(Optional) Displays output in JSON format.
`--help, -h`	(Optional) Displays help for using the command.

Example

```
# odacli list-auditrecords
ID                                    Resource type         Resource 
name         Operation type   DCS username     OS username     
Timestamp
------------------------------------  --------------------  
--------------------  ---------------  ---------------  ---------------  
-----------------------
41295d99-f263-4284-b6d9-2aff1ae0f850  BM_CPU_POOL           
testbmpool            CREATE           oda-admin        root             
2020-10-08 13:27:05 UTC
0f07a013-5bb4-4cd8-bd49-04dc61fcd454  BM_CPU_POOL           
pool_9f74a8e9-        DELETE           oda-admin        root             
2020-10-08 12:26:30 UTC
d858269b-6c28-4bc2-af71-79004f3561e6  BM_CPU_POOL           
pool_9f74a8e9-        CREATE           oda-admin        root             
2020-10-08 12:24:36 UTC
9d7852c1-93fb-410e-9e0c-8c0a95ed3f0c  VM_CPU_POOL           
pool_d48e81e4-        DELETE           oda-admin        root             
2020-10-08 12:06:45 UTC
0235cc84-9345-40bc-ac4f-7de3f63202e2  VM_CPU_POOL           
pool_4fe0b4f4-        DELETE           oda-admin        root             
2020-10-08 12:06:45 UTC
762f7263-7bd9-4b12-b891-48305165bf36  VM_CPU_POOL           
pool_4fe0b4f4-        MODIFY           oda-admin        root             
2020-10-08 12:06:22 UTC
0bd2a25d-2327-4918-bd47-8c00f7406f92  VM_CPU_POOL           
pool_4fe0b4f4-        MODIFY
```

odacli describe-auditrecord

Use the `odacli describe-auditrecord` command to describe the audit record for a CPU Pool on Oracle Database Appliance Bare Metal or Kernel-based Virtual Machine (KVM) deployment.

Syntax

```
 odacli describe-auditrecord -i [-j] [-h]
```

Parameters

Parameter	Description
`--id, -i`	Describes the ID of the audit record.

Parameter	Description
`--json, -j`	(Optional) Displays output in JSON format.
`--help, -h`	(Optional) Displays help for using the command.

Example

```
# odacli describe-auditrecord -i 41295d99-f263-4284-b6d9-2aff1ae0f850
Audit Record details
--------------------------------------------------------------------------------
 Event details
--------------------------
                Record ID:  41295d99-f263-4284-b6d9-2aff1ae0f850
         Record timestamp:  2020-10-08 13:27:05 UTC
             DCS username:  oda-admin
              OS username:  root
               Cluster ID:  test_cluster-c
                  Node ID:  test_cluster

 Resource/Operation
--------------------------
            Resource type:  BM_CPU_POOL
              Resource ID:  b17cb623-bf79-491f-86d8-d8502987e26c
            Resource name:  testbmpool
           Operation type:  CREATE
    Operation description:  Created with '2' cores and allocation
'test_cluster:1-2,17-18'
```

odacli Database Commands

Use the `odacli database` commands to perform database lifecycle operations.

- odacli clone-database
  Use the `odacli clone-database` command to clone a new database from a source database.
- odacli create-database
  Use the `odacli create-database` command to create a new database.
- odacli delete-database
  Use the `odacli delete-database` command to delete a database.
- odacli describe-database
  Use the `odacli describe-database` command to display database details.
- odacli list-databases
  Use the `odacli list-databases` command to list all databases on the appliance.
- odacli modify-database
  Use the `odacli modify-database` command to modify the configuration of a database, such as backup configuration, database class, and database type.
- odacli move-database
  Use the command `odacli move-database` to move a database from one Oracle home to another home of the same database version.

- odacli register-database
  Use the `odacli register-database` command to register a migrated database with the appliance.
- odacli upgrade-database
  You can the `odacli upgrade-database` command to upgrade a database from a supported release. This command is deprecated and will be desupported in a future release. Instead, use the command `odacli move-database` to move databases from one Oracle Database home to another.

odacli clone-database

Use the `odacli clone-database` command to clone a new database from a source database.

File Path

```
/opt/oracle/dcs/bin/odacli
```

Syntax

```
odacli clone-database [-u] [-n] [-s] [-t] [-j] [-f] [-nn] [-h] [-sh|-no-
sh] [-m]
```

Parameters

Parameter	Description
`--databaseUniqueName`, `-u`	(Optional) Defines a unique name for the database. If the `--databaseUniqueName` option is not provided, then the name of the database is set to the `--dbname` value.
`--dbname`, `-n`	Defines the name given to the new database (`dbname`.)
`--dbshape`, `-s`	Identifies the database shape (template) and determines the total memory allocated to the database. For example, odb1 and odb2. The default is `odb1`.
`--dbtype, -t [SI]`	Defines the database type. The default database type is the source database type, if the option is not specified.
`--help`, `-h`	(Optional) Displays help for using the command.
`--json`, `-j`	(Optional) Displays JSON output.
`--sourcedbname`, `-f`	Specifies the name of the source database
`--syspassword`, `-m`	Specifies the password for SYS user.
`--associated-networks`, `-nn`	Specifies the associated network names (in the format networkName1,networkName2,...).
`--disable-seha`, `-no-sh`	Specifies whether you want to disable Standard Edition High-Availability for Oracle Database Standard Edition 19c and later single-instance databases.

Parameter	Description
`--enable-seha`, `-sh`	Specifies whether you want to enable Standard Edition High-Availability for Oracle Database Standard Edition 19c and later single-instance databases.
`--cpupool`, `-cp`	(Optional) Specifies the CPU pool name.

Usage Notes

- The source database must be up and running.
- The source database must use Oracle ACFS storage.
- The source database must not be a multitenant container database (CDB)
- If `-cp` parameter is provided as part of the command, cloned database is associated with the particular CPU pool.
- If `-cp` parameter is not provided as part of the command, and if the parent database has an associated CPU pool, then the cloned database is also associated with the same CPU pool as that of parent database.
- If `-cp` parameter is not provided as part of the command, and if the parent database does not have any associated CPU pool, then the cloned database is also not associated with any CPU pool.

Example 16-95 Cloning a Database

The following example creates a clone database snap1 from source database acfsdb1.

```
# /opt/oracle/dcs/bin/odacli clone-database -n snap1 -u snap1u -f 
acfsdb1 -m password
```

Example 16-96 Cloning a Database and associating it with the same CPU Pool as the parent database

```
# odacli clone-database -f dbcpupin -n dbclone -u dbcloneUnique -m
Password for SYS:
{
  "jobId" : "74a80586-3523-4367-93a0-38401647c5a0",
  "status" : "Created",
  "message" : null,
  "reports" : [ ],
  "createTimestamp" : "August 09, 2020 10:25:40 AM UTC",
  "resourceList" : [ ],
  "description" : "Snap Database service creation with db name: 
dbclone",
  "updatedTime" : "August 09, 2020 10:25:40 AM UTC"
}
```

Example 16-97 Cloning a Database and associating it with a different CPU Pool

```
# odacli clone-database -f dbcpupin -n db1clone -u db1cloneUnique -cp 
testdbcpupool2 -m
```

```
Password for SYS:
{
  "jobId" : "2fe285b5-2e3b-4e80-9121-e7c8380952b3",
  "status" : "Created",
  "message" : null,
  "reports" : [ ],
  "createTimestamp" : "August 09, 2020 10:36:55 AM UTC",
  "resourceList" : [ ],
  "description" : "Snap Database service creation with db name:
db1clone",
  "updatedTime" : "August 09, 2020 10:36:55 AM UTC"
}
```

Related Topics

- Cloning an Oracle ACFS Database Using Command Line Interface
  Create a database from an existing Oracle ACFS database using CLI commands.

odacli create-database

Use the `odacli create-database` command to create a new database.

File Path

`/opt/oracle/dcs/bin/odacli`

Syntax

```
odacli create-database -n database_name -cs characterset -cl {OLTP|DSS|
IMDB}
-l dblanguage -s dbshape -r {ACFS|ASM} -dt dbterritory
-y dbtype -ns nationalscharacterset -d pdbadmin -p pdbname -v version
[-u databaseUniqueName] [-dh Database Home ID] [-c|-no-c] [-co|-no-co]
[-bi backupconfigid] [-io] [-dn] [-j] [-nn] [-h] [-rd] [-sh|-no-sh]
[-t] [-cp]
```

Parameters

Parameter	Description
`--backupconfigid`, `-bi`	(Optional) Defines the backup configuration identifier for future use.
`--cdb`, `-c`	(Optional) Creates the database as a container database. Use the `-c` flag to create a container database and use the `-no-c` flag to create a non-CDB database. The default is `-no-c`.
`--characterset`, `-cs`	Defines the character set. The default is AL32UTF8.
`--databaseUniqueName`, `-u`	(Optional) Defines a unique name for the database.
`--dbdomainname`, `-dn`	Defines the database domain name.
`--cpupool`, `-cp`	Defines the CPU pool name. The CPU pool must be of type bare metal (BM).
`--dbEdition`, `-de`	Defines the Database Edition.

Parameter	Description
`--dbclass`, `-cl {OLTP|DSS|IMDB}`	Defines the database class. The default is OLTP. The options are as follows: • Enterprise Edition: OLTP, DSS, or IMDB. • Standard Edition: OLTP
`--dbconsole`, `-co`	(Optional) Enables the Database Console. Use the `-no-co` flag to disable the Database Console. If not selected, the default is no database console.
`--dbhomeid`, `-dh`	(Optional) Identifies the existing Database Home ID.
`--dblanguage`, `-l`	Defines the database language. The default language is AMERICAN.
`--dbname`, `-n`	Defines the name given to the new database (`dbname`.)
`--dbshape`, `-s`	Identifies the database shape (template) and determines the total memory allocated to the database. For example, odb1 and odb2. The default is `odb1`. You cannot specify the database shape when you create a instance-only database.
`--dbstorage`, `-r{ACFS|ASM}`	Defines the Database Storage, either Oracle ACFS or Oracle ASM. The default value is Oracle ASM.
`--dbterritory`, `-dt`	Defines the database territory. The default territory is AMERICA.
`--dbtype, -y [SI]`	Defines the database type. The default database type is SI.
`--help`, `-h`	(Optional) Displays help for using the command.
`--instanceonly`, `-io`	(Optional) Creates a database instance, password file and also the underlying Oracle ACFS mount point. You can use the instance as an auxiliary instance for RMAN duplicate.
`--json`, `-j`	(Optional) Displays JSON output.
`--nationalscharacterset`, `-ns`	Defines the NLS National Character Set. The default is AL16UTF16.
`--no-cdb`, `-no-c`	(Optional) Creates a database that is *not* a container database. Use this flag when you want to create a non-CDB database. Use the `-c` flag to create a container database.
`--no-dbconsole`, `-no-co`	(Optional) Disables Database Console. Use the `-co` flag to enable Database Console.
`--pdbadmin`, `-d`	Defines the Pluggable Database (PDB) Admin User.
`--pdbname`, `-p`	Defines the Pluggable Database (PDB) name. The default value is `pdb1`.
`--version`, `-v`	Defines the database bundle patch number. To install the latest bundle patch for a release, specify the release version. To specify a specific supported bundle, use the 5 digit format. For example, 12.1.0.2.170814 or 11.2.0.4.170814.

Parameter	Description
--dbRedundancy, -rd	Specifies the database redundancy value, that is, {HIGH|MIRROR}. To specify the dbRedundancy option for an Oracle ASM or ACFS storage-based database, at least one disk group of FLEX redundancy must exist. To specify the dbRedundancy option for an Oracle ASM storage database, the dbVersion or dbHomeVersion must be 12.2 or later.
--associated-networks, -nn	Specifies the associated network names (in the format networkName1,networkName2,...).
--enable-tde, -t	Specifies whether to enable Transparent Data Encryption (TDE) which uses Software Keystore.
--disable-seha, -no-sh	Specifies whether you want to disable Standard Edition High-Availability for Oracle Database Standard Edition 19c and later single-instance databases.
--enable-seha, -sh	Specifies whether you want to enable Standard Edition High-Availability for Oracle Database Standard Edition 19c and later single-instance databases.
--targethost, -th	(Optional) Specifies the target host name (applicable only for Oracle RAC One Node Database and Standard Edition High Availability single-instance Oracle Database 19c and later).
--targetnode, -g	(Optional) Specifies the target node number (applicable only for Oracle RAC One Node database and Standard Edition High Availability single-instance Oracle Database 19c and later). The values are 0 or 1.
--levelzerobackupday, -lb	(Optional) Specifies the level zero backup day. The values can be Monday|Tuesday|Wednesday...|Sunday. The default is Sunday.
--backupconfigname, -bn	(Optional) Specifies the name of the backup configuration.
--bkuppassword, -bp	(Optional) Specifies the RMAN backup encryption password.
--enableFlashCache, -fc	(Optional) Specifies whether to enable Flash Cache.
--no-enableFlashCache, -no-fc	(Optional) Specifies whether to disable Flash Cache.
--dbOnFlashStorage, -f	(Optional) Specifies whether to enable data on Flash storage.
--no-dbOnFlashStorage, -no-f	(Optional) Specifies whether to disable data on Flash storage.

Usage Notes

- If the disk group redundancy is FLEX, then the default dbRedundancy value is MIRROR.
- Flash cache is disabled by default.
- You cannot mix Oracle Database Standard Edition and Enterprise Edition databases on the same appliance.

- For Standard Edition Oracle Database 19c or later, you cannot create Oracle RAC Or Oracle RAC One Node Database. For Standard Edition, you can only deploy single-instance Oracle Database with or without high-availability enabled.
- Transparent Data Encryption (TDE) is an Advanced Security Option (ASO) available with Oracle Database Enterprise Edition.
- TDE is not configured by default during database creation.
- The `dbname` and `databaseUniqueName` can contain underscores (-), lowercase and uppercase alphabet (a-zA-Z, and numeric characters (0-9), must start with an alphabet, and must not exceed 8 characters in length. The `dbname` and `databaseUniqueName` must not also be an Oracle reserved key word.
- Use the `--cdb` or `--no-cdb` flag to indicate whether or not the database is a container database. When neither flag is specified, the default database created is a non-CDB database.
- When `--dbhomeid` is not provided, the `create-database` command creates a new Oracle Database Home.
- When `--dbhomeid` is provided, the `create-database` command creates the database using the existing Oracle Home. Use the `odacli list-dbhomes` command to obtain the `dbhomeid`.
- When you use the command to create an instance-only database, then you cannot specify the database shape (template).
- When you specify both the `--version` and the`--`*`dbhomeid`*, the version is ignored and the database is created against the existing database home.
- Oracle Database 12.1 or later is supported on both Oracle Automatic Storage Management (Oracle ASM) and Oracle ASM Cluster file system (ACFS). The default is Oracle ASM.
- Oracle Database 11.2 is only supported on Oracle ACFS.
- When databases are created in Oracle ACFS, each database is configured with its own Oracle ACFS file system for the datafiles and uses the following naming convention: `/u02/app/`*`db user`*`/oradata/`*`db unique name`*. The default size of this mount point is 100 GB.

> **Note:**
>
> Oracle recommends not sharing the mount point across different databases.

- Online logs are stored in the `/u03/app/`*`db user`*`/redo/` directory.
- Oracle Fast Recovery Area (FRA) is located in the `/u03/app/`*`db user`*`/fast_recovery_area` directory.
- For the version, you can specify the database version, for example, 18.8.0.0, 12.2.0.1, 12.1.0.2 or 11.2.0.4, or you can use a 5 digit format to specify a specific patch bundle version. If you use the database version without specifying the bundle patch number, the latest bundle patch is used.

Note:

Oracle Database 11.2.0.4.160419 is not supported. Attempts to create an Oracle Database 11.2 against an 11.2.0.4.160419 database home will fail.

Caution:

When you create a database with Transparent Data Encryption (TDE) enabled, you are prompted to set a password for the TDE wallet. Provide a strong password for security compliance. Set the password carefully, and ensure that this password is available to you at all times for database management operations. Failure to provide the TDE wallet password when prompted, will cause an error in accessing encrypted data.

Example 16-98 Creating a TDE-enabled database

```
# odacli create-database -n test -t
Password for SYS,SYSTEM and PDB Admin:
Password for TDE Wallet:
```

Example 16-99 Creating a Database in Interactive Mode

This example creates a 19.9.0.0.0 OLTP container database named `hrdb` with shape `odb2` and enables you to provide the password interactively.

```
# odacli create-database -n hrdb -c -cl OLTP -s odb2 -p pdb1

Password for SYS,SYSTEM and PDB Admin:
{
   "jobId" : "f12485f2-dcbe-4ddf-aee1-de24d37037b6",
   "status" : "Created",
   "message" : null,
   "reports" : [ ],
   "createTimestamp" : "August 18, 2020 03:54:03 AM EDT",
   "description" : "Database service creation with db name: hrdb",
   "updatedTime" : "August 18, 2020 03:54:03 AM EDT"
}
```

Example 16-100 Creating a Database Against a Different Version

Either of the following statements creates a database against a home with Oracle Database Bundle applied:

```
# odacli create-database -n hrmsdb1 -v 19.9.0.0.0
# odacli create-database -n hrmsdb2 -v 19.9.0.0.201020
```

The following statement creates a new database against a home with a specific Oracle Database Bundle:

```
# odacli create-database -n hrmsdb3 -v 19.9.0.0.201020
```

Example 16-101 Creating a Database associated with a CPU Pool

The following command creates a new database associated with a CPU pool:

```
# odacli create-database -j -n dbcpupl -r ACFS -cp testdbcpupool
```

odacli delete-database

Use the `odacli delete-database` command to delete a database.

File Path

`/opt/oracle/dcs/bin/odacli`

Syntax

To delete a database:

```
odacli delete-database -i dbid  [-h] [-j] [-fd]
```

Parameters

Parameter	Description
`--dbid`, `-i`	Identifies the database home identifier (ID) to display. Use the `odacli list-databases` command to obtain the `--dbid`.
`--force`, `-fd`	(Optional) Forces the delete operation.
`--help`, `-h`	(Optional) Displays help for using the command.
`--json`, `-j`	(Optional) Displays JSON output.

Usage

> **Note:**
>
> The `delete-database` command deletes the database, the file system, and the underlying `advm` volumes assigned to the database. For example, deleting a database named `hrdb` also deletes the file system `/u02/app/oracle/oradata/hrdb`. Do not keep any other files on this database file location.

Example 16-102 Deleting a Database Named `hrmsdb`

In this example we want to delete a database named `hrmsdb`. Before we can delete the database, we need to know the database home identifier (*dbid*). This example shows how to run the `odacli list-databases` command to list the databases and their associated *dbid*, then how to delete database `hrmsdb`.

```
# odacli list-databases

ID                                    DB Name  DB Version   CDB
Class
------------------------------------  -------    ----------   ----
-----
a3f4a6c0-a0c9-4c79-bad7-898afcf9de46   hrmsdb  12.1.0.2      true   OLTP
7e28bf52-1a09-49fd-9391-841838d2c42f   crmdb   12.1.0.2      false  OLTP

(continued)
Shape     Storage  Status
------  ------   ----------
odb1     ACFS      Configured
odb1     ACFS      Configured

# odacli delete-database -i a3f4a6c0-a0c9-4c79-bad7-898afcf9de46
```

odacli describe-database

Use the `odacli describe-database` command to display database details.

File Path

$ORACLE_HOME`/opt/oracle/dcs/bin/odacli`

Syntax

To display database details:

```
   odacli describe-database -i dbid [-h] [-j]
```

Parameters

Parameter	Description
`--dbid`, `-i`	Identifies the database home identifier (ID) to display. Use the `odacli list-databases` command to obtain the `dbid`.
`--json`, `-j`	(Optional) Displays JSON output.
`--help`, `-h`	(Optional) Displays help for using the command.

Example 16-103

Display information for a database.

```
# odacli describe-database -i odacn

Database details
----------------------------------------------------------------
```

```
                     ID: 896238139
            Description: odacn
                DB Name: odacn
             DB Version: 19.6.0.0.200114
                DB Type: Si
                DB Role: PRIMARY
    DB Target Node Name: node1
             DB Edition: EE
                   DBID: 896238139
 Instance Only Database: false
                    CDB: false
               PDB Name:
    PDB Admin User Name:
           SEHA Enabled: false
                  Class: Oltp
                  Shape: Odb1
                Storage: Asm
          DB Redundancy: MIRROR
           CharacterSet: AL32UTF8
  National CharacterSet: AL16UTF16
               Language: AMERICAN
              Territory: AMERICA
                Home ID: bcc3991a-0ffc-4d29-86ae-40f2b8721dc4
        Console Enabled: false
     Level 0 Backup Day: Sunday
     AutoBackup Enabled: true
                Created: March 30, 2020 9:33:09 AM PDT
         DB Domain Name: domain.com
    Associated Networks: Public-network
```

Example 16-104   Displaying Database Details

Display information for database named `ac48e0d2-a7b0-4ffd-a27e-f8e42b028c5f` :

```
# odacli describe-database -i ac48e0d2-a7b0-4ffd-a27e-f8e42b028c5f

Database details
----------------------------------------------------------------
ID: ac48e0d2-a7b0-4ffd-a27e-f8e42b028c5f
Description: rdb1
DB Name: rdb1
DB Version: 19.9.0.0.0
DBID: 1339792271
CDB: true
PDB Name: r1pdb1
PDB Admin User Name: pdbadmin
Class: OLTP
Shape: odb2
Storage: ASM
CharacterSet: DbCharacterSet(characterSet=AL32UTF8,
nlsCharacterset=AL16UTF16, dbTerritory=AMERICA, dbLanguage=AMERICAN)
Home ID: fe87f30c-b810-45d1-8b96-13996ad7a255
Console Enabled: true
Created: August 18, 2020, 2016 6:21:14 PM
```

odacli list-databases

Use the `odacli list-databases` command to list all databases on the appliance.

File Path

`$ORACLE_HOME/opt/oracle/dcs/bin/odacli`

Syntax

To display a list of all databases:

```
 odacli list-databases [-h]
```

Parameters

Parameter	Description
`--help, -h`	(Optional) Displays help for using the command.

Example 16-105 Displaying a List of Databases

Display a list of databases:

```
# odacli  list-databases

ID                                    DB Name     DB Version  CDB
------------------------------------  ----------  ----------  ----
ad6c7326-e460-411e-94df-230dedbef743  rdb121a     19.9.0.0.0   true
fb4d02f3-2413-47ca-8584-a768e23ec2e7  ee12db      19.9.0.0.0   false

(Continued)
Class    Shape  Storage  Status
------ -------  ----------
OLTP    odb1   ACFS     Configured
IMDB    odb1   ASM      Configured
```

odacli modify-database

Use the `odacli modify-database` command to modify the configuration of a database, such as backup configuration, database class, and database type.

File Path

`/opt/oracle/dcs/bin/odacli`

Syntax

```
odacli modify-database [-i] [-dn] [-no-sh] [-sh] [-lb] [-nobkp] [-th]
[-g] [-cl] [-rd] [-s] [-an] [-bi] [-bin] [noab] [-bp] [-id] [-in] [-y]
[-cp] [-no-cpupool] [-rkt] [-ctp] [-h] [-j]
```

Parameters

Parameter	Description
`--databaseid`, `-id`	Defines the database identifier.
`--dbName`, `-in`	Defines the database name to be updated. Specify either `--dbName` or `--dbid`.
`--dbid`, `-i`	Defines the database ID to be updated. Specify either `--dbName` or `--dbid`.
`--dbRedundancy`, `-rd`	(Optional) Specifies the database redundancy value, that is, `{HIGH|MIRROR}`. To specify the `dbRedundancy` option for an Oracle ASM or ACFS storage-based database, at least one disk group of FLEX redundancy must exist. To specify the `dbRedundancy` option for an Oracle ASM storage database, the `dbVersion` or `dbHomeVersion` must be 12.2 or later.
`--levelzerobackupday`, `-lb`	(Optional) Specifies the Level zero Backup Day. For example, Monday|Tuesday|Wednesday...|Sunday
`--backupconfigid`, `-bi`	(Optional) Defines the backup configuration identifier for future use.
`--backupconfigname`, `-bin`	(Optional) Specifies the name of the backup configuration.
`--bkuppassword`, `-bp`	(Optional) Specifies the RMAN backup encryption password.
`--no-autobackup`, `-noab`	(Optional) Disables automatic database backups.
`--no-backup`, `-nobkp`	(Optional) Disables database backups. Specify this option to also remove the database backup and archivelog backup schedulers. To enable database backups again, you must update the database with a backupconfig object.
`--dbclass`, `-cl`	(Optional) Defines the database class. The default is OLTP. The options are OLTP, DSS, or IMDB.
`--dbshape`, `-s`	(Optional) Identifies the database shape (template) and determines the total memory allocated to the database. For example, odb1 and odb2. The default is odb1. You cannot specify the database shape for an instance-only database.
`--attachnetworks`, `-an`	(Optional) Specifies the name of the networks to be attached. Specify the networks in the format *network_name1*, *network_name1*, *network_name1*.
`--detachnetworks`, `-dn`	(Optional) Specifies the name of the networks to be detached. Specify the networks in the format *network_name1*, *network_name1*, *network_name1*.
`--dbtype`, `-y`	Defines new database type. The only option is SI.
`--disable-seha`, `-no-sh`	Disables Standard Edition High Availability for single-instance Oracle Database 19c and later.
`--enable-seha`, `-sh`	Enables Standard Edition High Availability for single-instance Oracle Database 19c and later.

Parameter	Description
`--targethost`, `-th`	(Optional) Specifies the target host name (applicable only for Oracle RAC One Node Database and Standard Edition High Availability single-instance Oracle Database 19c and later).
`--targetnode`, `-g`	(Optional) Specifies the target node number (applicable only for Oracle RAC One Node database and Standard Edition High Availability single-instance Oracle Database 19c and later). The values are 0 or 1.
`--cpupool`, `-cp`	(Optional) Specifies the CPU pool name. Use this option to associate a CPU pool to a database that does not use any CPU pool or to change the existing association of a CPU pool to a new CPU pool for a database.
`--no-cpupool`	(Optional) Removes the attached CPU pool.
`--change-tde-password`,`-ctp`	(Optional) When specified, you are prompted for the current and new TDE Wallet password.
`--rekey-tde`,`-rkt`	(Optional) When specified, current TDE Wallet password is prompted to rekey the TDE master encryption key.
`--help`, `-h`	(Optional) Displays help for using the command.
`--json`, `-j`	(Optional) Displays JSON output.

Usage Notes

> **Caution:**
>
> When you change the TDE wallet password for a database with Transparent Data Encryption (TDE) enabled, you are prompted to set a password for the TDE wallet. Provide a strong password for security compliance. Set the password carefully, and ensure that this password is available to you at all times for database management operations. Failure to provide the TDE wallet password when prompted, will cause an error in accessing encrypted data.

Example 16-106 Modifying the Database Shape (Template) and Database Class

```
# odacli modify-database -s database_shape  -cl database_class -i dbid
odacli modify-database -i 1941d594-c777-4eca-9fce-18b778d5c153 -s odb2
-cl DSS
{
  "jobId" : "833d43a7-bcc6-48a7-9f98-b42ffdab3fe1",
  "status" : "Created",
  "message" : null,
  "reports" : [ ],
  "createTimestamp" : "August 26, 2019 06:48:58 AM UTC",
  "resourceList" : [ ],
  "description" : "modify-database service with db ids: 1941d594-
c777-4eca-9fce-18b778d5c153",
  "updatedTime" : "August 26, 2019 06:48:58 AM UTC"
}
```

Example 16-107 Converting Oracle RAC or Oracle RAC One Node Database to Single-instance Oracle Database

```
# odacli modify-database -in db18 -y SI
For moving a database between homes please use the command 'move-
database'.
{
  "jobId" : "4b548365-dac5-4557-a6a8-2f65c2b725e7",
  "status" : "Created",
  "message" : "Modify database",
  "reports" : [ ],
  "createTimestamp" : "April 21, 2020 00:32:55 AM UTC",
  "resourceList" : [ {
    "resourceId" : "de2a7959-e31b-4dee-b600-6b16dfb78c34",
    "resourceType" : "DB",
    "resourceNewType" : null,
    "jobId" : "4b548365-dac5-4557-a6a8-2f65c2b725e7",
    "updatedTime" : "April 21, 2020 00:32:55 AM UTC"
  } ],
  "description" : "Modify database : db18",
  "updatedTime" : "April 21, 2020 00:32:55 AM UTC"
}
```

Example 16-108 Specifying the target node when converting database

```
# odacli modify-database -in db18 -y SI -g node_number
# odacli modify-database -in db18 -y SI -th node_name
```

Example 16-109 Changing the TDE Wallet Password

```
# odacli modify-database -in testdb -ctp
Current password for TDE wallet:
New password for TDE wallet:
```

Example 16-110 Re-keying the TDE Master Encryption Password

```
# odacli modify-database -in testdb -rkt
Current password for TDE wallet:
```

Example 16-111 Removing a CPU pool

```
# odacli modify-database -in dbcpupin  -cp testdbcpupool2
DB will be restarted as part of CPU Pool operation. Do you want to
continue [y/n]:y
For moving a database between homes please use the command 'move-
database'.
{
  "jobId" : "c1d05fb3-828a-4644-af9a-9d82b4ef5a89",
  "status" : "Created",
  "message" : "Modify database",
  "reports" : [ ],
  "createTimestamp" : "August 09, 2020 16:18:54 PM UTC",
  "resourceList" : [ {
    "resourceId" : "ff9c138b-a003-40cf-b1fc-0b33cd955ebf",
    "resourceType" : "DB",
    "resourceNewType" : null,
    "jobId" : "c1d05fb3-828a-4644-af9a-9d82b4ef5a89",
    "updatedTime" : "August 09, 2020 16:18:54 PM UTC"
  } ],
  "description" : "Modify database : dbcpupin",
  "updatedTime" : "August 09, 2020 16:18:54 PM UTC"
}
```

odacli move-database

Use the command `odacli move-database` to move a database from one Oracle home to another home of the same database version.

File Path

`/opt/oracle/dcs/bin/odacli`

Syntax

```
  odacli move-database [-i dbid] [-in dbname] [-dh dest-dbhome-id][-dhn
dest-dbhome-name][-j] [-h]
```

Parameters

Parameter	Description
`--dbid`, `-i`	(Optional) Defines the database ID.
`--dbName`, `-in`	(Optional) Defines the database name.
`--help`, `-h`	(Optional) Displays help for using the command.
`--json`, `-j`	(Optional) Displays JSON output. The default is false.
`--dest-db-home-id`, `-dh`	(Optional) Defines the destination database home ID.
`--dest-dbhome-name`, `-dhn`	(Optional) Defines the destination database home name.

Usage Notes

Example 16-112 Moving a Database from one Oracle home to another

```
# ./odacli move-database -i database_ID -dh destination_database_home_ID
```

odacli register-database

Use the `odacli register-database` command to register a migrated database with the appliance.

File Path

`/opt/oracle/dcs/bin/odacli`

Syntax

```
odacli register-database  -c {OLTP|DSS|IMDB} -s dbshape -t dbtypeSI -o
hostname -sn servicename [-bi backupconfigid] [-co|-no-co] [-nn] [-h]
[-j] [-sh|-no-sh]
```

Parameters

Parameter	Description
`--backupconfigid, -bi`	(Optional) Defines the backup configuration identifier for future use.
`--dbclass, -c` {OLTP|DSS|IMDB}	Defines the database class. The database class setting determines the database SGA memory and instance PGA memory configuration. The options are as follows: • Enterprise Edition: OLTP, DSS, or IMDB. • Standard Edition: OLTP
`--dbconsole, -co`	(Optional) Enables the Database Console. Use the `-no-co`flag to disable the Database Console. If not selected, the default is no Database Console.
`--dbshape, -s`	Identifies the database shape (template) and determines the total memory allocated to the database. For example, odb1 and odb2. The default is `odb1`.
`--dbtype, -t` [SI]	Defines the type of database. Only single-instance databases can be registered.
`--help, -h`	(Optional) Displays help for using the command.
`--hostname, -o`	Defines the host name. Default: local host name
`--json, -j`	(Optional) Displays JSON output.
`--no-dbconsole, -no-co`	(Optional) Disables Database Console. Use the `-co`flag to enable Database Console.
`--servicename, -sn`	Defines the Database Service Name. Using this service name, the EZCONNECT String is derived for connecting to the database. For example, `hostname:port/servicename`. The Port number is the port configured for the listener, as part of the deployment.

Parameter	Description
`--associated-networks`, `-nn`	Specifies the associated network names (in the format networkName1,networkName2,...).
`--disable-seha`, `-no-sh`	Specifies whether you want to disable Standard Edition High-Availability for Oracle Database Standard Edition 19c and later single-instance databases.
`--enable-seha`, `-sh`	Specifies whether you want to enable Standard Edition High-Availability for Oracle Database Standard Edition 19c and later single-instance databases.

Usage Notes

> **Note:**
>
> It is a good practice to use Easy Connect (EZCONNECT) to test the database connectivity before registering the database.
> Log in as the `sys` user and enter the following command:
>
> ```
> sqlplus sys/password@//hostname:1521/service name
> ```

- The `odacli register-database` command is supported only on the primary database.
- The migrated database is registered with the listener configured during the provisioning of the appliance. The migrated database must be in read-write or read-only mode for the registration to succeed.
- The `register-database` command validates the `datafile` and log file locations and moves the `controlfile` and `spfile` to the correct locations.
- The following are the minimum compatible parameters set, based on the database version:
  - Oracle Database 18*c* : 18.3.0.0
  - Oracle Database 12*c* : 12.1.0.2
  - Oracle Database 11 *g* : 11.2.0.4
- Some `init.ora` parameters are set, or reset, as part of the registration. Review the parameter changes before and after registration.

  The following are examples of changes implemented as part of registration:
  - The `memory_target` is reset.
  - The `sga_target/pga_aggregate_target/log_buffer/inmemory_size` is configured based on the database class and database shape settings used during registration.
  - The registration process sets, or resets, the recommended appliance-specific parameters.

- The database being registered must use Oracle Managed Files and the file location must match the DATA Location, REDO Location and RECO Location of the `odacli describe-dbstorage` command.
- As part of the registration process, the database is registered with Oracle Clusterware. Only the primary database is registered with Oracle Clusterware.

Example 16-113 Registering a Migrated Database

The following is the syntax to register a single instance OLTP database that is using shape odb1.

```
odacli register-database -c OLTP -s odb1 -sn crmdb.example.com -p
Password for SYS:
{
  "jobId" : "317b430f-ad5f-42ae-bb07-13f053d266e2",
  "status" : "Created",
  "message" : null,
  "reports" : [ ],
  "createTimestamp" : "August 18, 2020 05:55:49 AM EDT",
  "description" : "Database service registration with db service name:
crmdb.example.com",
  "updatedTime" : "August 18, 2020 05:55:49 AM EDT"
}
rpandrap: ]# odacli describe-job -i "317b430f-ad5f-42ae-
bb07-13f053d266e2"

Job details
----------------------------------------------------------------
                     ID: 317b430f-ad5f-42ae-bb07-13f053d266e2
            Description: Database service registration with db service
name: crmdb.example.com
                 Status: Success
                Created: August 18, 2020 5:55:49 AM EDT
                Message:

Task Name                       Start Time
----------------------------- ------------------------------
restore control file           August 18, 2020 5:55:49 AM EDT
move spfile to right location  August 18, 2020 5:56:08 AM EDT
register DB with clusterware   August 18, 2020 5:56:13 AM EDT
reset db parameters            August 18, 2020 5:57:05 AM EDT
Running DataPatch              August 18, 2020 5:57:36 AM EDT

(Continued)
  End Time                     Status
------------------------------- --------
August 18, 2020 5:56:08 AM EDT   Success
August 18, 2020 5:56:13 AM EDT   Success
August 18, 2020 5:57:05 AM EDT   Success
August 18, 2020 5:57:36 AM EDT   Success
August 18, 2020 5:57:49 AM EDT   Success
```

odacli upgrade-database

You can the `odacli upgrade-database` command to upgrade a database from a supported release. This command is deprecated and will be desupported in a future release. Instead, use the command `odacli move-database` to move databases from one Oracle Database home to another.

File Path

`/opt/oracle/dcs/bin/odacli`

Syntax

To upgrade an Oracle Database:

```
 odacli upgrade-database -i Comma separated list of database ids -from
source dbhome id -to destination dbhome id [-j] [-h] [-sh|-no-sh]
```

Parameters

Parameter	Description
`--databaseids`, `-i`	(Optional) Defines the Database IDs to upgrade. You can use a comma separated list of database IDs.
`--destDbHomeId`, `-to`	The DB HOME ID of the destination database home.
`--sourceDbHomeId`, `-from`	The DB HOME ID of the source database home.
`--json`, `-j`	(Optional) Displays JSON output. The default is false.
`--disable-seha`, `-no-sh`	Specifies whether you want to disable Standard Edition High-Availability for Oracle Database Standard Edition 19c and later single-instance databases.
`--enable-seha`, `-sh`	Specifies whether you want to enable Standard Edition High-Availability for Oracle Database Standard Edition 19c and later single-instance databases.
`--help`, `-h`	(Optional) Displays help for using the command.

Usage Notes

You cannot upgrade Oracle RAC or Oracle RAC One Node Database to a destination database home of Standard Edition 19c or later. You must first convert Oracle RAC or Oracle RAC One Node Database to single-instance Oracle Database using the `odacli modify-database` command and then upgrade the single-instance Oracle Database to a destination database home of Standard Edition 19c or later.

You have the following options for defining the databases to upgrade:

- When you define a single database ID, only the database of the source database home is upgraded.
- When you define more than one database ID, only those databases of the source database home are upgraded.
- When you do not define a database ID, all of the databases under the source database home are upgraded.

You can upgrade databases of the following releases:

- Oracle Database 18c to 19c
- Oracle Database 12.2 to 19c
- Oracle Database 12.1 to 19c
- Oracle Database 11.2.0.4 to 19c
- Oracle Database 12.2 to 18c
- Oracle Database 12.1 to 18c
- Oracle Database 11.2.0.4 to 18c
- Oracle Database 12.1 to 12.2
- Oracle Database 11.2.0.4 to 12.2
- Oracle Database 11.2.0.4 to 12.1

Example 16-114 Upgrading an Oracle Database

In this example, a single database is upgraded. Use the command `odacli list-databases` to display the database ID, then use the command `odacli upgrade-databases` to upgrade the 11.2.0.4 database. After the upgrade is complete, you can run the command `odacli list-databases` again to verify the upgrade.

```
# odacli  list-databases

ID                                     DB Name     DB Version  CDB
------------------------------------   ----------  ----------  ----
ad6c7326-e460-411e-94df-230dedbef743   rdb121a     11.2.0.4    true
fb4d02f3-2413-47ca-8584-a768e23ec2e7   ee12db      12.1.0.2    false

(Continued)
Class    Shape    Storage  Status
------ -------  --------  ----------
OLTP      odb1      ACFS     Configured
IMDB      odb1      ASM      Configured


# odacli upgrade-database -i ad6c7326-e460-411e-94df-230dedbef743 -from
fa4321f5-0543-477d-bb54-a429dcc8ee8d -to d752df28-ecdd-4af4-9454-38085ea17f8b
{
   "jobId" : "1bbe8boe-acb0-4296--9c8b-473b69da0c18",
   "status" : "Created",
   "message" : null,
   "reports" : [ ],
   "createTimestamp" : "October 24, 2017 03:54:03 AM EDT",
   "description" : "Database service upgrade with db ids: [ad6c7326-
e460-411e-94df-230dedbef743]",
   "updatedTime" : "October 24, 2017  03:54:03 AM EDT"
}

# odacli  list-databases

ID                                     DB Name     DB Version  CDB
------------------------------------   ----------  ----------  ----
ad6c7326-e460-411e-94df-230dedbef743   rdb121a     12.1.0.2    true
fb4d02f3-2413-47ca-8584-a768e23ec2e7   ee12db      12.1.0.2    false

(Continued)
Class    Shape    Storage  Status
------ -------  --------  ----------
OLTP      odb1      ACFS     Configured
```

```
IMDB       odb1       ASM       Configured
```

odacli DBHome Commands

Use the `odacli DBHome` commands to manage database Home operations.

- odacli create-dbhome
  Use the `odacli create-dbhome` command to create an Oracle Database Home.
- odacli delete-dbhome
  Use the `odacli delete-dbhome` command to delete database home that is not associated with a database.
- odacli describe-dbhome
  Use the `odacli describe-dbhome` command to display Oracle Database Home details.
- odacli list-dbhomes
  Use the `odacli list-dbhomes` command to display a list of Oracle Home directories.

odacli create-dbhome

Use the `odacli create-dbhome` command to create an Oracle Database Home.

File Path

$ORACLE_HOME/opt/oracle/dcs/bin/odacli

Syntax

To create an Oracle Database Home:

```
odacli create-dbhome -v version [-j] [-h]
```

Parameters

Parameter	Description
`-v` *version number*	Defines the database bundle patch number.
`--json`, `-j`	(Optional) Displays JSON output.
`--help`, `-h`	(Optional) Displays help for using the command.

Usage Notes

For the version number, you can specify the database version, such as 18.7.0.0, 18.5.0.0, 12.2.0.1, 12.1.0.2 or 11.2.0.4, or you can use a 5 digit format to specify a specific patch bundle version. For example, 19.9.0.0.201020. If you use the database version without specifying the bundle patch number, then the latest bundle patch is used.

> **Note:**
>
> Oracle Database 11.2.0.4.160419 is not supported. Attempts to create an Oracle Database 11.2 against an 11.2.0.4.160419 database home will fail.

Example 16-115 Creating an Oracle Database Home

The following example creates an Oracle Database Home version 19.9.0.0.201020.

```
# odacli  create-dbhome -v 19.9.0.0.201020
```

odacli delete-dbhome

Use the `odacli delete-dbhome` command to delete database home that is not associated with a database.

File Path

$ORACLE_HOME/opt/oracle/dcs/bin/odacli

Syntax

```
odacli delete-dbhome  -i [-h]
```

Parameters

Parameter	Description
`--id`, `-i`	Identifies the database home using a database identifier (ID).
`--help`, `-h`	(Optional) Displays help for using the command.

Usage Notes

- Use the `odacli list-dbhomes` command to locate the identifier.
- To delete, or uninstall, a database home (dbhome), there must not be any associated databases in the dbhome.
- Use the `odacli delete-database` command to delete an existing database.

Example 16-116 Deleting an Empty Database Home

```
# odacli delete-dbhome -i 0ce547ca-3df2-4178-a7e6-eefa613aeab4
```

odacli describe-dbhome

Use the `odacli describe-dbhome` command to display Oracle Database Home details.

File Path

$ORACLE_HOME/opt/oracle/dcs/bin/odacli

Syntax

To display details about Oracle Database Home:

```
  odacli describe-dbhome -i dbhomeid [-h] [-j] [-v]
```

Parameters

Parameter	Description
`-i` *dbhomeid*	Identifies the database home ID. Use the `odacli list-dbhomes` command to get the *dbhomeid*.
`--help`, `-h`	(Optional) Displays help for using the command.
`--json`, `-j`	(Optional) Displays JSON output. The default is false.
`-v`*dbversion*	(Optional) Identifies the Database Home Version. Use the `odacli list-dbhomes` –v command to get the *dbversion*.

Example 16-117   Displaying Oracle Database Home Details

The following output is an example of using the display Oracle Database Home details command:

```
# odacli  describe-dbhome -i b727bf80-c99e-4846-ac1f-28a81a725df6

DB Home details
----------------------------------------------------------------
                            ID: b727bf80-c99e-4846-ac1f-28a81a725df6
                          Name: OraDB12102_home1
                        Version: 12.1.0.2
               Home Location: /u01/app/orauser/product/12.1.0.2/dbhome_1
                       Created: Jun 2, 2016 10:19:23 AM
```

odacli list-dbhomes

Use the `odacli list-dbhomes` command to display a list of Oracle Home directories.

File Path

$ORACLE_HOME/opt/oracle/dcs/bin/odacli

Syntax

To display a list of Oracle Home directories:

```
   odacli  list-dbhomes  [-h] [-j]
```

Parameters

Parameter	Description
`--help,-h`	(Optional) Displays help for using the command.
`--json,-j`	(Optional) Displays JSON output.

Example 16-118   Displaying a List of Oracle Home Directories

Run the following command to display a list of Oracle Home directories:

```
# odacli list-dbhomes


ID                                   Name              DB Version
------------------------------------ ----------------- ----------
b727bf80-c99e-4846-ac1f-28a81a725df6 OraDB12102_home1  12.1.0.2

(continued)
Home Location
-----------------------------------------
/u01/app/orauser/product/12.1.0.2/dbhome_1
```

odacli Database Storage Commands

Use the Database Storage commands to list, describe, create, and delete Oracle database storage.

- odacli create-dbstorage
  Use the `odacli create-dbstorage` command to create the file system for database migrations.
- odacli delete-dbstorage
  Use the `odacli delete-dbstorage` command to delete database storage that is not associated with a database.
- odacli describe-dbstorage
  Use the `odacli describe-dbstorage` command to display storage configuration details.
- odacli describe-dgstorage
  Use the `odacli describe-dgstorages` command to display the disk group information.
- odacli list-dbstorages
  Use the `odacli list-dbstorages` command to display a list of all of the database storage configured in the appliance.

- odacli list-dgstorages
  Use the `odacli list-dgstorages` command to display the disk group information.
- odacli modify-dbstorage
  Use the `odacli modify-dbstorage` command to resize the database storage.
- odacli update-dgstorage
  Use the `odacli update-dgstorage` command to release disks.

odacli create-dbstorage

Use the `odacli create-dbstorage` command to create the file system for database migrations.

File Path

$ORACLE_HOME`/opt/oracle/dcs/bin/odacli`

Syntax

```
odacli create-dbstorage  -n dbname -s dataSize -u databaseUniqueName -r
[ASM|ACFS] [-h]
```

Parameters

Parameter	Description
`--dbname`, `-n`	Defines the name of the database.
`--dataSize`, `-s`	(Optional) Defines the size, in gigabytes (GB), of the filesystem for storing database files and temp files. The default is: 100 GB The minimum size is 10 GB. When entering the size, do not include GB. For example, for 50 GB, use 50.
`--databaseUniqueName`, `-u`	(Optional) Defines a unique name for the database. Specify only if the database unique name is different than the database name. The command creates the following mount point: `/u02/app/oracle/oradata/`*`db unique name`*
`--dbstorage`, `-r [ASM|ACFS]`	(Optional) Defines the type of database storage, either ASM or ACFS. When you select ASM, the command only creates the supporting directory structure for storing non-database files. The default is: ASM
`--help`, `-h`	(Optional) Displays help for using the command.

Usage Notes

- The `odacli create-dbstorage` command registers the storage metadata with the Appliance Manager.

- Oracle Database is supported on both Oracle Automatic Storage Management (Oracle ASM) and Oracle ASM Cluster file system (ACFS). The default is Oracle ASM.
- When you create ACFS database storage, the command creates a separate ACFS file system and creates the directory structure for other database files, such as archives and online logs.
- When you create ASM database storage, the command only creates the corresponding directories for non-database files.

Example 16-119 Creating Database Storage

The following statement creates 50 GB ACFS database storage for the APPSDB database.

```
# odacli create-dbstorage -n APPSDB -s 50 -r ACFS
{
   "jobId" : "fc6bf8fd-60c2-44f3-b8b7-efd0e9a2149f",
   "status" : "Created",
   "message" : null,
   "reports" : [ ],
   "createTimestamp" : "August 09, 2016 06:19:35 AM WSST",
   "description" : "Database storage service creation with db name: 
APPSDB",
   "updatedTime" : "August 09, 2016 06:19:35 AM WSST"
}
```

odacli delete-dbstorage

Use the `odacli delete-dbstorage` command to delete database storage that is not associated with a database.

File Path

$ORACLE_HOME/opt/oracle/dcs/bin/odacli

Syntax

```
odacli delete-dbstorage  -i [-h]
```

Parameters

Parameter	Description
`--id`, `-i`	Identifies the database storage using a database identifier (ID).
`--help`, `-h`	(Optional) Displays help for using the command.

Usage Notes

- You can only use the `delete-dbstorage` when the storage is not associated with any databases.
- Use the `delete-database` command to delete an existing database.

- Use the `list-dbstorages` command to locate the identifier.

Example 16-120 Deleting Empty Database Storage

```
# odacli delete-dbstorage  -i 9fe39332-cc1a-4b4b-8393-165524a6ef6b
```

odacli describe-dbstorage

Use the `odacli describe-dbstorage` command to display storage configuration details.

File Path

$ORACLE_HOME/opt/oracle/dcs/bin/odacli

Syntax

```
odacli describe-dbstorage  -i [-j] [-h]
```

Parameters

Parameter	Description
`--id`, `-i`	Identifies the database storage.
`--json`, `-j`	(Optional) Displays JSON output. The default is false.
`--help`, `-h`	(Optional) Displays help for using the command.

Usage Notes

- Use the `odacli list-dbstorages` command to get the database storage identifier (ID).
- The DATA Location corresponds to the `init.ora` parameter `db_create_file_dest`.
- RECO Location corresponds to the `init.ora` parameter `db_recovery_file_dest`
- REDO Location corresponds to the `init.ora` parameter `db_create_online_log_dest_1`

Example 16-121 Displaying Database Oracle ACFS Storage Details

The following example displays Oracle ASM Cluster file system (ACFS) storage details:

```
# odacli describe-dbstorage -i 9fe39332-cc1a-4b4b-8393-165524a6ef6b

DBStorage details
----------------------------------------------------------------
ID: 9fe39332-cc1a-4b4b-8393-165524a6ef6b
DB Name: rdb121a
DBUnique Name: rdb121a
```

```
DB Resource ID: ad6c7326-e460-411e-94df-230dedbef743
Storage Type: Acfs
DATA Location: /u02/app/oracle/oradata/rdb121a
RECO Location: /u03/app/oracle/fast_recovery_area/
REDO Location: /u03/app/oracle/redo/
State: ResourceState(status=Configured)
Created: July 22, 2016 12:07:12 PM SGT
UpdatedTime: July 22, 2016 12:26:39 PM SGT
```

Example 16-122 Displaying Database Oracle ASM Storage Details

The following example displays Oracle Automatic Storage Management (Oracle ASM) storage details:

```
# odacli describe-dbstorage -i 4f2a1b59-ca66-4d80-951c-425ab7b0acae

DBStorage details
----------------------------------------------------------------
ID: 4f2a1b59-ca66-4d80-951c-425ab7b0acae
DB Name: ee12db
DBUnique Name: ee12db
DB Resource ID: fb4d02f3-2413-47ca-8584-a768e23ec2e7
Storage Type: Asm
DATA Location: DATA
RECO Location: RECO
REDO Location: RECO
State: ResourceState(status=Configured)
Created: July 22, 2016 1:13:51 PM SGT
UpdatedTime: July 22, 2016 1:13:52 PM SGT
```

odacli describe-dgstorage

Use the `odacli describe-dgstorages` command to display the disk group information.

File Path

$ORACLE_HOME`/opt/oracle/dcs/bin/odacli`

Syntax

```
odacli describe-dgstorage  -d diskgroup -h
```

Parameters

Parameter	Description
`--diskgroup`, `-d`	Specifies the disk group for which information is displayed.
`--help`, `-h`	(Optional) Displays help for using the command.

Usage Notes

This command displays the storage information for all the databases backed by a disk group, for each disk group present in the system.

Example 16-123   Displaying Disk Group Storage

```
# odacli list-dgstorages –r  redundancy
Diskgroup storage details

------------------------------------------------------------------------
-----------

Diskgroup: DATA

                  Redundancy: extern|normal|high|flex

                  Physical Free Space: wGB

                  Physical Total Space: xGB

                  Database Unique Name: rdbx




                                    Location: /u02/app/test/test1/rdbx

                                    Used Space: dGB  (acfsutil.total –
acfsutil.freespace)

                                    Free Space: dGB
(acfsutil.freespace)

                 Database Unique Name: rdby

                                    Location: +DATA/rdby

                                    Used Space: zGB  (v$asm_file.bytes)

                                    Free Space: xGB   (PhyFree/
redundancy)

                                    Physical Space:
vGB(v$asm_diskgroup.total_mb)

                                    Physical Used : wGB
(v$asm_file.space)

                                    Physical Free :
uGB(v$asm_diskgroup.free_mb)

                                    Physical Reserved : uGB(Lookup
Table)
```

```
Diskgroup: RECO

                  Redundancy: normal|high|flex

                  Physical Free Space: wGB

                  Physical Total Space: xGB

                  Database Unique Name: rdbx

                                    Location: /u02/app/test/
fast_recovery_area




                                    Used Space: dGB  (acfsutil.total –
acfsutil.freespace)

                                    Free Space: dGB
(acfsutil.freespace)

                 Database Unique Name: rdby

                                    Location: +DATA/rdby

                                    Used Space: zGB  (v$asm_file.bytes)

                                    Free Space: xGB   (PhyFree/
redundancy)

                                    Physical Space:
vGB(v$asm_diskgroup.total_mb)

                                    Physical Used : wGB
(v$asm_file.space)

                                    Physical Free :
uGB(v$asm_diskgroup.free_mb)

                                    Physical Reserved : uGB(Lookup
Table)
```

odacli list-dbstorages

Use the `odacli list-dbstorages` command to display a list of all of the database storage configured in the appliance.

File Path

`/opt/oracle/dcs/bin/odacli`

Syntax

```
# odacli list-dbstorages  [-h]
```

Parameters

Parameter	Description
`--help`, `-h`	(Optional) Displays help for using the command.

Usage Notes

This command displays a list of all of the filesystems that are configured with the `create-database` command and the `create-dbstorage` command.

Example 16-124 Displaying a List of all Database Storage

```
# odacli list-dbstorages

ID Type                               DBUnique  Name         Status
------------------------------------ --------  ----------- ----------
9fe39332-cc1a-4b4b-8393-165524a6ef6b  Acfs       rdb121a     Configured
4f2a1b59-ca66-4d80-951c-425ab7b0acae  Asm        ee12db      Configured
0266edac-c729-4539-861f-3f3d543be9e4  Acfs       db12SE      Configured
```

odacli list-dgstorages

Use the `odacli list-dgstorages` command to display the disk group information.

File Path

`/opt/oracle/dcs/bin/odacli`

Syntax

```
odacli list-dgstorages  -r redundancy -h
```

Parameters

Parameter	Description
`--redundancy`, `-r`	Specifies the disk group redundancy for FLEX disk group.
`--help`, `-h`	(Optional) Displays help for using the command.

Usage Notes

- The command displays the storage-related information for all the disk groups present in the system.

- The redundancy option is valid only for FLEX disk groups. For all disk groups that are not FLEX, logical free space is calculated using the redundancy obtained from v$asm_diskgroup rather than the CLI option.
- Redundancy option can take the values MIRROR | HIGH. Use one of these options to specify the database redundancy for FLEX disk groups.
- In the example below, Physical Total Space is the total space in the disk group. (V$ASM_DISKGROUP.total_mb) Physical Reserved Space is the reserved space required to handle disk failures. Physical Free Space is the free space in the disk group. (V$ASM_DISKGROUP.free_mb) Logical Free Space is the logical free space in the diskgroup. (V$ASM_DISKGROUP.free_mb / redundancy)

This command displays the storage information for all the databases backed by a disk group, for each disk group present in the system.

Example 16-125   Displaying Disk Group Storage

```
# odacli list-dgstorages –r  redundancy
Diskgroup  Redundancy   Physical Total Space  Physical Reserved Space
Physical Free Space  Logical Free
 Space

--------------   -----------------    -----------------------------
---------------------------------
DATA          FLEX                xGB
yGB
        zGB                                uGB

REDO         HIGH                xGB
yGB
        zGB                                uGB

RECO         NORMAL         xGB
yGB
  zGB                                uGB
```

odacli modify-dbstorage

Use the `odacli modify-dbstorage` command to resize the database storage.

File Path

`/opt/oracle/dcs/bin/odacli`

Syntax

```
odacli modify-dbstorage [-ds] [-in] [-fs] [-rcs] [-rds] [-h] [-j]
```

Parameters

Parameter	Description
`--datasize`, `-ds`	(Optional) Specifies the extendable size in GB for the DATA volume. Specify at least one size from FLASH, RECO, REDO, or DATA volumes.
`--dbname`, `-in`	Defines the database name on which you want to extend the volumes.
`--flashsize`, `-fs`	(Optional) Specifies the extendable size in GB for the FLASH volume.
`--recosize`, `-rcs`	(Optional) Specifies the extendable size in GB for the RECO volume.
`--redosize`, `-rds`	(Optional) Specifies the extendable size in GB for the REDO volume.
`--help`, `-h`	(Optional) Displays help for using the command.
`--json`, `-j`	(Optional) Displays JSON output.

Usage Notes

- The command can resize DATA, RECO, REDO, and FLASH volumes.
- Database name is a mandatory parameter. All other parameters are optional, however, one of the volume sizes must be specified. If you only provide the DATA size, then the DCS agent calculates the recommended RECO size for the given DATA size is internally calculated. The storage is then extended with the recommended values.
- The mounted Oracle ACFS and its underlying Oracle ADVM storage is resized to match the new size specified.
- To check the result of the resize operation, use the `odacli list-dbstorages` command.
- After database resize operation is completed, use the `odacli describe-dbstorage` command to display storage configuration details.

Example 16-126   Modifying the Database Storage

```
# odacli modify-dbstorage -ds 10 -rcs 15 -n amdb1
{
 "jobId" : "e6d54155-ed4c-4fd6-a3f6-454120fa5c18",
 "status" : "Created",
 "message" : null,
 "reports" : [ ],
 "createTimestamp" : "June 03, 2019 06:06:42 AM UTC",
 "resourceList" : [ ],
 "description" : "Database storage modify operation",
 "updatedTime" : "June 03, 2019 06:06:42 AM UTC"
}
```

odacli update-dgstorage

Use the `odacli update-dgstorage` command to release disks.

File Path

`/opt/oracle/dcs/bin/odacli`

Syntax

To release disks:

```
odacli update-dgstorage [-h] [-f] [-rd] [-j]
```

Parameters

Parameter	Description
`--json`, `-j`	(Optional) Displays JSON output.
`--help`, `-h`	(Optional) Displays help for using the command.
`--force`, `-f`	(Optional) Forces release of specified disks. When this option is specified, the check to verify that all disk groups are mounted on the current node is skipped.
`--release-disk`, `-rd`	Specifies the disks to release. Generally, this specifies a single storage device with partitions on different disk groups. You can also specify a comma-separated list of disks to release.

Usage Notes

- Run the `odacli list-dgdisks` to view details of the disk, before running the `odacli update-dgstorage` command.
- The `odacli update-dgstorage` command runs a precheck to ensure all disk groups are mounted on the node. You can use the `-f` option to override the precheck.

Example 16-127 Releasing a physical disk HDD_E0_S10_577135552 which has two logical partitions on two different disk groups

```
# odacli update-dgstorage -rd HDD_E0_S10_577135552
Job details
----------------------------------------------------------------
                    ID:  46bc736c-417b-4ac2-826e-aa857db50e29
            Description:  Release disks: [HDD_E0_S10_577135552]
                 Status:  Running
                Created:  July 7, 2020 6:24:27 PM PDT
                Message:  Release ASM disks

Verifying the result of the Release Disks operation:
# odacli describe-job -i 46bc736c-417b-4ac2-826e-aa857db50e29
```

```
Job details
----------------------------------------------------------------
                     ID:  46bc736c-417b-4ac2-826e-aa857db50e29
            Description:  Release disks: [HDD_E0_S10_577135552]
                 Status:  Success
                Created:  July 7, 2020 6:24:27 PM PDT
                Message:  Release ASM disks
```

odacli Job Commands

Use the `odacli list-jobs` and `odacli describe-job` commands to display job details.

- odacli create-jobdata-retention-policy
  Use the `odacli create-jobdata-retention-policy` command to create job data retention policy for default DCS jobs and specific auto scheduled jobs.
- odacli create-purge-jobdata-job
  Use the `odacli create-purge-jobdata-job` command to create a job to delete data for default DCS jobs and specific auto scheduled jobs.
- odacli delete-jobdata-retention-policy
  Use the `odacli delete-jobdata-retention-policy` command to delete job data retention for default DCS jobs and specific auto scheduled jobs.
- odacli describe-job
  Use the `odacli describe-job` command to display details about a specific job, including the job ID, status, tasks, and the job created date and time stamp.
- odacli list-jobs
  Use the `odacli list-jobs` command to display a list of jobs, including the job IDs, status, and the job created date and time stamp.
- odacli list-jobdata-retention-policy
  Use the `odacli list-jobdata-retention-policy` command to list job data retention policy for default DCS jobs and specific auto scheduled jobs.
- odacli list-purge-jobdata-job
  Use the `odacli list-purge-jobdata-job` command to list purge job data for default DCS jobs and specific auto scheduled jobs.
- odacli list-scheduled-executions

odacli create-jobdata-retention-policy

Use the `odacli create-jobdata-retention-policy` command to create job data retention policy for default DCS jobs and specific auto scheduled jobs.

File Path

`/opt/oracle/dcs/bin/odacli`

Syntax

To create job data retention policy:

```
odacli create-jobdata-retention-policy [-j] [-h] [-w] [-s]
```

Parameters

Parameter	Description
`--json`, `-j`	(Optional) Displays JSON output.
`--help`, `-h`	(Optional) Displays help for using the command.
`--retentionWindow`, `-w`	(Optional) Describes the time interval to retain the job data. Default is 30 days if not specified.
`--retentionWindowUnit`, `-u`	(Optional) Describes the unit for the `retentionWindow`. Possible values are `Day|Hour|Minute`. Default is `Day` if no value is specified.
`--scheduleIds`, `-s`	(Optional) Specifies the IDs, delimited by commas, of the scheduled jobs similar to the `odacli list-schedules` result. Use `Default` for all DCS jobs.

Usage Notes

- Once a policy is created, an auto scheduled job is created to start purging DCS job records regularly, for example, every day at 4 AM, based on the retention policies you define.

Example 16-128 Creating a default policy to purge all the jobs and scheduled executions older than 30 days

```
# odacli create-jobdata-retention-policy

Job details
----------------------------------------------------------------
ID: 36d00489-39b1-425f-81bf-6d6e3bfede8b
Description: set job data retention policy
Status: Created
Created: April 23, 2020 3:32:09 PM PDT
Message:

Task Name Start Time End Time Status
----------------------------------------
----------------------------------- -----------------------------------
----------
[root@oda1]# ./odacli describe-job -i c40c17f0-4185-40fe-
a126-30fe1f0e5cdd

Job details
----------------------------------------------------------------
ID: c40c17f0-4185-40fe-a126-30fe1f0e5cdd
Description: set job data retention policy
Status: Success
Created: April 23, 2020 5:42:28 PM PDT

Message:
Task Name Start Time End Time Status
```

```
----------------------------------------
----------------------------------- -----------------------------------
----------
set job data retention policy   April 23, 2020 5:42:28 PM PDT   April
23, 2020 5:42:28 PM PDT   Success
create auto job data schedule   April 23, 2020 5:42:28 PM PDT   April
23, 2020 5:42:28 PM PDT   Success
```

Example 16-129   Set up a retention policy of 10 days for the schedule 'archive_log_backup'

```
# odacli create-jobdata-retention-policy -s 284a22b5-41e6-4be1-
a916-048eac74e076 -w 10 -u Day

Job details
----------------------------------------------------------------
ID: ea68a90e-a8e2-4fc4-a4f1-75461e12c387
Description: set job data retention policy
Status: Created
Created: April 23, 2020 6:22:14 PM PDT

Message:
Task Name Start Time End Time Status
----------------------------------------
----------------------------------- -----------------------------------
----------
[root@oda1]# ./odacli list-jobdata-retention-policy

Schedule Id     Retention Window    Unit    Modified
-------------------- -------------------- --------------------
-------------------------
Default     20      Day     April 23, 2020 6:16:59 PM PDT
284a22b5-41e6-4be1-a916-048eac74e076    10  Day     April 23, 2020
6:22:14 PM PDT
```

odacli create-purge-jobdata-job

Use the `odacli create-purge-jobdata-job` command to create a job to delete data for default DCS jobs and specific auto scheduled jobs.

File Path

`/opt/oracle/dcs/bin/odacli`

Syntax

To create job data purge:

```
   odacli create-purge-jobdata-job [-j] [-h] [-i] [-o] [-u] [-s]
```

Parameters

Parameter	Description
`--json`, `-j`	(Optional) Displays JSON output.
`--help`, `-h`	(Optional) Displays help for using the command.
`--jobIds`, `-i`	(Optional) Purges data for given DCS job IDs, delimited by commas.
`--olderThan`, `-o`	(Optional) Purges job data older than the specified time. If not specified, use the existing `retentionWindow` value.
`--olderThanUnit`, `-u`	(Optional) Describes the unit for the `OlderThan` option. Possible values are `Day|Hour|Minute`. If not specified, use the existing `retentionWindow` value.
`--scheduleIds`, `-s`	(Optional) Specifies the IDs, delimited by commas, of the scheduled jobs similar to the `odacli list-schedules` result.

Example 16-130 Creating a job to purge job data

```
# odacli create-purge-jobdata-job

Job details
----------------------------------------------------------------
ID: e43dbd56-dc7c-4812-b653-0fc3208e0929
Description: purge job data
Status: Created
Created: April 23, 2020 6:27:40 PM PDT

Message:
Task Name Start Time End Time Status
----------------------------------------
----------------------------------- -----------------------------------
----------
[root@oda1]# odacli describe-job -i e43dbd56-dc7c-4812-
b653-0fc3208e0929
Job details
----------------------------------------------------------------
ID: e43dbd56-dc7c-4812-b653-0fc3208e0929
Description: purge job data

Status: Success
Created: April 23, 2020 6:27:40 PM PDT
Message: Purged 21 metadata records and 10 files. Purge policies are:
Purge all jobs and scheduled executions older than 30 Days
Purge scheduled executions for ID:284a22b5-41e6-4be1-a916-048eac74e076
older than 10 Day

Task Name   Start Time  End Time    Status
----------------------------------------
----------------------------------- -----------------------------------
```

```
----------
purge job data  April 23, 2020 6:27:40 PM PDT   April 23, 2020 6:27:40
PM PDT   Success
```

Example 16-131 Purging job data older than 5 hours, including all jobs and scheduled executions related records

```
# odacli create-purge-jobdata-job -o 5 -u Hour
Job details
----------------------------------------------------------------
ID: 4d065c96-a8eb-4974-a446-573b5ad3cb95
Description: purge job data
Status: Created
Created: April 23, 2020 1:55:59 PM PDT
Message:
Task Name Start Time End Time Status

----------------------------------------
----------------------------------- -----------------------------------
----------
[root@oda1]# odacli describe-job -i 4d065c96-a8eb-4974-
a446-573b5ad3cb95

Job details
----------------------------------------------------------------
ID: 4d065c96-a8eb-4974-a446-573b5ad3cb95
Description: purge job data
Status: Success
Created: April 23, 2020 1:55:59 PM PDT
Message: Purged 242 metadata records and 0 files. Purge policies are:
Purge all jobs and scheduled executions older than 5 Hour

Task Name Start Time End Time Status
----------------------------------------
----------------------------------- -----------------------------------
----------
purge job data      April 23, 2020 1:55:59 PM PDT       April 23, 2020
1:55:59 PM PDT       Success
```

Example 16-132 Purging job data for multiple jobs

```
# odacli create-purge-jobdata-job -i 87a926cd-a243-49e0-
ba02-9d8968e1de1e,0e2a38c0-041a-41d8-91ad-7f9f7c646f12

Job details
----------------------------------------------------------------
ID: 217cbdbf-15a5-47d3-9582-3f26d6b5eebf
Description: purge job data
Status: Created
Created: April 23, 2020 2:01:25 PM PDT
Message: Task Name Start Time End Time Status
----------------------------------------
----------------------------------- -----------------------------------
----------
```

```
[root@oda1]# odacli describe-job -i
217cbdbf-15a5-47d3-9582-3f26d6b5eebf
Job details
----------------------------------------------------------------
ID: 217cbdbf-15a5-47d3-9582-3f26d6b5eebf
Description: purge job data
Status: Success
Created: April 23, 2020 2:01:25 PM PDT
Message: Purged 11 metadata records and 0 files. Purge policies are:
Purge job with ID:87a926cd-a243-49e0-ba02-9d8968e1de1e
Purge job with ID:0e2a38c0-041a-41d8-91ad-7f9f7c646f12

Task Name Start Time End Time Status
----------------------------------------
----------------------------------- -----------------------------------
----------
purge job data      April 23, 2020 2:01:25 PM PDT       April 23, 2020
2:01:25 PM PDT       Success
```

Example 16-133 Purging job data for specific job data schedules older than 5 days

```
# odacli create-purge-jobdata-job -s 39cc86d6-30c2-4744-bfbc-
e62535e2aa67,31b3a83b-76ca-44d3-9268-b4dac948e217 -o 5 -u Day

Job details
----------------------------------------------------------------
ID: be839a81-a79b-43ce-bf70-c8aba1a9cc91
Description: purge job data
Status: Created
Created: April 23, 2020 2:44:54 PM PDT
Message:

Task Name Start Time End Time Status
----------------------------------------
----------------------------------- -----------------------------------
----------
[root@oda1]# ./odacli describe-job -i be839a81-a79b-43ce-bf70-
c8aba1a9cc91

Job details
----------------------------------------------------------------
ID: be839a81-a79b-43ce-bf70-c8aba1a9cc91
Description: purge job data
Status: Success
Created: April 23, 2020 2:44:54 PM PDT
Message: Purged 0 metadata records and 0 files. Purge policies are:
Purge scheduled executions for ID:39cc86d6-30c2-4744-bfbc-e62535e2aa67
older than 5 Day
Purge scheduled executions for ID:31b3a83b-76ca-44d3-9268-b4dac948e217
older than 5 Day
Task Name Start Time End Time Status
----------------------------------------
```

```
---------------------------------- -----------------------------------
----------
purge job data April 23, 2020 2:44:54 PM PDT April 23, 2020 2:44:54 PM
PDT Success
```

odacli delete-jobdata-retention-policy

Use the `odacli delete-jobdata-retention-policy` command to delete job data retention for default DCS jobs and specific auto scheduled jobs.

File Path

`/opt/oracle/dcs/bin/odacli`

Syntax

To delete job data retention:

```
   odacli delete-jobdata-retention-policy [-j] [-h][-s]
```

Parameters

Parameter	Description
`--json`, `-j`	(Optional) Displays JSON output.
`--help`, `-h`	(Optional) Displays help for using the command.
`--scheduleIds`, `-s`	(Optional) Specifies the IDs applied by the job data retention policy. If not supplied, delete all the existing policies.

Example 16-134 Deleting the job data retention policies

```
# odacli delete-jobdata-retention-policy

Job details
----------------------------------------------------------------
ID: ab819d57-9e35-4f55-bd5e-d26fc6372448
Description: delete job data retention policy
Status: Running
Created: April 23, 2020 7:34:05 PM PDT

Message:
Task Name Start Time End Time Status
----------------------------------------
---------------------------------- -----------------------------------
----------
remove job data retention policy entries        April 23, 2020 7:34:05
PM PDT       April 23, 2020 7:34:05 PM PDT       Running

[root@oda1]# odacli describe-job -i ab819d57-9e35-4f55-bd5e-
d26fc6372448
```

```
Job details
----------------------------------------------------------------
ID: ab819d57-9e35-4f55-bd5e-d26fc6372448
Description: delete job data retention policy
Status: Success
Created: April 23, 2020 7:34:05 PM PDT
Message:

Task Name Start Time End Time Status
----------------------------------------
----------------------------------- -----------------------------------
----------
remove job data retention policy entries        April 23, 2020 7:34:05
PM PDT       April 23, 2020 7:34:05 PM PDT       Success
remove auto job data schedule                   April 23, 2020 7:34:05
PM PDT       April 23, 2020 7:34:05 PM PDT       Success

[root@oda1]# odacli list-jobdata-retention-policy

DCS-10032:Resource JobDataRetentionPolicy is not found.
```

odacli describe-job

Use the `odacli describe-job` command to display details about a specific job, including the job ID, status, tasks, and the job created date and time stamp.

File Path

$ORACLE_HOME`/opt/oracle/dcs/bin/odacli`

Syntax

To view a specific job, status, and tasks:

```
   odacli describe-job   -i jobid [-j] [-h]
```

Parameters

Parameter	Description
`--jobid`, `-i` *jobid*	Identifies the job. To get the job identifier (jobid), run the `list-jobs` command.
`--json`, `-j`	(Optional) Displays JSON output.
`--help`, `-h`	(Optional) Displays help for using the command.

Example 16-135 Displaying Details for a Job

To display details of a specific job with jobid `02df22c8-c21f-4162-8265-97f7826c243a`:

```
 # odacli describe-job -i 02df22c8-c21f-4162-8265-97f7826c243a
```

# odacli list-jobs

Use the `odacli list-jobs` command to display a list of jobs, including the job IDs, status, and the job created date and time stamp.

File Path

$ORACLE_HOME/opt/oracle/dcs/bin/odacli

Syntax

To list jobs and view job details and status:

```
odacli list-jobs [-j] [-h] [-o] [-f] [-t] [-hd] [-tl] [-k] [-s]
```

Parameters

Parameter	Description
`--json`, `-j`	(Optional) Displays JSON output.
`--help`, `-h`	(Optional) Displays help for using the command.
`--for`, `-o`	(Optional) Describes a job created on a specific date. In the format `YYYY-MM-DD`, such as `2018-01-01` . Example: `# odacli list-jobs -o 2018-08-09`

`--from`, `-f`	(Optional) Describes a job created since a specific date. In the format `YYYY-MM-DD` or `YYYY-MM-DD HH:mm:ss`, such as `2018-01-01` or `2018-01-01 01:00:00`.
	Examples:
	`# odacli list-jobs -f 2018-08-27`
	`# odacli list-jobs -f "2018-08-27 03:00:00"`

`--head`, `-hd`	(Optional) Describes the maximum number of older jobs to be displayed, values can be 1 to 200. Example: `odacli list-jobs -hd 10`

Parameter	Description
`--to`, `-t`	(Optional) Describes a job created ahead of a specific date. In the format `YYYY-MM-DD` or `YYYY-MM-DD HH:mm:ss`, such as `2018-01-01` or `2018-01-01 01:00:00`. Example: `# odacli list-jobs -t 2018-08-07`
`--tail`, `-tl`	(Optional) Describes the maximum number of latest jobs to be displayed, values can be 1 to 200. Example: `# odacli list-jobs -tl 10`
`--keyword`, `-k`	(Optional) Specifies the keyword that the job description contains. Example: `# odacli list-jobs -k OraDB`
`--status`, `-s`	(Optional) Specifies the status of the job, such as Created, Scheduled, Running, Failure, Success, InternalError. Example: `# odacli list-jobs -s Failure`

Example 16-136 Displaying a List of Jobs

To display a list of jobs:

```
# odacli list-jobs

ID                            Description           Created
---------------------------- ---------------------
----------------------------
a6084067-72a1-4625-bea7-efd  Provisioning service   creation Jun 2,
2018 10:19:23 AM

(Continued)
Status
-------
Success
```

Example 16-137 Displaying Specified Number of Older Jobs

To display a specified number of older jobs:

```
# odacli list-jobs -hd 5
ID Description Created Status
--- --- --
643c6186-a667-43d7-847f-d756a96fa072 Create detailed Backup Report
August 5, 2018 12:36:26 AM UTC Success
f29cb82c-6150-487d-aaff-52d65f6ab972 Create recovery-pitr : time
'08/05/2018 07:16:12'
for db : igIyoz August 5, 2018 1:01:39 AM UTC Success
cfe19337-ab2f-4ef3-85b5-24601ba31be2 Create detailed Backup Report
August 5, 2018 1:17:46 AM UTC Success
3749b5e2-240e-4df5-b3c1-32d345243b25 Create detailed Backup Report
August 5, 2018 2:01:07 AM UTC Success
64828852-bb16-4f06-aca9-4bdf9fe7b6f2 Create regular-5 Backup with TAG-
iD5UNjBZ8HN2FYL
for Db:igIyoz August 5, 2018 2:14:19 AM UTC Success
```

Example 16-138 Displaying Jobs in a Date Range

To display jobs created within a time frame:

```
# ./odacli list-jobs -f 2018-08-07 -t 2018-08-08
ID Description Created Status
--- --- --
1fc5ef97-a9db-49b2-9664-7c551bd005f4 Authentication key update for
test_user August 7, 2018 12:56:58 AM UTC Success
e24f86cf-bb2e-4ebe-84e0-da5cedb27ad4 Provisioning service creation
August 7, 2018 1:00:54 AM UTC Success
7f67efd6-cce5-47b4-8dc4-fdb732491f99 CPU cores service update August 7,
2018 1:41:05 AM UTC Success
0ae9a312-bac8-43be-8a64-5a12c24c2a02 SSH keys update August 7, 2018
1:42:59 AM UTC Success
af41fdc1-87ff-46cd-bc41-26615e115ae7 SSH key delete August 7, 2018
1:44:56 AM UTC Success
79e4cbb0-b474-48ab-9e04-d3d602bc0ed2 DcsCli patching August 7, 2018
1:50:18 AM UTC Success
edd55e7d-f81f-4a10-942d-1121aef0bff3 DcsCli patching August 7, 2018
1:50:32 AM UTC Success
acc22c60-3476-4566-8faa-4d36b116eded create backup
config:aaaaaaaaaaaaaaaaaaaaaaaaaaaaa August 7, 2018 2:01:46 AM UTC
Success
d89efedf-9110-429a-a3b2-ccd6a53f8564 Database Home OraDB12201_home2
creation with version :12.2.0.1 August 7, 2018 2:36:05 AM UTC Success
2a5532ae-41fa-47c2-bc90-010a5f26d6b2 Database service creation with db
name: my122 August 7, 2018 3:52:38 AM UTC Success
c4e533e9-c596-478f-92db-2f11f1384075 Discover Components : all August
7, 2018 4:07:09 AM UTC Success
149e89b5-27d3-4c7c-9c03-f029ca3dd495 Discover Components : all August
7, 2018 4:08:45 AM UTC Success
21d4c37b-49ad-48dd-a1db-1f25d9288312 Database Home OraDB11204_home1
creation with version :11.2.0.4 August 7, 2018 4:19:32 AM UTC Success
b61dbbca-edc1-4a4a-9db2-82b0bdcb64e6 Database service deletion with db
```

```
name: myTestDb with id : 6400c81d-5837-480c-b4a1-7c01591ee144 August 7,
2018 4:24:50 AM UTC Success
d4a104df-5796-4e37-9173-82f0e263d642 create backup config:bkfgd August
7, 2018 4:28:54 AM UTC Success
a121d40b-f33b-47a4-8fc6-4e3b84173f44 Database service creation with db
name: my112 August 7, 2018 6:51:13 PM UTC Success
42dd661f-9ba0-4877-ace9-39d3f212c071 Discover Components : all August
7, 2018 7:12:56 PM UTC Success
2f648f5a-c9c5-42ec-adb0-98cf6497c89e Discover System Components :
system August 8, 2018 3:28:12 AM UTC Success
a5755f43-509d-4d4c-b7ef-9f99660c4de7 DB Home Patching: Home Id is
97df26b3-42f2-4189-805b-82d1b38737d0 August 8, 2018 3:52:08 AM UTC
Success
79b0e697-065f-4630-a524-8d072a4e139a Database Home OraDB12102_home1
creation with version :12.1.0.2 August 8, 2018 4:34:30 AM UTC Success
112b75bc-3512-4c28-a479-3e0317eb0dc4 Database service creation with db
name: mynew121 August 8, 2018 8:02:51 AM UTC Failure
09f56fb0-1e91-4b02-a9b8-5add11a8da32 Database service creation with db
name: my121a August 8, 2018 9:13:01 AM UTC Success
5633ded9-07ea-4bf9-9533-31eb65789fe7 Database service deletion with db
name: mynew121 with id : 24be4362-16c8-476f-903a-f6f2ef59f5e4 August 8,
2018 9:24:31 AM UTC Success
458d1c45-02dc-456c-ae88-5da613faaa66 Database service creation with db
name: mynew121 August 8, 2018 9:27:31 AM UTC Success
f178f378-a9d7-4d5c-b6f5-6f62ea4e05bb Database service deletion with db
name: myTestDb with id : ef50387b-0c62-4446-b210-f8d070e2a043 August 8,
2018 9:40:43 AM UTC Success
7fab740f-a711-466a-ba6d-dd5643374c28 Database service deletion with db
name: myTestDb with id : 6632a083-558a-4eb4-8c2b-af0710179980 August 8,
2018 9:41:04 AM UTC Success
3121529d-2b9d-4bbe-bf58-996c2cf46996 Database service creation with db
name: mydss August 8, 2018 9:42:06 AM UTC Success
3d0a9261-19d7-42bb-8b92-00fcc4f8c41e Discover Components : db August 8,
2018 10:17:22 AM UTC Success
```

odacli list-jobdata-retention-policy

Use the `odacli list-jobdata-retention-policy` command to list job data retention policy for default DCS jobs and specific auto scheduled jobs.

File Path

`/opt/oracle/dcs/bin/odacli`

Syntax

To list jobs and view job details and status:

```
odacli list-jobdata-retention-policy [-j] [-h]
```

Parameters

Parameter	Description
`--json, -j`	(Optional) Displays JSON output.
`--help, -h`	(Optional) Displays help for using the command.

Example 16-139   Listing all job retention policies

```
# odacli list-jobdata-retention-policy

Schedule Id Retention Window Unit Modified
---------------------------------------- --------------------
-------------------- -------------------------
Default     30  Days     April 23, 2020 6:16:59 PM PDT
284a22b5-41e6-4be1-a916-048eac74e076    10  Days     April 23, 2020
6:22:14 PM PDT
```

odacli list-purge-jobdata-job

Use the `odacli list-purge-jobdata-job` command to list purge job data for default DCS jobs and specific auto scheduled jobs.

File Path

`/opt/oracle/dcs/bin/odacli`

Syntax

To list job data purge policy:

```
   odacli list-purge-jobdata-job [-j] [-h]
```

Parameters

Parameter	Description
`--json, -j`	(Optional) Displays JSON output.
`--help, -h`	(Optional) Displays help for using the command.

Usage Notes

The command describes the files that are purged, the purged count, the purged file size, and the time of purge.

Example 16-140   Listing history, statistics, and rules for job data purge jobs

```
# odacli list-purge-jobdata-jobs

Purge By Job                             Purged Object
Count       Size        Type            Purged Time
```

```
------------------------------------ --------------------
---------- ---------- -------------- -------------------
4d065c96-a8eb-4974-a446-573b5ad3cb95        TaskReport
102                 Metadata        April 23, 2020 1:55:59 PM PDT
4d065c96-a8eb-4974-a446-573b5ad3cb95        ServiceJobReport
24                  Metadata        April 23, 2020 1:55:59 PM PDT
4d065c96-a8eb-4974-a446-573b5ad3cb95        LogCleanupSummary
2                   Metadata        April 23, 2020 1:55:59 PM PDT
4d065c96-a8eb-4974-a446-573b5ad3cb95        JobExecutionResource
93                  Metadata        April 23, 2020 1:55:59 PM PDT
4d065c96-a8eb-4974-a446-573b5ad3cb95        JobDataPurgeResult
21                  Metadata        April 23, 2020 1:55:59 PM PDT
```

odacli list-scheduled-executions

Use the command `odacli list-scheduled-executions` to display a list of jobs that were executed.

File Path

$ORACLE_HOME/opt/oracle/dcs/bin/odacli

Syntax

```
   odacli list-scheduled-executions [-e] [-1] [-j] [-h]
```

Parameters

Parameter	Description
`--executionid`, `-e`	(Optional) Displays the execution ID.
`--scheduleid`, `-i`	(Optional) Displays the Schedule ID.
`--help`, `-h`	(Optional) Displays help for using the command.
`--json`, `-j`	(Optional) Displays JSON output. The default is false.

Example 16-141 Displaying a List of Scheduled and Executed Jobs

Display a list of scheduled tasks, the status, and the date and time that the task was executed. In the following example, three (3) scheduled tasks were executed. One task, Schedule ID 04b5750c-0d13-42cf-aba3-85416e8edafb, was executed twice.

```
# odacli list-scheduled-executions

ID                                     ScheduledId
JobId
-------------------------------------- --------------------------------------
--------------------------------------
9890508c-ff6d-4307-972f-7962ec390871   04b5750c-0d13-42cf-
aba3-85416e8edafb
10a33e08-695c-4d13-b970-7dc7215f3cdd
7ee1e2aa-80a8-4297-97f7-365b84bcce4d
4a9e9796-4bed-4df7-af1e-de49362dda97   04b5750c-0d13-42cf-aba3-85416e8edafb

(Continued)
Status    Executed Time
```

```
--------- -------------------------------
Executed  February 4, 2018 12:00:00 AM UTC
Executed  February 4, 2018 12:00:00 AM UTC
Executed  February 5, 2018 12:00:00 AM UTC
```

To learn more about a scheduled backup, run the command `odacli list-schedules`. The output displays the ID, name, description, and schedule for each task.

```
 # odacli list-schedules

ID                                         Name
Description
--------------------------------------- ----------------------------
-----------------------------------------------
d136cc72-4a80-4ab8-9f1e-120b995b2794    metastore maintenance
internal metastore maintenance
04b5750c-0d13-42cf-aba3-85416e8edafb    AgentState metastore cleanup
internal agentstateentry metastore maintenance
7ee1e2aa-80a8-4297-97f7-365b84bcce4d    backupreport maintenance
backup reports deletion

(Continued)
CronExpression                 Disabled
------------------------------ --------
0 0 0 1/1 * ? *                true
0 0 0 1/1 * ? *                false
0 0 0 1/3 * ? *                false
```

Log Commands

Use the `odacli` log commands to specify the options to collect and delete logs.

- odaadmcli manage diagcollect
  Use the `odaadmcli manage diagcollect` command to collect diagnostic logs for Oracle Database Appliance components.
- odacli create-auto-logclean-policy
  Use the `odacli create-auto-logclean-policy` command to create a policy for a job to automatically purge log files for a specified time period when certain criteria are met.
- odacli create-logcleanjob
  Use the `odacli create-logcleanjob` command to create a job to purge log files for a specified time period.
- odacli describe-logcleanjob
  Use the `odacli describe-logcleanjobcommand`to describe a log cleanup job.
- odacli list-auto-logclean-policy
  Use the `odacli list-auto-logclean-policy` command to list the jobs to purge log files.

- odacli list-logcleanjobs
  Use the `odacli list-logcleanjobs` command to list the jobs to purge log files.
- odacli list-logspaceusage
  Use the `odacli list-logspaceusage` command to display the log file usage.

odaadmcli manage diagcollect

Use the `odaadmcli manage diagcollect` command to collect diagnostic logs for Oracle Database Appliance components.

File Path

$ORACLE_HOME`/opt/oracle/dcs/bin/odaadmcli`

Syntax

To collect diagnostic logs for components:

```
   odaadmcli manage diagcollect [-h] [--dataMask] [--dataSanitize] [--
fromTime] [--toTime] [--Components]
```

Parameters

Parameter	Description
`--help`, `-h`	(Optional) Displays help for using the command.
`--dataMask`	(Optional) Masks sensitive data. The default is No.
`--dataSanitize`	(Optional) Sanitizes (redacts) sensitive data. The default is No.
`--fromTime`	(Optional) Specifies the time from when you want to collect data. The timestamp formats can be of the type: `mon/dd/yyyy hh:mm:ss`, or `yyyy-mm-dd hh:mm:ss`, or `yyyy-mm-ddThh:mm:ss`, or `yyyy-mm-dd`.
`--toTime`	(Optional) Specifies the time till when you want to collect data. The timestamp formats can be of the type: `mon/dd/yyyy hh:mm:ss`, or `yyyy-mm-dd hh:mm:ss`, or `yyyy-mm-ddThh:mm:ss`, or `yyyy-mm-dd`.
`--Components`	(Optional) Specifies the comma-separated list of components for which you want to collect data. The supported values are: `all, ips, oda, odalite, dcs, odabackup, odapatching, odadataguard, odaprovisioning, odaconfg, odasystem, odastorage, database, asm, crsclient, dbclient, dbwlm, tns, rhp, procinfo, afd, crs, cha, wls, emagent, oms, ocm, emplugins, em, acfs, install, cfgtools, os, ashhtml, ashtext, awrhtml, awrtext`
`--verbose`	Displays detailed message.

Usage Notes

The following types of sensitive information can be redacted using the `--dataMask` or the `--dataSanitize` option:

- Host names
- IP addresses
- Database names
- Tablespace names
- Service names
- Ports
- Operating System user names

For example, when the `--dataMask` option is used, all instances of a sensitive name such as a database name called "payrolldb" are replaced with "*********" in the TFA collection.

For example, when the `--dataSanitize` option is used, all instances of a sensitive name such as a database name called "payrolldb" are replaced with another string, such as "oCjlN7F8P", in the TFA collection.

Example 16-142 Masking Sensitive Data in Log Collection

```
# /opt/oracle/oak/bin/odaadmcli manage diagcollect --dataMask
DataMask is set as true
TFACTL command is: /opt/oracle/tfa/tfa_home/bin/tfactl
Data mask is set.
Collect data within last 12 hours as default
Please wait for several minutes for the collection to complete.
```

odacli create-auto-logclean-policy

Use the `odacli create-auto-logclean-policy` command to create a policy for a job to automatically purge log files for a specified time period when certain criteria are met.

File Path

$ORACLE_HOME`/opt/oracle/dcs/bin/odacli`

Syntax

To list jobs and view job details and status:

```
   odacli create-auto-logclean-policy [-h] [-c] [-o] [-u] [-uMB] [-f] 
[-uPer]
```

Parameters

Parameter	Description
`--help`, `-h`	(Optional) Displays help for using the command.
`--components`, `-c`	(Optional) Specifies the list of components, separated by comma. The values are `gi|database|dcs` For example, `gi|dcs`.
`--olderthan`, `-o`	(Optional) Cleans logs older than specified time interval. Default is 30 if it is not specified.
`--olderThanUnit`, `-u`	(Optional) Unit for the `--olderthan` parameter. Default is `Day` if it is not specified.
`--freeSpaceBelowPercentage`, `-f`	Starts purge when free disk space is below the specified number of percentage of the total partition size. Valid range is 20-50. Default is 20.
`--usageOverMB`, `-uMB`	Starts purge when log usage is over the specified number of MB. Valid range is 10%-50% of partition size.
`--usageOverPercentage`, `-uPer`	Starts purge when log usage is over the specified number of percentage of total partition space. Valid range is 10-50.

Example 16-143 Creating Automatic Jobs to Purge Logs

To create a policy for automatic jobs to purge logs:

```
# odacli create-auto-logclean-policy -c 'dcs' -o 30 -uPer 30
Component  UsageOverPercentage  freeSpaceBelowPercentage UsageOverMB
OlderThan   OlderThanUnit

-------------------- -------------- --------------------
-------------------- -------------
dcs                  30                    20
0             30           Day
```

odacli create-logcleanjob

Use the `odacli create-logcleanjob` command to create a job to purge log files for a specified time period.

File Path

`$ORACLE_HOME/opt/oracle/dcs/bin/odacli`

Syntax

To list jobs and view job details and status:

```
odacli create-logcleanjob [-h] [-c] [-o] [-u]
```

Parameters

Parameter	Description
`--help`, `-h`	(Optional) Displays help for using the command.
`--components`, `-c`	(Optional) Specifies the list of components, separated by comma. The values are `gi|database|dcs` For example, `gi,dcs`.
`--olderthan`, `-o`	(Optional) Cleans logs older than specified time interval. Default is 30 if it is not specified.
`--unit`, `-u`	(Optional) Unit for the `--olderthan` parameter. Default is `Day` if it is not specified.

Example 16-144 Creating Jobs to Purge Logs

To create jobs to purge logs:

```
# odacli create-logcleanjob
Job details
----------------------------------------------------------------

                     ID:  e03d90b5-41dd-45e0-8b7a-1480d6d7f86f

            Description:  log file cleanup

                 Status:  Created

                Created:  July 25, 2018 8:06:56 PM UTC

                Message:



Task Name   Start Time End Time  Status

----------------------------------------
----------------------------------- ------------
# ./odacli describe-job -i e03d90b5-41dd-45e0-8b7a-1480d6d7f86f

Job details

----------------------------------------------------------------

                     ID:  e03d90b5-41dd-45e0-8b7a-1480d6d7f86f
```

```
              Description:  log file cleanup

                   Status:  Success

                  Created:  July 25, 2018 8:06:56 PM UTC

                  Message:


Task Name    Start Time    End Time      Status
----------------------------------------
---------------------------------- -
Clean TFA logs     July 25, 2018 8:06:56 PM UTC July 25, 2018 8:06:59
PM UTC  Success

Clean DCS logs   July 25, 2018 8:06:56 PM UTC  July 25, 2018 8:06:56 PM
UTC        Success
```

odacli describe-logcleanjob

Use the `odacli describe-logcleanjobcommand`to describe a log cleanup job.

File Path

$ORACLE_HOME/opt/oracle/dcs/bin/odacli

Syntax

To list jobs and view job details and status:

```
odacli describe-logcleanjob [-h]
```

Parameters

Parameter	Description
`--help`, `-h`	(Optional) Displays help for using the command.
`--jobid`, `-i`	Displays the summary of the log cleanup with the specified job ID.

Example 16-145 Displaying Log Cleanup Jobs

To display log cleanup jobs:

```
# odacli describe-logcleanjob  -i e03d90b5-41dd-45e0-8b7a-1480d6d7f86f
JobId    Files Deleted  Size Freed   Component  Top Path
TimeStamp

-------------------- -------------------- --------------------
-------------------- -----
e03d90b5-41dd-45e0-8b7a-1480d6d7f86f 0 0 bytes dcs /opt/oracle/dcs/log
```

```
July 25, 2018 8:06:56 PM UTC

e03d90b5-41dd-45e0-8b7a-1480d6d7f86f 0 0 bytes  gi /u01/app/12.2.0.1/
grid July 25, 2018 8:06:59 PM UTC
```

odacli list-auto-logclean-policy

Use the `odacli list-auto-logclean-policy` command to list the jobs to purge log files.

File Path

$ORACLE_HOME/opt/oracle/dcs/bin/odacli

Syntax

To list jobs and view job details and status:

```
odacli list-auto-logclean-policy [-h] [-c]
```

Parameters

Parameter	Description
`--help`, `-h`	(Optional) Displays help for using the command.
`--components`, `-c`	(Optional) Specifies the list of components, separated by comma. The values are `gi|database|dcs` For example, `gi,dcs`.

Example 16-146 Listing Jobs to Purge Logs

To list jobs to purge logs:

```
# odacli list-auto-logclean-policy
Component  UsageOverPercentage  freeSpaceBelowPercentage UsageOverMB
OlderThan OlderThanUnit
--- -------------------- --------------------
------------------------------------------------
gi                    40                    20
0                     60         Day

database              40                    20
0                     60       Day

dcs                   30                    20
0                     30      Day
```

odacli list-logcleanjobs

Use the `odacli list-logcleanjobs` command to list the jobs to purge log files.

File Path

$ORACLE_HOME`/opt/oracle/dcs/bin/odacli`

Syntax

To list jobs and view job details and status:

```
odacli list-logcleanjobs [-h]
```

Parameters

Parameter	Description
`--help`, `-h`	(Optional) Displays help for using the command.

Example 16-147 Listing Jobs to Purge Logs

To list jobs to purge logs:

```
# odacli list-logcleanjobs
JobId   Files Deleted    Size Freed   Component    Top Path  TimeStamp

-------------------- -------------------- --------------------
-------------------- -------------------a8ef8315-02e8-4979-
ab1f-30251818c6eb 0  0 bytes gi /u01/app/12.2.0.1/grid July 25, 2018
7:45:10 PM UTC

e03d90b5-41dd-45e0-8b7a-1480d6d7f86f 0 0 bytes  gi   /u01/app/12.2.0.1/
grid July 25, 2018 8:06:59 PM UTC

e03d90b5-41dd-45e0-8b7a-1480d6d7f86f 0  0 bytes dcs  /opt/
oracle/dcs/log  July 25, 2018 8:06:56 PM UTC

---------- ------------------------------------------------------------
```

odacli list-logspaceusage

Use the `odacli list-logspaceusage` command to display the log file usage.

File Path

$ORACLE_HOME`/opt/oracle/dcs/bin/odacli`

Syntax

To list jobs and view job details and status:

```
odacli list-logspaceusage [-c] [-h]
```

Parameters

Parameter	Description
`--components`, `-c`	Describes the list of components delimited by comma. The values can be `gi|database|dcs`. For example,`gi,dcs`.
`--help`, `-h`	(Optional) Displays help for using the command.

Example 16-148 Displaying a List of Logs

To display log file space usage for a list of components:

```

odacli list-logspaceusage
Timestamp:  July 25, 2018 7:31:39 PM UTC

----------------------------------------------------------------

Component    Size(MB)   Partition            LogUsagePercentage
PartitionFreePercentage

-------------------- -------------------- --------------------
--------------------

dcs    477.00       /dev/mapper/VolGroupSys-LogVolOpt
0.79                 81.00

gi  1863.68      /dev/mapper/VolGroupSys-LogVolU01 1.85
86.00
```

odacli Oracle Auto Service Request Commands

Use the Oracle Auto Service Request (Oracle ASR) commands to configure, update, test, and delete Oracle ASR on the system.

- odacli configure-asr
- odacli delete-asr
- odacli describe-asr
- odacli test-asr
- odacli update-asr

odacli configure-asr

Use the `odacli configure-asr` command to configure Oracle Auto Service Request (Oracle ASR) after deploying the appliance.

File Path

```
$ORACLE_HOME/opt/oracle/dcs/bin/odacli
```

Syntax

```
odacli  configure-asr  -u username -a asrpassword [-r proxyserver] [-t
proxyport]
[-y proxyuser] [-ppwd proxypassword] [-s snmpversion] -i[asrip] -e
[internal|external] [-j] [-h]
```

Parameters

Parameter	Description
`--asrip`, `-i`	(Optional) Identifies the external Oracle ASR Manager IP address.
`--asrpassword`, `-a`	Defines the My Oracle Support password associated with the user name. Use this option to specify the password interactively. When using this option, do not enter the password in the command-line.
`--asrtype`, `-e` {internal | external}	Defines the Oracle ASR Configuration Type. The default is internal.
`--help`, `-h`	(Optional) Displays help for using the command.
`--json`, `-j`	(Optional) Displays JSON output.
`--proxypassword`, `-ppwd`	(Optional) Defines the proxy user password.
`--proxyport`, `-t`	(Optional) Defines the proxy server port.
`--proxyserver`, `-r`	(Optional) Defines the Proxy Server Address.
`--proxyuser`, `-y`	(Optional) Defines the proxy user name needed to authenticate the proxy server.
`--snmpversion`, `-s` `[V3]`	(Optional) Defines Simple Network Management Protocol (SNMP) Version 3.
`--username`, `-u`	Defines the Oracle ASR user name. The user name is the My Oracle Support user name under which the server is registered.

Usage Notes

All log files for Oracle ASR are located in the `/var/opt/asrmanager/log/` directory.

To configure an external Oracle ASR Manager, you must define the Oracle ASR Configuration Type as external (`-e external`). For example, `odacli configure-asr -e external -i 198.51.100.1`

Example 16-149 Configuring Oracle ASR with a Proxy Server

This example configures Oracle ASR for user name scott.tiger@example.com. A proxy server, www-proxy.example.com, and port 80 are defined.

```
# odacli configure-asr -u john.smithl@example.com -a -t 80 -r www-
proxy.example.com
Asr User password:

Job details
----------------------------------------------------------------

ID: d99559b6-d98d-4cb7-b44d-8577cab26667
Description: Configure ASR
Status: Created
Created: August 9, 2016 6:12:19 AM WSST
Message:

Task Name          Start Time          End Time        Status
 ---------------- ---------------- ----------------- ----------
```

Example 16-150 Configuring an External Oracle ASR

This example configures Oracle Database Appliance to use an external Oracle ASR instance at IP address 10.20.30.40.

```
# odacli configure-asr --asrip 10.20.30.40 --asrtype External
{
  "jobId" : "ea054a2f-d18d-4253-83bc-b57434e3598e",
  "status" : "Created",
  "message" : "Please run the script '/tmp/activateExternalAssets.pl'
on the ASRManager host once the current job is successful.",
  "reports" : [ ],
  "createTimestamp" : "November 20, 2016 22:12:34 PM EST",
  "description" : "Configure ASR",
  "updatedTime" : "November 20, 2016 22:12:34 PM EST"
}
```

When the job completes successfully, run the `/tmp/activateExternalAssets.pl` script on the Oracle ASR Manager host.

odacli delete-asr

Use the `odacli delete-asr` command to remove the Oracle Auto Service Request (Oracle ASR) configuration from the system.

File Path

$ORACLE_HOME/opt/oracle/dcs/bin/odacli

Syntax

```
# odacli delete-asr [-h]
```

Parameters

Parameter	Description
`--help`, `-h`	(Optional) Displays help for using the command.

Example 16-151   Deleting Oracle ASR From the System

```
# odacli delete-asr
{
"jobId" : "5d70bd17-ec4a-48da-8196-1364105db99d",
"status" : "Running",
"message" : null,
"reports" : [ ],
"createTimestamp" : 1469409622451,
"description" : "Delete ASR",
"updatedTime" : 1469409622458
}
```

odacli describe-asr

Use the `odacli describe-asr` command to display Oracle Auto Service Request (Oracle ASR) configuration details.

File Path

$ORACLE_HOME/opt/oracle/dcs/bin/odacli

Syntax

```
  describe-asr [-h]
```

Parameters

Parameter	Description
`--help`, `-h`	(Optional) Displays help for using the command.

Example 16-152   Displaying Oracle ASR Details

```
# odacli describe-asr

ASR details
----------------------------------------------------------------
ID: e841d74a-687b-4e87-9548-1baa2090d48e
Name: UserName: scott.tiger@example.com
ProvyServerName: www-proxy.example.com
ProxyPort: 80
ProxyUserName:
SnmpVersion: V3
```

```
State: N/A
Created: July 15, 2016 8:53:54 AM PST
Updated: July 15, 2016 8:53:54 AM PST
```

odacli test-asr

Use the `odacli test-asr` command to test the Oracle Auto Service Request (Oracle ASR) configuration.

File Path

`$ORACLE_HOME/opt/oracle/dcs/bin/odacli`

Syntax

```
# odacli test-asr [-h]
```

Parameters

Parameter	Description
`--help`, `-h`	(Optional) Displays help for using the command.

Usage Notes

This command internally invokes the SNMP test trap by invoking `/SP/alertmgmt/rules/1 testrule=true`.

Example 16-153 Testing the Oracle ASR Configuration

```
# odacli test-asr

Job details
----------------------------------------------------------------
ID: ec6783f4-551d-4686-ab1b-22e2d9e59c98
Description: Test ASR
Status: Created
Created: July 25, 2016 9:03:15 AM SGT
Message:

Task Name                     Start Time            End Time
Status
----------------------------- --------------------- ----------------
----------
```

odacli update-asr

Use the `odacli update-asr` command to make changes to Oracle Auto Service Request (Oracle ASR) configuration details after deploying the appliance.

File Path

$ORACLE_HOME/opt/oracle/dcs/bin/odacli

Syntax

```
  update-asr  -u username -a asrpassword [-r proxyserver] [-t
proxyport] [-y proxyuser [-ppwd proxypassword] [-s snmpversion] -
i[asrip] -e [internal|external] [-j] [-h]
```

Parameters

Parameter	Description
`--asrip`, `-i`	(Optional) Identifies the external Oracle ASR Manager IP address.
`--asrpassword`, `-a`	Defines the My Oracle Support password associated with the user name. Use this option to specify the password interactively. When using this option, do not enter the password in the command-line.
`--asrtype`, `-e` [internal | external]	Defines the Oracle ASR Configuration Type. The default is internal.
`--help`, `-h`	(Optional) Displays help for using the command.
`--json`, `-j`	(Optional) Displays JSON output.
`--proxypassword`, `-ppwd`	(Optional) Defines the proxy user password.
`--proxyport`, `-t`	(Optional) Defines the proxy server port.
`--proxyserver`, `-r`	(Optional) Defines the Proxy Server Address.
`--proxyuser`, `-y`	(Optional) Defines the proxy user name needed to authenticate the proxy server.
`--snmpversion`, `-s [v3]`	(Optional) Defines Simple Network Management Protocol (SNMP) Version 3.
`--username`, `-u`	Defines the Oracle ASR user name. The user name is the My Oracle Support user name under which the server is registered.

Usage Notes

- Enter the password during Oracle ASR configuration.
- All log files for Oracle ASR are located in the `/var/opt/asrmanager/log/` directory.
- You cannot use the `update-asr` command to change the Oracle ASR type. For example, from internal to external. To change the Oracle ASR type, delete

the existing configuration using the `odacli delete-asr` and then re-configure Oracle ASR using the `odacli configure-asr` command.

- To configure an external Oracle ASR Manager, you must define the Oracle ASR Configuration Type as external (`-e external`). For example, `odacli update-asr -e external -i 198.51.100.1`

Example 16-154 Updating Oracle ASR with a New Proxy Server

This example updates Oracle ASR for user name scott.tiger@example.com. The password is not defined in the command-line. You are prompted to enter the password during configuration. The proxy server is updated to www-proxy2.example.com.

```
# odacli update-asr -u scott.tiger@example.com --asrpassword --
proxyserver www-proxy2.example.com --proxyport 80
Asr User password:

Job details
---------------------------------------------------------
ID: 79cb2baa-1644-45c5-a004-a303e3111807
Description: Update ASR
Status: Created
Updated: July 15, 2016 9:53:54 AM PST
Message:

Task Name          Start Time          End Time         Status
---------------- ---------------- ----------------- ----------
```

odacli OS Commands

Use the `odacli OS` commands to list and update operating system (OS) parameters.

- odacli list-osconfigurations
  Use the command `odacli list-osconfigurations` to display the current HugePage and memlock values and view suggested values based on the total available space.
- odacli update-osconfigurations
  Use the command `odacli update-osconfigurations` to update the HugePage and memlock values.

odacli list-osconfigurations

Use the command `odacli list-osconfigurations` to display the current HugePage and memlock values and view suggested values based on the total available space.

File Path

$ORACLE_HOME/opt/oracle/dcs/bin/odacli

Syntax

```
odacli list-osconfigurations [-h] [-j]
```

Parameters

Parameter	Description
`--help`, `-h`	(Optional) Displays help for using the command.
`--json`, `-j`	(Optional) Displays JSON output. The default is false.

Usage Notes

The command displays the configured values for HugePage and memlock from the `/etc/sysctl.conf` and `/etc/security/limits.conf`files. Based on the total available space, suggested values are calculated for the parameters.

Example 16-155 Displaying a List of Configured and Suggested Memlock and HugePage Configurations

```
# odacli list-osconfigurations

Parameter       User            ConfiguredValue
SuggestedValue
--------------- --------------- ------------------------------
---------------
Memlock         grid            295971180KB
289034355KB

Memlock         oracle          295971180KB
289034355KB

HugeSpace       default         101430MB                       101161MB
```

odacli update-osconfigurations

Use the command `odacli update-osconfigurations` to update the HugePage and memlock values.

File Path

$ORACLE_HOME`/opt/oracle/dcs/bin/odacli`

Syntax

```
odacli update-osconfigurations [-h] [-hs] [-j] [-m]
```

Parameters

Parameter	Description
`--help`, `-h`	(Optional) Displays help for using the command.
`--hugespace`, `-hs`	(Optional) Updates the HugePage value.

Parameter	Description
`--json`, `-j`	(Optional) Displays JSON output. The default is false.
`--memlock`, `-m`	(Optional) Updates the memlock value.

Usage Notes

The command updates memlock in the `/etc/security/limits.conf`file and HugePage in the`/etc/sysctl.conf` file with the suggested values.

You can update memlock or hugepage. If no option is provided, then both parameters are updated to the suggested values.

Example 16-156 Updating the HugePage and Memlock Parameters to the Suggested Values

```
odacli update-osconfigurations
{
"jobId" : "954cf7a5-9cad-451c-8820-3140a716af26",
"status" : "Created",
"message" : "Successfully submitted a request to configure OS
parameters.",
"reports" : [ ],
"createTimestamp" : "February 06, 2018 00:03:51 AM MST",
"resourceList" : [ ],
"description" : "Configuring OS Parameter",
"updatedTime" : "February 06, 2018 00:03:51 AM MST"
[root@rwsoda6s002 ~]# odacli describe-job -i
"954cf7a5-9cad-451c-8820-3140a716af26"
Job details
----------------------------------------------------------------
ID: 954cf7a5-9cad-451c-8820-3140a716af26
Description: Configuring OS Parameter
Status: Success
Created: February 6, 2018 12:03:51 AM MST
Message:
Task Name             Start Time                         End
Time                          Status
--------------------  -------------------------------
--------------------------------  -------
Setting up memlock.   February 6, 2018 12:03:51 AM MST   February 6, 2018 12:03:51 AM
MST  Success
Setting up HugeSpace  February 6, 2018 12:03:51 AM MST   February 6, 2018 12:03:51 AM
MST  Success
```

odaadmcli Hardware Monitoring Commands

Use the `hardware monitoring` commands to display hardware configurations.

- odaadmcli show cooling
  Use the `odaadmcli show cooling` command to show cooling details.
- odaadmcli show env_hw
  Use the `odaadmcli show env_hw` command to display information about the environment and hardware.
- odaadmcli show fs
  Use the `odaadmcli show fs` command to display filesystem details.

- odaadmcli show memory
  Use the `odaadmcli show memory` command to display memory details.
- odaadmcli show network
  Use the `odaadmcli show network` command to show network details.
- odaadmcli show power
  Use the `odaadmcli show power` command to display power supply details.
- odaadmcli show processor
  Use the `odaadmcli show processor` command to display processor details.
- odaadmcli show server
  Use the `odaadmcli show server` command to display server details.

odaadmcli show cooling

Use the `odaadmcli show cooling` command to show cooling details.

File Path

$ORACLE_HOME`/opt/oracle/dcs/bin/odaadmcli`

Syntax

To show cooling details:

```
odaadmcli show cooling [-h]
```

Parameters

Parameter	Description
`--help`, `-h`	(Optional) Displays help for using the command.

odaadmcli show env_hw

Use the `odaadmcli show env_hw` command to display information about the environment and hardware.

File Path

$ORACLE_HOME`/opt/oracle/dcs/bin/odaadmcli`

Syntax

To display environment and hardware details:

```
odaadmcli show env_hw [-h]
```

Parameters

Parameter	Description
`--help`, `-h`	(Optional) Displays help for using the command.

Example 16-157   Displaying Environment and Hardware Details

To display the hardware details, enter the command `odaadmcli show env_hw`. The results show a bare metal Oracle Database Appliance system.

```
# odaadmcli show env_hw

BM ODA_Lite X7-2 Medium
```

odaadmcli show fs

Use the `odaadmcli show fs` command to display filesystem details.

File Path

$ORACLE_HOME`/opt/oracle/dcs/bin/odaadmcli`

Syntax

To display filesystem details:

```
   odaadmcli show fs [-h]
```

Parameters

Parameter	Description
`--help, -h`	(Optional) Displays help for using the command.

Example 16-158   Displaying Filesystem Details

```
# odaadmcli show fs

Type     Total Space   Free Space      Total DG Space  Free DG Space
ext3    30237M         7763M            -               -
ext3    484M            416M            -               -
ext3    60475M        38149M            -               -
ext3    100793M       22060M            -               -

acfs    102400M       102158M         4894016M        2418668M
acfs    102400M       100501M         4894016M        2418668M
acfs    102400M       100601M         4894016M        2418668M

(Continued)
Diskgroup Mount Point
          /
          /boot
          /opt
          /u01
DATA      /u02/app/oracle/oradata/ACFSDB1
DATA      /u02/app/oracle/oradata/ACFSDB2
DATA      /u02/app/oracle/oradata/EE12NCDB
```

odaadmcli show memory

Use the `odaadmcli show memory` command to display memory details.

File Path

$ORACLE_HOME`/opt/oracle/dcs/bin/odaadmcli`

Syntax

To show memory details:

```
odaadmcli show memory [-h]
```

Parameters

Parameter	Description
`--help`, `-h`	(Optional) Displays help for using the command.

Example 16-159   Display Memory Details

```
# odaadmcli show memory

NAME      HEALTH  HEALTH_DETAILS   PART_NO.         SERIAL_NO.
DIMM_0    OK       -               3A4K40BB1-CRC
00CE01154602EADA96
DIMM_11   OK       -               3A4K40BB1-CRC
00CE01154602EADADA
DIMM_3    OK       -               3A4K40BB1-CRC
00CE01154602EADBC7
DIMM_8    OK       -               3A4K40BB1-CRC
00CE01154602EADBA0

(Continued)
LOCATION MANUFACTURER  MEMORY_SIZE  CURR_CLK_SPEED  ECC_Errors
P0/D0    Samsung        32 GB       2400 MHz        0
P0/D1    Samsung        32 GB       2400 MHz        0
P0/D3    Samsung        32 GB       2400 MHz        0
P0/D8    Samsung        32 GB       2400 MHz        0
```

odaadmcli show network

Use the `odaadmcli show network` command to show network details.

File Path

$ORACLE_HOME`/opt/oracle/dcs/bin/odaadmcli`

Syntax

To show network details:

```
odaadmcli show network [-h]
```

Parameters

Parameter	Description
`--help`, `-h`	(Optional) Displays help for using the command.

Example 16-160 Showing Network Details

```
# odaadmcli show network
NAME            HEALTH HEALTH_DETAILS LOCATION PART_NO MANUFACTURER
MAC_ADDRESS LINK_DETECTED DIE_TEMP

Ethernet_NIC_0     OK     -              NET0     i210    INTEL
00:10:E0:DD:9D:14 no (em1) N/A
Ethernet_NIC_1     OK     -              NET1     X710/X557-AT Intel
3C:FD:FE:78:93:92 no (p2p3) N/A
Ethernet_NIC_2     OK     -              NET2     X710/X557-AT Intel
3C:FD:FE:78:93:91 yes (p2p2) N/A
Ethernet_NIC_3     OK     -              NET3     X710/X557-AT Intel
3C:FD:FE:78:93:90 yes (p2p1) N/A
Ethernet_NIC_4     OK     -              NET4     BCM57414 Broadcom
B0:26:28:3F:D8:B8 yes (p7p2) N/A
Ethernet_NIC_5     OK     -              NET5     X710/X557-AT Intel
3C:FD:FE:78:93:93 no (p2p4) N/A
Ethernet_NIC_6     OK     -              NET6     BCM57414 Broadcom
B0:26:28:3F:D8:B0 yes (p7p1) N/A
```

odaadmcli show power

Use the `odaadmcli show power` command to display power supply details.

File Path

`/opt/oracle/dcs/bin/odaadmcli`

Syntax

Run this command on the first node, to display power supply details on Oracle Database Appliance High-Availability (HA) models:

```
   odaadmcli show power [-h]
```

Parameters

Parameter	Description
`--help, -h`	(Optional) Displays help for using the command.

Example 16-161 Displaying Power Supply Details

```
# odaadmcli show power

NAME            HEALTH  HEALTH_DETAILS   PART_NO.      SERIAL_NO.
Power_Supply_0  OK            -          7079395     476856Z+1514CE056G

(Continued)
LOCATION    INPUT_POWER   OUTPUT_POWER   INLET_TEMP         EXHAUST_TEMP
PS0         Present       112 watts      28.000 degree C    34.938
degree C
```

odaadmcli show processor

Use the `odaadmcli show processor` command to display processor details.

File Path

$ORACLE_HOME`/opt/oracle/dcs/bin/odaadmcli`

Syntax

To show processor details:

```
odaadmcli show processor  [-h]
```

Parameters

Parameter	Description
`--help, -h`	(Optional) Displays help for using the command.

Example 16-162 Displaying Processor Details

```
# odaadmcli show processor

NAME     HEALTH HEALTH_DETAILS  PART_NO.  LOCATION   MODEL
CPU_0     OK      -              060F P0   (CPU 0)    Intel(R) Xeon(R)
CPU E5-2630

(Continued)
MAX_CLK_SPEED   TOTAL_CORES     ENABLED_CORES
2.200 GHz        10              10
```

odaadmcli show server

Use the `odaadmcli show server` command to display server details.

File Path

```
$ORACLE_HOME/opt/oracle/dcs/bin/odaadmcli
```

Syntax

To show server details:

```
odaadmcli show server [-h]
```

Parameters

Parameter	Description
`--help`, `-h`	(Optional) Displays help for using the command.

Example 16-163 Displaying Server Details

```
# odaadmcli show server

Power State : On
Open Problems : 0
Model : ORACLE SERVER X7-2
Type : Rack Mount
Part Number : 7320190
Serial Number : 1605NM10JJ
Primary OS : Not Available
ILOM Address : 10.209.8.215
ILOM MAC Address : 00:10:E0:95:98:F0
Description : Oracle Database Appliance X7-2 Small 1606NM1s02
Locator Light : Off
Actual Power Consumption : 135 watts
Ambient Temperature : 24.250 degree C
Open Problems Report : System is healthy
```

Storage Commands

Understand the commands to perform storage operations and diagnostics.

- odaadmcli expand storage
  Use the `odaadmcli expand storage` command to expand storage.
- odacli list-dgdisks
  Use the `odacli list-dgdisks` command to display details about the available disks.

- odacli validate-storagetopology
  Use the `odacli validate-storagetopology` command to check the cable connections between the system controllers and the storage shelf, as well as the cable connection to the storage expansion shelf (if one is installed).
- odaadmcli power disk
  Use the `odaadmcli power disk` command to power a disk on or off for NVMe drives only.
- odaadmcli show controller
  Use the `odaadmcli show controller` command to display details of the controller.
- odaadmcli show disk
  Use the `odaadmcli show disk` command to display the status of a single disk or of all disks on the system.
- odaadmcli show diskgroup
  Use the `odaadmcli show diskgroup` command to list configured diskgroups or display a specific diskgroup configuration.
- odaadmcli show raidsyncstatus
  Use the `odaadmcli show raidsyncstatus` command to display the RAID SYNC status.
- odaadmcli show storage
  Use the `odaadmcli show storage` command to show the storage controllers, expanders, and disks.
- odaadmcli stordiag
  Use the `odaadmcli stordiag` command to collect detailed information for each disk or NVMe.

odaadmcli expand storage

Use the `odaadmcli expand storage` command to expand storage.

File Path

```
/opt/oracle/dcs/bin/odaadmcli
```

Syntax

```
  odaadmcli expand storage -ndisk number of disks to be added -
enclosure {0|1} [-h]
```

Parameters

Parameter	Description
`--enclosure {0|1}`	Defines the JBOD or shelf number. The base storage shelf is 0. The storage expansion shelf is 1. This option is only available for multi-node platforms. It is not supported on Oracle Database Appliance single node platforms.

Parameter	Description
`--help, -h`	(Optional) Displays help for using the command.
`-ndisk`	Defines the number of disks to be added in the enclosure.

Usage Notes

On high-availability (HA) Oracle Database Appliance hardware models, run the command only on the first node.

Various storage options are available. On multi-node platforms, the base storage is SSD and you can choose to add either SSD or HDD disks. When adding a storage expansion shelf, all disks must be the same type (you cannot combine SSD and HDD disks).

> **Note:**
>
> In addition to reviewing the `expand storage` command, it is important to follow the procedures for adding storage. Cabling validation and disk placement is important. In some cases, you must move disks to different slots to successfully expand storage.

odacli list-dgdisks

Use the `odacli list-dgdisks` command to display details about the available disks.

File Path

`/opt/oracle/dcs/bin/odacli`

Syntax

To list available disk details:

```
odacli list-dgdisks [-h] [-dg] [-dp] [-j]
```

Parameters

Parameter	Description
`--json, -j`	(Optional) Displays JSON output.
`--help, -h`	(Optional) Displays help for using the command.
`--diskgroup, -dg`	(Optional) Displays all disks in the specified disk group. The possible values are: ALL, DATA, RECO, REDO, FLASH. If no value is specified, then ALL disks are displayed.

Parameter	Description
`--diskpath, -dp`	(Optional) Displays all disks that contains the specified value in the path. If no value is specified, then all disks are displayed.

Usage Notes

Example 16-164 Listing All Available Disks on the System

```
# odacli list-dgdisks -dg ALL

Name                      Group Mount St Group Num Mode St State
Redundancy Fail Grp                  Path
Health Inc
------------------------ ----- -------- --------- ------- --------
---------- ------------------------ ------------------------------
------ ---
HDD_E0_S19_576667504P1    DATA  CACHED   1         ONLINE  NORMAL
UNKNOWN    HDD_E0_S19_576667504P1    AFD:HDD_E0_S19_576667504P1
0      0
HDD_E0_S08_577087696P1    DATA  CACHED   1         ONLINE  NORMAL
UNKNOWN    HDD_E0_S08_577087696P1    AFD:HDD_E0_S08_577087696P1
0      0
HDD_E0_S11_576021940P1    DATA  CACHED   1         ONLINE  NORMAL
UNKNOWN    HDD_E0_S11_576021940P1    AFD:HDD_E0_S11_576021940P1
0      0
HDD_E0_S13_576660012P1    DATA  CACHED   1         ONLINE  NORMAL
UNKNOWN    HDD_E0_S13_576660012P1    AFD:HDD_E0_S13_576660012P1
0      0
HDD_E0_S15_577131668P1    DATA  CACHED   1         ONLINE  NORMAL
UNKNOWN    HDD_E0_S15_577131668P1    AFD:HDD_E0_S15_577131668P1
0      0
HDD_E0_S09_576662448P1    DATA  CACHED   1         ONLINE  NORMAL
UNKNOWN    HDD_E0_S09_576662448P1    AFD:HDD_E0_S09_576662448P1
0      0
HDD_E0_S18_577136300P1    DATA  CACHED   1         ONLINE  NORMAL
UNKNOWN    HDD_E0_S18_577136300P1    AFD:HDD_E0_S18_577136300P1
0      0
```

Example 16-165 Listing Disks with the Specified Disk Path on the System

```
# odacli list-dgdisks -dp HDD_E0_S10_577135552

Name                   Group Mount St Group Num Mode St State
Redundancy Fail Grp               Path                           Health Inc
---------------------- ----- -------- --------- ------- --------
---------- ---------------------- --------------------------- ------ ---
HDD_E0_S10_577135552P1 DATA  CACHED   1         ONLINE  NORMAL
UNKNOWN    HDD_E0_S10_577135552P1 AFD:HDD_E0_S10_577135552P1  0      0
HDD_E0_S10_577135552P2 RECO  CACHED   2         ONLINE  NORMAL
UNKNOWN    HDD_E0_S10_577135552P2 AFD:HDD_E0_S10_577135552P2  0      0
```

odacli validate-storagetopology

Use the `odacli validate-storagetopology` command to check the cable connections between the system controllers and the storage shelf, as well as the cable connection to the storage expansion shelf (if one is installed).

Oracle recommends that you run the `odacli validate-storagetopology` command before deploying the system to ensure that the cabling is correct. This will avoid and prevent problems during deployment due to incorrect or missing cable connections. If the cabling is not correct, you will see errors in your output.

File Path

$ORACLE_HOME`/opt/oracle/dcs/bin/odacli`

Syntax

```
odacli validate-storagetopology [–h]
```

Parameters

Parameter	Description
`--help, -h`	(Optional) Displays help for using the command.

odaadmcli power disk

Use the `odaadmcli power disk` command to power a disk on or off for NVMe drives only.

File Path

$ORACLE_HOME`/opt/oracle/dcs/bin/odaadmcli`

Syntax

To power an NVMe disk on or off:

```
   odaadmcli power disk {on|off|status} disk_name [-h]
```

Parameters

Parameter	Description
disk_name	Defines the disk resource name. The resource name format is pd_[0..3].
`{on|off|status}`	Power on a disk, power off a disk, display status.
`--help, -h`	(Optional) Displays help for using the command.

Example 16-166 Powering a Disk Off

This example shows how to power off a disk.

```
# odaadmcli power disk off pd_00
Disk 'pd_00' is already part of ASM

Are you sure you want to power OFF the disk?: 'pd_00'?
[yes/no]:
yes
Powered OFF pd_00
```

Example 16-167 Checking the Disk Status

This example shows how to get the status of disk pd_00.

```
# odaadmcli power disk status pd_00
The disk is powered ON
```

odaadmcli show controller

Use the `odaadmcli show controller` command to display details of the controller.

File Path

$ORACLE_HOME/opt/oracle/dcs/bin/odaadmcli

Syntax

To display details of the controller:

```
odaadmcli show controller id [-h]
```

Parameters

Parameter	Description
`controller_id`, *id*	Defines the controller.
`--help`, `-h`	(Optional) Displays help for using the command.

Example 16-168 Showing Controller Details

```
 # odaadmcli show controller 1
Controller [1] information:
        sun-controller-id = nvme:1b:00.00
        sun-id = nvme:1b:00.00
        sun-controller-manufacturer = Samsung
        pci-vendor-id = 0x0000144d
        sun-controller-model = 0xa821
        pci-device-id = 0x0000a821
        sun-controller-type = NVMe
        sun-card-manufacturer = Sun Microsystems
        pci-subvendor-id = 0x0000108e
        sun-card-model = 0xa803
        pci-subdevice-id = 0x0000a803
        pci-address = 1b:00.0
        sun-version-firmware = KPYA7R3Q
        sun-serial-number = S2LHNAAH101008
        sun-product-name = MS1PC2DD3ORA3.2T
        pci-slot-number = 11
        nvme-power-control = 1
        sun-nac-name = /SYS/DBP/NVME1
```

odaadmcli show disk

Use the `odaadmcli show disk` command to display the status of a single disk or of all disks on the system.

File Path

$ORACLE_HOME/opt/oracle/dcs/bin/odaadmcli

Syntax

To display the status of all disks on the system:

```
   odaadmcli show  disk [-h]
```

To display the status of a single disk:

```
  odaadmcli show disk disk_name [-h]
```

Parameters

Parameter	Description
disk_name	(Optional) Define the disk resource name. The resource name format is pd_[0..3].
--help, -h	(Optional) Displays help for using the command.

Example 16-169 Displaying the Status of All Disks

To display the status of all the disks on the system:

```
# odaadmcli show disk
NAME        PATH             TYPE     STATE     STATE_DETAILS
pd_00     /dev/nvme0n1 NVD         ONLINE     Good
pd_01     /dev/nvme1n1 NVD         ONLINE     Good
```

Example 16-170 Displaying the Status of a Single Disk

To display the status of a disk named pd_00:

```
# odaadmcli show disk pd_00
```

```
The Resource is : pd_00
ActionTimeout : 1500
ActivePath : /dev/nvme0n1
 AsmDiskList : |data_00||reco_00|
AutoDiscovery : 1
AutoDiscoveryHi : |data:80:NVD||reco:20:NVD|
CheckInterval : 300
ColNum : 0
CriticalWarning : 0
DependListOpr : add
 Dependency : |0|
DiskId : 360025380144d5332
DiskType : NVD
Enabled : 1
ExpNum : 19
HbaPortNum : 10
IState : 0
Initialized : 0
IsConfigDepende : false
 ModelNum : MS1PC2DD3ORA3.2T
 MonitorFlag : 1
MultiPathList : |/dev/nvme0n1|
Name : pd_00
NewPartAddr : 0
OSUserType : |userType:Multiuser|
PlatformName : X7_1_LITE_S
PrevState : Invalid
PrevUsrDevName :
SectorSize : 512
SerialNum : S2LHNAAH000001
Size : 3200631791616
SlotNum : 0
SmartDiskWarnin : 0
SmartTemperatur : 37
State : Online
StateChangeTs : 1465263789
StateDetails : Good
TotalSectors : 6251233968
TypeName : 0
UsrDevName : NVD_S00_S2LHNAAH101026
VendorName : Samsung
gid : 0
 mode : 660
uid : 0
```

odaadmcli show diskgroup

Use the `odaadmcli show diskgroup` command to list configured diskgroups or display a specific diskgroup configuration.

File Path

`$ORACLE_HOME/opt/oracle/dcs/bin/odaadmcli`

Syntax

To list configured diskgroups:

```
odaadmcli show diskgroup [-h]
```

To display DATA configurations:

```
odaadmcli show diskgroup [DATA] [-h]
```

To display RECO configurations:

```
odaadmcli show diskgroup [RECO] [-h]
```

Parameters

Parameter	Description
DATA	(Optional) Displays the DATA diskgroup configurations.
RECO	(Optional) Displays the RECO diskgroup configurations.
`--help`, `-h`	(Optional) Displays help for using the command.

Example 16-171 Listing All Diskgroups

```
# odaadmcli show diskgroup

DiskGroups
----------
DATA
RECO
```

Example 16-172 Displaying DATA Configurations

```
# odaadmcli show diskgroup DATA

ASM_DISK  PATH                           DISK   STATE   STATE_DETAILS

data_00   /dev/NVD_S00_S2LHNAAH101026p1  pd_00  ONLINE   Good
data_01   /dev/NVD_S01_S2LHNAAH101008p1  pd_01  ONLINE   Good
```

odaadmcli show raidsyncstatus

Use the `odaadmcli show raidsyncstatus` command to display the RAID SYNC status.

File Path

`$ORACLE_HOME``/opt/oracle/dcs/bin/odaadmcli`

Syntax

To display the status of RAID SYNC:

```
   odaadmcli show raidsyncstatus [-h]
```

Parameters

Parameter	Description
`--help`, `-h`	(Optional) Displays help for using the command.

Example 16-173   Displaying the RAID SYNC Status

To display the RAID SYNC details and status:

```
# odaadmcli show raidsyncstatus

Raid Type  Raid Device  Raid Status  maintainPdFailHistory  Rebuildrate
H/W Raid    /dev/sda     Optimal       ON                    30%
```

odaadmcli show storage

Use the `odaadmcli show storage` command to show the storage controllers, expanders, and disks.

File Path

$ORACLE_HOME/opt/oracle/dcs/bin/odaadmcli

Syntax

To display the storage controllers, expanders, and disks:

```
   odaadmcli show storage [-h]
```

To show storage errors:

```
   odaadmcli show storage -errors [-h]
```

Parameters

Parameter	Description
`--errors`	(Optional) Shows storage errors.
`--help`, `-h`	(Optional) Displays help for using the command.

Example 16-174   Displaying Storage Devices

The following example displays details about the storage devices on an appliance.

```
# odaadmcli show storage

==== BEGIN STORAGE DUMP ========
Host Description: Oracle Corporation:ORACLE SERVER X6-2
Total number of controllers: 2
    Id = 0
    Pci Slot = 10
    Serial Num = S2LHNAAH101026
     Vendor = Samsung
   Model = MS1PC2DD3ORA3.2T
   FwVers = KPYA7R3Q
   strId = nvme:19:00.00
      Pci Address = 19:00.0

      Id = 1
      Pci Slot = 11
      Serial Num = S2LHNAAH101008
      Vendor = Samsung
    Model = MS1PC2DD3ORA3.2T
    FwVers = KPYA7R3Q
     strId = nvme:1b:00.00
  Pci Address = 1b:00.0


Total number of expanders: 0
Total number of PDs: 2
   /dev/nvme0n1 Samsung NVD 3200gb slot: 0 pci : 19
   /dev/nvme1n1 Samsung NVD 3200gb slot: 1 pci : 1

==== END STORAGE DUMP =========
```

odaadmcli stordiag

Use the `odaadmcli stordiag` command to collect detailed information for each disk or NVMe.

File Path

`/opt/oracle/dcs/bin/odaadmcli`

Syntax

To collect storage diagnostics for disks and NVM Express (NVMe):

```
   odaadmcli stordiag [-n] [-h]
```

Parameters

Parameter	Description
`-n`*disk_name*	Defines the disk resource name. The resource name format is `pd_[0..3]`.
`--help`, `-h`	(Optional) Displays help for using the command.

Example 16-175   Displaying NVMe Details

To display detailed information for NVMe `pd_00`:

```
# odaadmcli stordiag pd_00
```

17 Oracle Appliance Manager Command-Line Interface for Virtualization

Oracle Appliance Manager Command-Line Interface (OAKCLI) is a command-line interface (CLI) for Oracle VM Server (Xen hypervisor technology virtualization) on Oracle Database Appliance virtualized platform. Only use the `oakcli` commands on an Oracle Database Appliance virtualized platform.

- About the Oracle Appliance Manager Command-line Interface (OAKCLI)
  The `oakcli` commands are the primary method for performing database and system administration on Oracle Database Appliance, and on Oracle Database Appliance Virtualized Platform.
- Managing OAKCLI Privileges and Security with SUDO
  Oracle Appliance Manager command-line utility requires `root` system privileges for most administration actions. You may want to use SUDO as part of your system auditing and security policy.
- oakcli add disk -local
  Use the `oakcli add disk -local` command to add a local disk to the system after physically replacing a failed disk.
- oakcli configure commands
  Use the `oakcli configure` commands to configure components on Oracle Database Appliance.
- oakcli copy
  Use the `oakcli copy` command to prepare a copy of the configuration file for use during the configuration of Oracle Database Appliance.
- oakcli create commands
  Use the `oakcli create` commands to create components on Oracle Database Appliance.
- oakcli delete commands
  Use the `oakcli delete` commands to delete components from Oracle Database Appliance.
- oakcli deploy
  Use the command `oakcli deploy` to deploy Oracle Grid Infrastructure for a cluster on Oracle Database Appliance.
- oakcli expand storage
  Use the `oakcli expand storage` command to configure the solid-state drives (SSDs) for data storage into the existing base configuration to fully populate the base storage shelf.
- oakcli diskwritecache
  Use the `oakcli diskwritecache` command to locate disks with write cache enabled and to disable disk write cache for those disks.

- oakcli locate disk
  Use the `oakcli locate disk` command to locate the physical disk that is associated with a named Oracle ASM disk by turning the disk's LED light on or off.
- oakcli manage diagcollect
  Use the `oakcli manage diagcollect` command to collect diagnostic information about Oracle Database Appliance for troubleshooting purposes, and for working with Oracle Support Services.
- oakcli describe-system
  Use the `oakcli describe-system` command to display details about components installed on the system.
- oakcli modify database
  Use the `oakcli modify database` command to modify the database type or size class for a named database.
- oakcli orachk
  Use the `oakcli orachk` command to audit configuration settings with the ORAchk utility.
- oakcli reconfigure osparams
  Use the `oakcli reconfigure osparams` command to adjust the kernel parameters based on the available RAM after you upgrade memory or DIMM.
- oakcli resize dbstorage
  Use the `oakcli resize dbstorage` command to resize the space used for a storage structure that was created for the purpose of migrating databases from Oracle ASM to Oracle ACFS.
- oakcli restart oda_base
  Use the `oakcli restart oda_base` command to stop and restart ODA_BASE on the local node.
- oakcli show commands
  Use the `oakcli show` commands to display the status of Oracle Database Appliance components.
- oakcli start commands
  Use the `oakcli start` commands to start a virtual machine, to start a shared repository on a node, or to start ODA_BASE on the local node.
- oakcli stop command
  Use the `oakcli stop` command to stop a virtual machine, to stop a shared repository on a node, or to stop ODA_BASE on the local node.
- oakcli stordiag
  Use the `oakcli stordiag` command to run diagnostic tests on a disk in the storage shelf or storage expansion shelf.
- oakcli test asr
  Use the `oakcli test asr` command to send a test trap to determine if Oracle Auto Service Request (Oracle ASR) is configured and working correctly.
- oakcli unpack
  Use the `oakcli unpack` command to unpack packages into the Oracle Appliance Manager repository.
- oakcli update
  Use the `oakcli update` command to apply Oracle Database Appliance patches.

- oakcli update-cpucore
  Use the `oakcli update-cpucore` command to enable a specified number of licensed CPU cores for Oracle Database Appliance.
- oakcli upgrade
  Use the `oakcli upgrade` command to upgrade the Oracle Database software on Oracle Database Appliance.
- oakcli validate
  Validates the state of an Oracle Database Appliance or the viability of an operating system patch.
- oakcli Virtual Disk Commands
  Use the oakcli virtual disk (vdisk) commands to manage virtual disks on Oracle Database Appliance virtualized platform.
- oakcli Virtual Machine Commands
  Use the oakcli virtual machine commands to list and manage virtual machines (VMs).
- oakcli Virtual Machine Template Commands
  Use the oakcli Virtual Machine template commands to list and manage virtual machine (VM) templates.
- oakcli VLAN Management Commands for Virtual Platform
  Use the oakcli VLAN commands to list and manage virtual local area networks (VLANs) on an Oracle Database Appliance virtualized platform.

About the Oracle Appliance Manager Command-line Interface (OAKCLI)

The `oakcli` commands are the primary method for performing database and system administration on Oracle Database Appliance, and on Oracle Database Appliance Virtualized Platform.

You can perform the following tasks with OAKCLI commands:

- List the hardware components
- Validate and diagnose the hardware components
- Install and upgrade software
- Apply software patches
- Create and drop databases
- Install and uninstall Oracle Homes
- Deploy and manage virtual machines
- Test Oracle Auto Service Request (Oracle ASR)
- Enable CPU cores

Depending on your version of Oracle Appliance Manager and your hardware, some of the OAKCLI commands may not be available to you. To see which OAKCLI commands are supported on your version of Oracle Appliance Manager and your hardware, run the help command for OAKCLI: `oakcli -h`

OAKCLI Command Location and Path Configuration

The Oracle Appliance Manager command-line interface is in the following directory:

```
/opt/oracle/oak/bin/oakcli
```

Configure the `root` user account on your Oracle Database Appliance servers to have the `PATH` variable defined to search for oakcli commands in the path `/opt/oracle/oak/bin/oakcli`.

OAKCLI Syntax

Oracle Appliance Manager command-line interface commands and parameters are case-insensitive.

An `oakcli` command uses the following command syntax:

```
oakcli command object [options]
```

- *`command`* is an action you want to perform on the appliance. For example: `show`, `locate`, `apply`.
- *`object`* is the target or object on which the `oakcli` command performs the operation. For example, you issue a command to create or configure a disk, or a controller, or perform other system or software administration. You can also use object abbreviations.
- *`options`* are optional parts of the `oakcli` command. Options can consist of one or more options that extend the use of the oakcli command carried out on an object. Options include additional information about the action that you want to perform on the object. Option names are preceded with a dash. Many options require the name of an object for the command to perform the action that you want to carry out. The help option (`-h`) is an option that is available with every command. When you include the `-h` option, you can obtain additional information about the command that you want to perform.

Oracle Appliance Manager Command-Line Interface Help

Run the following command to see the usage information for all `oakcli` commands available for your Oracle Database Appliance:

```
oakcli -h
```

Run the following command to see detailed help about a specific `oakcli` command:

```
oakcli command -h
```

Run the following command to see detailed help about a specific `oakcli` command carried out on an object, and the options that are available for you to use with that object.

```
oakcli command object -h
```

Managing OAKCLI Privileges and Security with SUDO

Oracle Appliance Manager command-line utility requires root system privileges for most administration actions. You may want to use SUDO as part of your system auditing and security policy.

For most tasks, Oracle recommends that you log in as root to use the Oracle Appliance Manager command-line interface on Oracle Database Appliance. If you are not logged in as root, then you cannot carry out most actions on the appliance. For example, if you are not logged in as root, then you can view storage information, but you cannot modify the storage.

Allowing Root User Access Using SUDO

In environments where system administration is handled by a different group than database administration, or where security is a significant concern, you may want to limit access to the root user account and password. SUDO enables system administrators to grant certain users (or groups of users) the ability to run commands as root, while logging all commands and arguments as part of your security and compliance protocol.

A SUDO security policy is configured by using the file /etc/sudoers. Within the sudoers file, you can configure groups of users and sets of commands to simplify and audit server administration with SUDO commands.

> **Caution:**
>
> Configuring SUDO to allow a user to perform any operation is equivalent to giving that user root privileges. Consider carefully if this is appropriate for your security needs.

SUDO Example 1: Allow a User to Perform Any OAKCLI Operation

This example shows how to configure SUDO to enable a user to perform any OAKCLI operation. You do this by adding lines to the commands section in the /etc/sudoers file:

```
## The commands section may have other options added to it.
##
Cmnd_Alias OAKCLI_CMDS=/opt/oracle/oak/bin/oakcli *
jdoe ALL = OAKCLI_CMDS
```

In this example, the user name is jdoe. The file parameter setting ALL= OAKCLI_CMDS grants the user jdoe permission to run all oakcli commands that are defined by the command alias OAKCLI_CMDS. After configuration, you can copy one sudoers file to multiple hosts. You can also create different rules on each host.

Note:

Before database creation, you must set up user equivalency with SSH for the root user on each server. If you do not set up user equivalency and configure SSH on each server, then you are prompted to provide the root password for each server during database creation.

After you configure the `sudoer` file with the user, the user jdoe can run the set of `oakcli` commands configured with the command alias `OAKCLI_CMDS`. For example:

```
$ sudo oakcli create database -db newdb

INFO: 2015-08-05 14:40:55: Look at the logfile  '/opt/oracle/oak/log/
scaoda1011/tools/12.1.2.4.0/createdb_newdb_91715.log' for more details

INFO: 2015-08-05 14:40:59: Database parameter file is not provided.
Will be using default parameters for DB creation
Please enter the 'SYSASM'  password:
Please re-enter the 'SYSASM' password:

INFO: 2015-08-05 14:41:10: Installing a new home: OraDb12102_home3
at /u01/app/oracle/product/12.1.0.2/dbhome_3

Please select one of the following for Database type  [1 .. 3]:
1    => OLTP
2    => DSS
3    => In-Memory
```

SUDO Example 2: Allow a User to Perform Only Selected OAKCLI Operations

To configure SUDO to allow a user to perform only selected OAKCLI operations, add lines to the commands section in the `/etc/sudoers` file as follows:

```
## oakcli commands
Cmnd_Alias OAKENV = /opt/oracle/oak/bin/oakcli show env_hw
Cmnd_Alias OAKVER = /opt/oracle/oak/bin/oakcli show version
oracle  ALL=       OAKENV,OAKVER
```

The following are sample outputs for the commands:

```
$ sudo /opt/oracle/oak/bin/oakcli show env_hw
VM-ODA_BASE ODA X6-2-HA

$ sudo /opt/oracle/oak/bin/oakcli show version
Version
-------
12.2.1.2.0
```

In this example, the user jdoe2 tries to run the oakcli show databases command, which is not part of the set of commands that is configured for that user. Sudo prevents jdoe2 from running the command.

```
$ sudo /opt/oracle/oak/bin/oakcli show databases
Sorry, user oracle is not allowed to execute '/opt/oracle/oak/bin/
oakcli show databases' as root on servernode1.
```

> **See Also:**
>
> The SUDO man pages for more information about configuring and using SUDO:
>
> http://www.sudo.ws/sudo.html

oakcli add disk -local

Use the oakcli add disk -local command to add a local disk to the system after physically replacing a failed disk.

Syntax

```
oakcli add disk -local
```

Usage Notes

- You cannot add more than two disks per node.
- You must remove the failed drive and replace it with a new drive before running the oakcli add disk -local command.
- The new disk must be inserted into the slot before you run this command.
- The oakcli add disk -local command is supported only on bare metal deployments. It is not supported on virtualized configurations.

oakcli configure commands

Use the oakcli configure commands to configure components on Oracle Database Appliance.

- oakcli configure additionalnet
  Use the oakcli configure additionalnet command to configure any unconfigured public networks in bare metal, Domain 0, and ODA_BASE.
- oakcli configure asr
  Use the oakcli configure asr command to configure Oracle Auto Service Request (Oracle ASR) on Oracle Database Appliance.
- oakcli configure cpupool
  Use the oakcli configure cpupool command to configure a CPU pool on one Oracle Database Appliance Virtualized Platform node.

- oakcli configure firstnet
  Use the `oakcli configure firstnet` command to configure an initial network on Oracle Database Appliance that enables you to download deployment software.
- oakcli configure network
  Use the `oakcli configure network` command to configure the network after either replacing a network card or swapping the public network from copper to fiber and vice versa. The meaning of the command changes depending on which parameter you use.
- oakcli configure oda_base
  Use the `oakcli configure oda_base` command to change the CPU core count assigned to ODA_BASE, add or remove virtual local area networks assigned to ODA_BASE, and adjust resource allocation among user domains and between ODA_BASE and other user domains.
- oakcli configure repo
  Use the `oakcli configure repo` command to increase the size of a shared repository.

oakcli configure additionalnet

Use the `oakcli configure additionalnet` command to configure any unconfigured public networks in bare metal, Domain 0, and ODA_BASE.

Syntax

```
oakcli configure additionalnet  [-h]
```

Parameter

`-h` displays online help for using the command.

Usage Notes

The `oakcli configure additionalnet` command automatically detects any unconfigured networks and runs an interactive script that guides you through how to configure the network. The script requires the following input:

- Interface name
- DHCP [Y/N]
- IP
- Netmask

> **Note:**
>
> If you are running the command on a bare metal deployment, then the interface name expects a bond name. If you are running the command on Dom0, then the interface name expects a net name. If you are running the command on Dom1, then the interface name expects an eth name.

Related Topics

- Configuring Additional Networks on Virtualized Platform
  Use the `oakcli configure additionalnet` command to create additional networks.

oakcli configure asr

Use the `oakcli configure asr` command to configure Oracle Auto Service Request (Oracle ASR) on Oracle Database Appliance.

Syntax

```
oakcli configure asr [-h]
```

Parameter

`-h` displays help for using the command.

Usage Notes

- The `oakcli configure asr` command initiates an interactive script that requests the following information to implement Oracle ASR on Oracle Database Appliance:
  - Action to be performed (setup internal, setup external, deinstall, or reconfigure Oracle ASR Manager)
  - PROXY server name, port, user ID, and password
  - Oracle ASR user ID and password
  - Oracle ASR Manager IP and port
- You can configure Oracle ASR on Oracle Database Appliance to use its own ASR Manager (**internal Oracle ASR**) or use Oracle ASR Manager configured on another server in the same network as your appliance (**external Oracle ASR**). If you already have Oracle ASR Manager configured in your environment, you can register Oracle Database Appliance with your existing Oracle ASR Manager.

> **Note:**
>
> With an internal Oracle ASR Manager, an alert is not sent when the server goes down. If a critical event occurs on Oracle Database Appliance with an external Oracle ASR Manager, then an alert can still be sent to Oracle.

Configuring Oracle ASR

```
# oakcli configure asr

INFO   : Logging all actions in /opt/oracle/oak/onecmd/tmp/
scaoda1011-20150805153300.log and traces in /opt/oracle/oak/onecmd/tmp/
scaoda1011-20150805153300.trc

Please enter
1 to setup Internal ASR
```

```
2 to setup External ASR
3 to Deinstall ASR
0 to Exit

 [1]:INFO   : Logging all actions in /opt/oracle/oak/onecmd/tmp/
scaoda1011-20150805153300.log and traces in /opt/oracle/oak/onecmd/tmp/
scaoda1011-20150805153300.trc
```

oakcli configure cpupool

Use the `oakcli configure cpupool` command to configure a CPU pool on one Oracle Database Appliance Virtualized Platform node.

Syntax

```
oakcli configure cpupool poolname -numcpu cpu_count -node nodenum [-h]
```

Parameters

Parameter	Description
poolname	Unique name for the CPU pool
-numcpu *cpu_count*	Number of CPUs for the CPU pool
-node *nodenum*	Node where the CPU pool will be created (0 or 1)
-h	(Optional) Display help for using the command.

Configuring a CPU Pool

Configure a CPU pool named `twonode` with two cores on Node 1 of Oracle Database Appliance Virtualized Platform:

```
oakcli configure cpupool twonode -numcpu 2 -node 1
```

oakcli configure firstnet

Use the `oakcli configure firstnet` command to configure an initial network on Oracle Database Appliance that enables you to download deployment software.

Syntax

```
oakcli configure firstnet
```

Example

The `oakcli configure firstnet` command creates an initial network on a new Oracle Database Appliance using an interactive script. The following example shows how to configure the initial network on a bare metal Oracle Database Appliance:

```
# oakcli configure firstnet
Select the interface to  configure network on [bond0 bond1 bond2 xbond0]:bond0
Configure DHCP on bond0?(yes/no):no
       INFO: Static configuration selected
       Enter the IP address to configure:192.0.2.18
       Enter the netmask address to configure:255.255.252.0
       Enter the gateway address to configure:192.0.2.1
Plumbing the IPs now
Restarting the network
:::::::::::::::::
```

> **Note:**
>
> Oracle recommends using the `oakcli configure firstnet` command only one time on Oracle Database Appliance. Subsequent use after configuring the initial network can cause unpredictable changes to your network settings.

oakcli configure network

Use the `oakcli configure network` command to configure the network after either replacing a network card or swapping the public network from copper to fiber and vice versa. The meaning of the command changes depending on which parameter you use.

Syntax

```
oakcli configure network [-changeNetCard|-publicNet][-h]
```

Parameters

Parameter	Description
`-changeNetCard`	Configures the network card after it has been replaced. You must run the `oakcli configure network -changeNetCard` command on each node if the network card was replaced. This parameter is supported on all Oracle Database Appliance hardware models. This command must be executed from Dom0 on virtualized platforms.
`-publicNet`	Configures the network after you have swapped the public network from copper to fiber and vice versa. The option can be `copper` or `fiber`. You must run the `oakcli configure network -publicNet` command on each node, and this requires the stack to be down. The stack includes GI and RDBMS. If you are using Oracle Database Appliance Virtualized Platform, the virtual machines must be down. The virtual machines may need some configuration changes, especially if they are using VLANs. This parameter is supported on Oracle Database Appliance X4-2-HA, X5-2-HA non-InfiniBand network, and X6-2-HA non-InfiniBand network.
`-h`	(Optional) Display help for using the command.

oakcli configure oda_base

Use the `oakcli configure oda_base` command to change the CPU core count assigned to ODA_BASE, add or remove virtual local area networks assigned to

ODA_BASE, and adjust resource allocation among user domains and between ODA_BASE and other user domains.

You must restart the domain for the resource allocation change to take effect.

Syntax

```
oakcli configure oda_base
```

Examples

Here are examples of how to use the `oakcli configure oda_base`command.

Changing the CPU Core Count in ODA_BASE

Change the CPU core count from six to eight in ODA_BASE:

```
# oakcli configure oda_base
Core Licensing Options:
        1. 2 CPU Cores
        2. 4 CPU Cores
        3. 6 CPU Cores
        4. 8 CPU Cores
        5. 10 CPU Cores
        6. 12 CPU Cores
        Current CPU Cores       :6
        Selection[1 : 6](default 12 CPU Cores) : 4
        ODA base domain memory in GB(min 8, max 88)(Current Memory 64G)[default 
32]     :
INFO: Using default memory size i.e. 32 GB
Additional vlan networks to be assigned to oda_base? (y/n) [n]:
Vlan network to be removed from oda_base (y/n) [n]
INFO: Node 0:Configured oda base pool
INFO: Node 1:Configured oda base pool
INFO: Node 0:ODA Base configured with new memory
INFO: Node 0:ODA Base configured with new vcpus
INFO: Changes will be incorporated after the domain is restarted on Node 0
INFO: Node 1:ODA Base configured with new memory
INFO: Node 1:ODA Base configured with new vcpus
INFO: Changes will be incorporated after the domain is restarted on Node 1
```

Changing the Amount of Memory Allocated to ODA_BASE

1. Log in to Dom0.
2. Execute the `oakcli configure oda_base` command and change the configuration.
3. Restart ODA_BASE.

Assigning VLANs to ODA_BASE

1. Log in to Dom0.
2. Execute the `oakcli configure oda_base` command.
3. Change the setting for `Additional vlan networks to be assigned to oda_base? (y/n)` to **y**.
4. Follow the prompts to assign additional VLANs to ODA_BASE.
5. Restart ODA_BASE.

oakcli configure repo

Use the `oakcli configure repo` command to increase the size of a shared repository.

Syntax

```
oakcli configure repo reponame -incsize size [M|G] [-h]
```

Parameter	Description
`reponame`	Name of the shared repository
`size`	Number that can be followed by M to define the size as megabytes or by G to define as size as gigabytes
`-h`	(Optional) Display help for using the command.

Increasing the Size of a Shared Repo

Increase the size of the `repo1` shared repository by 2 gigabytes:

```
# oakcli configure repo repo1 -incsize 2G

Configured Shared Repo : repo1 with new size 3712.0.
```

oakcli copy

Use the `oakcli copy` command to prepare a copy of the configuration file for use during the configuration of Oracle Database Appliance.

Syntax

```
oakcli copy -conf absolute_conf_file [-h]
```

Parameters

Parameter	Description
`-conf` *absolute_conf_file*	Specifies the full path name of the configuration file
`-h`	(Optional) Display help for using the command.

Example 17-1 Preparing a Copy of the Configuration File

If you created a configuration file previously and copied this file to Oracle Database Appliance, then prepare the configuration file to be used during the configuration process. For example, if you copied the file `myserver1.conf` to `/tmp`, then enter the following command:

```
oakcli copy -conf /tmp/myserver1.conf
```

oakcli create commands

Use the `oakcli create` commands to create components on Oracle Database Appliance.

- oakcli create cpupool
  Use the command `oakcli create cpupool` to create a CPU pool on one Oracle Database Appliance Virtualized Platform node.
- oakcli create database
  Use the `oakcli create database` command to create additional databases on Oracle Database Appliance.
- oakcli create dbhome
  Use the `oakcli create dbhome` command to create a new database home on Oracle Database Appliance.
- oakcli create dbstorage
  Use the `oakcli create dbstorage` command to create a storage structure for migrating databases from Oracle ASM to Oracle ACFS.
- oakcli create db_config_params
  Use the `oakcli create db_config_params` command to generate a database configuration file.
- oakcli create repo
  Use the `oakcli create repo` command to create a new shared repository on Oracle Database Appliance Virtualized Platform.
- oakcli create snapshotdb
  Use the `oakcli create snapshotdb` command to create a snapshot database from an existing database.

oakcli create cpupool

Use the command `oakcli create cpupool` to create a CPU pool on one Oracle Database Appliance Virtualized Platform node.

Syntax

```
oakcli create cpupool poolname -numcpu cpu_count -node nodenum [-h]
```

Parameters

Parameter	Description
poolname	Uniquely names the CPU pool
-numcpu *cpu_count*	Defines the number of CPUs for the CPU pool
-node *nodenum*	Defines the node where the CPU pool will be created (0 or 1)
-h	(Optional) Display help for using the command.

Example

Create a CPU pool with two CPUs on Node 1 of Oracle Database Appliance Virtualized Platform:

```
oakcli create cpupool twonode -numcpu 2 -node 1
```

oakcli create database

Use the `oakcli create database` command to create additional databases on Oracle Database Appliance.

When you run the command`oakcli create database`, the command prompts you for further inputs.

> **Note:**
>
> Do not use Oracle Database Configuration Assistant (DBCA) to create databases on Oracle Database Appliance. Only use Oracle Appliance Manager for database configuration. Deploying Oracle Database instances using Oracle Appliance Manager ensures that these databases are properly configured, optimized, and supported on Oracle Database Appliance.

File Path

`$ORACLE_HOME``/directory_name`

Syntax

```
oakcli create database -db db_name [[[-oh home] | [-version version]]
[-params params_file] [-storage asm] [-cdb]][h]
```

Parameters

Parameter	Description
`-cdb`	(Optional) Creates the database as a container database.
`-db` *`db_name`*	Name of the database that you want to create.
`-oh` *`home`*	(Optional) Name of an existing Oracle home to use when creating the database. By default, the command creates a new database home.
`-params` *`params_file`*	(Optional) Name of the configuration file. By default, Oracle Database Appliance uses the default configuration file.
`-storage [ASM|ACFS]`	(Optional) Creates an Oracle 12*c* database with the specified storage, either Oracle Automatic Storage Management (Oracle ASM) or Oracle Automatic Storage Management Cluster File System (Oracle ACFS). Oracle ASM storage is the default storage.
`-version` *`version`*	(Optional) Version of the database that you want to create. By default, Oracle Database Appliance uses the highest version that you have downloaded.
`-h`	(Optional) Display help for using the command.

Usage Notes

- Flash cache is disabled and cannot be enabled.
- The -oh and the -version parameters are mutually exclusive. Attempting to use both in the same command will generate an error.
- When a database is created without identifying an Oracle home, a new Oracle home is created using a standard naming convention (for example, OraDb11204_home3). The number at the end of the name is incremented by one for each new home created with the same version number.
- On Oracle Database Appliance hardware models, the minimum supported Oracle Database release is 11.2.0.4. Oracle Database 11.2.0.3.*x* is not supported.
- When you upgrade the database, infrastructure, and Oracle Grid Infrastructure, you must specify an existing home to create a new database.
- If you try to create a database using the option -version *version* before downloading and unpacking the specific version database clone files, then the command will fail.
- You can create configuration files with the oakcli create db_config_params command.
- The prompt "Do you want to keep the data files on FLASH storage: [Y | N] " is only shown if you choose the OLTP database type and if there is some free space available on flash storage.
- Beginning with Oracle Database 12c release 1 (12.1.0.2), you can create an Oracle Database in Oracle ASM. Oracle ASM is the default storage.

Examples

This section shows different scenarios for using the command oakcli create database.

Example 17-2   Creating a New Database Showing Prompts

When you run the command oakcli create database, you are prompted for several inputs.

The following command creates a database named mydb using an existing Oracle home named OraDb12102_home1:

```
# oakcli create database -db DBPROD

INFO: 2017-07-25 19:21:16: Please check the logfile
 '/opt/oracle/oak/log/ODADBI1/tools/12.2.1.1.0/
createdb_DBPROD_29285.log' for more details
INFO: 2017-07-25 19:21:24: Database parameter file is not provided.
Will be using default parameters for DB creation

Please enter the 'SYSASM'  password:
Please re-enter the 'SYSASM' password:

INFO: 2017-07-25 19:21:35: Installing a new Home : OraDb12102_home2 at
  /u01/app/oracle/product/12.1.0.2/dbhome_2
```

```
Please select one of the following for Database type  [1 .. 3] :
1    => OLTP
2    => DSS
3    => In-Memory
1
 The selected value is : OLTP

1 => EE : Enterprise Edition
2 => RACONE
3 => RAC1
3
Selected value is : RAC

Specify the  Database Class (1. odb-01 '1 core, 8 GB memory'
2.Others) [1]
:2

Please select one of the following for Database Class    [1 .. 10]:
1    => odb-01s  (   1 cores ,     4 GB memory)
2    =>  odb-01  (   1 cores ,     8 GB memory)
3    =>  odb-02  (   2 cores ,    16 GB memory)
4    =>  odb-04  (   4 cores ,    32 GB memory)
5    =>  odb-06  (   6 cores ,    48 GB memory)
6    =>  odb-08  (   8 cores ,    64 GB memory)
7    =>  odb-10  (  10 cores ,    80 GB memory)
```

Example 17-3   Creating a New Database in an Existing Oracle Home

Create a database called `sales1` in `OraDb11204_home2`:

```
oakcli create database -db sales1 -oh OraDb11204_home2
```

Example 17-4   Creating a New Database from a Template

Create a database called `sales2` from the `salesdbtemplate.bconf` file (by appending the default file extension to the file name provided). This example also creates a new Oracle home:

```
oakcli create database -db sales2 -params salesdbtemplate
```

oakcli create dbhome

Use the `oakcli create dbhome` command to create a new database home on Oracle Database Appliance.

Syntax

```
oakcli create dbhome [-version version] [-h]
```

Parameters

Parameter	Description
`-version` *`version`*	(Optional) Version that you want to install. If this is not provided, then Oracle Database Appliance uses the latest available version.
`-h`	(Optional) Display help for using the command.

Creating a Database Home

Create a database home called `sales1` using Oracle Database version 12.1.0.2.4.

```
oakcli create dbhome -version 12.1.0.2.4
```

oakcli create dbstorage

Use the `oakcli create dbstorage` command to create a storage structure for migrating databases from Oracle ASM to Oracle ACFS.

Syntax

```
oakcli create dbstorage -db db_name [-cdb][-h]
```

Parameters

Parameter	Description
`-db` *`db_name`*	Sets up the required Oracle ACFS storage structure for the database to be created called *`db_name`*
`-cdb`	Must be passed if you are creating a multitenant container database
`-h`	(Optional) Display help for using the command.

Example

The `oakcli create dbstorage` command requests user input to determine the size of the storage structure to create, as shown in this example:

```
# oakcli create dbstorage -db sales

Please enter the 'root' password :
Please re-enter the 'root' password:

Please enter the 'oracle' password :
Please re-enter the 'oracle' password:

Please enter the 'SYSASM' password:
Please re-enter the 'SYSASM' password:

Specify the Database Class (1. odb-01 '1 core, 8 GB memory' 2. Others) [1]:2

Please select one of the following for Database Class [1 .. 8] :
1 => odb-01s ( 1 cores , 4 GB memory)
2 => odb-01 ( 1 cores , 8 GB memory)
```

```
3 => odb-02 ( 2 cores , 16 GB memory)
4 => odb-04 ( 4 cores , 32 GB memory)
5 => odb-06 ( 6 cores , 48 GB memory)
6 => odb-12 ( 12 cores , 96 GB memory)
7 => odb-16 ( 16 cores , 128 GB memory)
8 => odb-24 ( 24 cores , 192 GB memory)


Selected value is: odb-01s ( 1 cores , 4 GB memory)
...
```

oakcli create db_config_params

Use the `oakcli create db_config_params` command to generate a database configuration file.

The configuration file is created in `/opt/oracle/oak/install/dbconf` and is given the default extension `.dbconf`.

Syntax

```
oakcli create db_config_params -conf filename [-h]
```

Parameters

Parameter	Description
`-conf` *`filename`*	Name you want to give to the configuration file, without its path name.
`-h`	(Optional) Display help for using the command

Example

Create the database parameter file: `/opt/oracle/oak/install/dbconf/newconf.dbconf`:

```
# oakcli create db_config_params -conf newconf

Please select one of the following for Database Block Size  [1 .. 4]:
1 ==> 4096
2 ==> 8192
3 ==> 16384
4 ==> 32768
2
Selected value is: 8192

Specify the  Database Language (1. AMERICAN 2. Others) [1]:
Selected value is: AMERICAN

Specify the  Database Characterset (1. AL32UTF8 2. Others) [1]:2

Please select one of the following for Database Characterset [0 .. 10] :
0 => Others
1 => AL32UTF8
2 => AR8ADOS710
3 => AR8ADOS710T
4 => AR8ADOS720
5 => AR8ADOS720T
6 => AR8APTEC715
```

```
7 => AR8APTEC715T
8 => AR8ARABICMACS
9 => AR8ASMO708PLUS
10 => AR8ASMO8X
1
Selected value is: AL32UTF8

Specify the  Database Territory (1. AMERICA 2. Others) [1]:2

Please select one of the following for Database Territory [0 .. 10] :
0 => Others
1 => ALBANIA
2 => ALGERIA
3 => AMERICA
4 => ARGENTINA
5 => AUSTRALIA
6 => AUSTRIA
7 => AZERBAIJAN
8 => BAHRAIN
9 => BANGLADESH
10 => BELARUS
3
Selected value is: AMERICA

Specify the  Component Language (1. en 2. Others) [1]:2

Please select one of the following for Component Language [0 .. 10] :
0 => Others
1 => en : English
2 => fr : French
3 => ar : Arabic
4 => bn : Bengali
5 => pt_BR : Brazilian Portuguese
6 => bg : Bulgarian
7 => fr_CA : Canadian French
8 => ca : Catalan
9 => hr : Croatian
10 => cs : Czech
1
Selected value is: en
Successfully generated the Database parameter file 'newconf'
```

oakcli create repo

Use the `oakcli create repo` command to create a new shared repository on Oracle Database Appliance Virtualized Platform.

Syntax

```
oakcli create repo repo_name -size size [M|G] -dg DATA|RECO [-h]
```

Parameters

Parameter	Description
repo_name	Name assigned to the shared repository
-size *size* [M|G]	Amount of storage to be assigned to the shared repository. It can be defined in megabytes with the M option or in gigabytes with the G option.

Parameter	Description
`-dg DATA|RECO`	Oracle ASM disk group in which the shared repository is to be stored, either the DATA+ disk group or the RECO+ disk group, selected by using the DATA or RECO option respectively
`-h`	(Optional) Display help for using the command.

Usage Notes

- The `-size` parameter requires a whole number for size.
- The minimum value for *`size`* is 500 when M is used or 1 when G is used for the sizing unit.
- The default unit for *`size`* is G (gigabytes).
- A shared repository should only be used for the virtual machine and not as a file staging area. Avoid copying or moving files into a shared repository.

Example

Create a 25-gigabyte shared repository named `repoprod1` in the DATA+ disk group:

```
oakcli create repo repoprod1 -dg DATA -size 25
```

oakcli create snapshotdb

Use the `oakcli create snapshotdb` command to create a snapshot database from an existing database.

Syntax

```
oakcli create snapshotdb [-db snap_dbname -from dbname] | [-h]
```

Parameters

Parameter	Description
`-db snap_dbname`	Name of the snapshot database to be created
`-from` source_dbname	Name of the source database
`-h`	(Optional) Display help for using the command

Example

Create a new snapshot database, name `snapprod`, from the database named `prod`:

```
oakcli create snapshotdb -db snapprod -from prod
```

oakcli delete commands

Use the `oakcli delete` commands to delete components from Oracle Database Appliance.

- oakcli delete network
  Use the oakcli delete network command to delete a network on Oracle Database Appliance X8-2 hardware models.
- oakcli delete cpupool
  Use the oakcli delete cpupool command to delete a CPU pool from one Oracle Database Appliance Virtualized Platform node.
- oakcli delete database
  Use the oakcli delete database command to delete a database from Oracle Database Appliance.
- oakcli delete db_config_params
  Use the oakcli delete db_config_params command to delete a database configuration file.
- oakcli delete dbhome
  Use the oakcli delete dbhome command to delete a database home from Oracle Database Appliance.
- oakcli delete dbstorage
  Use the oakcli delete dbstorage command to delete a storage structure that was created for the purpose of migrating databases from Oracle ASM to Oracle ACFS.
- oakcli delete repo
  Use the oakcli delete repo command to delete a shared repository.

oakcli delete network

Use the oakcli delete network command to delete a network on Oracle Database Appliance X8-2 hardware models.

Syntax

```
oakcli delete network network_name [-h]
```

Parameters

Parameter	Description
network_name	Name of the network to be deleted
-h	(Optional) Display help for using the command.

Usage Notes

The *network_name* can be a VLAN or a network such as bond3, for example. The VLAN name must not start with an alphabet, must not be more than 15 characters, and must contain only letters, numbers, '_' or '-'.

Example 17-5 Deleting a Network

```
[root@oak ~]# oakcli delete network bond3
Network bond3 has been deleted successfully
```

oakcli delete cpupool

Use the `oakcli delete cpupool` command to delete a CPU pool from one Oracle Database Appliance Virtualized Platform node.

Syntax

```
oakcli delete cpupool poolname -node nodenum [-h]
```

Parameters

Parameter	Description
poolname	Name of the CPU pool to be deleted
-node *nodenum*	Node from which the CPU pool will be deleted (0 or 1)
`-h`	(Optional) Display help for using the command.

Example

Delete the CPU pool named *twonode* from Node 1 of Oracle Database Appliance Virtualized Platform:

```
oakcli delete cpupool twonode -node 1
```

oakcli delete database

Use the `oakcli delete database` command to delete a database from Oracle Database Appliance.

Syntax

```
oakcli delete database -db db_name [-h]
```

Parameters

Parameter	Description
db_name	Name of the database that you want to delete
`-h`	(Optional) Display help for using the command

Example

Delete the database named `sales1`:

```
oakcli delete database -db sales1
```

oakcli delete db_config_params

Use the `oakcli delete db_config_params` command to delete a database configuration file.

Syntax

```
oakcli delete db_config_params -conf filename [-h]
```

Parameters

Parameter	Description
`-conf` *`filename`*	Name of the configuration file that you want to remove, without its path name
`-h`	(Optional) Display help for using the command

oakcli delete dbhome

Use the `oakcli delete dbhome` command to delete a database home from Oracle Database Appliance.

Syntax

```
oakcli delete dbhome -oh oracle_home [-h]
```

Parameters

Parameter	Description
`-oh` *`oracle_home`*	The database home to be uninstalled
`-h`	(Optional) Display help for using the command.

Example

Delete a database home called `ora11_1`:

```
oakcli delete dbhome -oh ora11_1
```

oakcli delete dbstorage

Use the `oakcli delete dbstorage` command to delete a storage structure that was created for the purpose of migrating databases from Oracle ASM to Oracle ACFS.

For example, run this command if you created a storage structure using `create dbstorage` that is no longer required.

Syntax

```
oakcli delete dbstorage -db  db_name [-cdb] [-h]
```

Parameters

Parameter	Description
`db` *`db_name`*	Name of the database structure to be deleted
`-cdb`	Must be passed if you are deleting a multitenant container database
`-h`	(Optional) Display help for using the command

Example

Delete the `sales` storage structure:

```
oakcli delete dbstorage -db sales
```

oakcli delete repo

Use the `oakcli delete repo` command to delete a shared repository.

Syntax

```
oakcli delete repo repository_name [-h]
```

Parameter

Parameter	Description
repository_name	The name of the shared repository to be deleted
-h	(Optional) Display help for using the command.

Example

Delete the `testrepo01` shared repository:

```
oakcli delete repo testrepo01
```

The command will not succeed if `testrepo01` is active on one or both nodes.

oakcli deploy

Use the command `oakcli deploy` to deploy Oracle Grid Infrastructure for a cluster on Oracle Database Appliance.

Syntax

```
oakcli deploy [-config] [-conf config_file] [-advance][-h]
```

Parameters

Parameter	Description
-config	(Optional) Run the Oracle Appliance Manager Configurator.
-conf *config_file*	(Optional) Preload the configuration stored in the named configuration file, *config_file*.
-advance	(Optional) Perform the deployment, or run the Oracle Appliance Manager Configurator, in advance mode. Use this option to launch Oracle Appliance Manager and change the default user ID or group user ID.
-h	(Optional) Display help for using the command.

Usage Notes

When defining the user ID and the group ID, it is a best practice to use different values.

Examples

Use these examples to understand how to use the command `oakcli deploy`.

Example 17-6 Deploying the Complete Oracle Database Appliance

```
oakcli deploy
```

Example 17-7 Running the Configurator

```
oakcli deploy -config
```

Example 17-8 Running the Offline Configurator with Advance Mode

To run the offline Configurator with advance mode, update the `config.sh` file and add `-advance`.

```
# cat config.sh
#!/bin/sh
java
-Djava.util.logging.config.file=onecommand.properties
-jar onecommand.jar config -advance
# sh ./config.sh
```

Example 17-9 Preloading an Existing Configuration File

Preload the configuration stored in the configuration file `MYCONFIG-VM`:

```
oakcli deploy -conf myconfig -vm_file
```

Example 17-10 Changing a User Group Name or ID

You can change the following group user names or IDs on the User Group Information page: GI User, DB User, Install Group, DBA Group, DBA Oper Group, ASM DBA Group, ASM Oper Group, and ASM Admin Group.

1. Run the Configurator or Offline Configurator in `-advance` mode.
2. Select **Custom** to display the User Group Information page.
3. Change the group name or ID, then click **Next**.
4. Click **Finish**.

Example 17-11 Viewing the Log File

The command `oakcli deploy` creates a log file that is prepended with the character string `STEP*`. The log file is stored in the following location:

```
/opt/oracle/oak/onecmd/tmp/
```

oakcli expand storage

Use the `oakcli expand storage` command to configure the solid-state drives (SSDs) for data storage into the existing base configuration to fully populate the base storage shelf.

File Path

`/opt/oracle/oak/bin/oakcli`

Syntax

```
 oakcli expand storage [-h]
```

Parameters

Parameter	Description
`-h`	(Optional) Display help for using the command.

Usage Notes

After all disks are inserted into the slots, execute the `oakcli expand storage` command on both nodes. First on the first node and then wait for 30 seconds and execute from the slave nodes. It takes about 10 to 12 minutes to add all of the disks.

Review the procedure for how to add the storage shelf for detailed steps on how to add the disks, the timing needed to avoid flooding disk events, and the steps to validate that all disks are online and are in a good state.

Example 17-12 Expanding Storage

```
# oakcli expand storage

Precheck passed.
Successfully formatted 1.6TB SSD disks...
Check the progress of expansion of storage by executing 'oakcli show
disk'
Waiting for expansion to finish ...
```

oakcli diskwritecache

Use the `oakcli diskwritecache` command to locate disks with write cache enabled and to disable disk write cache for those disks.

Enabled write caches should be disabled as soon as downtime for Oracle Database Appliance can be scheduled. During the downtime, use this command with the `disable` option for each disk, in turn, that has an enabled write cache.

Syntax

```
oakcli diskwritecache [disable disk_name | enable disk_name | status ] [-h]
```

Parameters

Parameter	Description
`disable` *`disk_name`*	(Optional) Disable disk write cache for named disk.
`enable` *`disk_name`*	(Optional) Enable disk write cache for named disk.
`status`	(Optional) Show the write cache status of all disks.
`-h`	(Optional) Display help for using the command.

Example 17-13   Displaying the Write Cache Status of Disks

Show the write cache status of all disks:

```
oakcli diskwritecache status
```

oakcli locate disk

Use the `oakcli locate disk` command to locate the physical disk that is associated with a named Oracle ASM disk by turning the disk's LED light on or off.

Syntax

```
oakcli locate disk diskname [on|off][-h]
```

Parameters

Parameter	Description
`diskname`	Name of the Oracle ASM disk to locate
`on`	(Optional) Turns on the LED of the named disk
`off`	(Optional) Turns off the LED of the named disk
`-h`	(Optional) Display help for using the command.

Example 17-14   Locating an Oracle ASM Disk by Turning on the Disk’s LED

Turn on the LED of the Oracle ASM disk named `disk pd_23`:

```
oakcli locate disk pd_23 on
```

oakcli manage diagcollect

Use the `oakcli manage diagcollect` command to collect diagnostic information about Oracle Database Appliance for troubleshooting purposes, and for working with Oracle Support Services.

Syntax

```
oakcli manage diagcollect [--all | --crs [--crshome crs_home_dir]
(continued)
[--core] | --install | --chmos [--incidenttime time] [--incidentduration time]

(continued)
|--adr adr_location [--afterdate date]

(continued)
[--aftertime time] [--beforetime time] ]
 [excl comp1,comp2,...] [--clean] [--storage][-h]
```

Parameters

Parameter	Description
`--all`	Collect all of the diagnostic information excluding Automatic Diagnostic Repository (ADR) and Cluster Health Monitor. This is the default option.
`--crs`	Collect Oracle Clusterware diagnostic information.
`--crshome` *crs_home_dir*	Specifies the location of the Oracle Clusterware home directory
`--core`	Package core files with the Oracle Clusterware diagnostic data.
`--install`	Collect the installation logs when the installation failed before running the script `root.sh`.
`--adr` *adr_location*	Collect diagnostic information for ADR, where *adr_location* specifies the location of the ADR information.
`--afterdate` *date*	Collect archives from the specified date. Specify the date in the `mm/dd/yyyy` format.
`--aftertime` *time*	Collect the archives after the specified time. Enter the time using the format `YYYYMMDDHHMMSS24`. Supported only with the `-adr` parameter.
`--beforetime` *time*	Collect the archives before the specified time. Enter the time using the format: `YYYYMMDDHHMMSS24`. Supported only the with the `-adr` parameter.
`--chmos`	Collect Cluster Health Monitor data.
`--incidenttime` *time*	Collect Cluster Health Monitor data from the specified time. Enter the time using the format: `YYYYMMDDHHMMSS24`. If you do not use the `--incidenttime` parameter, then the command collects data for the past 24 hours.
`--incidentduration` *time*	Collect Cluster Health Monitor data for the duration after the specified time. Enter the time using the format: HH:MM. If you do not specify a duration, then the command collects all Cluster Health Monitor data after the specified incident time.
`--excl` [*comp1*,*comp2*...]	Exclude the specified component logs. Valid components are: `acfs`, `invt`, `sys`, `ocr`, `crs`, `home`, and `base`.
`--clean`	Remove the diagnosability information gathered by this command.
`--storage`	Collect all of the logs for any storage issues. The logs can be used when you are experiencing any problems with storage and need support to diagnose the logs.
`--h`	(Optional) Display help for using the command.

oakcli describe-system

Use the `oakcli describe-system` command to display details about components installed on the system.

File Path

`/opt/oracle/oak/bin/oakcli`

Syntax

```
   oakcli describe-system
```

Usage Notes

The command describes the system components such as node information, installed RPMs, Oracle Grid Infrastructure version and patches, Database home details and stores the information in a file.

Example 17-15 Example Command to View the Bill of Materials from the Command Line for Virtualized Platforms Deployments

```
# oakcli describe-system

 Output : ./oakcli describe-system

                Generating a list of BOM component...

                Output file is : /opt/oracle/oak/Inventory/
oda_bom_20180821022110.log
```

oakcli modify database

Use the `oakcli modify database` command to modify the database type or size class for a named database.

Syntax

```
oakcli modify database -db db name [-dbtypeOLTP|DSS|in-Memory] [-to
dbSizeclass]
```

Parameters

Parameter	Description
`-db` *`db-name`*	Identifies the database being modified.
`-dbtype` *`OLTP|DSS|in-Memory`*	(Optional) Changes the database type. The parameter `dbtype` takes one of the following three options: • `OLTP`: Online transaction processing • `DSS`: Decision support system • `in-Memory`: Oracle Database In-Memory

Parameter	Description
`-to` *`dbclass`*	(Optional) Changes the database size class.
`-h`	(Optional) Displays help for using the command.

Usage Notes

> **Note:**
>
> When you resize the database, the redo log file size is not modified automatically. Change the size of the redo log manually to the size that you require for your applications.

Example 17-16 Modifying the Database Type

Here are examples of how to use the `oakcli modify database` command.

Change the database type assigned to the database `dbhome_1` to a `DSS` database:

```
oakcli modify database DB dbhome_1 -dbtype DSS
```

Example 17-17 Modifying the Database Size

Change the database size for the database named `dbhome_1` to a 6-core CPU Oracle Database Appliance DSS database template:

```
oakcli modify database dbhome_1 -to odb-06
```

oakcli orachk

Use the `oakcli orachk` command to audit configuration settings with the ORAchk utility.

Syntax

```
oakcli orachk [-a|-b|-v|-h|-p|-f|-m[-u -o][o]-c -t][-clusternodes |-
localonly][-debug][-dbnames |-dbnone|-dball][upgrade]listlist
```

Parameters

Parameter	Description
`-a`	Perform a best practice check and recommended patch check.
`-b`	Perform a best practice check only without the recommended patch check.
`-v`	Display version.
`-h`	Display command usage (help).
`-p`	Perform patch check only.
`-f`	Run the command offline.
`-m`	Exclude checks for Maximum Availability scorecards.

Parameter	Description
`-u -o`	Perform check on pre-upgrade best practices (-u -o pre) or on post-upgrade best practices (-u -o post).
`-o`	As an argument to an option, if `-o` is followed by `v`, `V`, `Verbose`, or `VERBOSE`, output will display checks that pass on the display. Without the `-o` option, only failures will display on the screen.
`-c`	Determines granularity of information displayed on the screen. For use only when working with Oracle Support Services.
`-clusternodes` *`list`*	*`list`* is a comma-delimited list containing the names of the nodes where the command should run.
`-localonly`	Run the command only on the local node.
`-debug`	Creates a debug log.
`-dbnames` *`list`*	*`list`* is a comma-delimited list containing the names of the subset of databases on which the command should run.
`-dbnone`	Skip all database-related checks on all databases without prompting to select which database to skip.
`-dball`	Run all database-related checks on all databases without prompting to select which databases to check.
`-upgrade`	Force upgrade of the version of the ORAchk utility being run.

Usage Notes

- The command offers multiple options that are generic to the ORAchk command when run on servers other than the Oracle Database Appliance server. You can find details about these options by running the command `oakcli orachk -h`. The options are grouped into the following categories, but this document does not list the options for each category:
  - Report Options
  - Auto Restart Options
  - Daemon Options
  - Profile Run Options
- For more information about ORAchk, see My Oracle Support note 1268927.2, "ORAchk Health Checks for the Oracle Stack" at https://support.oracle.com/rs?type=doc&id=1268927.2

oakcli reconfigure osparams

Use the `oakcli reconfigure osparams` command to adjust the kernel parameters based on the available RAM after you upgrade memory or DIMM.

After you change or expand memory on Oracle Database Appliance, use the `oakcli reconfigure osparams` command to display the current configuration and suggested values for `memlock` and `vm.nr_hugepages`. When prompted, answer `yes` or `no` to change the value to the suggested value.

Syntax

```
oakcli reconfigure osparams [-h]
```

Parameters

Parameter	Description
`-h`	(Optional) Displays help for using the command.

Usage Notes

After you change or expand memory on Oracle Database Appliance, use this command to update the kernel parameters.

> **Note:**
>
> When adjusting the settings, ensure that you make the changes on both nodes.

Example 17-18 Viewing the Current and Suggested Kernel Parameters

In this example, the output displays the configured and suggested values for `memlock` and `vm.nr_hugepages`. When prompted, enter `no` for both parameters to view, but not implement the suggested values.

```
# oakcli reconfigure osparams
Configured value for memlock is: 11000000
Suggested value for memlock is: 11000000
Do you want to use suggested value of memlock?: yes/no
no
User entered no, not updating kernel.memlock
Configured value for vm.nr_hugepages is: 2048
Suggested value for vm.nr_hugepages parameter is: 4150
Do you want to update to suggested value?: yes/no
no
User entered no, not updating kernel.vm.nr_hugepages
```

Example 17-19 Reconfiguring the Kernel Based on Available RAM

In this example, the output displays the configured and suggested values for `memlock` and `vm.nr_hugepages`. The `memlock` value does not require changing. A new value is suggested for `vm.nr_hugepages`. When prompted, enter `yes` to update to the suggested value.

> **Note:**
>
> You must adjust the value on both nodes.

```
# oakcli reconfigure osparams
Configured value for memlock is: 193000000
Suggested value for memlock is: 193000000
Configured and suggested values are same
Configured value for vm.nr_hugepages is: 67815
Suggested value for vm.nr_hugepages parameter is: 67748
Do you want to update to suggested value?: yes/no
yes
```

oakcli resize dbstorage

Use the `oakcli resize dbstorage` command to resize the space used for a storage structure that was created for the purpose of migrating databases from Oracle ASM to Oracle ACFS.

You can check the current space usage using `oakcli show fs` and then add space using `oakcli resize dbstorage`.

> **Note:**
>
> You cannot decrease the size of the space used for Oracle ACFS.

Syntax

```
oakcli resize dbstorage -data size -reco size -redo size -db  db_name
[-h]
```

Parameters

Parameter	Description
`-data` *size*	Extendable size in GB for the DATA volume.
`-reco` *size*	Extendable size in GB for the REDO volume.
`-redo` *size*	Extendable size in GB for the RECO volume.
`-db` *db_name*	Database for which these volumes must be resized.
`-h`	(Optional) Display help for using the command.

Example 17-20 Increasing the Size of the DATA Volume

Increase the size of the volume by 10 GB on the DATA volume:

```
oakcli resize dbstorage -data 10
```

oakcli restart oda_base

Use the `oakcli restart oda_base` command to stop and restart ODA_BASE on the local node.

Use this command only when you are not concerned about the current status of ODA_BASE, because it performs a forced shutdown. You must run this command from `Dom0`. Typically, if ODA_BASE needs to be restarted, then you must restart it on both nodes.

Syntax

```
oakcli restart oda_base [-h]
```

The ODA_BASE that you want to restart is on the same node as the `Dom0` from which you run this command.

Parameter

(Optional) -h displays help for using the command.

oakcli show commands

Use the `oakcli show` commands to display the status of Oracle Database Appliance components.

The `oakcli show` commands display status information for the node where you run the command. To see the list of components available on the current node, use the help option: `oakcli show -h`:

> **Note:**
>
> Depending on your model and version of Oracle Database Appliance software, the `oakcli show` command options may differ from the ones shown in this section and explained in the following sections. To obtain an annotated list of components available on your system, run the command `oakcli show -h`.

- oakcli show asr
  Use the `oakcli show asr` command to display your Oracle Auto Service Request configuration details.
- oakcli show cooling
  Use the `oakcli show cooling` command to display the status of the cooling units.
- oakcli show controller
  Use the `oakcli show controller` command to display information about the disk controllers.
- oakcli show cpupool
  Use the `oakcli show cpupool` command to display core allocations to virtual machine mappings.

- oakcli show databases
  Use the `oakcli show databases` command to display information about each existing database, including database name, database type, database home name and location, and database version.
- oakcli show db_config_params
  Use the `oakcli show db_config_params` command to display configuration file names and parameters.
- oakcli show dbhomes
  Use the `oakcli show dbhomes` command to display information about each existing Oracle database home, including home name, home location, and database version.
- oakcli show dbstorage
  Use the `oakcli show dbstorage` command to display database storage information for databases created on Oracle Automatic Storage Management Cluster File System (Oracle ACFS).
- oakcli show disk
  Use the `oakcli show disk` command to display disk information.
- oakcli show diskgroup
  Use the `oakcli show diskgroup` command to display Oracle Automatic Storage Management (Oracle ASM) disk group information.
- oakcli show enclosure
  Use the `oakcli show enclosure` command to display information about the storage enclosure subsystem on the node where the command is executed.
- oakcli show env_hw
  Use the `oakcli show env_hw` command to display the environment type and hardware version of the current node.
- oakcli show expander
  Use the `oakcli show expander` command to display information about a SAS expander.
- oakcli show ismaster
  Use the `oakcli show ismaster` command to determine which node is the first node.
- oakcli show fs
  Use the `oakcli show fs` command to display all database and cloudfs file systems created on ASM Cluster File System (ACFS) in addition to the local file systems on the Oracle Database Appliance node.
- oakcli show memory
  Use the `oakcli show memory` command to display information about memory modules.
- oakcli show network
  Use the `oakcli show network` command to display information about the network subsystem.
- oakcli show power
  Use the `oakcli show power` command to display information about the power supply subsystem.
- oakcli show processor
  Use the `oakcli show processor` command to display information about CPU processors.

- oakcli show raidsyncstatus
  Use the `oakcli show raidsyncstatus` command to display the status of the RAID rebuild after a failed local disk is replaced.
- oakcli show repo
  Use the `oakcli show repo` command to display information about virtual machine repositories.
- oakcli show server
  Use the `oakcli show server` command to display information about the server subsystem.
- oakcli show storage
  Use the `oakcli show storage` command to display information about the storage for controllers, expanders, and disks.
- oakcli show validation storage
  Use the `oakcli show validation storage` command to show whether validation storage is enabled or disabled.
- oakcli show validation storage errors
  Use the `oakcli show validation storage errors` command to show hard storage errors.
- oakcli show validation storage failures
  Use the `oakcli show validation storage failures` command to show soft validation errors. A typical soft disk error would be an invalid version of the disk firmware.
- oakcli show version
  Use the `oakcli show version` command to display the applied patch versions for Oracle Database Appliance software and firmware.

oakcli show asr

Use the `oakcli show asr` command to display your Oracle Auto Service Request configuration details.

Syntax

```
oakcli show asr [-h]
```

Parameters

(Optional) `-h` displays the help for using this command.

oakcli show cooling

Use the `oakcli show cooling` command to display the status of the cooling units.

Syntax

```
oakcli show cooling [-h]
```

Parameters

(Optional) `-h` displays the help for using this command.

Example

Display the cooling unit information for the node where the command is executed:

```
# oakcli show cooling
NAME   HEALTH HEALTH_DETAILS LOCATION FAN % FAN SPEED
Fan_0  OK     -              FM0      30 %  6300 RPM
Fan_1  OK     -              FM0      19 %  3800 RPM
Fan_10 OK     -              FM2      34 %  6600 RPM
Fan_11 OK     -              FM2      23 %  4100 RPM
Fan_12 OK     -              FM3      32 %  6300 RPM
Fan_13 OK     -              FM3      22 %  3900 RPM
Fan_14 OK     -              FM3      24 %  4700 RPM
Fan_15 OK     -              FM3      14 %  2500 RPM
Fan_2  OK     -              FM0      29 %  6400 RPM
Fan_3  OK     -              FM0      18 %  3700 RPM
Fan_4  OK     -              FM1      32 %  6400 RPM
Fan_5  OK     -              FM1      20 %  3700 RPM
Fan_6  OK     -              FM1      33 %  6400 RPM
Fan_7  OK     -              FM1      22 %  3800 RPM
Fan_8  OK     -              FM2      33 %  6400 RPM
Fan_9  OK     -              FM2      22 %  3900 RPM
```

oakcli show controller

Use the `oakcli show controller` command to display information about the disk controllers.

Syntax

```
oakcli show controller controller_id [-h]
```

Parameters

Parameter	Description
controller_id	Specifies the controller for which to display information
`-h`	(Optional) Display help for using the command.

Displaying Disk Controller Details

Display details of controller 0:

```
oakcli show controller 0
```

oakcli show cpupool

Use the `oakcli show cpupool` command to display core allocations to virtual machine mappings.

Syntax

```
oakcli show cpupool -node nodenum
```

nodenum is the number of the Oracle Database Appliance node that you want to examine, either `0` or `1`.

Displaying Core Mapping for Node 0

Display the core mapping information for Node 0:

```
# oakcli show cpupool -node 0
         Pool           Cpu List          VM List
default-unpinned-pool   [14, 15, 16, 17,
['test1_odarepo1','sample5_odarepo1',
                         18, 19, 20, 21,
'vm_very_long_name_sample1_odarepo1',
                         22, 23]           'win_vm1']
         twocpu          [12, 13]         ['vm1_odarepo1']
      odaBaseCpuPool     [0, 1, 2, 3, 10  ['oakDom1']
                          , 11]
```

oakcli show databases

Use the `oakcli show databases` command to display information about each existing database, including database name, database type, database home name and location, and database version.

Syntax

```
oakcli show databases [-h]
```

Parameters

Parameter	Description
`-h`	(Optional) Displays help for using the command.

Usage Notes

On Oracle Database Appliance, the minimum supported Oracle Database release is 11.2.0.4. Oracle Database 11.2.0.3.*x* is not supported.

Example 17-21 Displaying Database Details

```
# oakcli show databases
Name   Type   Storage   HomeName            HomeLocation
Version
-----  -----  --------  --------------      ----------------
----------
omydb  RAC     ACFS      OraDb12102_home1    /u01/app/oracle/product/12.1.0.2/dbhome_1
12.1.0.2.160719(23054246,23054327)
orcl   RAC     ACFS      OraDb12102_home1    /u01/app/oracle/product/12.1.0.2/dbhome_1
12.1.0.2.160719(23054246,23054327)
```

Example 17-22 Displaying Database Details for Four Databases

```
#oakcli show databases

Name Type     Storage  HomeName         HomeLocation                              Version
---- ----     -------  --------         ------------                              -------
db1 RAC        ACFS    OraDb12102_home1 /u01/app/oracle/product/12.1.0.2/dbhome_1
12.1.0.2.5(21359755,21359758)
db2 SINGLE     ACFS    OraDb12102_home2 /u01/app/oracle/product/12.1.0.2/dbhome_2
12.1.0.2.5(21359755,21359758)
db3 RACOneNode ACFS    OraDb12102_home3 /u01/app/oracle/product/12.1.0.2/dbhome_3
12.1.0.2.5(21359755,21359758)
db4 RAC        ACFS    OraDb12102_home4 /u01/app/oracle/product/12.1.0.2/dbhome_4
12.1.0.2.5(21359755,21359758)
```

oakcli show db_config_params

Use the `oakcli show db_config_params` command to display configuration file names and parameters.

The command searches for files with the extension `.dbconf` located in the `/opt/oracle/oak/install/dbconf` directory.

Syntax

```
oakcli show db_config_params [-conf filename] [-detail] [-h]
```

Parameters

Parameter	Description
`-conf` *filename*	(Optional) Name of configuration file to be displayed. If not included, then the command displays all configuration files.
`-detail`	(Optional) Display the parameter values stored in the configuration file or files.
`-h`	(Optional) Display help for using the command.

Displaying the Default Database Configuration Parameters

Display the default database configuration parameter values stored in the configuration file or files:

```
# oakcli show db_config_params -detail
Available DB configuration files are:
          Default
```

```
DATABASE_BLOCK_SIZE       =>     8192
DATABASE_LANGUAGE         =>     AMERICAN
DATABASE_CHARACTERSET     =>     AL32UTF8
DATABASE_TERRITORY        =>     AMERICA
COMPONENT_LANGUAGES       =>     en
```

oakcli show dbhomes

Use the `oakcli show dbhomes` command to display information about each existing Oracle database home, including home name, home location, and database version.

Syntax

```
oakcli show dbhomes [-detail] [-h]
```

Parameters

Parameter	Description
`-detail`	(Optional) Include a list of databases associated with each home.
`-h`	(Optional) Display help for using the command.

Usage Notes

On Oracle Database Appliance, the minimum supported Oracle Database release is 11.2.0.4. Oracle Database 11.2.0.3.*x* is not supported.

Example 17-23   Displaying DB Home Details

```
# oakcli show dbhomes

Oracle Home Name      Oracle Home version                    Home
Location
---------------       -------------------                    ------------
OraDb12102_home1      12.1.0.2.160719(23054246,23054327)  /u01/app/
oracle/product/12.1.0.2/dbhome_1
```

Example 17-24   Displaying DB Home Details

```
# oakcli show dbhomes -detail

Oracle HomeName  Oracle Home Version            Oracle HomeLocation               Database Name  Database
Type
---------------  -------------------            -------------------               -------------
-------------
OraDb11204_home1 11.2.0.4.8(21352635,21352649)  /u01/app/oracle/product/11.2.0.4/dbhome_1  no DB
available
OraDb12102_home1 12.1.0.2.5(21359755,21359758)  /u01/app/oracle/product/12.1.0.2/dbhome_1  one43
RACOneNode
OraDb12102_home1 12.1.0.2.5(21359755,21359758)  /u01/app/oracle/product/12.1.0.2/dbhome_1  ee120      SINGLE
OraDb12102_home1 12.1.0.2.5(21359755,21359758)  /u01/app/oracle/product/12.1.0.2/dbhome_1  one311
RACOneNode
OraDb12102_home1 12.1.0.2.5(21359755,21359758)  /u01/app/oracle/product/12.1.0.2/dbhome_1  ee311      SINGLE
OraDb12102_home1 12.1.0.2.5(21359755,21359758)  /u01/app/oracle/product/12.1.0.2/dbhome_1  rac311     RAC
OraDb12102_home1 12.1.0.2.5(21359755,21359758)  /u01/app/oracle/product/12.1.0.2/dbhome_1  ee43       SINGLE
OraDb12102_home1 12.1.0.2.5(21359755,21359758)  /u01/app/oracle/product/12.1.0.2/dbhome_1  one120
```

```
RACOneNode
OraDb12102_home1 12.1.0.2.5(21359755,21359758)  /u01/app/oracle/product/12.1.0.2/dbhome_1  odacn      RAC
OraDb12102_home1 12.1.0.2.5(21359755,21359758)  /u01/app/oracle/product/12.1.0.2/dbhome_1  rac43      RAC
OraDb12102_home1 12.1.0.2.5(21359755,21359758)  /u01/app/oracle/product/12.1.0.2/dbhome_1  rac120     RAC
```

oakcli show dbstorage

Use the `oakcli show dbstorage` command to display database storage information for databases created on Oracle Automatic Storage Management Cluster File System (Oracle ACFS).

All non-cdb databases are listed together, because they share a common set of volumes. Each CDB database is listed separately.

Syntax

```
oakcli show dbstorage [-db] db_name[-h]
```

Parameters

Parameter	Description
`-db` *dbname*	(Optional) Display the name of the database for the storage information.
`-h`	(Optional) Display help for using the command.

Usage Notes

Example 17-25 Oracle Database Appliance with Non-CDB Databases

Here is an example of the `oakcli show dbstorage` command output for an Oracle Database Appliance. The output includes only non-CDB databases. Half of the available disk group storage is allocated to Oracle ACFS, except for the FLASH disk group. In the FLASH disk group, all storage is allocated to Oracle ACFS.

```
# oakcli show dbstorage

All the DBs with DB TYPE as non-CDB share the same volumes

DB_NAMES            DB_TYPE  Filesystem                       Size    Used  Available  AutoExtend Size DiskGroup
--------            -------  ----------                       -----   ----  ---------  --------------- ---------
db1, db2, db3, db4  non-CDB /u01/app/oracle/oradata/datastore   62G  27.26G    34.74G       6G         REDO
                            /u02/app/oracle/oradata/datastore 3730G   7.86G  3722.14G     373G         DATA
                            /u02/app/oracle/oradata/flashdata  558G 205.25G   352.75G      55G         FLASH
                            /u01/app/oracle/fast_recovery_area/datastore
                                                              4958G  21.05G  4936.95G      495G        RECO
```

oakcli show disk

Use the `oakcli show disk` command to display disk information.

Syntax

```
oakcli show  disk  [-shared | -local | -shared_disk_name |-asm [-all]
[-h]
```

Parameters

Parameter	Description
`-local`	(Optional) Display information for all of the local disks.
`-shared`	(Optional) Display information for all of the shared disks.
`-`*`shared_disk_name`*	(Optional) Display information for only the specified shared disk.
`-asm`	(Optional) Displays information for an assembly.
`-all`	(Optional) Display complete details of the selected disk or disks.
`-h`	(Optional) Display help for using the command.

Usage Notes

- Running the command with no parameters is identical to running the `oakcli show disk -shared` command.
- The `-all` parameter produces valid output only when used with the *`shared_disk_name`* parameter. All other parameters are optional and cannot be combined with other parameters.

Example 17-26 Displaying Information About the Local Disks

```
oakcli show disk -local
```

Example 17-27 Displaying Information About the Shared Disks

```
oakcli show disk -shared
```

Example 17-28 Displaying Information About a Specific Shared Disk

Display information about the shared disk named `pd_01`:

```
oakcli show disk -shared pd_01
```

oakcli show diskgroup

Use the `oakcli show diskgroup` command to display Oracle Automatic Storage Management (Oracle ASM) disk group information.

Syntax

```
oakcli show diskgroup [disk_group_name][-h]
```

Parameters

Parameter	Description
disk_group_name	(Optional) The name of an Oracle ASM disk group for which complete details should be displayed. If you do not specify this parameter, then information for all of the Oracle ASM disk groups is displayed.
-h	(Optional) Display help for using the command.

oakcli show enclosure

Use the `oakcli show enclosure` command to display information about the storage enclosure subsystem on the node where the command is executed.

Syntax

```
oakcli show enclosure [-h]
```

Parameter

`-h` displays help for using the command.

oakcli show env_hw

Use the `oakcli show env_hw` command to display the environment type and hardware version of the current node.

Syntax

```
oakcli show env_hw [-h]
```

Parameter

(Optional) `-h` displays help for using the command.

Displaying the Environment and Hardware for a Virtualized Platform

Show the environment type and hardware model when logged in to ODA_BASE on Oracle Database Appliance Virtualized Platform:

```
oakcli show env_hw
VM-ODA_BASE ODA X7-2
```

oakcli show expander

Use the `oakcli show expander` command to display information about a SAS expander.

Syntax

```
oakcli show expander [expander_id] [-h]
```

Parameter

Parameter	Description
expander_id	(Optional) Identifies the specific SAS expander
-h	(Optional) Display help for using the command.

oakcli show ismaster

Use the `oakcli show ismaster` command to determine which node is the first node.

File Path

`/opt/oracle/oak/bin/oakcli`

Syntax

```
 oakcli show ismaster [-h]
```

Parameters

Parameter	Description
-h	(Optional) Display help for using the command.

Example 17-29   Determining Which Node is the First Node

```
# oakcli show ismaster
```

oakcli show fs

Use the `oakcli show fs` command to display all database and cloudfs file systems created on ASM Cluster File System (ACFS) in addition to the local file systems on the Oracle Database Appliance node.

Syntax

```
oakcli show fs [-h]
```

Parameter

(Optional) `-h` displays help for using the command.

oakcli show memory

Use the oakcli show memory command to display information about memory modules.

Syntax

```
oakcli show memory [-h]
```

Parameter

(Optional) -h displays help for using the command.

oakcli show network

Use the oakcli show network command to display information about the network subsystem.

Syntax

```
oakcli show network
```

Parameter

(Optional) -h displays help for using the command.

oakcli show power

Use the oakcli show power command to display information about the power supply subsystem.

Syntax

```
oakcli show power [-h]
```

Parameter

(Optional) -h displays help for using the command.

Example 17-30 Displaying Power Supply Information

Display the power supply information of the node where the command is executed:

```
# oakcli show power

NAME            HEALTH HEALTH_DETAILS PART_NO. SERIAL_NO.
LOCATION INPUT_POWER OUTPUT_POWER INLET_TEMP      EXHAUST_TEMP
Power_Supply_0  OK      -             7047410  476856F+1242CE0020
PS0      Present     113 watts    33.250 degree C 36.688 degree C
Power_Supply_1  OK      -             7047410  476856F+1242CE004J
```

```
PS1      Present     89 watts     37.000 degree C 39.438 degree C
```

oakcli show processor

Use the `oakcli show processor` command to display information about CPU processors.

Syntax

```
oakcli show processor [-h]
```

Parameter

(Optional) `-h` displays help for using the command.

Displaying CPU Processor Information

Display the CPU processor information of the node where the command is executed:

```
# oakcli show processor
        NAME  HEALTH HEALTH_DETAILS PART_NO. LOCATION
MODEL                         MAX_CLK_SPEED TOTAL_CORES ENABLED_CORES

        CPU_0 OK     -              060D     P0 (CPU 0)
Intel(R) Xeon(R) CPU E5-2690  2.900 GHZ        8           8
        CPU_1 OK     -              060D     P1 (CPU 1)
Intel(R) Xeon(R) CPU E5-2690  2.900 GHZ    8           8
```

oakcli show raidsyncstatus

Use the `oakcli show raidsyncstatus` command to display the status of the RAID rebuild after a failed local disk is replaced.

> **Note:**
>
> The `show raidsyncstatus` command is only supported on a bare metal platform; it is not supported on the virtualized platform. For general RAID information, use the `oakcli show iraid` command.

Syntax

```
oakcli show raidsyncstatus [-h]
```

Parameter

(Optional) `-h` displays help for using the command.

oakcli show repo

Use the `oakcli show repo` command to display information about virtual machine repositories.

Syntax

```
oakcli show repo [reponame -node 0|1] [-h]
```

Parameters

Parameter	Description
`reponame`	[Optional] Identifies a specific repository name
`-node`	[Optional] Identifies the node number `0` or `1`
`-h`	[Optional] Display help for using the command.

To see all repositories, omit the repository name and node number. To see a specific shared repository, include the repository name and node.

Examples

Here are examples of how to use the `oakcli show repo` command.

Example 17-31 Displaying the Available Virtual Machine Repositories

Display the virtual machine repositories on Oracle Database Appliance Virtualized Platform nodes:

```
# oakcli show repo
        NAME      REPOTYPE  NODENUM
        odarepo1  local     0
        odarepo2  local     1
        repo1     shared    0
        repo1     shared    1
```

Example 17-32 Displaying Details About a Specific Shared Repository

Display information about the repository named `repo1` on Node 1:

```
# oakcli show repo repo1 -node 1

Resource: repo1_1
        AutoStart       :       restore
        DG              :       DATA
        Device          :       /dev/asm/repo1-286
        ExpectedState   :       Online
        MountPoint      :       /u01/app/repo1
        Name            :       repo1_0
        Node            :       all
        RepoType        :       shared
        Size            :       102400
        State           :       Online
```

oakcli show server

Use the `oakcli show server` command to display information about the server subsystem.

Syntax

```
oakcli show server [-h]
```

Parameter

(Optional) `-h` displays help for using the command.

oakcli show storage

Use the `oakcli show storage` command to display information about the storage for controllers, expanders, and disks.

Syntax

```
oakcli show storage -errors [-h]
```

Parameters

Parameter	Description
`-errors`	Display detailed information about reported errors.
`-h`	(Optional) Display help for using the command.

oakcli show validation storage

Use the `oakcli show validation storage` command to show whether validation storage is enabled or disabled.

Syntax

```
oakcli show validation storage [-h]
```

Parameter

(Optional) `-h` displays help for using the command.

Example 17-33 Determining if Storage Validation is Enabled

```
# oakcli show validation storage
Enabled
```

oakcli show validation storage errors

Use the oakcli show validation storage errors command to show hard storage errors.

Hard errors include having the wrong type of disk inserted into a particular slot, an invalid disk model, or an incorrect disk size.

Syntax

```
oakcli show validation storage errors [-h]
```

Parameter

(Optional) -h displays help for using the command.

oakcli show validation storage failures

Use the oakcli show validation storage failures command to show soft validation errors. A typical soft disk error would be an invalid version of the disk firmware.

Syntax

```
oakcli show validation storage failures [-h]
```

Parameter

(Optional) -h displays help for using the command.

oakcli show version

Use the oakcli show version command to display the applied patch versions for Oracle Database Appliance software and firmware.

Syntax

```
oakcli show version [-detail] [-h]
```

Parameter	Description
-detail	(Optional) Display detailed version information.
-h	(Optional) Display help for using the command.

Usage Notes

When you apply the patch and then run the command oakcli show version -detail, the output shows the installed version and that the supported versions are Up-to-date for each component. If you unpack the patch bundle (oakcli unpack -pack) and then run the command oakcli show version -detail before applying the patch, the output shows No-update in the Supported Version column.

> **Note:**
>
> After unpacking the patch bundle, but before applying the patch, use the `oakcli update -patch` *`version`* `--verify` command to verify the contents of the patch instead of issuing `oakcli show version -detail`.

Displaying the Oracle Database Appliance Version

This is an example of how to determine if all of the components are successfully updated after applying the 12.1.2.10.0 patch. You can also view the applied patch version information for the software and firmware on Oracle Database Appliance. All components are successfully updated when `Up-to-date` appears in the Supported Version column.

```
# oakcli show version -detail

Mon Feb 13 03:31:48 PST 2017
Reading the metadata. It takes a while...
System Version   Component Name             Installed Version           Supported Version
--------------   ---------------           ------------------           -----------------
12.1.2.10.0

                Controller_INT            4.230.40-3739             Up-to-date

                Controller_EXT            09.00.00.00               Up-to-date

                Expander                  0291                      Up-to-date

                SSD_SHARED {

                [ c2d20,c2d21,c2d22,      A29A                      Up-to-date

                c2d23 ]

                [ c2d0,c2d1,c2d2,c2d      A29A                      Up-to-date

                3,c2d4,c2d5,c2d6,c2d

                7,c2d8,c2d9,c2d10,c2

                d11,c2d12,c2d13,c2d1

                4,c2d15,c2d16,c2d17,

                c2d18,c2d19 ]

                             }

                SSD_LOCAL                 0R3Q                      Up-to-date

                ILOM                      3.2.8.24 r114611          Up-to-date

                BIOS                      38070000                  Up-to-date

                IPMI                      1.8.12.4                  Up-to-date

                HMP                       2.3.5.2.8                 Up-to-date

                OAK                       12.1.2.10.0               Up-to-date

                OL                        6.8                       Up-to-date

                GI_HOME                   12.1.0.2.170117(2473      Up-to-date

                                            2082,24828633)

                DB_HOME                   12.1.0.2.170117(2473      Up-to-date

                                          2082,24828633)
```

Related Topics

- oakcli update
  Use the `oakcli update` command to apply Oracle Database Appliance patches.

oakcli start commands

Use the `oakcli start` commands to start a virtual machine, to start a shared repository on a node, or to start ODA_BASE on the local node.

- oakcli start oda_base
  Use the `oakcli start oda_base` command to start ODA_BASE on the local node.
- oakcli start repo
  Use the `oakcli start repo` command to start a shared repository on a node.

oakcli start oda_base

Use the `oakcli start oda_base` command to start ODA_BASE on the local node.

Syntax

```
oakcli start oda_base [-h]
```

Parameter

(Optional) `-h` displays help for using the command.

Example 17-34 Starting ODA_BASE on the Local Node

Connect to Dom0 on the desired node and enter the following command to start ODA_BASE on that node:

```
oakcli start oda_base
```

oakcli start repo

Use the `oakcli start repo` command to start a shared repository on a node.

Syntax

```
oakcli start repo repo_name [-node node_number] [-h]
```

Parameters

Parameter	Description
`repo_name`	*`repo_name`* is the name of the shared repository to be started.
`-node` *`node_number`*	Specifies the node on which to start the shared repository. *`node_number`* is the number of the node where it is to be started, either 0 or 1. If `-node` is not specified, the shared repository is started on both nodes.
`-h`	(Optional) Displays help for using the command.

Example 17-35 Starting a Shared Repository on Node 0

Start the shared repository named `repo1` on Node 0:

```
oakcli start repo repo1 -node 0
```

oakcli stop command

Use the `oakcli stop` command to stop a virtual machine, to stop a shared repository on a node, or to stop ODA_BASE on the local node.

Syntax

```
oakcli stop [vm vm_name [-force] | repo repo_name [-node node_number] |
oda_base ] [-h]
```

Parameters

Parameter	Description
`vm` *`vm_name`*	*`vm_name`* is the name of the virtual machine to be stopped.
`-force`	(Optional) forces the virtual machine to stop.
`repo` *`repo_name`*	*`repo_name`* is the name of the shared repository to be stopped.
`-node` *`node_number`*	*`node_number`* is the number of the node where the shared repository is to be stopped, either 0 or 1. The `-node` parameter is only valid when stopping a virtual machine on a shared repository. If `-node` is not specified, the shared repository is stopped on both nodes.
`oda_base`	Stops ODA_BASE on the local node
`-h`	(Optional) Displays help for using the command.

Examples

Here are examples of how to use the `oakcli stop` command.

Example 17-36 Forcing a Virtual Machine to Stop

Force the virtual machine named `vm1_odarepo1` to stop:

```
oakcli stop vm vm_odarepo1 -force
```

Example 17-37 Stopping a Shared Repository

Stop the shared repository named `repo1` on Node 0:

```
oakcli stop repo repo1 -node 0
```

Example 17-38 Stopping the Local ODA_Base

Connect to Dom0 on the desired node and enter the following command to stop ODA_BASE on that node:

```
oakcli stop oda_base
```

oakcli stordiag

Use the `oakcli stordiag` command to run diagnostic tests on a disk in the storage shelf or storage expansion shelf.

The tool produces a list of 14 disk checks for each node.

Syntax

```
oakcli stordiag resource_type [n| [-h]
```

Parameters

Parameter	Description
resource_type	Prefix that depends on the configuration. See "Usage Notes."
n	(Optional) Disk number (starting with 0 and increasing to one less than the number of disks)
-h	(Optional) Display help for using the command.

Usage Notes

Select the value for *resource_type* based from one of the following options:

- On Oracle Database Appliance Version 1, use `d`.
- On Oracle Database Appliance with a single storage shelf, use `pd_`.
- On Oracle Database Appliance with an expansion storage shelf, use `e0_pd_` for a disk in the storage shelf and use `e1_pd_` for a disk in the expansion storage shelf.

For Oracle Database Appliance systems that have internal storage, use the format d_[..] to identify the disk to be diagnosed. For Oracle Database Appliance systems that have connected a storage shelf (and optional storage expansion shelf), use the format e[0..1] pd_[0..23] to identify the disk to be diagnosed.

Example 17-39 Running Diagnostic Tests on a Disk in the Expansion Storage Shelf

Runs the diagnostic tests on disk 3 in the expansion storage shelf:

```
# oakcli stordiag e1_pd_3
 Node Name : hr0
 Test : Diagnostic Test Description

   1  : OAK Check
        NAME           PATH           TYPE           STATE
STATE_DETAILS
```

```
        pd_03          /dev/sdw       HDD            ONLINE         Good

   2  : ASM Check
. . .
<output truncated>
```

oakcli test asr

Use the `oakcli test asr` command to send a test trap to determine if Oracle Auto Service Request (Oracle ASR) is configured and working correctly.

The command returns a success message if Oracle ASR is functioning properly.

Syntax

```
oakcli test asr [-h]
```

Parameter

(Optional) `-h` displays help for using the command.

Usage Notes

Run the command on both nodes. The Oracle ASR logs are always on the node where the ASR Manager is installed, which is the first node.

oakcli unpack

Use the `oakcli unpack` command to unpack packages into the Oracle Appliance Manager repository.

Syntax

```
oakcli unpack -package absolute_package_name
```

Parameters

Parameters	Description
absolute_package_name	Identifies the package to be unpacked using the package's full absolute path and file name
-h	(Optional) Display help for using the command.

Example 17-40 Unpacking Packages into the Oracle Appliance Manager Repository

Unpack the `p13982331_23000_Linux-86-62.zip` package, which was previously copied to `/tmp` on the current node, into the node's Oracle Appliance Manager command-line interface repository:

```
oakcli unpack -package /tmp/p13982331_23000_Linux-86-62.zip
```

oakcli update

Use the `oakcli update` command to apply Oracle Database Appliance patches.

You can apply patches using the patch bundle and use the `--local` patching option to patch components one node at a time without impacting the other node. This reduces the downtime when applying the patch.

> **Note:**
>
> If you want to update only the Oracle Database software, use the `oakcli upgrade` command.

Syntax

```
oakcli update -patch version [--server | --storage | --database] [--
local} [--noreboot] | [--clean] | [--verify][-h]
```

Parameters

Parameter	Description
`- patch version`	Patch version that you want to install. For example: 19.9.
`--server`	Contains the patches previously obtained in earlier releases from the Infrastructure (infra) and Grid Infrastructure (gi) patch updates.
`--storage`	Contains only patches for shared storage components.
`--database`	(Optional) Patches Oracle database homes.
`--local`	Patches the component only on the local node. By default, this is set to false.
`--noreboot`	(Optional) Node is not rebooted after patching.
`--clean`	(Optional) Cleans up all temporary files on the local node.
`--verify`	(Optional) Lists the patchable components on the node.
`-h`	(Optional) Display help for using the command.

Usage Notes

After unpacking the patch bundle, but before applying the patch, verify the contents of the patch for the release.

When patching a virtualized platform, the `--local` option is supported, when Oracle Grid Infrastructure upgrade is not required. For example, after applying the patch for Oracle Database Appliance 19.9, Oracle Grid Infrastructure is upgraded to 18.0.0.0. The `--local` option then works.

```
# oakcli update -patch 19.9.0.0.0 --server --local
INFO: Local patch is running on the Node <0>
INFO: ***************************************************
INFO: ** Please do not patch both nodes simultaneously **
```

```
INFO: ***************************************************
INFO: DB, ASM, Clusterware may be stopped during the patch if required
INFO: Local Node may get rebooted automatically during the patch if 
necessary
```

Example 17-41 Verify the Contents of a Patch Bundle

Display the installed version and the version available in the 19.9 release patch bundle for each of the components on the node. When the latest supported version is installed, `Up-to-date` appears in the Proposed column.

```
# oakcli update -patch 19.9.0.0.0 --verify

INFO: 2017-02-13 14:20:37: Reading the metadata file now...

Patch Version         Component Name        Installed Version      Proposed
---------------       ------------------    -----------------      ----------
                     Controller_INT            4.230.40-3739         Up-to-date
                     Controller_EXT            09.00.00.00           10.00.00.00
                      Expander                  0291                 Up-to-date

                    SSD_SHARED {

                [ c2d20,c2d21,c2d22,            A29A                 Up-to-date
                c2d23 ]

                [ c2d0,c2d1,c2d2,c2d            A29A                 Up-to-date
                3,c2d4,c2d5,c2d6,c2d

                7,c2d8,c2d9,c2d10,c2

                d11,c2d12,c2d13,c2d1

                4,c2d15,c2d16,c2d17,

                c2d18,c2d19 ]

                             }

                SSD_LOCAL                 0R3Q                       Up-to-date
                ILOM                      3.2.7.26.a r112632         3.2.8.24 r114611
                BIOS                      38050100                   38070000

                IPMI                      1.8.12.4                   Up-to-date
                HMP                       2.3.5.2.5                  2.3.5.2.8

                OAK                       12.2.1.4                 19.9
                OL                        6.8                        Up-to-date
                GI_HOME                   12.1.0.2.161018(2400       12.1.0.2.170117(2473
                                          6101,23854735)             2082,24828633)
                DB_HOME                   12.1.0.2.160719(2305       12.1.0.2.170117(2473
                                          4246,23054327)             2082,24828633)
                ASR                       5.5.1                      Up-to-date
```

oakcli update -patch Command Examples

Update the appliance with the 19.9 patch:

```
oakcli update -patch 19.9.0.0.0
```

Patch the Oracle Database homes on both nodes:

```
oakcli update -patch 19.9.0.0.0 --database
```

oakcli update-cpucore

Use the `oakcli update-cpucore` command to enable a specified number of licensed CPU cores for Oracle Database Appliance.

Prerequisites

If all cores are not enabled, you can enable multiples of 2 licensed CPU cores up to the maximum number of cores.

File Path

`/opt/oracle/oak/bin/oakcli`

Syntax

```
 oakcli update-cpucore  -cores number of cores per server [-h]
```

Parameters

Parameter	Description
`-cores`	Defines the number of cores to enable per server, in multiples of 2. To enable all available cores, specify `All` instead of the number of cores.
`-h`	(Optional) Display help for using the command.

Usage Notes

- This command applies only to bare metal deployments. It is not available on an Oracle Database Appliance Virtualized Platform.
- The number of licensed cores you enable must be a multiple of 2, up to the maximum number of cores.
- After the initial configuration, you cannot reduce the number of cores. You can purchase additional cores and increase the number of cores, up to the maximum number of cores for the hardware model.

Example 17-42 Enabling 12 CPU Cores for Oracle Database Appliance

The following command enables 12 CPU cores on an Oracle Database Appliance system.

```
# oakcli update-cpucore -cores 12

Please enter the 'root' password:
Please re-enter the 'root' password:
Setting up SSH .............Completed
INFO   : Running as root: /usr/bin/ssh -l root 192.0.2.1 /etc/rc.d/
rc3.d/S90cpu-core
```

```
INFO    : Running as root: /usr/bin/ssh -l root 192.0.2.1 /etc/rc.d/
rc3.d/S90cpu-core
```

Example 17-43 Enabling All CPU Cores for Oracle Database Appliance

The following command enables all cores on an Oracle Database Appliance system.

```
# oakcli update-cpucore -cores All

Please enter the 'root' password:
Please re-enter the 'root' password:
Setting up SSH .............Completed
INFO    : Running as root: /usr/bin/ssh -l root 192.0.2.1 /etc/rc.d/
rc3.d/S90cpu-core
INFO    : Running as root: /usr/bin/ssh -l root 192.0.2.1 /etc/rc.d/
rc3.d/S90cpu-core
```

oakcli upgrade

Use the `oakcli upgrade` command to upgrade the Oracle Database software on Oracle Database Appliance.

For patching Oracle Database Appliance itself, use the `oakcli update` command.

Syntax

```
oakcli upgrade database [-db db_names | -from source_home] -to destination_home
```

Parameters

Parameter	Description
`-db` *`db_names`*	Specifies the name or names (in a comma-delimited list) of the database or databases you want to upgrade
`-from` *`source_home`*	Specifies the current Oracle Database home of the databases you are upgrading
`-to` *`destination_home`*	Specifies the Oracle Database home containing the version to which you want to upgrade the databases
`-h`	(Optional) Display help for using the command.

Usage Notes

- You must include either a `-db` parameter or a `-from` parameter.
- Running the command with a `-db` parameter upgrades only the named databases, regardless of their current Oracle Database homes. If you include a `-from` parameter in addition to a `-db` parameter, then the command ignores the `-from` parameter. That is, the command upgrades named databases from other homes and ignores the databases in the named home if they are not listed in the `-db` parameter.
- Running the command without a `-db` parameter will upgrade all of the databases in the named Oracle Database home.

- You must always provide a `-to` parameter that names an existing Oracle Database home.

Example

Upgrade an Oracle 11.2.0.3.1 database named `tpcc` from Oracle Database 11.2.0.3.1 to Oracle Database 12.1.0.2 using the Oracle Database home directory `OraDb12102_home1`:

```
oakcli upgrade database -db tpcc -to OraDb12102_home1
```

oakcli validate

Validates the state of an Oracle Database Appliance or the viability of an operating system patch.

Syntax

```
oakcli validate [[-V | -l | -h]] | [[-v][-f output_file] [-a | -d | -c checklist]
[-ver patch_version]]
```

Parameters

Parameter	Description
`-V`	Display the version of `oakValidation`.
`-l`	List the items that can be checked (and their descriptions).
`-h`	(Optional) Display help for using the command.
`-v`	Show verbose output (must be used with a parameter that generates a validation report).
`-f` *`output_file`*	Send output to a file with a fully qualified file name, *`output_file`*, instead of to the screen (`stdout`).
`-a`	Run all system checks, including `DiskCalibration`. Oracle recommends that you use this command to validate system readiness before deployment. Do not run `oakcli validate` with this option on a busy production system, because the `DiskCalibration` system check can cause performance issues.
-d	Run only the default checks. The default checks are `NetworkComponents`, `OSDiskStorage`, `SharedStorage`, and `SystemComponents`. The `NetworkComponents` validation check is not available on Oracle Database Appliance V1.
`-c` *`checklist`*	Run the validation checks for the items identified in *`checklist`*, a comma-delimited list. Use this parameter to check either a single item or subset of items.
`-c` ospatch	Run the validation checks for the patch version identified in `-ver` *`patch_version`*.
`-ver` *`patch_version`*	Report any reasons for not being able to patch Oracle Database Appliance with the patch named in *`patch_version`*.

Listing All Checks and Their Descriptions

```
# oakcli validate -l

         Checkname -- Description
         =========    ===========
         *SystemComponents -- Validate system components based on ilom sensor
data
         readings
         *OSDiskStorage -- Validate OS disks and filesystem information
         *SharedStorage -- Validate Shared storage and multipathing information
         DiskCalibration -- Check disk performance with orion
         *NetworkComponents -- Validate public and private network components
         *StorageTopology -- Validate external JBOD connectivity
         asr -- Validate asr components based on asr config file and ilom sensor
         data readings

* -- These checks are also performed as part of default checks
```

Running All Checks

Enter the following command to run all checks:

```
# oakcli validate -a
```

Validating Storage Cable Connections

Check the cable connections between the system controllers and the storage shelf, as well as the cable connection to the storage expansion shelf (if one is installed):

```
# oakcli validate -c storagetopology

Oracle recommends that you run the oakcli validate -c StorageTopology command
before deploying the system. This will avoid and prevent problems during
deployment due to wrong or missing cable connections. The output shown in the
following example reports a successful configuration. If the cabling is not
correct, you will see errors in your output.

# oakcli validate -c storagetopology
 It may take a while. Please wait...
 INFO : ODA Topology Verification
 INFO : Running on Node0
 INFO : Check hardware type
 SUCCESS : Type of hardware found : X4-2
 INFO : Check for Environment(Bare Metal or Virtual Machine)
 SUCCESS : Type of environment found : Virtual Machine(ODA BASE)
 SUCCESS : Number of External LSI SAS controller found : 2
 INFO : Check for Controllers correct PCIe slot address
 SUCCESS : External LSI SAS controller 0 : 00:15.0
 SUCCESS : External LSI SAS controller 1 : 00:16.0
 INFO : Check if  powered on
 SUCCESS : 1 : Powered-on
 INFO : Check for correct number of EBODS(2 or 4)
 SUCCESS : EBOD found : 2
 INFO : Check for External Controller 0
 SUCCESS : Controller connected to correct ebod number
 SUCCESS : Controller port connected to correct ebod port
 SUCCESS : Overall Cable check for controller 0
 INFO : Check for External Controller 1
 SUCCESS : Controller connected to correct ebod number
 SUCCESS : Controller port connected to correct ebod port
 SUCCESS : Overall Cable check for controller 1
 INFO : Check for overall status of cable validation on Node0
 SUCCESS : Overall Cable Validation on Node0
 INFO : Check Node Identification status
 SUCCESS : Node Identification
 SUCCESS : Node name based on cable configuration found : NODE0
 INFO : Check  Nickname
 SUCCESS :  Nickname set correctly : Oracle Database Appliance - E0
 INFO : The details for Storage Topology Validation can
also be found in log file=/opt/oracle/oak/log/<hostname>/storagetopology/
StorageTopology-2014-07-03-08:57:31_7661_15914.log
```

Validating Oracle ASR

Enter the following syntax to validate your Oracle ASR configuration:

```
# oakcli validate -c asr
INFO: oak Asr information and Validations
RESULT: /opt/oracle/oak/conf/asr.conf exist
RESULT: ASR Manager ip:10.139.154.17
RESULT: ASR Manager port:1162
SUCCESS: ASR configuration file validation successfully completed
RESULT: /etc/hosts has entry 141.146.156.46 transport.oracle.com
RESULT: ilom alertmgmt level is set to minor
RESULT: ilom alertmgmt type is set to snmptrap
RESULT: alertmgmt snmp_version is set to 2c
RESULT: alertmgmt community_or_username is set to public
RESULT: alertmgmt destination is set to 10.139.154.17
RESULT: alertmgmt destination_port is set to 1162
SUCCESS: Ilom snmp confguration for asr set correctly
RESULT: notification trap configured to ip:10.139.154.17
RESULT: notification trap configured to port:1162
SUCCESS: Asr notification trap set correctly
INFO: IP_ADDRESS HOST_NAME SERIAL_NUMBER ASR PROTOCOL SOURCE PRODUCT_NAME
INFO: --------------- ------------------------------
------------------------------ -------- --------- --------------
------------------------------
10.170.79.98 oda-02-c 1130FMW00D Enabled SNMP ILOM SUN FIRE X4370 M2 SERVER
10.170.79.97 oda-01-c 1130FMW00D Enabled SNMP ILOM SUN FIRE X4370 M2 SERVER
INFO: Please use My Oracle Support 'http://support.oracle.com' to view the
activation status.
SUCCESS: asr log level is already set to Fine.
RESULT: Registered with ASR backend.
RESULT: test connection successfully completed.
RESULT: submitted test event for asset:10.139.154.17
RESULT: bundle com.sun.svc.asr.sw is in active state
RESULT: bundle com.sun.svc.asr.sw-frag is in resolved state
RESULT: bundle com.sun.svc.asr.sw-rulesdefinitions is in resolved state
RESULT: bundle com.sun.svc.ServiceActivation is in active state
SUCCESS: ASR diag successfully completed
```

Checking the Viability of a Patch

Use the `oakcli validate ospatch -ver` *`patch_version`* command to report any reasons for not being able to patch Oracle Database Appliance with the patch named in *`patch_version`*. Run this command before you attempt to patch Oracle Database Appliance to determine if it will succeed or if you need to make changes before applying the patch.

```
# oakcli validate -c ospatch -ver 12.1.2.5.0
INFO: Validating the OS patch for the version 12.1.2.5.0
WARNING: 2015-10-10 06:30:32: Patching sub directory /opt/oracle/oak/pkgrepos/
orapkgs/OEL/5.10/Patches/5.10.1 is not existing
INFO: 2015-10-10 06:30:32: May need to unpack the Infra patch bundle for the
version: 12.1.2.5.0
ERROR: 2015-10-10 06:30:32: No OS patch directory found in the repository
```

Validating Hardware System and Network Components

The following command runs system checks to validate hardware system components and Oracle Database Appliance network components:

```
# oakcli validate -c SystemComponents,NetworkComponents
```

oakcli Virtual Disk Commands

Use the oakcli virtual disk (vdisk) commands to manage virtual disks on Oracle Database Appliance virtualized platform.

- oakcli create vdisk
  Use the `oakcli create vdisk` command to create a new virtual disk in a shared repository on Oracle Database Appliance Virtualized Platform.
- oakcli clone vdisk
  Use the `oakcli clone vdisk` command to create clones of virtual disks.
- oakcli delete vdisk
  Use the `oakcli delete vdisk` command to delete a virtual disk from a shared repository on Oracle Database Appliance Virtualized Platform.
- oakcli show vdisk
  Use the `oakcli show vdisk` command to display information about virtual disks on Oracle Database Appliance Virtualized Platform.

oakcli create vdisk

Use the `oakcli create vdisk` command to create a new virtual disk in a shared repository on Oracle Database Appliance Virtualized Platform.

Syntax

```
oakcli create vdisk vdisk_name -repo repository_name -size size -type shared|
local -sparse [-h]
```

Parameters

Parameter	Description
vdisk_name	Name assigned to the virtual disk that is unique within the name repository
`-repo` *repository_name*	Name of the shared repository where the virtual disk will be created and from which it will acquire its storage
`-size` *size*	Amount of storage to be assigned from the shared repository to the shared disk. The default unit is G (for gigabytes) and the minimum size is 500 M (for megabytes)

Parameter	Description
`-type shared | local`	Sets the option of allowing the virtual disk to be shared by more than one virtual machine (`shared`) or used by only one virtual machine (`local`)
`-sparse`	Creates a sparse vdisk
`-h`	(Optional) Display help for using the command.

Example

Create a virtual disk named `t2g` in the shared repository named `repoprod1` for use by only one virtual machine at a time in that repository. Assign the `t2g` virtual disk 2 GB in the `repoprod1` shared repository.

```
oakcli create vdisk t2g -repo repoprod1 -type local -size 2G
```

oakcli clone vdisk

Use the `oakcli clone vdisk` command to create clones of virtual disks.

Syntax

```
oakcli clone vdisk new_vdisk_name -repo repo_name -src
source_vdisk_name [-h]
```

Parameters

Parameter	Description
new_vdisk_name	Name given to the clone virtual disk
repo_name	Name of the repository source for the virtual disk being cloned
source_vdisk_name	Name of the virtual disk being cloned
`-h`	(Optional) Display help for using the command.

Usage

The virtual disk and vm.cfg files are stored in the following directories:

- `Dom0`: `/Repositories/`*`vm_repo_name`*`/.ACFS/snaps/`*`vm_name`*`/VirtualMachines/`*`vm_name`*
- `ODA_BASE`: `/app/sharedrepo/`*`vm_repo_name`*`/.ACFS/snaps/`*`vm_name`*`/VirtualMachines/`*`vm_name`*

Example 17-44 Cloning a Virtual Disk

Clone a virtual disk named `my_vdisk2` from an existing virtual disk named `vdisk1` that is stored in the repository named `vrepo1`:

```
oakcli clone vdisk my_vdisk2 -repo vrepo1 -src vdisk1
```

oakcli delete vdisk

Use the `oakcli delete vdisk` command to delete a virtual disk from a shared repository on Oracle Database Appliance Virtualized Platform.

Syntax

```
oakcli delete vdisk vdisk_name -repo repository_name [-h]
```

Parameters

Parameter	Description
vdisk_name	Name assigned to the virtual disk
-repo *repository_name*	Name of the shared repository where the virtual disk was created
-h	(Optional) Display help for using the command.

Example

Remove a virtual disk named `t2g` from the shared repository named `repoprod1`:

```
oakcli delete vdisk t2g -repo repoprod1
```

oakcli show vdisk

Use the `oakcli show vdisk` command to display information about virtual disks on Oracle Database Appliance Virtualized Platform.

Syntax

```
oakcli show vdisk [vdisk_name -repo repository_name] [-h]
```

Parameters

Parameter	Description
vdisk_name	(Optional) Display information for just one virtual disk.
-repo *repository_name*	Required parameter if a virtual disk is specified in the command
-h	(Optional) Display help for using the command.

Examples

Here are examples of how to use the `oakcli show vdisk` command.

Example 17-45 Displaying Information for All Virtual Disks

Display information about all virtual disks on Oracle Database Appliance Virtualized Platform:

```
# oakcli show vdisk

    NAME                          SIZE     TYPE     REPOSITORY
    myvdisk                      10G      local   vdiskrepo
    newv                         1G       local   vdiskrepo
```

Example 17-46   Displaying Information for a Single Virtual Disk

Display information for the virtual disk named *myvdisk*1:

```
# oakcli show vdisk myvdisk1
Resource: myvdisk_vdiskrepo
        Name          :     myvdisk_vdiskrepo
        RepoName      :     vdiskrepo
        Size          :     10G
        Type          :     local
        VmAttached    :     0
```

oakcli Virtual Machine Commands

Use the oakcli virtual machine commands to list and manage virtual machines (VMs).

- oakcli clone vm
  Use the `oakcli clone vm` command to create clones and snap clones of virtual machines.
- oakcli configure vm
  Use the `oakcli configure vm` command to configure a virtual machine on Oracle Database Appliance Virtualized Platform and to increase or decrease resource allocation to user domains.
- oakcli delete vm
  Use the `oakcli delete vm` command to delete a virtual machine.
- oakcli migrate vm
  Use the `oakcli migrate vm` command to migrate a currently running virtual machine to another node.
- oakcli modify vm
  Use the `oakcli modify vm` command to modify an existing virtual machine.
- oakcli show vm
  Use the `oakcli show vm` command to display information about virtual machines.
- oakcli show vmconsole
  Use the `oakcli show vmconsole` command to open a GUI virtual machine console to manage a specific virtual machine.
- oakcli start vm
  Use the `oakcli start vm` command to start a virtual machine on a node.

oakcli clone vm

Use the `oakcli clone vm` command to create clones and snap clones of virtual machines.

Syntax

To create a virtual machine from a template:

```
oakcli clone vm vm_name -vmtemplate template_name -repo repo_name [-
node 0|1] [-driverdomain]
```

To create a snapshot clone of an existing virtual machine:

```
oakcli clone vm vm_name -vm src_vm_name -snap [-force] [-driverdomain]
```

To create a virtual machine snapshot from a template:

```
oakcli clone vm <vm_name> -vmtemplate src_vmtempl_name -snap [-
driverdomain]
```

Parameters

Parameter	Description
`-vm`*vm_name*	Identifies the name given to the new cloned virtual machine.
`-vmtemplate` *template_name*	Identifies the name of the template containing the virtual machine that you want to clone.
`-repo` *repo_name*	Identifies the name of the repository that contains the template being cloned.
`-node` *0* | *1*	Identifies the Oracle Database Appliance node that contains the shared repository from which the virtual machine is to be cloned.
`-vm` *src_name*	Identifies the name of the virtual machine that is to be cloned.
`-snap`	(Optional) Creates a snapshot of the source virtual machine or virtual machine template.
`-driverdomain`	(Optional) Creates the virtual machine with the driver domain option. The driver domain option improves performance by enabling guest virtual machines to use `ODA_BASE` instead of `Dom0` to access virtual disks. Newly created virtual disks are mounted directly from `ODA_BASE` to a guest virtual machine.
`-force`	(Optional) When cloning a source virtual machine, the `-force` option enables you to make a change from the source virtual machine. For example, if the source file does not use a driver domain, you can use `-force -driverdomain` to create a clone virtual machine that does use the driver domain.
`-h`	(Optional) Displays help for using the command.

Usage Notes

- The `-node` parameter must be used when you clone from a shared repository. The `-node` parameter is invalid for non-shared repositories.
- The virtual disk and `vm.cfg` files are stored in the following directories:
  - `Dom0`: `/Repositories/`*`vm_repo_name`*`/.ACFS/snaps/`*`vm_name`*`/VirtualMachines/`*`vm_name`*
  - `ODA_BASE`: `/app/sharedrepo/`*`vm_repo_name`*`/.ACFS/snaps/`*`vm_name`*`/VirtualMachines/`*`vm_name`*
- Live migration of driver domain virtual machines is not supported.
- The driver domain option is supported with the following guest operating systems:
  - Oracle Linux with the latest Unbreakable Enterprise Kernel 2 (UEK2), Unbreakable Enterprise Kernel 3 (UEK3), or Unbreakable Enterprise Kernel Release 4 (UEK R4).
  - Microsoft Windows with Oracle VM Windows PV Driver 3.4.1. Oracle VM Windows PV Driver 3.4.1 release is available for download on My Oracle Support as patch number 23346086.
  - Oracle Solaris 11.3 or higher x86.
- The driver domain only works when you add virtual disks to a guest virtual machine. When `-driverdomain` is specified, the cloned virtual machine is in driver domain mode. The corresponding virtual machine configuration file, `vm.cfg`, has the following disk entries:

  When `-driverdomain` is specified, the cloned virtual machine is in driver domain mode. The corresponding virtual machine configuration file, `vm.cfg`, has the following disk entries:

  ```
  disk = [u'file:/OVS/Repositories/repo5/.ACFS/snaps/vm10/
  VirtualMachines/

  vm10/System.img,xvda,w',

  u'file:/u01/app/sharedrepo/repo5/.ACFS/snaps/

  vm10/VirtualMachines/vm10/u01.img,xvdb,w,oakDom1']
  ```

  All disks, with the exception of the `xvda` boot disk, have the path from `oakDom1`, that is `odabase`.
- The driver domain functionality applies to non-system disks. Once a virtual machine is created in driver domain mode, any new vDisks are added in driver domain mode.
- To determine if a virtual machine is configured in driver domain mode, use the `oakcli show vm` *vmname* command. When the virtual machine is in driver mode, the output for the DriverDomain attribute is TRUE.

Example 17-47 Creating a Virtual Machine Image

Create a virtual machine image named myol6u_test from the virtual machine template named myol6u_15gb1, which is stored in the shared repository named repo2 on Node 0:

```
# oakcli clone vm myol6u_test -vmtemplate myol6u_15gb1 -repo repo2
-node 0
```

Example 17-48 Creating a Virtual Machine Image in Driver Domain Mode

Create a virtual machine image named myol6u_test from the virtual machine template named myol6u_15gb1, which is stored in the shared repository named repo2 on Node 0 in driver domain mode:

```
# oakcli clone vm myol6u_test -vmtemplate myol6u_15gb1 -repo repo2
-node 0 -driverdomain
```

oakcli configure vm

Use the oakcli configure vm command to configure a virtual machine on Oracle Database Appliance Virtualized Platform and to increase or decrease resource allocation to user domains.

You must restart the domain for the resource allocation change to take effect.

Syntax

```
oakcli configure vm name [-vcpu cpucount -maxvcpu maxcpu -cpuprio priority
-cpucap cap -memory memsize -maxmemory max_memsize -os sys -keyboard lang -mouse
mouse_type -domain dom -network netlist -autostart astart -disk disks -bootoption
bootstrap -cpupool pool -prefnode 0|1 -failover true|false][-h]
```

Parameters

Parameter	Description
name	The name assigned to the virtual machine.
-vcpu *cpucount*	Number of nodes assigned to the virtual machine. The range is 1 to 72. This number depends on your Oracle Database Appliance configuration
-maxvcpu *maxcpu*	Maximum number of CPUs that the virtual machine can consume. The range is 1 to 72. This number depends on your Oracle Database Appliance configuration.
-cpuprio *priority*	Priority for CPU usage, where larger values have higher priority. The range is 1 to 65535.
-cpucap *cap*	Percentage of a CPU the virtual machine can receive. The range is 10 to 100.
-memory *memsize*	Amount of memory given to the virtual machine: (1 to 248)G to (1to 760G) or (1 to 253952)M to (1 to 778240)M, based on RAM. The default is M.
-maxmemory *max_memsize*	Maximum amount of memory allowed for the virtual machine: (1 to 248)G to (1 to 760)G or (1-253952)M to (1-778240)M, based on RAM. The default is M.

Parameter	Description
`-os` *`sys`*	Operating system used by the virtual machine (WIN_2003, WIN_2008, WIN_7, WIN_VISTA, OTHER_WIN, OL_4, OL_5, OL_6, RHL_4, RHL_5, RHL_6, LINUX_RECOVERY, OTHER_LINUX, SOLARIS_10, SOLARIS_11, OTHER_SOLARIS, or NONE)
`-keyboard` *`lang`*	Keyboard used by virtual machine (en-us, ar, da, de, de-ch, en-gb, es, et, fi, fo, fr, fr-be, fr-ca, hr, hu, is, it, ja, lt, lv, mk, nl, n--be, no, pl, pt, pt-br, ru, sl, sv, th, or tr)
`-mouse` *`mouse_type`*	Mouse type used by the virtual machine (OS_DEFAULT, PS2_MOUSE, USB_MOUSE, or USB_TABLET)
`-domain` *`dom`*	Domain type from the following options: • Hardware virtualized guest (XEN_HVM) - The kernel or operating system is not virtualization-aware and can run unmodified. - Device drivers are emulated. • Para virtualized guest (XEN_PVM) - The guest is virtualization-aware and is optimized for a virtualized environment. - PV guests use generic, idealized device drivers. • Hardware virtualized guest (XEN_HVM_PV_DRIVERS) The PV drivers are hypervisor-aware and significantly reduce the overhead of emulated device input/output. • Hardware virtualized guest (UNKNOWN)
`-network` *`netlist`*	MAC address and list of networks used by the virtual machine
`-autostart` *`astart`*	Startup option for virtual machine (always, restore, or never)
`-disk` *`disks`*	List of disks (slot, disktype, and content) used by virtual machine
`-bootoption` *`bootstrap`*	Boot option used to bootstrap the virtual machine (DISK or CDROM)
`-cpupool` *`pool`*	Named CPU pool assigned to the virtual machine
`-prefnode 0|1`	Preferred node on which the virtual machine will attempt to start (Node 0 or Node 1). This parameter is only valid for virtual machines created in shared repositories.
`-failover true|false`	Allow (use the keyword "true") or disallow (use the keyword "false") the virtual machine to start or restart on a node other than the node defined by the `-prefnode` parameter. This parameter is only valid for virtual machines created in shared repositories.
`-h`	(Optional) Display help for using the command.

Usage Notes

- All of the parameters, except for *name*, are optional.
- You must include at least one optional parameter for the command to work.
- When you create a virtual machine, select the Processor Cap as a percentage, between 10 and 100%. The default is 100%. This value is then converted to a CPU utilization limit in the `vm.cfg` file for the virtual machine. The value set in the `vm.cfg` file limits the amount of CPU a guest is allowed to consume. If the Processor Cap is set at 100% in Oracle VM, then the value set in `vm.cfg` is 0, which means there is no limit to CPU utilization.

See Also:

Oracle VM release 3.1 documentation contains more information about the options in the preceding table. Access the library at the following URL:

http://docs.oracle.com/cd/E27300_01

For example, refer to 2.8. Virtual Machines for information about the the `-domain` *`dom`* options:

http://docs.oracle.com/cd/E27300_01/E27309/html/vmusg-ovm-vms.html

Changing the Number of Virtual CPUs

This command example changes the number of virtual CPUs to 3, and changes the virtual memory size to 4 GB in a virtual machine named `odarep01`:

```
oakcli configure vm odarep01 -vcpu 3 -memory 4196
```

oakcli delete vm

Use the `oakcli delete vm` command to delete a virtual machine.

Syntax

```
oakcli delete vm vm_name [-server node_number] [-h]
```

Parameters

Parameter	Description
`vm` *`vm_name`*	(Optional) Name of the virtual machine to be deleted
`-server` *`node_number`*	(Optional) Oracle Database Appliance node from which you want to remove the virtual machine. If this optional parameter is not included, then the virtual machine is removed from both nodes.
`-h`	(Optional) Display help for using the command.

Example

Delete the `ovu22` virtual machine from Node 1:

```
oakcli delete vm ovu22 -server 1
```

oakcli migrate vm

Use the `oakcli migrate vm` command to migrate a currently running virtual machine to another node.

Syntax

```
oakcli migrate vm vmname [-h]
```

Parameters

Parameter	Description
vmname	Name of the virtual machine to be migrated
`-h`	(Optional) Display help for using the command.

oakcli modify vm

Use the `oakcli modify vm` command to modify an existing virtual machine.

Syntax

```
oakcli modify vm vmname [-attachvdisk|-deletenetworknetwork_name] [-s
key1:value1;key2:value2;...] [-addnetwork|-deletenetworknetwork_name] [-
h]
```

Parameters

Parameter	Description
`-attachvdisk`*vdisk_name*	(Optional) Attaches the named VDisk (virtual disk) to the named virtual machine.
`-detachvdisk`*vdisk_name*	(Optional) Detaches the named VDisk disk from the named virtual machine.
`-s` *key1*`:`*value1*`;`*key2*`:`*value2*`;...`	(Optional) Identifies a message consisting of one or more semicolon separated key:value pairs to send to the ovmd utility. Each key and value is separated by a colon (:) and each key/ value pair is separated from the next key/value pair by quotation marks.
`-addnetwork`*network_name*	(Optional) Adds a network to the named virtual machine.
`-deletenetwork`*network_name*	(Optional) Removes a network from the named virtual machine. This option is enabled only on Oracle Database Appliance X8-2 hardware models.
`-h`	(Optional) Displays help for using the command.

Usage Notes

- Do not use the `-attachvdisk` or the `-detachvdisk` option with the `-addnetwork`, `-deletenetwork`, or `-s` parameters.
- Include only one of the `-addnetwork`, `-deletenetwork`, or `-s` parameters when you use this command.

Example 17-49 Sending a Message to a Running Virtual Machine

Update the `root` user password for the *gc_11g* virtual machine:

```
oakcli modify vm gc_11g -s "com.oracle.linux.root-password:password"
```

oakcli show vm

Use the `oakcli show vm` command to display information about virtual machines.

Syntax

```
oakcli show vm [vm_name | -h]
```

Parameters

Parameter	Description
vm_name	(Optional) The name of the virtual machine for which details should be displayed. If you do not specify this parameter, then information for all the virtual machines is displayed.
-h	(Optional) Display help for using the command.

Usage Notes

When a virtual machine is configured in driver domain mode, the output of the `oakcli show vm` *vmname* command displays TRUE for the DriverDomain attribute.

Examples

Here are examples of how to use the `oakcli show vm` command.

Example 17-50 Displaying Details for All Virtual Machines

Display the virtual machine names, memory and vCPU allocations, status, virtual disks, and repository name for all virtual machines:

```
# oakcli show vm

NAME              NODENUM MEMORY VCPU STATE REPOSITORY
sample5_odarepo1 0       2048    2   OFFLINE odarepo1
sample6_odarepo1 0       2048    2   OFFLINE odarepo2
test1_odarepo1   0       2048    2   OFFLINE odarepo1
test2_odarepo2   1       2048    2   OFFLINE odarepo2
vm1_odarepo1     0       4096    4   ONLINE  odarepo1
vm2_odarepo2     1       2048    2   OFFLINE odarepo2
win_vm1          0       1500    1   ONLINE  odarepo1
```

Example 17-51 Displaying Information for a Single Virtual Machine

Display information about the *vm1_odarepo1* virtual machine:

```
oakcli show vm vm1_odarepo1
Resource: vm1_odarepo1
        AutoStart       :       restore
        CPUPriority     :       100
        Disks           :       |file:/OVS/Repositories/odarepo1/Vi
                                rtualMachines/vm1_odarepo1/System.i
                                mg,xvda,w||file:/OVS/Repositories/o
                                darepo1/VirtualMachines/vm1_odarepo
                                1/u01.img,xvdb,w|
        Domain          :       XEN_PVM
        ExpectedState   :       online
        FailOver        :       false
        IsSharedRepo    :       false
        Keyboard        :       en-us
        MaxMemory       :       3000
        MaxVcpu         :       4
        Memory          :       4096
        Mouse           :       OS_DEFAULT
        Name            :       vm1_odarepo1
        Networks        :       |mac=00:21:F6:00:00:E4|
        NodeNum         :       0
        NodeNumStart    :
        OS              :       OL_5
        PrivateIP       :       None
        ProcessorCap    :       100
        RepoName        :       odarepo1
        State           :       Online
        TemplateName    :       otml_sample1_odarepo1
        Vcpu            :       4
        cpupool         :       twocpu
        vncport         :       5901
```

oakcli show vmconsole

Use the `oakcli show vmconsole` command to open a GUI virtual machine console to manage a specific virtual machine.

Syntax

```
oakcli show vmconsole vm_name [-h]
```

Parameters

Parameter	Description
vm_name	Name of the virtual machine for which you want to open a console.
`-h`	(Optional) Display help for using the command.

Example 17-52 Opening a Virtual Machine Console

Open a console for the virtual machine named `vm1_odarepo1`:

```
oakcli show vmconsole vm1_odarepo1
```

oakcli start vm

Use the `oakcli start vm` command to start a virtual machine on a node.

Syntax

```
oakcli start vm vm_name [-node node_number] [-d] [-h]
```

Parameters

Parameter	Description
`vm_name`	*`vm_name`* is the name of the virtual machine to be started.
`-node` *`node_number`*	Specifies the node on which to start the virtual machine. *`node_number`* is the number of the node where it is to be started, either 0 or 1. If `-node` is not specified, a virtual machine is started on both nodes.
`-d`	Provides details about the virtual machine starting procedure
`-h`	(Optional) Display help for using the command.

Example 17-53 Starting a Virtual Machine on Node 0

Start the virtual machine named `vm1_odarepo1` on Node 0.

```
oakcli start vm vm_odarepo1 -node 0
```

oakcli Virtual Machine Template Commands

Use the oakcli Virtual Machine template commands to list and manage virtual machine (VM) templates.

- oakcli configure vmtemplate
  Use the `oakcli configure vmtemplate` command to configure a virtual machine template on Oracle Database Appliance Virtualized Platform.
- oakcli delete vmtemplate
  Use the `oakcli delete vmtemplate` command to delete a virtual machine template.
- oakcli import vmtemplate
  Use the `oakcli import vmtemplate` command to import virtual machine templates.
- oakcli modify vmtemplate
  Use the `oakcli modify vmtemplate` command to add networks to or delete networks from an existing virtual machine template.
- oakcli show vmtemplate
  Use the `oakcli show vmtemplate` command to display information about virtual machine templates.

oakcli configure vmtemplate

Use the `oakcli configure vmtemplate` command to configure a virtual machine template on Oracle Database Appliance Virtualized Platform.

Syntax

```
oakcli configure vmtemplate name [-vcpu cpucount -maxvcpu maxcpu -
cpuprio priority -cpucap cap -memory memsize -maxmemory max_memsize -os
sys -keyboard
 lang -mouse mouse_type -domain dom -network netlist -disk disks][h]
```

Parameters

Parameter	Description
name	Name assigned to the virtual machine template
`-vcpu` *cpucount*	Number of nodes assigned to virtual machines cloned from the template.
`-maxvcpu` *maxcpu*	Maximum number of CPUs that virtual machines cloned from the template can consume.
`-cpuprio` *priority*	Priority for CPU usage, where larger values have higher priority (1 to 256).
`-cpucap` *cap*	Percentage of a CPU that virtual machines cloned from the template can receive (1 to 100).
`-memory` *memsize*	Amount of memory given to virtual machines cloned from the template (1G to 88 G or 1M to 90112M)
`-maxmemory` *max_memsize*	Maximum amount of memory allowed for virtual machines cloned from the template
`-os` *sys*	Operating system used by virtual machines cloned from the template (WIN_2003, WIN_2008, WIN_7, WIN_VISTA, OTHER_WIN, OL_4, OL_5, OL_6, RHL_4, RHL_5, RHL_6, LINUX_RECOVERY, OTHER_LINUX, SOLARIS_10, SOLARIS_11, OTHER_SOLARIS, or NONE)
`-keyboard` *lang*	Keyboard used by virtual machines cloned from the template (en-us, ar, da, de, de-ch, en-gb, es, et, fi, fo, fr, fr-be, fr-ca, hr, hu, is, it, ja, lt, lv, mk, nl, n--be, no, pl, pt, pt-br, ru, sl, sv, th, or tr)
`-mouse` *mouse_type*	Mouse type used by virtual machines cloned from the template (OS_DEFAULT, PS2_MOUSE, USB_MOUSE, or USB_TABLET)

Parameter	Description
`-domain` *`dom`*	Domain type from the following options: • Hardware virtualized guest (XEN_HVM) - The kernel or operating system is not virtualization-aware and can run unmodified. - Device drivers are emulated. • Para virtualized guest (XEN_PVM) - The guest is virtualization-aware and is optimized for a virtualized environment. - PV guests use generic, idealized device drivers. • Hardware virtualized guest (XEN_HVM_PV_DRIVERS) The PV drivers are hypervisor-aware and significantly reduce the overhead of emulated device input/output.
`-network` *`netlist`*	MAC address and list of networks used by virtual machines cloned from the template
`-disk` *`disks`*	List of disks (slot, disktype, and content) used by virtual machines cloned from the template
`-h`	(Optional) Display help for using the command.

Usage Notes

- All of the parameters, except for *`name`*, are optional.
- You must include at least one optional parameter for the command to work.

> **See Also::**
>
> Oracle VM Release 3.1 documentation, which is available at the following URL:
>
> http://docs.oracle.com/cd/E27300_01 for more information about the options in the preceding table.
>
> For example, see 2.8. Virtual Machines for details about the option `-domain` *`dom`*
>
> http://docs.oracle.com/cd/E27300_01/E27309/html/vmusg-ovm-vms.html

Setting Values for a Virtual Machine

Set values for the following configuration values in the virtual machine template named `myol5u7_10gb`:

```
oakcli configure vmtemplate myol5u7_10gb
-vcpu 2 -maxvcpu 4 -cpucap 40 -memory 1536M -maxmemory 2G
-network "['type=netfront,bridge=net1']" -os OTHER_LINUX
```

- `-vcpu 2` = Two CPUs will assigned when the virtual machine starts up
- `-maxvcpu 4` = The maximum number of CPUs that can be assigned to the virtual machine is 4.

- `-cucap 40` = The maximum percentage of a CPU's capacity that will be assigned to the virtual machine is 40%.
- `-memory 1536M` = The amount of memory assigned when the virtual machine starts up is 1536 MB.
- `-maxmemory 2G` = The maximum amount of memory that can be assigned to the virtual machine is 2 GB.
- `-network type=netfront,bridge=net1` = This is the list of networks used by virtual machines cloned from the template.
- `-os` = The operating system used by the virtual machine is OTHER_LINUX.

oakcli delete vmtemplate

Use the `oakcli delete vmtemplate` command to delete a virtual machine template.

Syntax

```
oakcli delete vmtemplate template_name [-server=node_number][-h]
```

Parameters

Parameter	Description
`template_name`	Name of the virtual machine template to be removed
`-server` *`node_number`*	(Optional) Oracle Database Appliancenode from which you want to remove the virtual machine template. If this optional parameter is not included, then the virtual machine template is removed from both nodes.
`-h`	(Optional) Display help for using the command.

Example

Delete the `ovu22` virtual machine template from both nodes:

```
oakcli delete vmtemplate ovu22
```

oakcli import vmtemplate

Use the `oakcli import vmtemplate` command to import virtual machine templates.

Syntax

```
oakcli import vmtemplate vmtemplatename -files image_files | -assembly
assembly_file -repo repo_name [- node 0 | 1 ][-h]
```

Parameters

Parameter	Description
`vmtemplatename`	Name that you want to assign to the template

Parameter	Description
`-files`	Use the `-files` option when importing one or more files that comprise a template.
`image_files`	*`image_files`* is one of the following: • A single template file name • A comma-separated list of files that comprise a single template • A URL enclosed in single quotation marks that links to a template file
`-assembly`	Use the `-assembly` option when importing an assembly file.
`assembly_file`	An assembly file, or a URL enclosed in single quotation marks, that links to an assembly file
`repo_name`	Name of the repository to store the template or templates that you are importing
`-node`	When you are importing to a shared repository, use the `-node` option with a value of 0 or 1 to identify the node.
`-h`	(Optional) Display help for using the command.

Usage Notes

- Include only one of the options, `-files` or `-assembly`, each time you run this command. You cannot include both of these options in the same statement.
- If the command imports more than one template from an assembly, then each template will automatically be given a unique name. These template names will include the name given in the `vmtemplate` *`vmtemplatename`* clause followed by a sequence number, such as *`vmtemplatename1`*, *`vmtemplatename2`*, and *`vmtemplatename3`*.
- When importing into a shared repository, you must include the `-node` option with a valid node number, 0 or 1. Using the `-node` option for imports into non-shared repositories will cause the command to fail.

Examples

Here are examples of how to use the `oakcli import vmtemplate` command.

Example 17-54 Importing a Virtual Machine Template from Dom0

Import the required template (`OVM_OL5U7_X86_64_PVM_10GB.tgz`) from the `/OVS` directory in Dom0 into the `odarepo1` repository and name the template file `OL5U7`:

```
oakcli import vmtemplate OL5U7 -files /OVS/
OVM_OL5U7_X86_64_PVM_10GB.tgz -repo odarepo1
```

Example 17-55 Importing a Virtual Machine Template from a Remote Server

Import a template from a remote server using a URL to identify the server and the template file:

```
oakcli import vmtemplate OL5U6 -files 'http://example.com/vm-template/
OEL-5/OVM_OL5U6_X86_64_PVM_10GB.tgz' -repo odarepo2
```

Example 17-56 Importing Virtual Machine Templates from an Assembly on a Remote Server

Import the templates contained in the assembly file stored on a remote server at the URL provided into the odarepo1 repository:

```
oakcli import vmtemplate OL6U1 -assembly 'http://example.com/assemblies/
OEL6/OVM_OL6U1_x86_PVHVM.ova' -repo odarepo1
```

Example 17-57 Importing Virtual Machine Templates Into a Shared Repository From an Assembly on a Remote Server

Import the templates contained in the assembly file stored on a remote server at the URL provided into a shared repository named repo4 on Node 1:

```
oakcli import vmtemplate OL6U1 -assembly 'http://example.com/assemblies/
OEL6/OVM_OL6U1_x86_PVHVM.ova' -repo repo4 -node 1
```

oakcli modify vmtemplate

Use the `oakcli modify vmtemplate` command to add networks to or delete networks from an existing virtual machine template.

Syntax

```
oakcli modify vmtemplate vmtemplatename [-addnetwork|-
deletenetworknetwork_name] [-h]
```

Parameters

Parameter	Description
-addnetwork*network_name*	(Optional) Adds a network to the named virtual machine template
-deletenetwork*network_name*	(Optional) Deletes a network from the named virtual machine template. This option is enabled only on Oracle Database Appliance X8-2 hardware models.
-h	(Optional) Displays help for using the command.

Example 17-58 Modifying the Network Defined in a Virtual Machine Template

Replace the network assigned to the *gc_18c* virtual machine template with the *net1* network:

```
oakcli modify vmtemplate gc_18c -addnetwork net1
```

oakcli show vmtemplate

Use the `oakcli show vmtemplate` command to display information about virtual machine templates.

Syntax

```
oakcli show vmtemplate [vmtemplate_name | -h]
```

Parameters

Parameter	Description
vmtemplate_name	(Optional) The name of the virtual template for which details should be displayed. If you do not specify this parameter, then information for all of the virtual templates is displayed.
-h	(Optional) Display help for using the command.

Example 17-59 Display Information About a Virtual Template

Display information about the `sample1_odarepo1` virtual template:

```
# oakcli show vmtemplate sample_odarepo1
Resource: sample1_odarepo1
        CPUPriority     :       100
        Disks           :       |file:/OVS/Repositories/odarepo1/Te
                                mplates/otml_sample1_odarepo1/Syste
                                m.img,xvda,w||file:/OVS/Repositorie
                                s/odarepo1/Templates/otml_sample1_o
                                darepo1/u01.img,xvdb,w|
        Domain          :       XEN_PVM
        Keyboard        :       en-us
        MaxMemory       :       2048
        MaxVcpu         :       2
        Memory          :       2048
        Mouse           :       OS_DEFAULT
        Name            :       sample1_odarepo1
        Networks        :       |bridge=priv1||bridge=net1||bridge=
                                net2|
        NodeNum         :       0
        OS              :       OL_5
        ProcessorCap    :       100
        RepoName        :       odarepo1
        Vcpu            :       2
```

oakcli VLAN Management Commands for Virtual Platform

Use the oakcli VLAN commands to list and manage virtual local area networks (VLANs) on an Oracle Database Appliance virtualized platform.

- oakcli create vlan
  Use the `oakcli create vlan` command to create a new virtual local area network (VLAN) on an Oracle Database Appliance Virtualized Platform node.
- oakcli delete vlan
  Use the `oakcli delete vlan` command to delete a virtual local area network.

- oakcli show vlan
  Use the `oakcli show vlan` command to display information about virtual local area networks (VLANs) configured on Oracle Database Appliance.

oakcli create vlan

Use the `oakcli create vlan` command to create a new virtual local area network (VLAN) on an Oracle Database Appliance Virtualized Platform node.

Syntax

```
oakcli create vlan vlan_name -vlanid tag_id -if interface_name -node
0|1 [-h]
```

Parameters

Parameter	Description
vlan_name	Name assigned to the VLAN.
-vlanid *tag_id*	Tag number, used for packet routing, from 2 to 4096 inclusive. It uniquely identifies the VLAN on a node. You assign the ID and you can use the same tag number on both nodes.
-if *interface_name*	Name of the interface on which the VLAN network is created
-node 0 | 1	Node on which the VLAN is created, either Node0 or Node1.
-h	(Optional) Display help for using the command.

Usage Notes

- You can assign VLANs to ODA_BASE during the deployment.
- The VLAN for the ODA_BASE is created from DOM-0.
- Only execute the VLAN created in Dom-0 from Node0.
- VLAN creation in dom0 should be executed only from Node 0.

Examples

Here are examples of how to use the `oakcli create vlan` command.

Creating a New VLAN

Create a VLAN named `sample10` on Node 1 using the `bond1` interface and a tag with the number `10`:

```
oakcli create vlan sample10 -vlanid 10 -if bond1 -node 1
```

Duplicating a VLAN on the Second Node

Create a VLAN named `sample10` on Node 0:

```
oakcli create vlan sample10 -vlanid 10 -if bond1 -node 0
```

oakcli delete vlan

Use the `oakcli delete vlan` command to delete a virtual local area network.

Syntax

```
oakcli delete vlan vlan_name -node node_number [-h]
```

Parameters

Parameter	Description
`vlan` *`vlan_name`*	Name of the virtual local area network to be deleted
`-node` *`node_number`*	Oracle Database Appliance node from which you want to remove the virtual local area network
`-h`	(Optional) Display help for using the command.

Example

Delete the `sample1` virtual local area network from Node 1:

```
oakcli delete vlan sample1 -node 1
```

oakcli show vlan

Use the `oakcli show vlan` command to display information about virtual local area networks (VLANs) configured on Oracle Database Appliance.

Syntax

```
oakcli show vlan [-h]
```

Parameter

(Optional) `-h` displays help for using the command.

Example 17-60 Displaying Details of Available Virtual Area Networks (VLANs)

Display the names, tag ID numbers, networks, and node assignments for the available virtual local area networks:

```
# oakcli show vlan
        NAME                     ID    INTERFACE   NODENUM

        net1                     1     bond1       0
        net1                     1     bond1       1
        net2                     1     bond2       0
        net2                     1     bond2       1
        net3                     1     bond3       0
        net3                     1     bond3       1
        net4                     1     xbond0      0
        net4                     1     xbond0      1
```

```
priv1                   1     bond0       0
priv1                   1     bond0       1
```

18

Oracle Database Appliance Command-Line Interface for KVM

Use `odacli` commands to manage Oracle Linux Kernel-based Virtual Machine (KVM) on Oracle Database Appliance.

- About Command-Line Interface for Kernel-Based Virtual Machine (KVM)
  The `odacli` commands are the primary method for performing database and system administration on Oracle Database Appliance Kernel-Based Virtual Machine (KVM).
- odacli VM Storage Commands for KVM
  Use the odacli virtual machine storage commands to manage storage on Oracle Database Appliance for Oracle KVM.
- odacli Virtual Disk Commands for Oracle KVM
  Use the odacli virtual disk commands to manage virtual disks on Oracle Database Appliance for Oracle KVM.
- odacli CPU Pool Commands for Bare Metal and KVM
  Use odacli commands to manage resource allocations on Oracle Database Appliance for bare metal and KVM deployments.
- odacli VM Network Commands for KVM
  Use the odacli virtual machine network commands to manage network on Oracle Database Appliance for Oracle KVM.
- odacli Virtual Machine Commands for Oracle KVM
  Use the odacli virtual machine commands to manage virtual machines on Oracle Database Appliance for Oracle KVM.

About Command-Line Interface for Kernel-Based Virtual Machine (KVM)

The `odacli` commands are the primary method for performing database and system administration on Oracle Database Appliance Kernel-Based Virtual Machine (KVM).

You can perform the following tasks with ODACLI commands on Kernel-Based Virtual Machine (KVM):

- Manage VM instances
- Manage VM storage
- Manage virtual disks
- Manage virtual network
- Manage CPU pools

ODACLI Command Location and Path Configuration

The `odacli` command-line interface is in the following directory:

```
/opt/oracle/dcs/bin/odacli
```

Configure the `root` user account on your Oracle Database Appliance servers to have the `PATH` variable defined to search for odacli commands in the path `/opt/oracle/dcs/bin/odacli`.

ODACLI Syntax

Oracle Appliance Manager command-line interface commands and parameters are case-insensitive.

An `odacli` command uses the following command syntax:

```
odacli command object [options]
```

- *`command`* is an action you want to perform on the appliance. For example: `show`, `locate`, `apply`.
- *`object`* is the target or object on which the `odacli` command performs the operation. For example, you issue a command to create or configure a virtual disk, or a network, or perform other system or software administration. You can also use object abbreviations.
- *`options`* are optional parts of the `odacli` command. Options can consist of one or more options that extend the use of the `odacli` command carried out on an object. Options include additional information about the action that you want to perform on the object. Option names are preceded with a dash. Many options require the name of an object for the command to perform the action that you want to carry out. The help option (`-h`) is an option that is available with every command. When you include the `-h` option, you can obtain additional information about the command that you want to perform.

Oracle Appliance Manager Command-Line Interface Help

Run the following command to see the usage information for all `odacli` commands available for your Oracle Database Appliance:

```
odacli -h
```

Run the following command to see detailed help about a specific `odacli` command:

```
odacli command -h
```

Run the following command to see detailed help about a specific `odacli` command carried out on an object, and the options that are available for you to use with that object.

```
odacli command object -h
```

odacli VM Storage Commands for KVM

Use the odacli virtual machine storage commands to manage storage on Oracle Database Appliance for Oracle KVM.

- odacli create-vmstorage
  Use the `odacli create-vmstorage` command to create a new VM storage on Oracle Database Appliance Kernel-based Virtual Machine (KVM).
- odacli list-vmstorages
  Use the `odacli list-vmstorages` command to list all VM storages on Oracle Database Appliance Kernel-based Virtual Machine (KVM).
- odacli describe-vmstorage
  Use the `odacli describe-vmstorage` command to describe VM storage on Oracle Database Appliance Kernel-based Virtual Machine (KVM).
- odacli modify-vmstorage
  Use the `odacli modify-vmstorage` command to modify VM storage configuration on Oracle Database Appliance Kernel-based Virtual Machine (KVM).
- odacli delete-vmstorage
  Use the `odacli delete-vmstorage` command to delete a vmstorage configuration on Oracle Database Appliance Kernel-based Virtual Machine (KVM).

odacli create-vmstorage

Use the `odacli create-vmstorage` command to create a new VM storage on Oracle Database Appliance Kernel-based Virtual Machine (KVM).

Syntax

```
odacli create-vmstorage -n name -s size -dg disk_group [-j] [-h]
```

Parameters

Parameter	Description
`--name`, `-n`	Name assigned to the VM storage.
`--size`, `-s`	Specifies the storage size. Format is K|M|G|T. Minimum Size is 1024M (1G)
`--diskgroup`, `-dg`	(Optional) Defines the ASM disk group of the VM storage (Default: DATA).
`--json`, `-j`	(Optional) Displays output in JSON format.
`--help`, `-h`	(Optional) Displays help for using the command.

Example

Create a VM storage named `share1` of 8 GB.

```
# odacli create-vmstorage -n share1 -s 8G
```

odacli list-vmstorages

Use the `odacli list-vmstorages` command to list all VM storages on Oracle Database Appliance Kernel-based Virtual Machine (KVM).

Syntax

```
odacli list-vmstorages [-j] [-h]
```

Parameters

Parameter	Description
`--json`, `-j`	(Optional) Displays output in JSON format.
`--help`, `-h`	(Optional) Displays help for using the command.

Example

```
# odacli list-vmstorages
```

odacli describe-vmstorage

Use the `odacli describe-vmstorage` command to describe VM storage on Oracle Database Appliance Kernel-based Virtual Machine (KVM).

Syntax

```
odacli describe-vmstorage -n name [-j] [-h]
```

Parameters

Parameter	Description
`--name`, `-n`	Specifies the name of the VM storage.
`--json`, `-j`	(Optional) Displays output in JSON format.
`--help`, `-h`	(Optional) Displays help for using the command.

Example: Describing a VM Storage named `share1`

```
# odacli describe-vmstorage -n share1
```

odacli modify-vmstorage

Use the `odacli modify-vmstorage` command to modify VM storage configuration on Oracle Database Appliance Kernel-based Virtual Machine (KVM).

Syntax

```
odacli modify-vmstorage -n name -i increment [-j] [-h]
```

Parameters

Parameter	Description
`--name, -n`	Specifies the virtual disk name
`--increment, -i`	Incremental storage size to be modified. Format is K|M|G|T
`--json, -j`	(Optional) Displays output in JSON format.
`--help, -h`	(Optional) Displays help for using the command.

Example

Increase the size of a VM storage named `share1` by 10 gigabytes.

```
# odacli modify-vmstorage -n share1 -i 10G
```

odacli delete-vmstorage

Use the `odacli delete-vmstorage` command to delete a vmstorage configuration on Oracle Database Appliance Kernel-based Virtual Machine (KVM).

Syntax

```
 odacli delete-vmstorage -n name [-f] [-j] [-h]
```

Parameters

Parameter	Description
`--name, -n`	Specifies the vmstorage name to be deleted
`--force, -f`	(Optional) Specifies the force option
`--json, -j`	(Optional) Displays output in JSON format.
`--help, -h`	(Optional) Displays help for using the command.

Example

Delete a VM storage named `share1`.

```
odacli delete-vmstorage -n share1
```

odacli Virtual Disk Commands for Oracle KVM

Use the odacli virtual disk commands to manage virtual disks on Oracle Database Appliance for Oracle KVM.

- odacli create-vdisk
  Use the `odacli create-vdisk` command to create a new virtual disk in a VM storage on Oracle Database Appliance Kernel-based Virtual Machine (KVM).
- odacli list-vdisks
  Use the `odacli list-vdisks` command to list all virtual disks on Oracle Database Appliance Kernel-based Virtual Machine (KVM).

- odacli describe-vdisk
  Use the `odacli describe-vdisk` command to describe a virtual disk on Oracle Database Appliance Kernel-based Virtual Machine (KVM).
- odacli modify-vdisk
  Use the `odacli modify-vdisk` command to modify a virtual disk on Oracle Database Appliance Kernel-based Virtual Machine (KVM).
- odacli clone-vdisk
  Use the `odacli clone-vdisk` command to clone a virtual disk on Oracle Database Appliance Kernel-based Virtual Machine (KVM).
- odacli delete-vdisk
  Use the `odacli delete-vdisk` command to delete a virtual disk on Oracle Database Appliance Kernel-based Virtual Machine (KVM).

odacli create-vdisk

Use the `odacli create-vdisk` command to create a new virtual disk in a VM storage on Oracle Database Appliance Kernel-based Virtual Machine (KVM).

Syntax

```
odacli create-vdisk -n name -vms vmstorage_name -s size -sh -sp [-j] [-h]
```

Parameters

Parameter	Description
`--name`, `-n`	Name assigned to the virtual disk that is unique within the name repository
`--vmstorage`, `-vms`	Name of the VM storage where the virtual disk will be created
`--size`, `-s`	Amount of storage to be assigned from the shared repository to the shared disk. The default unit is G (for gigabytes) and the minimum size is 500 M (for megabytes). Format is K|M|G|T
`--shareable`, `-sh`	(Optional) Sets the option of allowing the virtual disk to be shared by more than one virtual machine (`shared`)
`--sparse`, `-sp`	(Optional) Creates a sparse vdisk
`--json`, `-j`	(Optional) Displays output in JSON format.
`--help`, `-h`	(Optional) Displays help for using the command.

Example

Create a 2 GB non-sparse and shareable Virtual Disk named `vdisk1` inside the VM storage `vms1`.

```
odacli create-vdisk -n vdisk1 -vms vms1 -s 2G -sh
```

odacli list-vdisks

Use the `odacli list-vdisks` command to list all virtual disks on Oracle Database Appliance Kernel-based Virtual Machine (KVM).

Syntax

```
odacli list-vdisks [-j] [-h]
```

Parameters

Parameter	Description
`--json`, `-j`	(Optional) Displays output in JSON format.
`--help`, `-h`	(Optional) Displays help for using the command.

Example

```
odacli list-vdisks
```

odacli describe-vdisk

Use the `odacli describe-vdisk` command to describe a virtual disk on Oracle Database Appliance Kernel-based Virtual Machine (KVM).

Syntax

```
odacli describe-vdisk -n name [-j] [-h]
```

Parameters

Parameter	Description
`--name`, `-n`	Specifies the name of the virtual disk.
`--json`, `-j`	(Optional) Displays output in JSON format.
`--help`, `-h`	(Optional) Displays help for using the command.

Example: Describing a Virtual Disk named `vdisk1`

```
odacli describe-vdisk -n vdisk1
```

odacli modify-vdisk

Use the `odacli modify-vdisk` command to modify a virtual disk on Oracle Database Appliance Kernel-based Virtual Machine (KVM).

Syntax

```
odacli modify-vdisk -n name -i [-no-s|-s] [-j] [-h]
```

Parameters

Parameter	Description
--name, -n	Specifies the virtual disk name
--increment, -i	Defines the size to increase the virtual disk. Format is *value units*, units are K|M|G|T
-no-shareable, --no-s	(Optional) Set the Virtual Disk as non-shareable
--shareable, -s	(Optional) Set the Virtual Disk as shareable
--json, -j	(Optional) Displays output in JSON format.
--help, -h	(Optional) Displays help for using the command.

Example

Increase the size of a virtual disk named vdisk1 by 4 gigabytes.

```
# odacli modify-vdisk -n vdisk1 -i 4G
```

odacli clone-vdisk

Use the odacli clone-vdisk command to clone a virtual disk on Oracle Database Appliance Kernel-based Virtual Machine (KVM).

Syntax

```
odacli clone-vdisk -n name -cn clone_name [-j] [-h]
```

Parameters

Parameter	Description
--name, -n	Specifies the virtual disk name to be cloned
--clone-name, -cn	Specifies the name of the cloned virtual disk
--json, -j	(Optional) Displays output in JSON format.
--help, -h	(Optional) Displays help for using the command.

Example

Create a clone of a virtual disk named vdisk1, with the name vdisk1_clone. The cloned disk is created on the same storage as vdisk1.

```
# odacli clone-vdisk -n vdisk1 -cn vdisk1_clone
```

odacli delete-vdisk

Use the odacli delete-vdisk command to delete a virtual disk on Oracle Database Appliance Kernel-based Virtual Machine (KVM).

Syntax

```
odacli delete-vdisk -n name [-f] [-j] [-h]
```

Parameters

Parameter	Description
`--name`, `-n`	Specifies the virtual disk name to be deleted
`--force`, `-f`	(Optional) Specifies the force option
`--json`, `-j`	(Optional) Displays output in JSON format.
`--help`, `-h`	(Optional) Displays help for using the command.

Example

Delete a virtual disk named `vdisk1`.

```
# odacli delete-vdisk -n vdisk1
```

odacli CPU Pool Commands for Bare Metal and KVM

Use odacli commands to manage resource allocations on Oracle Database Appliance for bare metal and KVM deployments.

CPU pools enable management of CPU resources in both bare metal and KVM environments. There are two types of CPU pools, that is, BM and VM.

Use the BM CPU pool to ensure that the database on a bare metal host runs exclusively on the CPUs specified in the CPU pool.

Use the VM CPU pools to cage and manage CPU resource allocations to workloads for virtual machines. Workloads are isolated by creating CPU pools and assigning or pinning virtual machines to a specific CPU pool. When you pin a virtual machine to a CPU pool, you ensure that the virtual machine uses CPUs in only that CPU pool.

Resources in CPU pools cannot overlap, that is, CPU pools cannot share CPUs.

- odacli create-cpupool
  Use the `odacli create-cpupool` command to create a new CPU pool on Oracle Database Appliance Bare Metal or Kernel-based Virtual Machine (KVM) deployment.
- odacli list-cpupools
  Use the `odacli list-cpupools` command to list all CPU Pools on Oracle Database Appliance Bare Metal or Kernel-based Virtual Machine (KVM) deployment.
- odacli describe-cpupool
  Use the `odacli describe-cpupool` command to describe CPU Pools on Oracle Database Appliance Bare Metal or Kernel-based Virtual Machine (KVM) deployment.
- odacli modify-cpupool
  Use the `odacli modify-cpupool` command to modify a CPU Pool configuration on Oracle Database Appliance Bare Metal or Kernel-based Virtual Machine (KVM) deployment.

- odacli delete-cpupool
  Use the `odacli delete-cpupool` command to delete a CPU Pool configuration on Oracle Database Appliance Kernel-based Virtual Machine (KVM).
- odacli list-auditrecords
  Use the `odacli list-auditrecords` command to list the audit records for a CPU Pool on Oracle Database Appliance Bare Metal or Kernel-based Virtual Machine (KVM) deployment.
- odacli describe-auditrecord
  Use the `odacli describe-auditrecord` command to describe the audit record for a CPU Pool on Oracle Database Appliance Bare Metal or Kernel-based Virtual Machine (KVM) deployment.

odacli create-cpupool

Use the `odacli create-cpupool` command to create a new CPU pool on Oracle Database Appliance Bare Metal or Kernel-based Virtual Machine (KVM) deployment.

Syntax

```
odacli create-cpupool -n name -c {-bm|-vm} -nn node_name [-j] [-h]
```

Parameters

Parameter	Description
`--name, -n`	Specifies the CPU Pool name.
`--cores, -c`	Specifies the CPU Pool cores
`--bm, -bm`	Specifies the CPU Pool as Bare Metal
`--vm, -vm`	Specifies the CPU Pool as Virtual Machine.
`--node-name, -nn`	(Optional) Specifies the node where the CPU Pool will be created. On High-Availability deployment, if this option is not specified, then the CPU pool is created on both nodes.
`--json, -j`	(Optional) Displays output in JSON format.
`--help, -h`	(Optional) Displays help for using the command.

Usage Notes

- Attach the BM CPU pool to databases. Bare metal CPU pools can be assigned to multiple databases.
- Attach VM CPU pool VM guest machines. VM CPU pools can be assigned to multiple VMs.
- Resources in CPU pools cannot overlap, that is, CPU pools cannot share CPUs.
- After you create a BM CPU pool, you can associate this CPU pool to a database using the `create-database` or `modify-database` command.
- After you create a VM CPU pool, you can associate this CPU pool to a VM using the `create-vm` or `modify-vm` command.
- Number of cores mustbe an even number between 2 and the total number of available cores on the system.

Example

Create a BM CPU pool named `cpupool1` with 6 cores associated to it.

```
# odacli create-cpupool -n cpupool1 -c 6 -bm
```

Create a VM CPU pool named `cpupool2` with 6 cores associated to it.

```
# odacli create-cpupool -n cpupool2 -c 6 -vm
```

odacli list-cpupools

Use the `odacli list-cpupools` command to list all CPU Pools on Oracle Database Appliance Bare Metal or Kernel-based Virtual Machine (KVM) deployment.

Syntax

```
 odacli list-cpupools [-j] [-h]
```

Parameters

Parameter	Description
`--json`, `-j`	(Optional) Displays output in JSON format.
`--help`, `-h`	(Optional) Displays help for using the command.

Example

```
# odacli list-cpupools
```

odacli describe-cpupool

Use the `odacli describe-cpupool` command to describe CPU Pools on Oracle Database Appliance Bare Metal or Kernel-based Virtual Machine (KVM) deployment.

Syntax

```
 odacli describe-cpupool -n name [-j] [-h]
```

Parameters

Parameter	Description
`--name`, `-n`	Specifies the name of the CPU Pool.
`--json`, `-j`	(Optional) Displays output in JSON format.
`--help`, `-h`	(Optional) Displays help for using the command.

Example: Describing a CPU pool named `cpupool1`

```
# odacli describe-cpupool -n cpupool1
```

odacli modify-cpupool

Use the `odacli modify-cpupool` command to modify a CPU Pool configuration on Oracle Database Appliance Bare Metal or Kernel-based Virtual Machine (KVM) deployment.

Syntax

```
odacli modify-cpupool -n name -c cores -f -l [-j] [-h]
```

Parameters

Parameter	Description
`--name`, `-n`	Specifies the CPU Pool name
`--cores`, `-c`	Specifies the new number of CPU cores
`--force`, `-f`	(Optional) Forces the operation
`--live`, `-l`	(Optional) Applies the changes to running VMs
`--json`, `-j`	(Optional) Displays output in JSON format.
`--help`, `-h`	(Optional) Displays help for using the command.

Usage Notes

For VM CPU pool, if `--live` is not specified, then the changes are applied to the VM configuration file and will be activated next time the VM is started. If `--live` is specified, then the changes will be applied to both VM configuration file and to the running VM.

Example

Set the size of a CPU Pool `cpupool1` to 10. If --live is not specified, the change is applied to the VM configuration file and will be activated next time the VM is started.

```
# odacli modify-cpupool -n cpupool1 -c 10
```

odacli delete-cpupool

Use the `odacli delete-cpupool` command to delete a CPU Pool configuration on Oracle Database Appliance Kernel-based Virtual Machine (KVM).

Syntax

```
odacli delete-cpupool -n name -f [-j] [-h]
```

Parameters

Parameter	Description
`--name`, `-n`	Specifies the CPU Pool name to be deleted
`--force`, `-f`	(Optional) Forces deletion.
`--json`, `-j`	(Optional) Displays output in JSON format.
`--help`, `-h`	(Optional) Displays help for using the command.

Example

Delete a CPU pool named `cpupool1`.

```
# odacli delete-cpupool -n cpupool1
```

odacli list-auditrecords

Use the `odacli list-auditrecords` command to list the audit records for a CPU Pool on Oracle Database Appliance Bare Metal or Kernel-based Virtual Machine (KVM) deployment.

Syntax

```
 odacli list-auditrecords -du dcs-username -f from_date-range -l latest -n
node_ID -ot operation_type -ou OS_username -rn resource_name -rt resource_type
-t to_date-range [-j] [-h]
```

Parameters

Parameter	Description
`--dcs-user`, `-du`	(Optional) Specifies the DCS user name.
`--from`, `-f`	(Optional) Specfies the *from* date in the date range for the CPU pool audit records.
`--latest`, `-l`	(Optional) Specifies the latest number of CPU pool audit records.
`--node-id`, `-n`	(Optional) Specifies the node ID.
`--op-type`, `-ot`	(Optional) Specifies the type of operation.
`--os-user`, `-ou`	(Optional) Specifies the operating system user.
`--rsc-name`, `-rn`	(Optional) Specifies the resource name.
`--rsc-type`, `-rt`	(Optional) Specifies the resource type.
`--to`, `-t`	(Optional) Specfies the *to* date in the date range for the CPU pool audit records.
`--json`, `-j`	(Optional) Displays output in JSON format.
`--help`, `-h`	(Optional) Displays help for using the command.

Example

```
# odacli list-auditrecords
ID                                    Resource type        Resource
name          Operation type   DCS username     OS username
Timestamp
------------------------------------  --------------------
--------------------  ---------------  ---------------  ---------------
-----------------------
41295d99-f263-4284-b6d9-2aff1ae0f850  BM_CPU_POOL
testbmpool            CREATE           oda-admin        root
2020-10-08 13:27:05 UTC
0f07a013-5bb4-4cd8-bd49-04dc61fcd454  BM_CPU_POOL
pool_9f74a8e9-        DELETE           oda-admin        root
2020-10-08 12:26:30 UTC
d858269b-6c28-4bc2-af71-79004f3561e6  BM_CPU_POOL
pool_9f74a8e9-        CREATE           oda-admin        root
```

```
2020-10-08 12:24:36 UTC
9d7852c1-93fb-410e-9e0c-8c0a95ed3f0c  VM_CPU_POOL
pool_d48e81e4-        DELETE           oda-admin        root
2020-10-08 12:06:45 UTC
0235cc84-9345-40bc-ac4f-7de3f63202e2  VM_CPU_POOL
pool_4fe0b4f4-        DELETE           oda-admin        root
2020-10-08 12:06:45 UTC
762f7263-7bd9-4b12-b891-48305165bf36  VM_CPU_POOL
pool_4fe0b4f4-        MODIFY           oda-admin        root
2020-10-08 12:06:22 UTC
0bd2a25d-2327-4918-bd47-8c00f7406f92  VM_CPU_POOL
pool_4fe0b4f4-        MODIFY
```

odacli describe-auditrecord

Use the `odacli describe-auditrecord` command to describe the audit record for a CPU Pool on Oracle Database Appliance Bare Metal or Kernel-based Virtual Machine (KVM) deployment.

Syntax

```
 odacli describe-auditrecord -i [-j] [-h]
```

Parameters

Parameter	Description
`--id, -i`	Describes the ID of the audit record.
`--json, -j`	(Optional) Displays output in JSON format.
`--help, -h`	(Optional) Displays help for using the command.

Example

```
# odacli describe-auditrecord -i 41295d99-f263-4284-b6d9-2aff1ae0f850
Audit Record details
--------------------------------------------------------------------------------
 Event details
--------------------------
                Record ID:  41295d99-f263-4284-b6d9-2aff1ae0f850
         Record timestamp:  2020-10-08 13:27:05 UTC
             DCS username:  oda-admin
              OS username:  root
               Cluster ID:  test_cluster-c
                  Node ID:  test_cluster

 Resource/Operation
--------------------------
            Resource type:  BM_CPU_POOL
              Resource ID:  b17cb623-bf79-491f-86d8-d8502987e26c
            Resource name:  testbmpool
           Operation type:  CREATE
    Operation description:  Created with '2' cores and allocation
'test_cluster:1-2,17-18'
```

odacli VM Network Commands for KVM

Use the odacli virtual machine network commands to manage network on Oracle Database Appliance for Oracle KVM.

- odacli create-vnetwork
  Use the `odacli create-vnetwork` command to create a new network on Oracle Database Appliance Kernel-based Virtual Machine (KVM).
- odacli list-vnetworks
  Use the `odacli list-vnetworks` command to list all virtual networks on Oracle Database Appliance Kernel-based Virtual Machine (KVM).
- odacli describe-vnetwork
  Use the `odacli describe-vnetwork` command to describe virtual networks on Oracle Database Appliance Kernel-based Virtual Machine (KVM).
- odacli start-vnetwork
  Use the `odacli start-vnetwork` command to start a virtual network on Oracle Database Appliance Kernel-based Virtual Machine (KVM).
- odacli stop-vnetwork
  Use the `odacli stop-vnetwork` command to stop a virtual network on Oracle Database Appliance Kernel-based Virtual Machine (KVM).
- odacli modify-vnetwork
  Use the `odacli modify-vnetwork` command to modify a network on Oracle Database Appliance Kernel-based Virtual Machine (KVM).
- odacli delete-vnetwork
  Use the `odacli delete-vnetwork` command to delete a virtual network configuration on Oracle Database Appliance Kernel-based Virtual Machine (KVM).

odacli create-vnetwork

Use the `odacli create-vnetwork` command to create a new network on Oracle Database Appliance Kernel-based Virtual Machine (KVM).

Syntax

```
 odacli create-vnetwork -n name -if interface-name -t type -br bridge -g gateway
-ip IP-address -nm netmask -u uniform -vlan VLAN-network ID [-j] [-h]
```

Parameters

Parameter	Description
`--name, -n`	Specifies the virtual network name.
`--interface-name, -if`	Specifies the the network interface on the host. This can be physical interface or bonded interface.
`--type, -t`	Specifies the virtual network type. Values are bridged or bridged-vlan.
`--bridge, -br`	(Optional) Specifies the name of the bridge.
`--gateway, -gw`	(Optional) Specifies the virtual network gateway

Parameter	Description
`--ip`, `-ip`	(Optional) Specifies the virtual network addresses. For more than one address, use the format "*node0_ip,node1_ip,...*"
`--netmask`, `-nm`	(Optional) Specifies the virtual network netmask
`--uniform`, `-u`	(Optional) Specifies whether the virtual network is created on both nodes in a high-availability deployment
`--vlan-id`, `-vlan`	(Optional) Specifies the VLAN network ID
`--json`, `-j`	(Optional) Displays output in JSON format.
`--help`, `-h`	(Optional) Displays help for using the command.

Usage Notes

If you did not specify the IP address, or netmask, or gateway during vnetwork creation, then you can add them later using the `odacli modify-vnetwork` command.

Example

Create a VM network of type `bridged` using the interface `btbond2`.

```
# odacli create-vnetwork -n vnet1 -if btbond2 -type bridged
```

odacli list-vnetworks

Use the `odacli list-vnetworks` command to list all virtual networks on Oracle Database Appliance Kernel-based Virtual Machine (KVM).

Syntax

```
odacli list-vnetworks [-j] [-h]
```

Parameters

Parameter	Description
`--json`, `-j`	(Optional) Displays output in JSON format.
`--help`, `-h`	(Optional) Displays help for using the command.

Example

```
# odacli list-vnetworks
```

odacli describe-vnetwork

Use the `odacli describe-vnetwork` command to describe virtual networks on Oracle Database Appliance Kernel-based Virtual Machine (KVM).

Syntax

```
odacli describe-vnetwork -n [-j] [-h]
```

Parameters

Parameter	Description
`--name`, `-n`	Specifies the name of the virtual network.
`--json`, `-j`	(Optional) Displays output in JSON format.
`--help`, `-h`	(Optional) Displays help for using the command.

Example: Describing a VM Network named `vnet1`

```
# odacli describe-vnetwork -n vnet1
```

odacli start-vnetwork

Use the `odacli start-vnetwork` command to start a virtual network on Oracle Database Appliance Kernel-based Virtual Machine (KVM).

Syntax

```
odacli start-vnetwork -n name [-j] [-h]
```

Parameters

Parameter	Description
`--name`, `-n`	Specifies the virtual machine name to be stopped
`--json`, `-j`	(Optional) Displays output in JSON format.
`--help`, `-h`	(Optional) Displays help for using the command.

Example

Start a virtual network named `vnet1`.

```
# odacli start-vnetwork -n vnet1
```

odacli stop-vnetwork

Use the `odacli stop-vnetwork` command to stop a virtual network on Oracle Database Appliance Kernel-based Virtual Machine (KVM).

Syntax

```
odacli stop-vnetwork -n name [-j] [-h]
```

Parameters

Parameter	Description
`--name`, `-n`	Specifies the virtual network to be stopped
`--json`, `-j`	(Optional) Displays output in JSON format.
`--help`, `-h`	(Optional) Displays help for using the command.

Example

Stop a virtual network named vnet1.

```
# odacli stop-vnetwork -n vnet1
```

odacli modify-vnetwork

Use the `odacli modify-vnetwork` command to modify a network on Oracle Database Appliance Kernel-based Virtual Machine (KVM).

Syntax

```
 odacli modify-vnetwork -n name -if -t -br -gw -ip -nm -u -vlan [-j] [-h]
```

Parameters

Parameter	Description
`--name`, `-n`	Specifies the virtual network name.
`--gateway`, `-gw`	(Optional) Specifies the virtual network gateway
`--ip`, `-ip`	(Optional) Specifies the virtual network addresses. For more than one address, use the format "*node0_ip,node1_ip,...*"
`--netmask`, `-nm`	(Optional) Specifies the virtual network netmask
`--json`, `-j`	(Optional) Displays output in JSON format.
`--help`, `-h`	(Optional) Displays help for using the command.

Example

Modify a VM network to specify the gateway.

```
# odacli modify-vnetwork -n vnet1 -g 10.11.44.41
```

odacli delete-vnetwork

Use the `odacli delete-vnetwork` command to delete a virtual network configuration on Oracle Database Appliance Kernel-based Virtual Machine (KVM).

Syntax

```
 odacli delete-vnetwork -n name [-j] [-h]
```

Parameters

Parameter	Description
`--name`, `-n`	Specifies the vnetwork name to be deleted
`--json`, `-j`	(Optional) Displays output in JSON format.
`--help`, `-h`	(Optional) Displays help for using the command.

Example

Delete a VM network named vnet1.

```
# odacli delete-vnetwork -n vnet1
```

odacli Virtual Machine Commands for Oracle KVM

Use the odacli virtual machine commands to manage virtual machines on Oracle Database Appliance for Oracle KVM.

- odacli create-vm
  Use the `odacli create-vm` command to create a new virtual machine on Oracle Database Appliance Kernel-based Virtual Machine (KVM).
- odacli list-vms
  Use the `odacli list-vms` command to list all virtual machines on Oracle Database Appliance Kernel-based Virtual Machine (KVM).
- odacli describe-vm
  Use the `odacli describe-vm` command to describe a virtual machine on Oracle Database Appliance Kernel-based Virtual Machine (KVM).
- odacli modify-vm
  Use the `odacli modify-vm` command to modify a virtual machine on Oracle Database Appliance Kernel-based Virtual Machine (KVM).
- odacli start-vm
  Use the `odacli start-vm` command to start a virtual machine on Oracle Database Appliance Kernel-based Virtual Machine (KVM).
- odacli stop-vm
  Use the `odacli stop-vm` command to stop a virtual machine on Oracle Database Appliance Kernel-based Virtual Machine (KVM).
- odacli migrate-vm
  Use the `odacli migrate-vm` command to migrate a virtual machine on Oracle Database Appliance Kernel-based Virtual Machine (KVM).
- odacli clone-vm
  Use the `odacli clone-vm` command to clone a virtual machine configuration on Oracle Database Appliance Kernel-based Virtual Machine (KVM).
- odacli delete-vm
  Use the `odacli delete-vm` command to delete a virtual machine configuration on Oracle Database Appliance Kernel-based Virtual Machine (KVM).

odacli create-vm

Use the `odacli create-vm` command to create a new virtual machine on Oracle Database Appliance Kernel-based Virtual Machine (KVM).

Syntax

```
 odacli create-vm -n name -m memory -src source -vc vcpus -vms vmstorage -cp
cpupool -d description -g graphics
-mm max-mem-size -mvc max-vcpu-count -ost os-type -osv os_variant -pn
```

```
preferred_node -s disk_size -vd vdisks
-vn virtual_networks [-j] [-h]
```

Parameters

Parameter	Description
`--name, -n`	Specifies the VM name
`--memory, -st`	Specifies the size of the VM memory. The format is "value_unit". Unit is M|G.
`--source, -src`	Specifies the source installation. If local, it can be an ISO or a bootable disk image. If remote, it can be an URI pointing to an install tree hosted remotely over HTTP, HTTPS, FTP or NFS.
`--vcpus, -vc`	Specifies the number of vCPUs to use.
`--vmstorage, -vms`	Specifies the VM storage name
`--cpupool, -cp`	(Optional) Specifies the CPU pool name
`--description, -d`	(Optional) Specifies the VM description
`--extra-args, -ea`	(Optional) Specifies the extra arguments for the VM installer.
`--graphics, -g`	(Optional) Specifies the graphics settings for the VM
`--max-memory, -mm`	(Optional) Specifies the maximum size of the VM memory. The format is "value_unit". Unit is M|G.
`--max-vcpus, -mvc`	(Optional) Specifies the maximum number of VCPUs
`--os-type, -ost`	(Optional) Specifies the operating system type
`--os-variant, -osv`	(Optional) Specifies the operating system variant
`--pref-node, -pn`	(Optional) Specifies the preferred node to run the VM
`--size, -s`	(Optional) Specifies the size of the VM. The format is "value_unit". Unit is K|M|G|T.
`--vdisks, -vd`	(Optional) Specifies the names of the vdisks to use
`--vnetworks, -vn`	(Optional) Specifies the names of the virtual networks to use
`--json, -j`	(Optional) Displays output in JSON format.
`--help, -h`	(Optional) Displays help for using the command.

Usage Notes

Use the `--extra-args` parameter to add kickstart configuration file, kernel parameters for example, serial console. For example: `--extra-args "console=tty0 console=ttyS0,115200 ks=http://192.168.122.100:80/ks.txt"`

Example

Create a VM named `vm1` with 8 vcpus and 8 GB memory. The VM is stored in the VM Storage `vms1`. The source used for the installation is located on `/u01/OL7.iso`.

```
# odacli create-vm -n vm1 -vc 8 -m 8G -vms vs1 -src /u01/OL7.iso
```

odacli list-vms

Use the `odacli list-vms` command to list all virtual machines on Oracle Database Appliance Kernel-based Virtual Machine (KVM).

Syntax

```
odacli list-vms [-j] [-h]
```

Parameters

Parameter	Description
`--json, -j`	(Optional) Displays output in JSON format.
`--help, -h`	(Optional) Displays help for using the command.

Example

```
# odacli list-vms
```

odacli describe-vm

Use the `odacli describe-vm` command to describe a virtual machine on Oracle Database Appliance Kernel-based Virtual Machine (KVM).

Syntax

```
odacli describe-vm -n name [-j] [-h]
```

Parameters

Parameter	Description
`--name, -n`	Specifies the name of the virtual machine.
`--json, -j`	(Optional) Displays output in JSON format.
`--help, -h`	(Optional) Displays help for using the command.

Example: Describing a Virtual Machine named `vm1`

```
# odacli describe-vm -n vm1
```

odacli modify-vm

Use the `odacli modify-vm` command to modify a virtual machine on Oracle Database Appliance Kernel-based Virtual Machine (KVM).

Syntax

```
odacli modify-vm -n name -as -b boot_option -cfg -avd attach_vdisks -avn
attach_vnetworks -d description -dvd detach-vdisk -dvn detach-vnetworks -mm max-
memory -mvc max-vcpuc -m memory -no-cp -pn preferred-node -vc vcpu -di disk-
increment [-j] [-h]
```

Parameters

Parameter	Description
`--name`, `-n`	Specifies the VM name
`--autostart`, `-as`	(Optional) Specifies if the auto-start option must be set for the VM
`--no-autostart`, `-no-as`	(Optional) Disables the auto-start option for the VM
`--boot-option`, `-bo`	(Optional) Specifies the the boot option to use
`--config`, `-cfg`	(Optional) Specifies whether the changes persist.
`--live`, `-l`	(Optional) Indicates whether the specified changes take place live (true) or after the next boot (false). Default is false
`--cpu-pool`, `-cp`	(Optional) Specifies the CPU pool name
`--description`, `-d`	(Optional) Specifies the VM description
`--failover`, `-fo`	(Optional) Specifies the configuration for the failover
`--no-failover`, `-no-fo`	(Optional) Specifies the configuration for the failover
`--vcpus`, `-vc`	(Optional) Specifies the number of vCPUs.
`--memory`, `-m`	(Optional) Specifies the memory size of the VM. The format is "value_unit". Unit is M|G.
`--max-memory`, `-mm`	(Optional) Specifies the maximum memory size of the VM. The format is "value_unit". Unit is M|G.
`--max-vcpus`, `-mvc`	(Optional) Specifies the maximum number of vCPUs.
`--no-cpupool`, `-no-cp`	(Optional) Dissasociates the associated CPU Pool
`--detach-vdisk`, `-dvd`	(Optional) Specifies the names of the virtual disks to detach
`--detach-vnetworks`, `-dvn`	(Optional) Specifies the names of the virtual networks to detach
`--pref-node`, `-pn`	(Optional) Specifies the preferred node to run the VM
`--disk-increment`, `-di`	Specifies the change in size of the VM. The format is "value_unit". Unit is K|M|G|T.
`--attach-vdisks`, `-avd`	(Optional) Specifies the names of the vdisks to attach
`--attach-vnetworks`, `-avn`	(Optional) Specifies the names of the virtual networks to attach
`--json`, `-j`	(Optional) Displays output in JSON format.
`--help`, `-h`	(Optional) Displays help for using the command.

Usage Tips

- `--live`: The change is applied to the running VM instance, but does not persist after the VM stops.
- `--config`: The change persists in the configuration of VM instance and takes effect on subsequent reboots.
- If neither `--live` or `--config` is specified, then the default behavior is `--config`.
- You can specify both the `--live` or `--config` options if you want the modification to take effect immediately and on subsequent boots.

Example

Update the configuration of a VM named vm1, setting the CPU count to 2 and the maximum memory to 2 gigabytes on both the running VM and subsequent boots.

```
# odacli modify-vm -n vm1 -vc 6 -mm 6G --live --config
```

odacli start-vm

Use the `odacli start-vm` command to start a virtual machine on Oracle Database Appliance Kernel-based Virtual Machine (KVM).

Syntax

```
 odacli start-vm -n name -nn [-j] [-h]
```

Parameters

Parameter	Description
`--name, -n`	Specifies the virtual machine name to be stopped
`--node-name, -nn`	(Optional) Specifies the node name where the virtual machine will be started
`--json, -j`	(Optional) Displays output in JSON format.
`--help, -h`	(Optional) Displays help for using the command.

Usage Notes

- If `pref-node` is defined for the VM, then the VM starts on the `pref-node`. If `pref-node` is not defined for the VM, then the VM can start on any node, in a high-availability deployment.
- If you specify the node name `-n`, then the VM starts on the specified node, even if the preferred node is defined.

Example

Start a virtual machine named vm1.

```
# odacli start-vm -n vm1
```

odacli stop-vm

Use the `odacli stop-vm` command to stop a virtual machine on Oracle Database Appliance Kernel-based Virtual Machine (KVM).

Syntax

```
 odacli stop-vm -n name [-f] [-j] [-h]
```

Parameters

Parameter	Description
`--name, -n`	Specifies the virtual machine name to be stopped

Parameter	Description
`--force`, `-f`	(Optional) Specifies the force option
`--json`, `-j`	(Optional) Displays output in JSON format.
`--help`, `-h`	(Optional) Displays help for using the command.

Example

Stop a virtual machine named `vm1`.

```
# odacli stop-vm -n vm1
```

odacli migrate-vm

Use the `odacli migrate-vm` command to migrate a virtual machine on Oracle Database Appliance Kernel-based Virtual Machine (KVM).

Syntax

```
 odacli migrate-vm -n name -to node [-j] [-h]
```

Parameters

Parameter	Description
`--name`, `-n`	Specifies the virtual machine name to be migrated
`--target-node`, `-to`	Specifies the destination node
`--json`, `-j`	(Optional) Displays output in JSON format.
`--help`, `-h`	(Optional) Displays help for using the command.

Example

Migrate a virtual machine named `vm1` to node `n1`.

```
odacli migrate-vm -n vm1 -to n1
```

odacli clone-vm

Use the `odacli clone-vm` command to clone a virtual machine configuration on Oracle Database Appliance Kernel-based Virtual Machine (KVM).

Syntax

```
# odacli clone-vm -n name_of_vm_to_clone_from -cn clone_name [-j] [-h]
```

Parameters

Parameter	Description
`--name`, `-n`	Specifies the virtual machine name to be cloned
`--clone-name`, `-cn`	Specifies the name of the cloned virtual machine
`--description`, `-d`	(Optional) Specifies the description of the virtual machine

Parameter	Description
`--json, -j`	(Optional) Displays output in JSON format.
`--help, -h`	(Optional) Displays help for using the command.

Example

Create a clone of a virtual machine named `vm1`, with the name `vm1_clone`. The cloned VM is created on the same storage as `vm1`.

```
# odacli clone-vm -n vm1 -cn vm1_clone
```

odacli delete-vm

Use the `odacli delete-vm` command to delete a virtual machine configuration on Oracle Database Appliance Kernel-based Virtual Machine (KVM).

Syntax

```
 odacli delete-vm -n name [-f] [-j] [-h]
```

Parameters

Parameter	Description
`--name, -n`	Specifies the virtual machine name to be deleted
`--force, -f`	(Optional) Specifies the force option
`--json, -j`	(Optional) Displays output in JSON format.
`--help, -h`	(Optional) Displays help for using the command.

Example

Delete a virtual machine named `vm1`.

```
odacli delete-vm -n vm1
```

19

Troubleshooting Oracle Database Appliance

Understand tools you can use to validate changes and troubleshoot Oracle Database Appliance problems.

- Viewing Component Information on the Appliance
  View details of all the components installed on the appliance, and the RPM drift information.
- Errors When Logging into the Browser User Interface
  If you have problems logging into the Browser User Interface, then it may be due to your browser or credentials.
- Errors when re-imaging Oracle Database Appliance
  Understand how to troubleshoot errors that occur when re-imaging Oracle Database Appliance.
- Backup and Recovery for Oracle Database Appliance Upgrades on Virtualized Platform
  Before patching your deployment to Oracle Database Appliance release 19.9 on virtualized platform, understand how you can take a backup before the upgrade and then restore from the backup, if necessary.
- Analyzing the Pre-Checks Report for Operating System Upgrades on Virtualized Platform
  Understand the patching pre-checks report and the components checked during the operating system upgrade when patching Oracle Database Appliance Virtualized Platform.
- Analyzing the Preupgrade Checks Report for Operating System Upgrades on Virtualized Platform
  Understand the patching preupgrade checks report before performing the operating system upgrade when patching Oracle Database Appliance Virtualized Platform.
- Analyzing the Post Upgrade Checks Report for Operating System Upgrades on Virtualized Platform
  Understand the patching post upgrade checks report after performing the operating system upgrade when patching Oracle Database Appliance Virtualized Platform.
- Using Oracle Autonomous Health Framework for Running Diagnostics
  Oracle Autonomous Health Framework collects and analyzes diagnostic data collected, and proactively identifies issues before they affect the health of your system.
- Running the Disk Diagnostic Tool
  Use the Disk Diagnostic Tool to help identify the cause of disk problems.
- Running the Oracle Database Appliance Hardware Monitoring Tool
  The Oracle Database Appliance Hardware Monitoring Tool displays the status of different hardware components in Oracle Database Appliance server.

- Configuring a Trusted SSL Certificate for Oracle Database Appliance
  The Browser User Interface and DCS Controller use SSL-based HTTPS protocol for secure communication. Understand the implications of this added security and the options to configure SSL certificates.
- Disabling the Browser User Interface
  You can also disable the Browser User Interface. Disabling the Browser User Interface means you can only manage your appliance through the command-line interface.
- Preparing Log Files for Oracle Support Services
  If you have a system fault that requires help from Oracle Support Services, then you may need to provide log records to help Oracle support diagnose your issue.

Viewing Component Information on the Appliance

View details of all the components installed on the appliance, and the RPM drift information.

Viewing the Bill of Materials in the Browser User Interface

Use the Appliance tab in the Browser User Interface to view information about your deployment and the installed components. The Advanced Information tab displays information about the following components:

- Grid Infrastructure Version, and the home directory
- Database Version, Home location, and Edition
- Location and details about the databases configured
- All patches applied to the appliance
- Firmware Controller and Disks
- ILOM information
- BIOS version
- List of RPMs

In the List of RPMs section, click **Show** and then click **RPM Drift** to view the differences between the RPMs installed on the appliance, and the RPMs shipped in the latest Oracle Database Appliance Patch Bundle Update release.

Click **Download** to save the components report. You can use this report to help diagnose any deployment issues.

Viewing the Bill of Materials from the Command Line

The bill of materials is also available through the command line for bare metal and virtualized platforms deployments. The information about the installed components is collected according to a set schedule, and stored in the location `/opt/oracle/dcs/Inventory/` for bare metal deployments and in the `/opt/oracle/oak/Inventory/` directory for virtualized platforms. The file is stored in the format `oda_bom_TimeStamp.json`. Use the command `describe-system` to view the bill of materials on the command line. See the *Oracle Database Command-Line Interface* chapter for command options and usage notes.

Example 19-1 Example Command to View the Bill of Materials from the Command Line for Bare Metal Deployments

```
# odacli describe-system -b
ODA Components Information
------------------------------
Component Name                Component
Details
---------------
------------------------------------------------------------------------
-----------------------
NODE                          Name : oda1
                              Domain Name : testdomain.com
                              Time Stamp : April 21, 2020 6:21:15 AM
UTC


RPMS                          Installed RPMS :
abrt-2.1.11-55.0.1.el7.x86_64,
                                               abrt-addon-
ccpp-2.1.11-55.0.1.el7.x86_64,
                                               abrt-addon-
kerneloops-2.1.11-55.0.1.el7.x86_64,
                                               abrt-addon-
pstoreoops-2.1.11-55.0.1.el7.x86_64,
                                               abrt-addon-
python-2.1.11-55.0.1.el7.x86_64,
                                               abrt-addon-
vmcore-2.1.11-55.0.1.el7.x86_64,
                                               abrt-addon-
xorg-2.1.11-55.0.1.el7.x86_64,
                                               abrt-
cli-2.1.11-55.0.1.el7.x86_64,
                                               abrt-console-
notification-2.1.11-55.0.1.el7.x86_64,
                                               abrt-
dbus-2.1.11-55.0.1.el7.x86_64,
                                               abrt-
libs-2.1.11-55.0.1.el7.x86_64,
                                               abrt-
python-2.1.11-55.0.1.el7.x86_64,
                                               abrt-
tui-2.1.11-55.0.1.el7.x86_64,
                                               acl-2.2.51-14.el7.x86_64,
                                               adwaita-cursor-
theme-3.28.0-1.el7.noarch,
                                               adwaita-icon-
theme-3.28.0-1.el7.noarch,
                                               aic94xx-
firmware-30-6.el7.noarch,
                                               
aide-0.15.1-13.0.1.el7.x86_64,
                                               alsa-
firmware-1.0.28-2.el7.noarch,
                                               alsa-
```

```
lib-1.1.8-1.el7.x86_64,
                                               alsa-tools-
firmware-1.1.0-1.el7.x86_64,
                                               at-3.1.13-24.el7.x86_64,
                                               at-spi2-
atk-2.26.2-1.el7.x86_64,
                                               at-spi2-
core-2.28.0-1.el7.x86_64,
                                               atk-2.28.1-1.el7.x86_64,

attr-2.4.46-13.el7.x86_64,
                                               audit-2.8.5-4.el7.x86_64,
                                               audit-
libs-2.8.5-4.el7.x86_64,
                                               audit-libs-
python-2.8.5-4.el7.x86_64,
                                               augeas-
libs-1.4.0-9.el7.x86_64,

authconfig-6.2.8-30.el7.x86_64,
                                               autogen-
libopts-5.18-5.el7.x86_64,
                                               avahi-
libs-0.6.31-19.el7.x86_64,

basesystem-10.0-7.0.1.el7.noarch,

bash-4.2.46-33.el7.x86_64,
                                               bash-
completion-2.1-6.el7.noarch,
                                               bc-1.06.95-13.el7.x86_64,
                                               bind-export-
libs-9.11.4-9.P2.el7.x86_64,
                                               bind-
libs-9.11.4-9.P2.el7.x86_64,
                                               bind-libs-
lite-9.11.4-9.P2.el7.x86_64,
                                               bind-
license-9.11.4-9.P2.el7.noarch,
                                               bind-
utils-9.11.4-9.P2.el7.x86_64,

binutils-2.27-41.base.0.7.el7_7.2.x86_64,

biosdevname-0.7.3-2.el7.x86_64,

blktrace-1.0.5-9.el7.x86_64,
                                               bnxtnvm-1.40.10-1.x86_64,
                                               boost-date-
time-1.53.0-27.el7.x86_64,
                                               boost-
filesystem-1.53.0-27.el7.x86_64,
                                               boost-
iostreams-1.53.0-27.el7.x86_64,
....
```

```
....
....
```

Example 19-2 Example Command to View the Bill of Materials from the Command Line for Virtualized Platforms

```
# oakcli describe-system -b
```

Example 19-3 Example Command to View the Bill of Materials Report from the Stored Location

```
# ls -la /opt/oracle/dcs/Inventory/
total 264
-rw-r--r-- 1 root root 83550 Apr 26 05:41
oda_bom_2018-04-26_05-41-36.json
```

Errors When Logging into the Browser User Interface

If you have problems logging into the Browser User Interface, then it may be due to your browser or credentials.

> **Note:**
>
> Oracle Database Appliance uses self-signed certificates. Your browser determines how you log into the Browser User Interface. Depending on the browser and browser version, you may receive a warning or error that the certificate is invalid or not trusted because it is self-signed, or that the connection is not private. Ensure that you accept the self-signed certificate for the agent and Browser User Interface.

Follow these steps to log into the Browser User Interface:

1. Open a browser window.
2. Go to the following URL: `https://`*`ODA-host-ip-address`*`:7093/mgmt/index.html`
3. Get the security certificate (or certificate), confirm the security exception, and add an exception.
4. Log in with your Oracle Database Appliance credentials.

   If you have not already set the `oda-admin` password, then a message is displayed, advising you to change the default password to comply with your system security requirements.
5. If you have not added an exception for the agent security certificate, then a message about accepting agent certificate is displayed.
6. Using a different tab in your browser, go to the following URL: `https://`*`ODA-host-ip-address`*`:7070/login`
7. Get the security certificate (or certificate), confirm the security exception, and add an exception.

8. Refresh the Browser User Interface URL : `https://ODA-host-ip-address:7093/mgmt/index.html`

> **Note:**
>
> If you have any issues logging into the Oracle Database Appliance Browser User Interface on browsers such as macOS Catalina and Google Chrome, then you may need to use any workaround as described on the official site for the product.

Related Topics

- http://www.oracle.com/technetwork/indexes/products/browser-policy-2859268.html

Errors when re-imaging Oracle Database Appliance

Understand how to troubleshoot errors that occur when re-imaging Oracle Database Appliance.

If re-imaging Oracle Database Appliance fails, with old header issues such as errors in storage discovery, or in running GI root scripts, or disk group RECO creation, then use the force mode with `cleanup.pl`.

```
# cleanup.pl -f
```

To ensure that re-imaging is successful, remove the old headers from the storage disks by running the secure erase tool. Verify that the OAK/ASM headers are removed.

```
# cleanup.pl -erasedata
# cleanup.pl -checkHeader
```

Retry the re-imaging operation.

Related Topics

- Re-imaging Oracle Database Appliance
  Bare metal operating system re-imaging installs Oracle Database Appliance operating system software on the local (boot) drive.

Backup and Recovery for Oracle Database Appliance Upgrades on Virtualized Platform

Before patching your deployment to Oracle Database Appliance release 19.9 on virtualized platform, understand how you can take a backup before the upgrade and then restore from the backup, if necessary.

Backing Up the ODA_BASE Domain

Follow these steps to take a backup of ODA_BASE, before applying the Oracle Database Appliance server patch on virtualized platform for this release of Oracle Database Appliance.

1. Login into `domain0` as `root` user.
2. Stop the ODA_BASE domain.

   ```
   $ oakcli stop oda_base
   ```

3. Run the `rsync` command to take a backup of the ODA_BASE domain.

   ```
   $ /usr/bin/rsync -test --delete --progress --exclude 'exclude
   files' Source location: ODA_BASE location Target location: External
   NFS storage to move the backup
   ```

   For example:

   ```
   $ /usr/bin/rsync -test --delete --progress --exclude *zip --exclude
   *gz ' /OVS/Repositories/odabaseRepo /external
   ```

   The above command backs up the `/OVS/Repositories/odabaseRepo/VirtualMachines/oakDom1` directory to the external NFS directory, for example, `/external`.

   You can also compress the `/OVS/Repositories/odabaseRepo` file to reduce the size, and then perform the `rsync` operation on the `backup.tar.gz` file.
   For example:

   ```
   $ /bin/tar -zcvf backup.tar.gz /OVS/Repositories/odabaseRepo --
   exclude=*.gz --exclude=*.zip
   ```

4. Start the ODA_BASE domain.

   ```
   $ oakcli start oda_base
   ```

5. Repeat steps 1-4 on the ODA_BASE domain on the other node.

Restoring the ODA_BASE Domain

Follow these steps to restore the ODA_BASE domain from a backup.

1. Login into `domain0` as `root` user.

2. Stop the ODA_BASE domain.

   ```
   $ oakcli stop oda_base
   ```

3. Create directory, if it does not already exist.

   ```
   $ mkdir -p /OVS/Repositories
   ```

4. Run the `rsync` command to copy the ODA_BASE domain from the backup.

   ```
   $ /usr/bin/rsync -vaz --delete --progress --exclude 'exclude files'
   Backup location restore location
   ```

   For example:

   ```
   $ /usr/bin/rsync -vaz --delete --progress --exclude *zip --exclude
   *gz /external/OVS/Repositories/
   ```

   If the backup is a `backup.tar.gz` file, then transfer the file using the same method, and then uncompress the `backup.tar.gz` file.
   For example:

   ```
   $ tar -zxvf backup.tar.gz -C /OVS/Repositories/odabaseRepo
   ```

   The above command restores the backup of `/OVS/Repositories/odabaseRepo/VirtualMachines/oakDom1` directory to `/OVS/Repositories/` from `/external` directory.

5. Start the ODA_BASE domain.

   ```
   $ oakcli start oda_base
   ```

6. Validate the environment using the `oakcli validate` command and ensure that ODA_BASE is functioning normally.

   ```
   $ oakcli validate –d
   ```

Related Topics

- Analyzing the Pre-Checks Report for Operating System Upgrades on Virtualized Platform
  Understand the patching pre-checks report and the components checked during the operating system upgrade when patching Oracle Database Appliance Virtualized Platform.
- Analyzing the Preupgrade Checks Report for Operating System Upgrades on Virtualized Platform
  Understand the patching preupgrade checks report before performing the operating system upgrade when patching Oracle Database Appliance Virtualized Platform.

- Analyzing the Post Upgrade Checks Report for Operating System Upgrades on Virtualized Platform
  Understand the patching post upgrade checks report after performing the operating system upgrade when patching Oracle Database Appliance Virtualized Platform.

Analyzing the Pre-Checks Report for Operating System Upgrades on Virtualized Platform

Understand the patching pre-checks report and the components checked during the operating system upgrade when patching Oracle Database Appliance Virtualized Platform.

When you patch your Oracle Database Appliance Virtualized Platform deployment to release 19.8, your operating system is upgraded to Oracle Linux 7. The patching pre-checks report contains a section on the operating system upgrade checks run, similar to the following:

```
# oakcli update -patch 19.8.0.0.0 --pre-patchreport --local
INFO: Running OS prepatch checks ...
INFO: Validate supported versions
SUCCESS: Validated minimum supported versions.
INFO: Validate patching tag
SUCCESS: Validated patching tag: 19.8.0.0.0
INFO: Is patch location available
SUCCESS: Patch location is available.
INFO: Space checks for OS upgrade
SUCCESS: Validated space checks.
INFO: Install OS upgrade software
INFO: This action migth take a while if packages need to be uncompressed
SUCCESS: Extracted OS upgrade patches into /root/oda-upgrade.
Do not remove this directory until OS upgrade completes.
INFO: Verify OS upgrade by running preupgrade checks
INFO: This operation will take long, please wait
SUCCESS: Results stored in: '/root/preupgrade-results/
preupg_results-200626121721.tar.gz' .
Read complete report file '/root/preupgrade/result.html' before
attempting OS upgrade.
INFO: Validate custom rpms installed
SUCCESS: No additional RPMs found installed
SUCCESS: All OS prepatch tasks ran correctly

INFO: Running Storage prepatch checks ...

INFO: Validate patching tag
SUCCESS: Validated patching tag: 19.8.0.0.0
INFO: Patch location validation
SUCCESS: Verified patch location.
INFO: Patch tag validation
SUCCESS: Verified patching tag.
INFO: Verify ASM disks status
SUCCESS: ASM disk are online.
SUCCESS: All Storage prepatch tasks ran correctly
```

```
SUCCESS: Pre patch report ended successfully
```

Following is a description of the pre-checks for the operating system upgrade. Note that you can override these pre-check failures with the `--force` flag, but it is is recommended that you fix these failures before proceeding with the operating system upgrade.

Operating System Checks

Validate supported versions: Validates that the current OAK version can be upgraded to the patch version.

Success message:

```
Validated minimum supported versions.
```

Error message:

```
Unable to get RPM version
```

Reason: RPM command failed or formatting is wrong.

Error message:

```
Current system is not up-to-date
```

Reason: -patch should be greater than current version and metadata file is used to confirm that upgrade is feasible.
Error message:

```
Could not get minimum compatible version
```

Reason: Could not determine the compatible version to upgrade from.
Error message:

```
Current version current_oak_version is incompatible
```

Reason: The current *oak* version cannot be upgraded to -patch version.
Validate patching tag: Validates that the -patch parameter has the correct format and that the metadata file exists.

Success message:

```
Validated patching tag: 19.8.0.0.0
```

Error message:

```
Supplied version patch is invalid.
```

Reason: Either the -patch format is invalid, or the metadata file does not exist.

Is patch location available: Make sure that the patching OS tools are available. The directory that contains oda-upgrade.tar and the OS upgrade resources must exist.

Success message:

```
Patch location is available.
```

Error message:

```
Unavailable location: /opt/oracle/oak/pkgrepos/oda-os-upgrade/
```

Reason: The location of the OS upgrade tools is not available.
Error message:

```
Unavailable location: patch location
```

Reason: The location of the OS patch data is not available (OEL).
Validated space checks: Checks the next space requirements. On ODA_BASE, checks for 7 GB of free space on `/root`, 150 MB of free space on `/boot`. On dom0, checks for 3 GB of free space on `/root` and 150 MB of free space on `/boot`.

Success message:

```
Validated space checks.
Current node OS is up to date
```

Error message:

```
Minimum 7 GB free space required under "/root"
```

Reason: There is less than 7 GB free space on `/root`.
Error message:

```
Minimum 150 MB free space required under "/boot"
```

Reason: There is less than 150 MB free space on `/boot`.
Error message:

```
Dom 0 space checks failed
```

Reason: There is either less than 3 GB free space in the `/root` directory, or less than 150 MB free space in the `/boot` directory on dom0.
Install OS upgrade software: Prepares upgrade tools by extracting `oda-upgrade.tar` to `/root`.

Success message:

```
Extracted OS upgrade patches into /root/oda-upgrade.
```

Error message:

```
Minimum 5 Gb free space required under "/root" to extract the oda-
upgrade.tar
```

Reason: There is not enough space to extract and run the oda-upgrade tools.
Error message:

```
Component Metadata file or related is not accessible
```

Reason: The `oda-upgrade` metadata file is not available.
Error message:

```
Could not extract file: oda-upgrade.tar
```

Reason: Error on tar command.
Error message:

```
Tar file extracted but oda-upgrade.sh does not exist
```

Reason: Tar file was extracted but the `oda-upgrade.sh` script is missing.
Verify operating system upgrade by running preupgrade checks: This precheck runs the RHEL upgrade tool. Check the `/root/preupgrade/result.html` file and fix any critical failures before performing the operating system upgrade. Results are stored in `/root/preupgrade-results/preupg_results-200626121721.tar.gz`. Read the complete report file `/root/preupgrade/result.html` before attempting the operating system upgrade.

Success message:

```
Current node OS is up to date
```

Error message:

```
Not enough space on /root. At least 1 GB is required.
```

Reason: Not enough space to run the `oda-upgrade` script.

Error message:

```
Upgrade script is not available
```

Reason: `oda-upgrade` script not found.
Error message:

```
Could not store the name logFilename into our internal flat file
```

Reason: For some reason, the /root/oda-upgrade/.upgrade_log_file could not be written.

Error message:

```
Error executing upgradeos.exp: cmdResult
```

Reason: Expect command finished unsuccessfully.
Error message:

```
User action is required, results are not successful.
```

Reason: The result.html file suggests that there are failed rules.
Validate custom RPMs installed: ODACLI handles upgrade of only those RPMs that are part of the Oracle Database Appliance operating system image, as listed in the versionlock file, or those included as part of the Oracle Database Appliance software, such as DCS and HMP RPMs, or those required to perform the operating system upgrade itself. As part of prechecks, any other Oracle supplied RPMs are listed in `/root/oda-upgrade/rpms-added-from-Oracle` and other third-party RPMs in `/root/oda-upgrade/rpms-added-from-Thirdparty` files respectively. For custom RPMs, you must separately upgrade these RPMs on each node after the operating system is successfully upgraded to Oracle Linux 7. These files are preserved in the same location after the operating system upgrade completes.

Success message:

```
No additional RPMs found installed
Skip check for custom RPMs, as OS is OL7
Found additional RPMs installed warning: user is responsible for
updating custom RPM files
```

Error message:

```
The custom rpm checks may not have run
```

Reason: The evidence that the rpm checks were performed could not be found.

Storage Checks

Validate patching tag: Validates that the -patch parameter has the correct format and that the metadata file exists.

Success message:

```
Validated patching tag: 19.8.0.0.0
```

Error message:

```
Supplied version patch is invalid.
```

Reason: Either the -patch format is invalid, or the metadata file does not exist.

patch location validation: Verifies that the metadata file exists.

Success message:

```
Verified patch location.
```

Error message:

```
System patch metadata does not exist.
```

Reason: Patch metadata file could not be found.
patch tag validation: Builds disk, expander, and controller patching tags from the metadata file.

Success message:

```
Verified patching tag.
```

Error message:

```
Firmware patches for storage components are not present.
```

Reason: Disk, expander or controller patching tag could not be generated using the available metadata.
Verify ASM disks status: If CRS is running, check that disks are online. If CRS is not running, this check is skipped.

Success message:

```
ASM disks are online.
CRS is not running, skipping ASM check.
```

Error message:

```
One or more ASM disk are not online. Rolling storage update cannot
proceed.
```

Reason: One or more Oracle ASM disks were not online at this stage.
Error message:

```
Failed to get ASM disk status.
```

Reason: Oracle ASM check script failed.

Analyzing the Preupgrade Checks Report for Operating System Upgrades on Virtualized Platform

Understand the patching preupgrade checks report before performing the operating system upgrade when patching Oracle Database Appliance Virtualized Platform.

The patching preupgrade checks report on Virtualized Platform checks that the virtual machines and shared repositories are stopped before the upgrade.

Update DOM0

If the DOM0 agent is updated, then the following message is displayed:

```
SUCCESS: dom0 agent updated
```

Action Required: If there is an error in the dom0 update, then review the logs to find out the reason, and re-run the pre-osupgrade step.

Stopping Vms and Repos on both nodes

If virtual machines and shared repositories are stopped on both nodes, then the following message is displayed:

```
SUCCESS: Repos and vms stopped
```

Action Required: If there is an error in stopping virtual machines and shared repositories, use `oakcli` commands to stop them manually, and then re-run the pre-osupgrade step.

Stopping CRS in local node

If Oracle Clusterware is stopped successfully on the local node, then the following message is displayed:

```
SUCCESS: CRS stopped in local node
```

Action Required: If a message `Could not stop CRS` is displayed, then check the log files and stop Oracle Clusterware manually, and re-run the pre-osupgrade step.

Check loop devices

If the operation to check loop devices on dom0 completed successfully, then the following message is displayed:

```
SUCCESS: Loop devices check passed
```

Action Required: If any error is encountered in this step, then run the command `loseup -a` on dom0 and verify there are extra loop devices besides the ODA_BASE.

Sample Preupgrade Checks Report

Sample output from a system before the upgrade.

```
# oakcli update -patch 19.9.0.0.0 --pre-osupgrade --local
INFO: Trying to ping dom0 agent
INFO: dom0 agent is live
INFO: dom0 agent is not updated.
INFO: Updating dom0 agent, this will take a while...
SUCCESS: dom0 agent updated
INFO: Stopping Vms and Repos on both nodes. This may take a while...
```

```
SUCCESS: Repos and vms stopped
INFO: Disabling start repo
Start repo operation is now DISABLED on node 0
Start repo operation is now DISABLED on node 1
SUCCESS: Start repo disabled
INFO: Stopping CRS in local node
INFO: 2020-06-26 12:22:53: Clusterware is running on local node
INFO: 2020-06-26 12:22:53: Attempting to stop clusterware and its
resources locally
SUCCESS: 2020-06-26 12:24:01: Successfully stopped the clusterware on
local node
SUCCESS: CRS stopped in local node
SUCCESS: Loop devices check passed
SUCCESS: Pre-OSupgrade finished successfully
```

Analyzing the Post Upgrade Checks Report for Operating System Upgrades on Virtualized Platform

Understand the patching post upgrade checks report after performing the operating system upgrade when patching Oracle Database Appliance Virtualized Platform.

The patching post upgrade checks report on Virtualized Platform validates operating system upgrade, OAK upgrade, Oracle Grid Infrastructure upgrade, RPMs, and enabling of NFS service after upgrade.

Operating System Upgrade (OS upgrade check)

If the operating system is upgraded, then the following message is displayed:

```
SUCCESS: OS has been upgraded to 4.14.35-1902.303.4.1.el7uek
successfully.
```

OAK Upgrade

If OAK is upgraded successfully, then the following message is displayed:

```
SUCCESS: ODA software has been upgraded to 19.8.0.0.0 successfully.
```

Oracle Grid Infrastructure (GI Upgrade Check)

If Oracle Grid Infrastructure version is current, then the following message is displayed:

```
SUCCESS: GI software is running at correct version:
18.8.0.0.191015(30112122,30581079).
```

RPM (Extra RPM Check)

If extra RPMS were discovered during the upgrade, then the following message is displayed:

```
WARNING: There are additional RPMs installed on the system
WARNING: Please upgrade these RPMs.
```

Action Required: Check the directory `/root/oda-upgrade/rpms-added-from-ThirdParty` and `/root/oda-upgrade/rpms-added-from-Oracle`. Download and install the equivalent Oracle Linux 7 RPMs for all the RPMs listed in these directories.

Enable NFS Service

If NFS service is enabled successfully after upgrade, then the following message is displayed:

```
SUCCESS: NFS service has been started successfully
```

Action Required: If the error message `ERROR: Cannot start NFS service` is shown in the ouput, then check the NFS status using the command `systemctl status nfs -l`.

Sample Post Upgrade Checks Report

Sample output from a system after all upgrading all components.

```
# oakcli update -patch 19.9.0.0.0 --post-osupgrade --local
INFO: Validating OS version
SUCCESS: OS has been upgraded to 4.14.35-1902.303.4.1.el7uek
successfully.
INFO: Validating OAK version
SUCCESS: ODA software has been upgraded to 19.8.0.0.0 successfully.
INFO: Validating GI version
SUCCESS: GI software is running at correct version:
18.8.0.0.191015(30112122,30581079).
INFO: Starting CRS
CRS-4638: Oracle High Availability Services is online
CRS-4537: Cluster Ready Services is online
CRS-4529: Cluster Synchronization Services is online
CRS-4533: Event Manager is online
INFO: Starting NFS service
SUCCESS: NFS service has been started successfully.
INFO: Removing ODA OS patching software
SUCCESS: ODA OS patching software has been removed
SUCCESS: Patching post-osupgrade command finished successfully
```

Using Oracle Autonomous Health Framework for Running Diagnostics

Oracle Autonomous Health Framework collects and analyzes diagnostic data collected, and proactively identifies issues before they affect the health of your system.

- About Installing Oracle Autonomous Health Framework
  Oracle Autonomous Health Framework is installed automatically when you provision or patch to Oracle Database Appliance release 19.9.
- Using the Oracle ORAchk Health Check Tool
  Run Oracle ORAchk to audit configuration settings and check system health.
- Generating and Viewing Oracle ORAchk Health Check Tool Reports in the Browser User Interface
  Generate Oracle ORAchk Health Check Tool reports using the Browser User Interface.
- Running Oracle Trace File Analyzer (TFA) Collector Commands
  Understand the installed location of `tfactl` and the options for the command.
- Sanitizing Sensitive Information in Diagnostic Collections
  Oracle Autonomous Health Framework uses Adaptive Classification and Redaction (ACR) to sanitize sensitive data.
- Sanitizing Sensitive Information in Oracle Trace File Analyzer Collections
  You can redact (sanitize or mask) Oracle Trace File Analyzer diagnostic collections.
- Sanitizing Sensitive Information in Oracle ORAchk Output
  You can sanitize Oracle ORAchk output.

About Installing Oracle Autonomous Health Framework

Oracle Autonomous Health Framework is installed automatically when you provision or patch to Oracle Database Appliance release 19.9.

When you provision or patch your appliance to Oracle Database Appliance release 19.9, Oracle Autonomous Health Framework is installed in the path `/opt/oracle/dcs/oracle.ahf`.

You can verify that Oracle Autonomous Health Framework is installed by running the following command:

```
[root@oak ~]# rpm -q oracle-ahf
oracle-ahf-193000-########.x86_64
```

> **Note:**
>
> When you provision or patch to Oracle Database Appliance release 19.9, Oracle Autonomous Health Framework automatically provides Oracle ORAchk Health Check Tool and Oracle Trace File Analyzer Collector.

Oracle ORAchk Health Check Tool performs proactive health checks for the Oracle software stack and scans for known problems. Oracle ORAchk Health Check Tool audits important configuration settings for Oracle RAC deployments in the following categories:

- Operating system kernel parameters and packages
- Oracle Database Database parameters, and other database configuration settings
- Oracle Grid Infrastructure, which includes Oracle Clusterware and Oracle Automatic Storage Management

Oracle ORAchk is aware of the entire system. It checks the configuration to indicate if best practices are being followed.

Oracle Trace File Collector provides the following key benefits and options:

- Encapsulation of diagnostic data collection for all Oracle Grid Infrastructure and Oracle RAC components on all cluster nodes into a single command, which you run from a single node
- Option to "trim" diagnostic files during data collection to reduce data upload size
- Options to isolate diagnostic data collection to a given time period, and to a particular product component, such as Oracle ASM, Oracle Database, or Oracle Clusterware
- Centralization of collected diagnostic output to a single node in Oracle Database Appliance, if desired
- On-Demand Scans of all log and trace files for conditions indicating a problem
- Real-Time Scan Alert Logs for conditions indicating a problem (for example, Database Alert Logs, Oracle ASM Alert Logs, and Oracle Clusterware Alert Logs)

Using the Oracle ORAchk Health Check Tool

Run Oracle ORAchk to audit configuration settings and check system health.

> **Note:**
>
> Before running ORAchk, check for the latest version of Oracle Autonomous Health Framework, and download and install it. See My Oracle Support Note 2550798.1 for more information about downloading and installing the latest verion of Oracle Autonomous Health Framework.

Running ORAchk on Oracle Database Appliance 19.9 Baremetal Systems for New Installation

When you provision or upgrade to Oracle Database Appliance 19.9, ORAchk is installed using Oracle Autonomous Framework in the directory `/opt/oracle/dcs/oracle.ahf`.

To run orachk, use the following command:

```
[root@oak bin]# orachk
```

When all checks are finished, a detailed report is available. The output displays the location of the report in an HTML format and the location of a zip file if you want to upload the report. For example, you can choose the filter to show failed checks only, show checks with a Fail, Warning, Info, or Pass status, or any combination.

Review the Oracle Database Appliance Assessment Report and system health and troubleshoot any issues that are identified. The report includes a summary and filters that enable you to focus on specific areas.

Running ORAchk on Oracle Database Appliance 19.9 Virtualized Platform

When you provision or upgrade to Oracle Database Appliance 19.9, ORAchk is installed using Oracle Autonomous Framework in the directory `/opt/oracle.ahf`.

To run `orachk`, use the following command:

```
[root@oak bin]# oakcli orachk
```

Related Topics

- https://support.oracle.com/rs?type=doc&id=2550798.1

Generating and Viewing Oracle ORAchk Health Check Tool Reports in the Browser User Interface

Generate Oracle ORAchk Health Check Tool reports using the Browser User Interface.

1. Log into the Browser User Interface with the `oda-admin` username and password.

   ```
   https://Node0–host-ip-address:7093/mgmt/index.html
   ```

2. Click the **Monitoring** tab.
3. In the Monitoring page, on the left navigation pane, click **ORAchk Report**.

   On the ORAchk Reports page, a list of all the generated ORAchk reports is displayed.
4. In the Actions menu for the ORAchk report you want to view, click **View**.

   The Oracle Database Appliance Assessment Report is displayed. It contains details of the health of your deployment, and lists current risks, recommendations for action, and links for additional information.
5. **To create an on-demand ORAchk report:** On the ORAchk Reports page, click **Create** and then click **Yes** in the confirmation box.

   The job to create an ORAchk report is submitted.
6. Click the link to view the status of the job. Once the job completes successfully, you can view the Oracle Database Appliance Assessment Report on the ORAchk Reports page.
7. **To delete an ORAchk report:** In the Actions menu for the ORAchk report you want to delete, click **Delete**.

Running Oracle Trace File Analyzer (TFA) Collector Commands

Understand the installed location of `tfactl` and the options for the command.

About Using tfactl to Collect Diagnostic Information

When you provision or upgrade to Oracle Database Appliance 19.9, Oracle Trace File Analyzer (TFA) Collector is installed in the directory `/opt/oracle.ahf/bin/tfactl`. You can invoke the command line utility for TFA, `tfactl` from the directory `/opt/oracle.ahf/bin/tfactl`, or simply type `tfactl`.

You can use the following command options to run `tfactl`:

```
 /opt/oracle.ahf/bin/tfactl diagcollect -ips|-oda|-odalite|-dcs|-
odabackup|
-odapatching|-odadataguard|-odaprovisioning|-odaconfig|-odasystem|-
odastorage|-database|
-asm|-crsclient|-dbclient|-dbwlm|-tns|-rhp|-procinfo|-afd|-crs|-cha|-
wls|
-emagent|-oms|-ocm|-emplugins|-em|-acfs|-install|-cfgtools|-os|-
ashhtml|-ashtext|
-awrhtml|-awrtext -mask -sanitize
```

Table 19-1 Command Options for tfactl Tool

Option	Description
`-h`	(Optional) Describes all the options for this command.
`-ips`	(Optional) Use this option to view the diagnostic logs for the specified component.
`-oda`	(Optional) Use this option to view the logs for the entire Appliance.
`-odalite`	(Optional) Use this option to view the diagnostic logs for the odalite component.
`-dcs`	(Optional) Use this option to view the DCS log files.
`-odabackup`	(Optional) Use this option to view the diagnostic logs for the backup components for the Appliance.
`-odapatching`	(Optional) Use this option to view the diagnostic logs for patching components of the Appliance.
`-odadataguard`	(Optional) Use this option to view the diagnostic logs for Oracle Data Guard component of the Appliance.
`-odaprovisioning`	(Optional) Use this option to view provisioning logs for the Appliance.
`-odaconfig`	(Optional) Use this option to view configuration-related diagnostic logs.

Table 19-1 (Cont.) Command Options for tfactl Tool

Option	Description
`-odasystem`	(Optional) Use this option to view system information.
`-odastorage`	(Optional) Use this option to view the diagnostic logs for the Appliance storage.
`-database`	(Optional) Use this option to view database-related log files.
`-asm`	(Optional) Use this option to view the diagnostic logs for the Appliance.
`-crsclient`	(Optional) Use this option to view the diagnostic logs for the Appliance.
`-dbclient`	(Optional) Use this option to view the diagnostic logs for the Appliance.
`-dbwlm`	(Optional) Use this option to view the diagnostic logs for the specified component.
`-tns`	(Optional) Use this option to view the diagnostic logs for TNS.
`-rhp`	(Optional) Use this option to view the diagnostic logs for Rapid Home Provisioning.
`-afd`	(Optional) Use this option to view the diagnostic logs for Oracle ASM Filter Driver.
`-crs`	(Optional) Use this option to view the diagnostic logs for Oracle Clusterware.
`-cha`	(Optional) Use this option to view the diagnostic logs for the Cluster Health Monitor.
`-wls`	(Optional) Use this option to view the diagnostic logs for Oracle WebLogic Server.
`-emagent`	(Optional) Use this option to view the diagnostic logs for the Oracle Enterprise Manager agent.
`-oms`	(Optional) Use this option to view the diagnostic logs for the Oracle Enterprise Manager Management Service.
`-ocm`	(Optional) Use this option to view the diagnostic logs for the specified component.
`-emplugins`	(Optional) Use this option to view the diagnostic logs for Oracle Enterprise Manager plug-ins.
`-em`	(Optional) Use this option to view the diagnostic logs for Oracle Enterprise Manager deployment.
`-acfs`	(Optional) Use this option to view the diagnostic logs for Oracle ACFS storage.
`-install`	(Optional) Use this option to view the diagnostic logs for installation.
`-cfgtools`	(Optional) Use this option to view the diagnostic logs for the configuration tools.

Table 19-1 (Cont.) Command Options for tfactl Tool

Option	Description
`-os`	(Optional) Use this option to view the diagnostic logs for the operating system.
`-ashhtml`	(Optional) Use this option to view the diagnostic logs for the specified component.
`-ashtext`	(Optional) Use this option to view the diagnostic logs for the Appliance.
`-awrhtml`	(Optional) Use this option to view the diagnostic logs for the Appliance.
`-awrtext`	(Optional) Use this option to view the diagnostic logs for the specified component.
`-mask`	(Optional) Use this option to choose to mask sensitive data in the log collection.
`-sanitize`	(Optional) Use this option to choose to sanitize (redact) sensitive data in the log collection.

Usage Notes

You can use Trace File Collector (the `tfactl` command) to collect all log files for the Oracle Database Appliance components.

You can also use the command `odaadmcli manage diagcollect`, with similar command options, to collect the same diagnostic information.

For more information about using the `-mask` and `-sanitize` options, see the next topic.

Sanitizing Sensitive Information in Diagnostic Collections

Oracle Autonomous Health Framework uses Adaptive Classification and Redaction (ACR) to sanitize sensitive data.

After collecting copies of diagnostic data, Oracle Trace File Analyzer and Oracle ORAchk use Adaptive Classification and Redaction (ACR) to sanitize sensitive data in the collections. ACR uses a Machine Learning based engine to redact a pre-defined set of entity types in a given set of files. ACR also sanitizes or masks entities that occur in path names. Sanitization replaces a sensitive value with random characters. Masking replaces a sensitive value with a series of asterisks ("*").

ACR currently sanitizes the following entity types:

- Host names
- IP addresses
- MAC addresses
- Oracle Database names
- Tablespace names
- Service names
- Ports
- Operating system user names

ACR also masks user data from the database appearing in block and redo dumps.

Example 19-4   Block dumps before redaction

```
14A533F40 00000000 00000000 00000000 002C0000 [..............,.]
14A533F50 35360C02 30352E30 31322E37 380C3938 [..650.507.2189.8]
14A533F60 31203433 37203332 2C303133 360C0200 [34 123 7310,...6]
```

Example 19-5   Block dumps after redaction

```
14A533F40 ******** ******** ******** ******** [****************]
14A533F50 ******** ******** ******** ******** [****************]
14A533F60 ******** ******** ******** ******** [****************]
```

Example 19-6   Redo dumps before redaction

```
col 74: [ 1] 80
col 75: [ 5] c4 0b 19 01 1f
col 76: [ 7] 78 77 06 16 0c 2f 26
```

Example 19-7   Redo dumps after redaction

```
col 74: [ 1] **
col 75: [ 5] ** ** ** ** **
col 76: [ 7] ** ** ** ** ** ** **
```

Redaction of Literal Values in SQL Statements in AWR, ASH and ADDM Reports

Automatic Workload Repository (AWR), Active Session History (ASH), and Automatic Database Diagnostic Monitor (ADDM) reports are HTML files, which contain sensitive entities such as hostnames, database names, and service names in the form of HTML tables. In addition to these sensitive entities, they also contain SQL statements, that can contain bind variables or literal values from tables. These literal values can be sensitive personal information (PI) stored in databases. ACR processes such reports to identify and redact both usual sensitive entities and literal values present in the SQL statements.

Sanitizing Sensitive Information Using odaadmcli Command

Use the `odaadmcli manage diagcollect` command to collect diagnostic logs for Oracle Database Appliance components. During collection, ACR can be used to redact (sanitize or mask) the diagnostic logs.

```
odaadmcli manage diagcollect [--dataMask|--dataSanitize]
```

In the command, the `--dataMask` option blocks out the sensitive data in all collections, for example, replaces `myhost1` with `*******`. The default is None. The `--dataSanitize` option replaces the sensitive data in all collections with random characters, for example, replaces `myhost1` with `orzhmv1`. The default is None.

Sanitizing Sensitive Information in Oracle Trace File Analyzer Collections

You can redact (sanitize or mask) Oracle Trace File Analyzer diagnostic collections.

Enabling Automatic Redaction

To enable automatic redaction, use the command:

```
tfactl set redact=[mask|sanitize|none]
```

In the command, the `-mask` option blocks out the sensitive data in all collections, for example, replaces `myhost1` with `*******`. The `-sanitize` option replaces the sensitive data in all collections with random characters, for example, replaces `myhost1` with `orzhmv1`. The `none` option does not mask or sanitize sensitive data in collections. The default is `none`.

Enabling On-Demand Redaction

You can redact collections on-demand, for example, `tfactl diagcollect -srdc ORA-00600 -mask or tfactl diagcollect -srdc ORA-00600 -sanitize`.

1. To mask sensitive data in all collections:

   ```
   tfactl set redact=mask
   ```

2. To sanitize sensitive data in all collections:

   ```
   tfactl set redact=sanitize
   ```

Example 19-8 Masking or Sanitizing Sensitive Data in a Specific Collection

```
tfactl diagcollect -srdc ORA-00600 -mask
tfactl diagcollect -srdc ORA-00600 -sanitize
```

Sanitizing Sensitive Information in Oracle ORAchk Output

You can sanitize Oracle ORAchk output.

To sanitize Oracle ORAchk output, include the `-sanitize` option, for example, `orachk -profile asm -sanitize`. You can also sanitize post process by passing in an existing log, HTML report, or a zip file, for example, `orachk -sanitize` *`file_name`*.

Example 19-9 Sanitizing Sensitive Information in Specific Collection IDs

```
orachk -sanitize comma_delimited_list_of_collection_IDs
```

Example 19-10 Sanitizing a File with Relative Path

```
orachk -sanitize new/orachk_node061919_053119_001343.zip
orachk is sanitizing
```

```
/scratch/testuser/may31/new/orachk_node061919_053119_001343.zip. Please
wait...

Sanitized collection is:
/scratch/testuser/may31/orachk_aydv061919_053119_001343.zip
orachk -sanitize ../orachk_node061919_053119_001343.zip
orachk is sanitizing
/scratch/testuser/may31/../orachk_node061919_053119_001343.zip. Please
wait...

Sanitized collection is:
/scratch/testuser/may31/orachk_aydv061919_053119_001343.zip
```

Example 19-11 Sanitizing Oracle Autonomous Health Framework Debug Log

```
orachk -sanitize new/orachk_debug_053119_023653.log
orachk is sanitizing /scratch/testuser/may31/new/
orachk_debug_053119_023653.log.
Please wait...

Sanitized collection is: /scratch/testuser/may31/
orachk_debug_053119_023653.log
```

Example 19-12 Running Full Sanity Check

```
orachk -localonly -profile asm -sanitize -silentforce

Detailed report (html) -
/scratch/testuser/may31/orachk_node061919_053119_04448/
orachk_node061919_053119_04448.html

orachk is sanitizing /scratch/testuser/may31/
orachk_node061919_053119_04448.
Please wait...

Sanitized collection is: /scratch/testuser/may31/
orachk_aydv061919_053119_04448

UPLOAD [if required] - /scratch/testuser/may31/
orachk_node061919_053119_04448.zip
```

To reverse lookup a sanitized value, use the command:

```
orachk -rmap all|comma_delimited_list_of_element_IDs
```

You can also use `orachk -rmap` to lookup a value sanitized by Oracle Trace File Analyzer.

Example 19-13 Printing the Reverse Map of Sanitized Elements

```
orachk -rmap MF_NK1,fcb63u2
```

```
________________________________________________________________________
________
| Entity Type | Substituted Entity Name | Original Entity Name |
________________________________________________________________________
________
| dbname      | MF_NK1                  | HR_DB1               |
| dbname      | fcb63u2                 | rac12c2              |
________________________________________________________________________
________
orachk -rmap all
```

Running the Disk Diagnostic Tool

Use the Disk Diagnostic Tool to help identify the cause of disk problems.

The tool produces a list of 14 disk checks for each node. To display details, where n represents the disk resource name, enter the following command:

```
# odaadmcli stordiag n
```

For example, to display detailed information for NVMe pd_00:

```
# odaadmcli stordiag pd_00
```

Running the Oracle Database Appliance Hardware Monitoring Tool

The Oracle Database Appliance Hardware Monitoring Tool displays the status of different hardware components in Oracle Database Appliance server.

The tool is implemented with the Trace File Analyzer collector. Use the tool both on bare-metal and on virtualized systems. The Oracle Database Appliance Hardware Monitoring Tool reports information only for the node on which you run the command. The information it displays in the output depend on the component that you select to review.

Bare Metal Platform

You can see the list of monitored components by running the command `odaadmcli show -h`

To see information about specific components, use the command syntax `odaadmcli show` *`component`*, where *`component`* is the hardware component that you want to query. For example, the command `odaadmcli show power` shows information specifically about the Oracle Database Appliance power supply:

```
# odaadmcli show power

NAME            HEALTH  HEALTH_DETAILS   PART_NO.      SERIAL_NO.
Power_Supply_0  OK            -          7079395     476856Z+1514CE056G

(Continued)
```

```
LOCATION    INPUT_POWER   OUTPUT_POWER   INLET_TEMP         EXHAUST_TEMP
PS0         Present       112 watts      28.000 degree C    34.938
degree C
```

Virtualized Platform

You can see the list of monitored components by running the command `oakcli show -h`

To see information about specific components, use the command syntax `oakcli show` *`component`*, where *`component`* is the hardware component that you want to query. For example, the command `oakcli show power` shows information specifically about the Oracle Database Appliance power supply:

```
# oakcli show power

NAME            HEALTH HEALTH_DETAILS PART_NO. SERIAL_NO.
Power Supply_0  OK      -             7047410   476856F+1242CE0020
Power Supply_1  OK     -              7047410   476856F+1242CE004J

(Continued)

LOCATION  INPUT_POWER OUTPUT_POWER INLET_TEMP         EXHAUST_TEMP
PS0       Present     88 watts     31.250 degree C    34.188 degree C
PS1       Present     66 watts     31.250 degree C    34.188 degree C
```

Note:

Oracle Database Appliance Server Hardware Monitoring Tool is enabled during initial startup of ODA_BASE on Oracle Database Appliance Virtualized Platform. When it starts, the tool collects base statistics for about 5 minutes. During this time, the tool displays the message "Gathering Statistics…" message.

Configuring a Trusted SSL Certificate for Oracle Database Appliance

The Browser User Interface and DCS Controller use SSL-based HTTPS protocol for secure communication. Understand the implications of this added security and the options to configure SSL certificates.

The Browser User Interface provides an added layer of security using certificates and encryption, when an administrator interacts with the appliance. Encryption of data ensures that:

- Data is sent to the intended recipient, and not to any malicious third-party.
- When data is exchanged between the server and the browser, data interception cannot occur nor can the data be edited.

When you connect to the Browser User Interface through HTTPS, the DCS Controller presents your browser with a certificate to verify the identity of appliance. If the web browser finds that the certificate is not from a trusted Certificate Authority (CA), then the browser assumes it has encountered an untrusted source, and generates a security alert message. The security alert dialog boxes display because Browser User Interface security is enabled through HTTPS and SSL, but you have not secured your Web tier properly with a trusted matching certificate from a Certificate Authority. It is possible to purchase commercial certificates from a Certificate Authority or create your own and register them with a Certificate Authority. However, the server and browser certificates must use the same public certificate key and trusted certificate to avoid the error message produced by the browser.

There are three options to configure your certificates:

- Create your own key and Java keystore, ensure it is signed by a Certificate Authority (CA) and then import it for use.
- Package an existing Privacy Enhanced Mail (PEM) format key and certificates in a new Java keystore.
- Convert an existing PKCS or PFX keystore to a Java keystore and configure it for the Browser User Interface.

> **Note:**
>
> For Oracle Database Appliance High-Availability hardware models, run the configuration steps on **both** nodes.

The following topics explain how to configure these options:

- Option 1: Creating a Key and Java Keystore and Importing a Trusted Certificate
  Use `keytool`, a key and certificate management utility, to create a keystore and a signing request.
- Option 2: Packaging an Existing PEM-format Key and Certificates in a New Java Keystore
  Use the OpenSSL tool to package Privacy Enhanced Mail (PEM) files in a PKCS keystore.
- Option 3: Converting an Existing PKCS or PFX Keystore to a Java Keystore
  If you have an existing PKCS or PFX keystore for your server's domain, convert it to a Java keystore.
- Configuring the DCS Server to Use Custom Keystore
  After packaging or converting your keystore into Java keystore, configure the DCS server to use your keystore.
- Configuring the DCS Agent for Custom Certificate
  After you import the certificate into the keystore, configure the DCS agent to use the same certificate.

Option 1: Creating a Key and Java Keystore and Importing a Trusted Certificate

Use `keytool`, a key and certificate management utility, to create a keystore and a signing request.

1. Create the keystore:

   ```
   keytool -genkeypair -alias your.domain.com -storetype jks -keystore
   your.domain.com.jks -validity 366 -keyalg RSA -keysize 4096
   ```

2. The command prompts you for identifying data:

   ```
   1. What is your first and last name? your.domain.com
   2. What is the name of your organizational unit? yourunit
   3. What is the name of your organization? yourorg
   4. What is the name of your City or Locality? yourcity
   5. What is the name of your State or Province? yourstate
   6. What is the two-letter country code for this unit? US
   ```

3. Create the certificate signing request (CSR):

   ```
   keytool -certreq -alias your.domain.com -file your.domain.com.csr
   -keystore your.domain.com.jks -ext san=dns:your.domain.com
   ```

4. Request a Certificate Authority (CA) signed certificate:

   a. In the directory where you ran Step 1 above, locate the file `your.domain.com.csr`.

   b. Submit the file to your Certificate Authority (CA).

      Details vary from one CA to another. Typically, you submit your request through a website; then the CA contacts you to verify your identity. CAs can send signed reply files in a variety of formats, and CAs use a variety of names for those formats. The CA's reply must be in PEM or PKCS#7 format.

   c. There may be a waiting period for the CA's reply.

5. Import the CA's reply. The CA's reply will provide one PKCS file or multiple PEM files.

   a. Copy the CA's files into the directory where you created the keystore in Step 1 above.

   b. Use keytool to export the certificate from the keystore:

      ```
      keytool -exportcert -alias your.domain.com -file /opt/oracle/dcs/
      conf/keystore-cert.crt
      -keystore your.domain.name.jks
      ```

6. Use `keytool` to import the keystore certificate and the CA reply files:

   ```
   keytool -importcert -trustcacerts -alias your.domain.com
   -file /opt/oracle/dcs/conf/keystore-cert.crt  -keystore /opt/
   oracle/dcs/conf/dcs-ca-certs
   ```

   To import PKCS file, run the command:

   ```
   keytool -importcert -trustcacerts -alias your.domain.com -file
   CAreply.pkcs -keystore /opt/oracle/dcs/conf/dcs-ca-certs
   ```

CAreply.pkcs is the name of the PKCS file provided by the CA and *your.domain.com* is the complete domain name of your server.

If the CA sent PEM files, then there may be one file, but most often there are two or three. Import the files to your keystore with commands in the order shown below, after substituting your values:

```
keytool -importcert -alias root -file root.cert.pem -keystore /opt/
oracle/dcs/conf/dcs-ca-certs -trustcacerts
keytool -importcert -alias intermediate -file intermediate.cert.pem
/opt/oracle/dcs/conf/dcs-ca-certs -trustcacerts
keytool -importcert -alias intermediat2 -file intermediat2.cert.pem
/opt/oracle/dcs/conf/dcs-ca-certs -trustcacerts
keytool -importcert -alias your.domain.com -file server.cert.pem
/opt/oracle/dcs/conf/dcs-ca-certs -trustcacerts
```

root.cert.pem is the name of the root certificate file and *intermediate.cert.pem* is the name of the intermediate certificate file. The root and intermediate files link the CA's signature to a widely trusted root certificate that is known to web browsers. Most, but not all, CA replies include roots and intermediates. *server.cert.pem* is the name of the server certificate file. The file links your domain name with your public key and the CA's signature.

Option 2: Packaging an Existing PEM-format Key and Certificates in a New Java Keystore

Use the OpenSSL tool to package Privacy Enhanced Mail (PEM) files in a PKCS keystore.

If you have an existing private key and certificates for your server's domain in PEM format, importing them into a Java keystore requires the OpenSSL tool. OpenSSL can package the PEM files in a PKCS keystore. Java keytool can then convert the PKCS keystore to a Java keystore.

1. Install OpenSSL.
2. Copy your private key, server certificate, and intermediate certificate into one directory.
3. Package the key and certificates into a PKCS keystore as follows:

   ```
   openssl pkcs12 -export -in server.cert.pem -inkey private.key.pem
   -certfile
   intermediate.cert.pem -name "your.domain.com" -out
   your.domain.com.p12
   ```

   server.cert.pem is the name of the server certificate file, *your.domain.com* is the complete domain name of your server, *private.key.pem* is the private counterpart to the public key in *server.cert.pem*, and *intermediate.cert.pem* is the name of the intermediate certificate file.

   Convert the resulting PKCS keystore file, *your.domain.com*.p12 into a Java keystore.

Option 3: Converting an Existing PKCS or PFX Keystore to a Java Keystore

If you have an existing PKCS or PFX keystore for your server's domain, convert it to a Java keystore.

1. Run the command:

   ```
   keytool -importkeystore -srckeystore your.domain.com.p12 -
   srcstoretype PKCS12
   -destkeystore /opt/oracle/dcs/conf/dcs-ca-certs -deststoretype jks
   ```

   `your.domain.com.p12` is the existing keystore file and `your.domain.com` is the complete domain name of your server.

2. Configure the DCS server as explained in the topic *Configuring the DCS Server to Use Custom Keystore*.

Configuring the DCS Server to Use Custom Keystore

After packaging or converting your keystore into Java keystore, configure the DCS server to use your keystore.

1. Login to the appliance.

   ```
   ssh -l root oda-host-name
   ```

2. Generate the obfuscated keystore password:

   ```
   java -cp /opt/oracle/dcs/bin/dcs-controller-n.n.n.-SNAPSHOT.jar
    org.eclipse.jetty.util.security.Password keystore-password
   ```

   For example:

   ```
   [root@oda]# java -cp /opt/oracle/dcs/bin/dcs-controller-2.4.18-
   SNAPSHOT.jar
   org.eclipse.jetty.util.security.Password test
   12:46:33.858 [main] DEBUG org.eclipse.jetty.util.log
   - Logging to Logger[org.eclipse.jetty.util.log] via
   org.eclipse.jetty.util.log.Slf4jLog
   12:46:33.867 [main] INFO org.eclipse.jetty.util.log
   - Logging initialized @239ms to org.eclipse.jetty.util.log.Slf4jLog
   test
   OBF:1z0f1vu91vv11z0f
   MD5:098f6bcd4621d373cade4e832627b4f6
   [root@scaoda7s001 conf]#
   ```

   Copy the password that starts with OBF:.

3. Update the DCS controller configuration file.

   ```
   cd /opt/oracle/dcs/conf
   ```

   Update the following parameters in `dcs-controller.json`:

   ```
   "keyStorePath": "keystore-directory-path/your.domain.com.jks"
    "trustStorePath": /opt/oracle/dcs/conf/dcs-ca-certs
    "keyStorePassword": "obfuscated keystorepassword"
    "certAlias": "your.domain.com"
   ```

4. Restart the DCS Controller.

   ```
   systemctl stop initdcscontroller
   systemctl start initdcscontroller
   ```

5. Access the Browser User Interface at `https://`*`oda-host-name`*`:7093/mgmt/index.html`.

Configuring the DCS Agent for Custom Certificate

After you import the certificate into the keystore, configure the DCS agent to use the same certificate.

1. Update the DCS agent configuration file:

   ```
   cd /opt/oracle/dcs/conf
   ```

   Update the following parameters in the `dcs-agent.json` file:

   ```
   "keyStorePath": "keystore-directory-path/your.domain.com.jks"
    "trustStorePath": /opt/oracle/dcs/conf/dcs-ca-certs
    "keyStorePassword": "obfuscated keystorepassword"
    "certAlias": "your.domain.com"
   ```

2. Restart the DCS agent:

   ```
   systemctl stop initdcsagent
   systemctl start initdcsagent
   ```

3. Access the agent at `https://`*`oda-host-name`*`:7070`.
4. Update the CLI certificates.

   ```
   cp -f /opt/oracle/dcs/conf/dcs-ca-certs
   /opt/oracle/dcs/dcscli/dcs-ca-certs
   ```

5. Update the DCS command-line configuration files:

   ```
   [root@]# cd /opt/oracle/dcs/dcscli
   ```

Update the following parameters in dcscli-adm.conf and dcscli.conf:

```
TrustStorePath=/opt/oracle/dcs/conf/dcs-ca-certs
TrustStorePassword=keystore_password
```

Disabling the Browser User Interface

You can also disable the Browser User Interface. Disabling the Browser User Interface means you can only manage your appliance through the command-line interface.

1. Log in to the appliance:

   ```
   ssh -l root oda-host-name
   ```

2. Stop the DCS controller. For High-Availability systems, run the command on both nodes.

   ```
   systemctl stop initdcscontroller
   ```

Preparing Log Files for Oracle Support Services

If you have a system fault that requires help from Oracle Support Services, then you may need to provide log records to help Oracle support diagnose your issue.

You can collect diagnostic information for your appliance in the following ways:

- Use the Bill Of Materials report saved in the `/opt/oracle/dcs/Inventory/` directory, to enable Oracle Support to help troubleshoot errors, if necessary.
- You can use Trace File Collector (the `tfactl` command) to collect all log files for the Oracle Database Appliance components.
- Use the command `odaadmcli manage diagcollect` to collect diagnostic files to send to Oracle Support Services.

The `odaadmcli manage diagcollect` command consolidates information from log files stored on Oracle Database Appliance into a single log file for use by Oracle Support Services. The location of the file is specified in the command output.

Example 19-14 Collecting log file information for a time period, masking sensitive data

```
# odaadmcli manage diagcollect --dataMask --fromTime 2019-08-12 --
toTime 2019-08-25
DataMask is set as true
FromTime is set as: 2019-08-12
ToTime is set as: 2019-08-25
TFACTL command is: /opt/oracle/tfa/tfa_home/bin/tfactl
Data mask is set.
Collect data from 2019-08-12
Collect data to 2019-08-25
```

A

Oracle Database Appliance Software Configuration Defaults

Oracle Database Appliance software configuration defaults.

- Directory Paths for Oracle Database Appliance
  Locate the storage and mount configuration file paths for Oracle Database Appliance.
- Location of Log Files
  Log files are available for actions performed in the command-line interface and Browser User Interface and are useful when you need to track and debug jobs.
- Oracle Groups and User Configurations for Oracle Database Appliance
  Review the groups and default users when you use the Browser User Interface to deploy the appliance. All passwords are set to the password that you define during deployment.

Directory Paths for Oracle Database Appliance

Locate the storage and mount configuration file paths for Oracle Database Appliance.

Oracle homes on Oracle Database Appliance follow Optimal Flexible Architecture guidelines.

Directory Paths for Oracle Database Appliance

Item	Directory Path
Grid home	/u01/app/*release-specific_name/gi owner*
Grid base	/u01/app/*gi owner*
Oracle home	/u01/app/*rdbms owner*/product/*rdbms_version*/*dbhome_home_sequence_number*
Oracle base	/u01/app/*rdbms owner*
Oracle Inventory	/u01/app/oraInventory
Java Runtime Environment (JRE)	/opt/oracle/dcs/java/*release_specific_JRE_version*/
Java SDK	/opt/oracle/dcs/odajavasdk/

Location of Log Files

Log files are available for actions performed in the command-line interface and Browser User Interface and are useful when you need to track and debug jobs.

You can also use the Oracle Appliance Manager Browser User Interface to view job activity, including the tasks that make up the job. The status of each task appears in the Browser User Interface and you can drill down to get greater details.

If you log a Service Request, upload all of the logs in the `/opt/oracle/dcs/log` directory.

Patching Log Files

All patching-related information is logged in the `dcs-agent` log in the directory `/opt/oracle/dcs/log/`.

DCS Agent Log Directories

Agent-specific activities are logged in the `dcs-agent` log.

The DCS Agent, controller, and command-line interface output appear in the directory `/opt/oracle/dcs/log/`.

If an error occurs in the command-line interface layer, then the output will show in the `/opt/oracle/dcs/log/dcscli.log` file first.

Storage Logs

Storage-related activity is logged in the `oakd` log file.

```
/opt/oracle/oak/log/hostname/oak/oakd.log
```

For example, `/opt/oracle/oak/log/myhost/oak/oakd.log`

Use the `odaadmcli manage diagcollect` command to collect diagnostic logs for storage components. The files are saved in the `oakdiag` log file.

```
/opt/oracle/oak/log/hostname/oakdiag/file name.tar.gz
```

For example, `/opt/oracle/oak/log/myhost/oakdiag/oakStorage-myhost-20161120_2217.tar.gz`

Database Logs

Online logs are stored in the `/u03/app/db user/redo/` directory.

Oracle Fast Recovery Area (FRA) is located in the `/u03/app/db user/fast_recovery_area` directory.

Database alert logs are stored in the location `$ORACLE_BASE/diag/rdbms/`*`database_unique_name`*.

Oracle Auto Service Request (Oracle ASR) Log Files

All log files for Oracle ASR are located in the `/var/opt/asrmanager/log/` directory.

Oracle Groups and User Configurations for Oracle Database Appliance

Review the groups and default users when you use the Browser User Interface to deploy the appliance. All passwords are set to the password that you define during deployment.

Default Operating System Groups and User Configurations

Table A-1 Default Operating System Groups and Users Configuration for Oracle Database Appliance

Groups and Users	Default Value
Oracle Grid Infrastructure installation owner	`grid`, UID 1001
Oracle Database installation owner	`oracle`, UID 1000
Oracle Database system administrator	`sys`
Oracle Database generic administrator	`system`
Oracle Inventory system privileges group	`oinstall`, GID 1001
Oracle ASM Administrators system privileges	`asmadmin`, GID 1004
Oracle ASM Users system privileges	`asmdba`, GID 1006
Oracle ASM Operator system privileges	`asmoper`, GID 1005
Oracle Database Administrators system privileges	`dba`, GID 1003
Oracle Database Operator system privileges	`dbaoper`, GID 1002

Oracle Groups and User Configurations

You can use the Browser User Interface or the `odacli create-appliance` command and a JSON file to deploy the appliance. The following configurations are supported:

- 2 Users with 6 groups (operating system role separation)
- Single User with 6 groups (no operating system role separation)
- Single user with 2 groups (no operating system role separation)

You can customize `groupname`, `username`, and `UID`.

B

Oracle Database Appliance Storage Defaults

Review this section to understand Oracle Database Appliance storage architecture and options and how to determine usable storage.

- About Oracle Database Appliance Storage
  Oracle Database Appliance uses the Oracle Automatic Storage Management Cluster File System (Oracle ACFS) for storage of database and virtual machine files.
- Determining Usable Storage for Oracle Database Appliance X6-2-HA
  Review the usable disk capacity available for Oracle Database Appliance X6-2-HA and how capacity is derived.
- Oracle ACFS Space Management
  The Oracle ACFS file systems are automatically created when you create a database on Oracle Database Appliance.

About Oracle Database Appliance Storage

Oracle Database Appliance uses the Oracle Automatic Storage Management Cluster File System (Oracle ACFS) for storage of database and virtual machine files.

Oracle ACFS provides both servers with concurrent access to some or all of the shared storage on Oracle Database Appliance. Oracle ACFS supports space-efficient storage snapshots, which provides fast provisioning databases and virtual machines within Oracle Database Appliance.

Storage Systems Used With Oracle Database Appliance

Three types of Oracle ACFS file systems are used in Oracle Database Appliance:

- Database File Systems
- Shared repositories
- General-purpose storage

About Database File Systems

Database file systems are used exclusively for storing database files, and they include a FLASH file system for storing database data files and flash cache files, a DATA file system for database data files, a RECO file system for storing archive files and backups, and a REDO file system for storing redo log files.

About Shared Repositories

Shared repositories are file systems created on Oracle Database Appliance Virtualized Platform, and they are used to store virtual machine templates, runtime images, and virtual disks.

About General Purpose Storage

Every Oracle Database Appliance has a general-purpose cluster file system created by default That cluster file system is named `cloudfs`. You can use the `cloudfs` file system for general-purpose storage of files that must be shared between the servers. For example, you can use the `cloudfs` file system for staging data loads.

All Oracle ACFS file systems are created on Oracle ASM Dynamic Volumes provisioned from disk groups that are created in the shared disk storage pool. In a bare-metal deployment, these file systems are mounted directly in the operating system hosting the databases. In a virtualized deployment, these file systems are managed and mounted directly in ODA_BASE.

- Oracle ACFS Mount Points and Storage Space
  Review Oracle ASM Cluster file system (ACFS) mount points for Oracle Database Appliance.
- Displaying Mounted Disk Details
  Use the Oracle Automatic Storage Management `lsdg` command to display mounted disk groups and their information for Oracle Database Appliance.

Oracle ACFS Mount Points and Storage Space

Review Oracle ASM Cluster file system (ACFS) mount points for Oracle Database Appliance.

The storage shelf in the base Oracle Database Appliance X6-2-HA system is half populated with 10 solid-state drives (SSDs) for data storage, totaling 12TB of raw storage capacity. The storage shelf in the base system also has four 200 GB high endurance SSDs for database redo logs to improve performance and reliability. A separate ACFS file system is created from the REDO diskgroup for redo log files. Add 10 more SSDs on the base system for a total of 20 SSDs and 24 TB of raw storage capacity.

If you need additional storage, an optional storage expansion shelf is available. With the optional storage expansion shelf, the raw data storage capacity increases to a total of 48TB. The expansion shelf contains four 200 GB SSDs to expand the storage capacity for the database REDO logs. In addition, you can use external NFS storage outside of the appliance for online backups, data staging, or additional database files.

Table B-1 Oracle ACFS Mount Points and Related Oracle ASM Disk Groups and Volume Information

File System	Oracle ASM Disk Group	Oracle ASM Dynamic Volume	Mount Point
DATA	+DATA	`/dev/asm/dat`*`dbname-nnn`* For example: `/dev/asm/datodacn-123`	`/u02/app/`*`oracleuser`*`/oradata/`*`dbname`* For example: `/u02/app/example/oradata/odacn`

Table B-1 (Cont.) Oracle ACFS Mount Points and Related Oracle ASM Disk Groups and Volume Information

File System	Oracle ASM Disk Group	Oracle ASM Dynamic Volume	Mount Point
RECO	+RECO	/dev/asm/reco-*nn*	`/u03/app/`*`oracleuser`* This mount point is shared by all databases for `fast_recovery_area` and `redo` logs. For `fast_recovery_area`, the path is: `/u03/app/`*`oracleuser`*`/fast_recovery_area/`*`db_name`* For redo logs, the path is: `/u03/app/`*`oracleuser`*`/redo/`*`db_name`*

Example B-1 Oracle ACFS Storage Space

When the Oracle ACFS file systems are created, they do not initially consume all of the storage in the appliance. Space is preserved for additional repositories, or in some cases, database files stored directly in Oracle ASM. You can check for available storage space in your file systems by running the operating system command `df -k` as shown in the following example.

```
# df -k
Filesystem                          1K-blocks   Used         Available  Use%
Mounted on
/dev/mapper/VolGroupSys-LogVolRoot    30963708   14203568     15187276
49%     /
tmpfs                                 65952292     647800     65304492
1%     /dev/shm
/dev/sda1                               495844      43872       426372
10%     /boot
/dev/mapper/VolGroupSys-LogVolOpt     61927420   18594420     40187272
32%     /opt
/dev/mapper/VolGroupSys-LogVolU01    103212320   49621560     48347880
51%     /u01
/dev/asm/reco-62                      76546048    1469676     75076372
2%     /u03/app/oracle
/dev/asm/datrdb2-268                 104857600    3872368    100985232
4%     /u02/app/oracle/oradata/rdb2
/dev/asm/datndb11-268                104857600     247160    104610440
1%     /u02/app/oracle/oradata/ndb11
/dev/asm/datndb12-268                104857600     247160    104610440
1%     /u02/app/oracle/oradata/ndb12
```

Displaying Mounted Disk Details

Use the Oracle Automatic Storage Management `lsdg` command to display mounted disk groups and their information for Oracle Database Appliance.

To display information about a specific disk group, specify the disk group in the command.

1. Log in as a `grid` user.

2. Run the Oracle Automatic Storage Management `lsdg` command.

Example B-2 Determining Storage on the DATA Disk Group

```
ASMCMD [+] > lsdg data

State     Type     Rebal  Sector  Block       AU  Total_MB  Free_MB
Req_mir_free_MB  Usable_file_MB
MOUNTED  NORMAL  N         512   4096  4194304     12288
8835             1117            3859

(continued)
Offline_disks  Voting_files  Name
            0             N  DATA
```

Determining Usable Storage for Oracle Database Appliance X6-2-HA

Review the usable disk capacity available for Oracle Database Appliance X6-2-HA and how capacity is derived.

Oracle Database Appliance X6-2-HA use 1.6TB raw Solid-State Drives, formatted to 1.2TB for performance. The usable data capacity varies because it is derived by converting disk hardware terabytes (based on 1 kilobyte equals 1,000 bytes) into software storage terabytes (based on 1 kilobyte equals 1,024 bytes) and splitting the usable capacity into Oracle Automatic Storage Management (Oracle ASM) disk groups.

Each of the SSD usable storage is approximately 1.1TB. This is calculated by the storage usable capacity of the drive converted to TB (1.2 TB divided by 1.024^4= 1.1TB.)

The following tables provide the approximate amount of usable space for the Oracle Database Appliance X6-2-HA for the DATA and RECO disk groups.

Usable Disk Capacity on Oracle Database Appliance X6-2-HA

The following table provides the approximate amount of usable space for the Oracle Database Appliance X6-2-HA.

Table B-2 Usable Disk Capacity on Oracle Database Appliance X6-2-HA

Description	Sizing for X6-2-HA with 10 SSD Drives	Sizing for X6-2-HA with 20 SSD Drives	Sizing for X6-2-HA with 40 SSD Drives
Number of SSD Drives	10	20	40
Total usable Space	10.9TB	22TB	44TB
Reserved Space Normal Redundancy	1.4TB	2.4TB	3.0TB
Total Usable Normal (Double Mirror) Oracle ASM Redundancy	4.7TB	9.8TB	20.5TB

Table B-2 (Cont.) Usable Disk Capacity on Oracle Database Appliance X6-2-HA

Description	Sizing for X6-2-HA with 10 SSD Drives	Sizing for X6-2-HA with 20 SSD Drives	Sizing for X6-2-HA with 40 SSD Drives
DATA Disk Group Normal Redundancy, External Backup (80% usable)	3.8TB	7.8TB	16.4TB
RECO Disk Group Normal Redundancy, External Backup (20% usable)	0.9TB	2.0TB	4.1TB
DATA Disk Group Normal Redundancy, Internal Backup (40% Usable)	1.9TB	3.9TB	8.2TB
RECO Disk Group Normal Redundancy, Internal Backup (60% usable)	2.8TB	5.9TB	12.3TB
Reserved Space High Redundancy	2.9TB	5.4TB	8.9TB
Total usable High (Triple Mirror) Oracle ASM Redundancy	2.6TB	5.5TB	11.9TB
DATA Disk Group High Redundancy, External Backup(80% usable)	2.0TB	4.4TB	9.5TB
RECO Disk Group High Redundancy, External Backup (20% usable)	0.6TB	1.1TB	2.4TB
DATA Disk Group High Redundancy, Internal Backup(40% usable)	1.0TB	2.2TB	4.7TB
RECO Disk Group (10% usable)	1.6TB	3.3TB	7.2TB
Reserved Space Flex Redundancy	2.9TB	5.4TB	8.9TB
Total Usable Flex Oracle ASM Redundancy	2.6TB to 4.7TB	5.5TB to 9.8TB	11.9TB to 20.5TB
DATA Disk Group Flex Redundancy, External Backup (80% usable)	2.0TB to 3.8TB	4.4TB to 7.8TB	9.5TB to 16.4TB
RECO Disk Group Flex Redundancy, External Backup (20% usable)	0.6TB to 0.9TB	1.1TB to 2.0TB	2.4TB to 4.1TB
DATA Disk Group Flex Redundancy, Internal Backup(40% usable)	1.0TB to 1.9TB	2.2TB to 3.9TB	4.7TB to 8.2TB
RECO Disk Group (60% usable)	1.6TB to 2.8TB	3.3TB to 5.9TB	7.2TB to 12.3TB

The Reserved Space values represent the amount of storage required to maintain full redundancy in case of disk failure.

The REDO disk group uses 800 GB raw Solid-State Drives or 0.8TB total usable space. The REDO disk group uses high redundancy that provides approximately 0.3TB usable space for database redo logs.

> **Note:**
>
> For non-CDB databases, the REDO disk group has 50% free disk space.
>
> For CDB databases, an Oracle ASM Cluster file system (ACFS) mount point is created per CDB database, based on the template log file size. If this is a Single Instance (SI) database, then multiply by 3. If the database is an Oracle RAC database, then multiply by 4.

Oracle ASM Calculations

When Oracle ASM calculates Usable Free Space, it determines the amount of space to reserve in the case of a disk failure. When you query Oracle ASM or Oracle Database Appliance commands to view the amount of storage available, the `usable_File_MB` value may report a negative number.

Table B-3 Oracle ASM Calculations

Number of Drives	Redundancy	Total_MB	Free_MB	Req_mir_free _MB	Usable_file_ MB	Name
2	NORMAL	4894016	4893372	2441888	1220644	DATA/
4	NORMAL	1231176	1230996	610468	305150	RECO/

> **Note:**
>
> Note: 1TB = MB divided by 1024^2

The following table describes how capacity terms are defined by Oracle ASM and Oracle Database Appliance.

Table B-4 Definition of Terminology

Term	Oracle ASM Definition	Oracle Database Appliance Definition
`Total_MB`	Size of the disk group in MB	Total usable storage. For example, for 2 NVMe drives, total usable storage is 5.8TB.
`Free_MB`	Free space in the disk group in MB, without regard to redundancy.	Total usable storage after formatting to Oracle ASM disk groups. For example, for 2 NVMe drives, total usable storage is 5.8TB.

Table B-4 (Cont.) Definition of Terminology

Term	Oracle ASM Definition	Oracle Database Appliance Definition
`Req_mir_free_MB`	Amount of space that must be available in the disk group to restore full redundancy after the worst failure that can be tolerated by the disk group.	Usable space required to restore full redundancy. When storage is consumed higher than the `usable_file_MB` value, this number will report a negative value.
`Usable_file_MB`	Amount of free space, adjusted for mirroring, that is available for new files.	Total usable space taking into consideration the mirroring level. Oracle ASM also calculates the amount of space required

Oracle ACFS Space Management

The Oracle ACFS file systems are automatically created when you create a database on Oracle Database Appliance.

When you use Oracle ACFS for database storage, the following is created:

- A 100G ACFS is created from +DATA diskgroup for each database. This Oracle ACFS automatically extends the space on demand.
- A common Oracle ACFS with 25% of +RECO diskgroup is created with auto extension on. This file system is used for fast recovery area and redo logs for all databases.

When the Oracle ACFS file systems are created, they do not initially consume all of the storage in the appliance. Space is preserved for additional repositories, or in some cases, database files stored directly in Oracle ASM. You can check for available storage space in your file systems by running the operating system command `df -k` as shown in the following example.

```
# df -k
Filesystem                            1K-blocks   Used         Available  Use%
Mounted on
/dev/mapper/VolGroupSys-LogVolRoot    30963708    14203568     15187276
49%     /
tmpfs                                 65952292      647800     65304492
1%     /dev/shm
/dev/sda1                               495844       43872       426372
10%     /boot
/dev/mapper/VolGroupSys-LogVolOpt     61927420    18594420     40187272
32%     /opt
/dev/mapper/VolGroupSys-LogVolU01    103212320    49621560     48347880
51%     /u01
/dev/asm/reco-62                      76546048     1469676     75076372
2%     /u03/app/oracle
/dev/asm/datrdb2-268                 104857600     3872368    100985232
4%     /u02/app/oracle/oradata/rdb2
/dev/asm/datndb11-268                104857600      247160    104610440
1%     /u02/app/oracle/oradata/ndb11
/dev/asm/datndb12-268                104857600      247160    104610440
1%     /u02/app/oracle/oradata/ndb12
```

C
Creating an Appliance Using JSON File

Understand the process to create an appliance using the command `odacli create-appliance` and view an example JSON file.

- Loading and Saving Appliance Configurations
  You can load a saved JSON file and use it to configure your appliance, and save an existing configuration as a JSON file from the Browser User Interface.
- Readme for the Command odacli create-appliance
  If you want to create the appliance outside of the Browser User Interface, then review the readme file for details on how to create a JSON file to use with the command-line interface.
- Example JSON Files to Create a Single Node Appliance with the CLI
  Follow these JSON file examples to create a JSON file to deploy a single node appliance with the command `odacli create-appliance`.
- Example JSON File to Create a Multi-Node Appliance with the CLI
  Follow the JSON file example to create a JSON file to deploy a multi-node appliance with the command `odacli create-appliance`.

Loading and Saving Appliance Configurations

You can load a saved JSON file and use it to configure your appliance, and save an existing configuration as a JSON file from the Browser User Interface.

Using a Saved Configuration to Create a New Appliance in the Browser User Interface

You can load a saved configuration from your client machine, and create a new appliance.

1. Log into the Browser User Interface.
2. In the Create Appliance page, click **Browse** next to Load Configuration.
3. Select the JSON file from the local machine, being used to access the Browser User Interface.
4. The appliance configuration values from the JSON file are populated in the fields on the Create Appliance page.
5. Make any changes required, and submit the request to create the appliance

   Note that for security requirements, you must enter passwords manually.

Saving an Appliance Configuration from the Browser User Interface

You can save an appliance configuration and use it to create another appliance.

1. Log into the Browser User Interface.
2. If you have already configured your appliance, then in the Create Appliance page, click **Save Configuration**.

3. The configuration is saved as a JSON file on the local machine, being used to access the Browser User Interface.

Readme for the Command odacli create-appliance

If you want to create the appliance outside of the Browser User Interface, then review the readme file for details on how to create a JSON file to use with the command-line interface.

You can use the command `odacli create-appliance` and a JSON file that includes your appliance configuration settings to deploy the appliance instead of using the Browser User Interface.

> **Note:**
>
> It is important to review the readme and the examples carefully before creating your JSON file. If you do not enter your network and Oracle ILOM information correctly based on your setup, you will lose network access to both the host and Oracle ILOM.

Readme

The readme is located in the `/opt/oracle/dcs/sample` directory. Review the readme carefully along with the provided JSON example files. Create a JSON file with the necessary changes based on your environment and requirements.

Example JSON Files to Create a Single Node Appliance with the CLI

Follow these JSON file examples to create a JSON file to deploy a single node appliance with the command `odacli create-appliance`.

Use the example JSON files and the information located in the readme as a template to create a file for your environment. Examples and the readme are located in the `/opt/oracle/dcs/sample` directory.

> **Note:**
>
> If you do not enter your network and Oracle ILOM information correctly based on your setup, then network access is lost to both the host and Oracle ILOM.

When using the example to create your JSON file, change the definitions to match your environment. The password must meet password requirements.

Example C-1 JSON File to Create a Single Node Oracle Database Appliance with Role Separation

The following is an example of a JSON file that creates a single node appliance on Oracle Database Appliance. The example uses role separation.

```
  {
"instance" : {
  "name" : "odambox",
  "instanceBaseName" : "odambox-c",
  "dbEdition" : "EE",
  "timeZone" : "UTC",
  "ntpServers" : ["10.0.3.14"],
  "dnsServers" : ["10.0.4.10","10.0.4.11","10.0.4.12"],
  "domainName" : "example.com",
  "isRoleSeparated" : true,
  "osUserGroup" : {
    "groups" : [ {
      "groupId" : 1001,
      "groupName" : "oinstall",
      "groupRole" : "oinstall"
    }, {
      "groupId" : 1002,
      "groupName" : "dbaoper",
      "groupRole" : "dbaoper"
    }, {
      "groupId" : 1003,
      "groupName" : "dba",
      "groupRole" : "dba"
    }, {
      "groupId" : 1004,
      "groupName" : "asmadmin",
      "groupRole" : "asmadmin"
    }, {
      "groupId" : 1005,
      "groupName" : "asmoper",
      "groupRole" : "asmoper"
    }, {
      "groupId" : 1006,
      "groupName" : "asmdba",
      "groupRole" : "asmdba"
    } ],
    "users" : [ {
      "userId" : 1000,
      "userName" : "oracle",
      "userRole" : "oracleUser"
    }, {
      "userId" : 1001,
      "userName" : "grid",
      "userRole" : "gridUser"
    } ]
  }
},
"nodes" : [ {
  "nodeNumber" : "0",
  "nodeName" : "odambox",
  "network" : [ {
     "nicName" : "btbond1",
     "ipAddress" : "10.0.1.11",
     "subNetMask" : "255.255.240.0",
     "gateway" : "10.0.0.1",
     "networkType" : [ "Public" ],
     "isDefaultNetwork" : true
    },
  ],
  "ilom" : {
    "ilomName":"odambox-c",
    "ipAddress":"10.0.2.10",
    "subNetMask":"255.255.240.0",
    "gateway":"10.0.0.1"
   }
} ],
"grid" : {
  "diskGroup" : [ {
    "diskGroupName" : "DATA",
    "redundancy" : "NORMAL",
    "diskPercentage" :80
  }, {
    "diskGroupName" : "RECO",
    "redundancy" : "NORMAL",
    "diskPercentage" :20
  } ],
"scan" : {
   "scanName":"odambox-scan",
   "ipAddresses":[
  "10.0.1.11"
   ]
  },
"vip":[
   {
  "nodeNumber":"0",
  "vipName":"odambox-vip",
  "ipAddress":"10.0.1.11"
   }
  ],
  "language" : "en",
  "enableAFD":"TRUE"
},
"database" : {
  "dbName" : "myTestDb",
  "databaseUniqueName":"myTestDb_sea1kj",
  "dbEdition" : "EE",
  "dbVersion" : "12.2.0.1",
  "dbHomeId":null,
  "instanceOnly" : false,
  "isCdb" : true,
  "pdBName" : "pdb1",
  "pdbAdminuserName" : "pdbuser",
  "enableTDE":true,
  "adminPassword" : "password",
      "dbType" : "SI",
      "dbTargetNodeNumber" : null,
      "dbClass" : "OLTP",
      "dbShape" : "odb1",
      "dbStorage" : "ACFS",
      "dbCharacterSet" : {
        "characterSet" : "AL32UTF8",
        "nlsCharacterset" : "AL16UTF16",
        "dbTerritory" : "AMERICA",
        "dbLanguage" : "AMERICAN"
      },
      "dbConsoleEnable" : false,
      "backupConfigId":null,
      "rmanBkupPassword": null
    },
    "asr" :{
      "asrType": "INTERNAL",
      "userName":"john.smith@example.com",
      "password":"password",
      "proxyServerName":"www-proxy.example.com",
      "proxyPort":"80",
      "proxyUserName":"proxy-user",
      "proxyPassword":"proxy-password",
      "snmpVersion":"v2"
    }
  }
```

Example C-2 JSON File to Create a Single Node Oracle Database Appliance without Role Separation

The following is an example of a JSON file that creates an Oracle Database Appliance without using role separation. This example creates two groups (oinstall and dba) and one user ("oracle").

```
{
  "instance" : {
    "name" : "odambox",
    "instanceBaseName" : "odambox-c",
    "dbEdition" : "EE",
    "timeZone" : "UTC",
    "ntpServers" : ["10.0.3.14"],
    "dnsServers" : ["10.0.4.10","10.0.4.11","10.0.4.12"],
    "domainName" : "example.com",
    "isRoleSeparated" : false,
    "osUserGroup" : {
      "groups" : [ {
        "groupId" : 1001,
        "groupName" : "oinstall",
        "groupRole" : "oinstall"
      }, {
        "groupId" : 1002,
        "groupName" : "dba",
        "groupRole" : "dba"
      } ],
     "users" : [ {
      "userId" : 1000,
      "userName" : "oracle",
      "userRole" : "oracleUser"
    } ]
  }
},
"nodes" : [ {
  "nodeNumber" : "0",
  "nodeName" : "odambox",
  "network" : [ {
     "nicName" : "btbond1",
     "ipAddress" : "10.0.1.11",
     "subNetMask" : "255.255.240.0",
     "gateway" : "10.0.0.1",
     "networkType" : [ "Public" ],
     "isDefaultNetwork" : true
    },
  ],
  "ilom" : {
    "ilomName":"odambox-c",
    "ipAddress":"10.0.2.10",
    "subNetMask":"255.255.240.0",
    "gateway":"10.0.0.1"
   }
} ],
"grid" : {
  "diskGroup" : [ {
    "diskGroupName" : "DATA",
    "redundancy" : "NORMAL",
    "diskPercentage" :80
  }, {
    "diskGroupName" : "RECO",
    "redundancy" : "NORMAL",
    "diskPercentage" :20
  } ],
"scan" : {
   "scanName":"odambox-scan",
   "ipAddresses":[
  "10.0.1.11"
   ]
  },
"vip":[
   {
  "nodeNumber":"0",
  "vipName":"odambox-vip",
  "ipAddress":"10.0.1.11"
   }
  ],
  "language" : "en",
  "enableAFD":"TRUE"
},
"database" : {
  "dbName" : "myTestDb",
  "databaseUniqueName":"myTestDb_sea1kj",
  "dbEdition" : "EE",
    "dbVersion" : "12.2.0.1",
    "dbHomeId":null,
    "instanceOnly" : false,
    "isCdb" : true,
    "pdBName" : "pdb1",
    "pdbAdminuserName" : "pdbuser",
    "enableTDE":true,
    "adminPassword" : "password",
    "dbType" : "SI",
    "dbTargetNodeNumber" : null,
    "dbClass" : "OLTP",
    "dbShape" : "odb1",
    "dbStorage" : "ACFS",
    "dbCharacterSet" : {
      "characterSet" : "AL32UTF8",
      "nlsCharacterset" : "AL16UTF16",
      "dbTerritory" : "AMERICA",
      "dbLanguage" : "AMERICAN"
    },
    "dbConsoleEnable" : false,
    "backupConfigId":null,
    "rmanBkupPassword": null
  },
  "asr" :{
    "asrType": "INTERNAL",
    "userName":"john.smith@example.com",
    "password":"password",
    "proxyServerName":"www-proxy.example.com",
    "proxyPort":"80",
    "proxyUserName":"proxy-user",
    "proxyPassword":"proxy-password",
    "snmpVersion":"v2"
  }
}
```

Example JSON File to Create a Multi-Node Appliance with the CLI

Follow the JSON file example to create a JSON file to deploy a multi-node appliance with the command `odacli create-appliance`.

Use the example JSON files and the information located in the readme as a template to create a file for your environment. Examples and the readme are located in the `/opt/oracle/dcs/sample` directory.

> **Note:**
>
> It is important to review the readme and the examples carefully before creating your JSON file. If you do not enter your network and Oracle ILOM information correctly based on your setup, then network access is lost to both the host and Oracle ILOM.

Example C-3 JSON File to Create a Multi-Node Oracle Database Appliance with Role Separation

The following is an example of a JSON file that creates a multi-node appliance on Oracle Database Appliance bare metal platform. The example uses role separation. When using the example to create your JSON file, change the definitions to match your environment. The password must meet password requirements.

```
{
   "instance":{
      "name":"odahabox",
      "instanceBaseName":"odahabox",
      "dbEdition":"EE",
      "timeZone":"UTC",
      "ntpServers" : ["10.0.3.14"],
      "dnsServers" : ["10.0.4.10","10.0.4.11","10.0.4.12"],
      "domainName":"example.com",
      "isRoleSeparated":true,
      "osUserGroup":{
         "groups":[
            {
               "groupId":1001,
               "groupName":"oinstall",
               "groupRole":"oinstall"
            },
            {
               "groupId":1002,
               "groupName":"dbaoper",
               "groupRole":"dbaoper"
            },
            {
               "groupId":1003,
               "groupName":"dba",
               "groupRole":"dba"
            },
            {
               "groupId":1004,
               "groupName":"asmadmin",
               "groupRole":"asmadmin"
            },
            {
               "groupId":1005,
               "groupName":"asmoper",
               "groupRole":"asmoper"
            },
            {
               "groupId":1006,
               "groupName":"asmdba",
               "groupRole":"asmdba"
            }
         ],
         "users":[
            {
               "userId":101,
               "userName":"grid",
               "userRole":"gridUser"
            },
            {
               "userId":102,
               "userName":"oracle",
               "userRole":"oracleUser"
            }
         ]
      },
      "objectStoreCredentials":null
   },
   "nodes":[
      {
         "nodeNumber":"0",
         "nodeName":"odahaboxc1n2",
         "network":[
            {
               "nicName":"btbond1",
               "ipAddress":"10.31.98.133",
               "subNetMask":"255.255.240.0",
               "gateway":"10.31.96.1",
               "networkType":[
                  "Public"
               ],
               "isDefaultNetwork":true
            }
         ],
         "ilom":{
            "ilomName":"odahabox2-c",
            "ipAddress":"10.31.16.140",
            "subNetMask":"255.255.240.0",
            "gateway":"10.31.16.1"
         }
      },
      {
         "nodeNumber":"1",
         "nodeName":"odahaboxc1n1",
         "network":[
            {
               "nicName":"btbond1",
               "ipAddress":"10.31.98.132",
               "subNetMask":"255.255.240.0",
               "gateway":"10.31.96.1",
               "networkType":[
                  "Public"
               ],
               "isDefaultNetwork":true
            }
         ],
         "ilom":{
            "ilomName":"odahabox1-c",
            "ipAddress":"10.31.16.139",
            "subNetMask":"255.255.240.0",
            "gateway":"10.31.16.1"
         }
   }
],
"grid":{
   "diskGroup":[
      {
         "diskGroupName":"DATA",
         "redundancy":"HIGH",
         "diskPercentage":80
      },
      {
         "diskGroupName":"RECO",
         "redundancy":"HIGH",
         "diskPercentage":20
      },
      {
         "diskGroupName":"REDO",
         "redundancy":"HIGH",
         "diskPercentage":null
      }
   ],
   "scan":{
      "scanName":"odahaboxc1-scan",
      "ipAddresses":[
         "10.31.98.182",
         "10.31.98.183"
      ]
   },
   "vip":[
      {
         "nodeNumber":"0",
         "vipName":"odahaboxc1n2-vip",
         "ipAddress":"10.31.98.159"
      },
      {
         "nodeNumber":"1",
         "vipName":"odahaboxc1n1-vip",
         "ipAddress":"10.31.98.158"
      }
   ],
   "language":"en",
   "enableAFD":"TRUE"
},
"database":{
   "dbName":"myTestDb",
   "databaseUniqueName":"myTestDb_sea1kj",
   "dbVersion":"12.2.0.1",
   "dbHomeId":null,
   "instanceOnly":false,
   "isCdb":true,
   "pdBName":"pdb1",
   "pdbAdminuserName":"pdbuser",
   "enableTDE":true,
   "adminPassword":"password",
   "dbType":"RAC",
   "dbTargetNodeNumber":null,
      "dbClass":"OLTP",
      "dbShape":"odb1",
      "dbStorage":"ACFS",
      "dbCharacterSet":{
         "characterSet":"AL32UTF8",
         "nlsCharacterset":"AL16UTF16",
         "dbTerritory":"AMERICA",
         "dbLanguage":"AMERICAN"
      },
      "dbConsoleEnable":false,
      "backupConfigId":null
   },
   "asr":null
}
```

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Database Templates for Oracle Database Appliance

Use the information in this appendix to select database templates for your planned databases.

Topics:

- About Database Templates for Oracle Database Appliance
  Review this information to help determine the database template to use.
- Types of Database Templates for Oracle Database Appliance X6-2-HA
  Use one of the database templates defined for Oracle Database Appliance X6-2-HA.

About Database Templates for Oracle Database Appliance

Review this information to help determine the database template to use.

Oracle Database Appliance enables you to consolidate many databases into a single system. Consolidation can minimize idle resources, maximize efficiency, and lower costs. By using instance caging in conjunction with Oracle Database Resource Manager (the Resource Manager), you can provide desired levels of service across multiple instances on a single Oracle Database Appliance.

Oracle Database Appliance templates are already tuned for the size of each database instance workload. They are designed to run on a specific number of cores. Caging ensures that each database workload is restricted to the set of cores allocated by the template, enabling multiple databases to run concurrently with no performance degradation, up to the capacity of Oracle Database Appliance. You can select database template sizes larger than your current needs to provide for planned growth, which you accommodate later by adjusting System Global Area (SGA) and Program Global Area (PGA) sizes as well as the number of cores.

The Oracle Appliance Manager Configurator refers to the database sizing templates as *classes* of databases.

> **Note:**
>
> Oracle strongly recommends that you use the Oracle Database Appliance templates, because they implement best practices and are configured specifically for Oracle Database Appliance.

Use the database sizing tables to help select the best templates for your databases. When using the sizing tables remember that:

- The information in the tables assumes that you are creating disk backups.
  The information in the tables assume that you are creating local disk backups.

Consider the space requirements for your database and the policy for local disk backups versus external backups. Typically, external backups have more space available for the database than local backups.

- Container databases are created on Oracle ACFS.
- The log file size assumes four redo log groups for each instance with a log switch every 15 minutes when the system is running at full capacity.
- Storage is shared between the servers on Oracle Database Appliance.

About Oracle Database Appliance Template Options

The database templates are configured specifically for the type of database workload that you want to carry out on your databases on Oracle Database Appliance. Choose the template that best matches the common workload your databases perform (OLTP, DSS, In-Memory).

The database sizing tables provide template names and sizing based on the number of CPUs and memory attributes for each type of database workload.

Identify the template type that is appropriate to your database workload and hardware:

- Use Oracle Database Appliance OLTP Database Templates if your database workload is primarily online transaction processing (OLTP).
- Use Oracle Database Appliance DSS database templates if your database workload is primarily decision support services (DSS) or data warehousing.
- Use Oracle Database Appliance In-Memory (IMDB) database templates if your database workload can fit in memory, and can benefit from in-memory performance capabilities.
- Use the platform-specific database templates if your database is on a specific platform. For example, use Oracle Database Appliance X6-2-HA generic database templates if your database is on Oracle Database Appliance X6-2-HA.

The templates provide general guidelines about the maximum number of databases on a fully deployed Oracle Database Appliance. Base the memory and CPU sizing on the number of instances per server, not the number of databases. Memory and CPUs are shared by all databases and the number of databases impacts performance. For example, when you have one database, the database receives full I/O throughput. If you have 9 databases, then each database has only 1/9th of the available I/O throughput for all disks.

When you have multiple databases, they share and compete over available CPU resources. When choosing a template, do not have more CPU_COUNTs distributed than available threads in the system. Oracle recommends partitioning, where every database has exclusive CPUs. If you choose to exceed the recommended maximum number of databases on Oracle Database Appliance (over-provision), be aware of your I/O results and performance degradation. With the over-provisioned approach, the sum of the CPU_COUNT across all instances can exceed the number of CPUs. Better resource utilization is provided with over-provisioning; however, it is possible for contention to occur when multiple databases are heavily loaded at the same time. Over-provisioning is best used for systems running non-critical applications. Avoid using over-provisioning for databases with high I/O requirements or those with high transaction rates. If you choose to over-provision, then do not exceed twice the number of total CPUs. Twice the allocation of total CPUs is based on hyper-threading of 2 CPU threads per core.

Types of Database Templates for Oracle Database Appliance X6-2-HA

Use one of the database templates defined for Oracle Database Appliance X6-2-HA.

Oracle Database Appliance OLTP Database Template Sizes

Table D-1 Oracle Database Appliance OLTP Database Template Sizes

Template	CPU Cores	SGA (GB)	PGA (GB)	Processes	LOG buffer, Redo Log
odb-01s	1	2	1	200	16 MB, 1 GB
odb-01	1	4	2	200	16 MB, 1 GB
odb-02	2	8	4	400	16 MB, 1 GB
odb-04	4	16	8	800	32 MB, 1 GB
odb-06	6	24	12	1200	64 MB, 2 GB
odb-08	8	32	16	1600	64 MB, 2 GB
odb-10	10	40	20	2000	64 MB, 2 GB
odb-12	12	48	24	2400	64 MB, 4 GB
odb-16	16	64	32	3200	64 MB, 4 GB
odb-20	20	80	40	4000	64 MB, 4 GB

Oracle Database Appliance DSS Database Template Sizes

Table D-2 Oracle Database Appliance DSS Database Template Sizes

Template	CPU Cores	SGA (GB)	PGA (GB)	Processes	Redo log file size (GB)	Log buffer (MB)
odb-01s	1	1	2	200	1	16
odb-01	1	2	4	200	1	16
odb-02	2	4	8	400	1	16
odb-04	4	8	16	800	1	32
odb-06	6	12	24	1200	2	64
odb-08	8	16	32	1600	2	64
odb-10	10	20	40	2000	2	64
odb-12	12	24	48	2400	4	64
odb-16	16	32	64	3200	4	64
odb-20	20	40	80	4000	4	64

Oracle Database Appliance In-Memory Database Template Size

Table D-3 Oracle Database Appliance In-Memory Database Template Size

Template	CPU Cores	SGA (GB)	PGA (GB)	In-Memory (GB)	Processes	Redo log file size (GB)	Log buffer (MB)
odb-01s	1	2	1	1	200	1	16
odb-01	1	4	2	2	200	1	16
odb-02	2	8	4	4	400	1	16
odb-04	4	16	8	8	800	1	32
odb-06	6	24	12	12	1200	2	64
odb-08	8	32	16	16	1600	2	64
odb-10	10	40	20	20	2000	2	64
odb-12	12	48	24	24	2400	4	64
odb-16	16	64	32	32	3200	4	64
odb-20	20	80	40	40	4000	4	64

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