Oracle® Database Appliance

X6-2S/X6-2M/X6-2L Deployment and User’s Guide

Release 19.7 for Linux x86-64
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ORACLE®

Oracle Database Appliance X6-2S/X6-2M/X6-2L Deployment and User’s Guide, Release 19.7 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
- Documentation Accessibility
- Related Documents
- Conventions

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
  - 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
- **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.

2
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
  Determine how many CPU cores you want to enable, determine your database configuration options, and gather the system information for your Oracle Database Appliance Bare Metal deployment 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

Determine how many CPU cores you want to enable, determine your database configuration options, and gather the system information for your Oracle Database Appliance Bare Metal deployment configuration.

> **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.

- Selecting an Oracle Database Appliance Configuration
  Compare and select an Oracle Database Appliance X6-2S, X6-2M, or X6-2L hardware configuration.
- Selecting Operating System Groups and Users
  Determine how you want to configure your operating system groups and users and whether or not you want to allow operating system role separation.
- Selecting Database Deployment Options
  See the Oracle Database editions that are available for deployment.
- Selecting Database Shapes for Oracle Database Appliance
  Oracle Database Appliance software includes preconfigured templates, known as shapes, that incorporate Oracle best practices with optimization for different classes of databases.

Selecting an Oracle Database Appliance Configuration

Compare and select an Oracle Database Appliance X6-2S, X6-2M, or X6-2L hardware configuration.

- 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 and database consolidation.

You cannot expand or reconfigure Oracle Database Appliance to a different configuration. For example, you cannot expand Oracle Database Appliance X6-S to Oracle Database Appliance X6-2M. For Oracle Database Appliance X6-2 configuration details, see the *Oracle Database Appliance Owner's Guide*.

Selecting Operating System Groups and Users

Determine how you want to configure your operating system groups and users and whether or not you want to allow operating system role separation.

About Operating System Groups and Users

Role separation enables you to configure groups and users to provide separate groups for operating system authentication.

Without role separation, a single user owns all of the Oracle installations. All of the databases are installed under a single user. Role separation enables you to have separate users for Oracle and Oracle Clusterware. You can install multiple databases without sharing operating system authentication for system privileges. In addition, each Oracle software installation is owned by a separate installation owner, to provide operating system user authentication for modifications to Oracle Database binaries.

> **Note:**
>
> Any Oracle software owner can start and stop all databases and shared Oracle Grid Infrastructure resources, such as Oracle Automatic Storage Management (Oracle ASM) or Virtual IP (VIP). The job role separation configuration enables database security, it does not restrict user roles in starting and stopping various Oracle Clusterware resources.

With Oracle Grid Infrastructure role separation, separate operating system groups provide operating system authentication for Oracle ASM system privileges for storage tier administration. This operating system authentication is separated from Oracle Database operating system authentication. In addition, the Oracle Grid Infrastructure installation owner provides operating system user authentication for modifications to Oracle Grid Infrastructure binaries.

You can configure the appliance with one of four combinations of operating system users, groups, and roles. The default users are the Oracle Database installation owner (`oracle`) and Oracle Grid Infrastructure installation owner (`grid`). The default groups are `oinstall`, `dbaoper`, `dba`, `asmadmin`, `asmoper`, and `asmdba`

Default Configuration: Two Users with Six Groups

The default configuration is a combination of two operating system roles for users with six groups.

To configure two users, `oracle` user with the Oracle User (`oracleUser`) role and the `grid` user with the `gridUser` role, allow operating system role separation.

To configure six groups, `oinstall`, `dbaoper`, `dba`, `asmadmin`, `asmoper`, and `asmdba`, do not select the option to customize users and groups.

> **Note:**
>
> When you select the default configuration in the Web Console, the users and groups do not appear in the interface.

Two Custom Users with Six Custom Groups

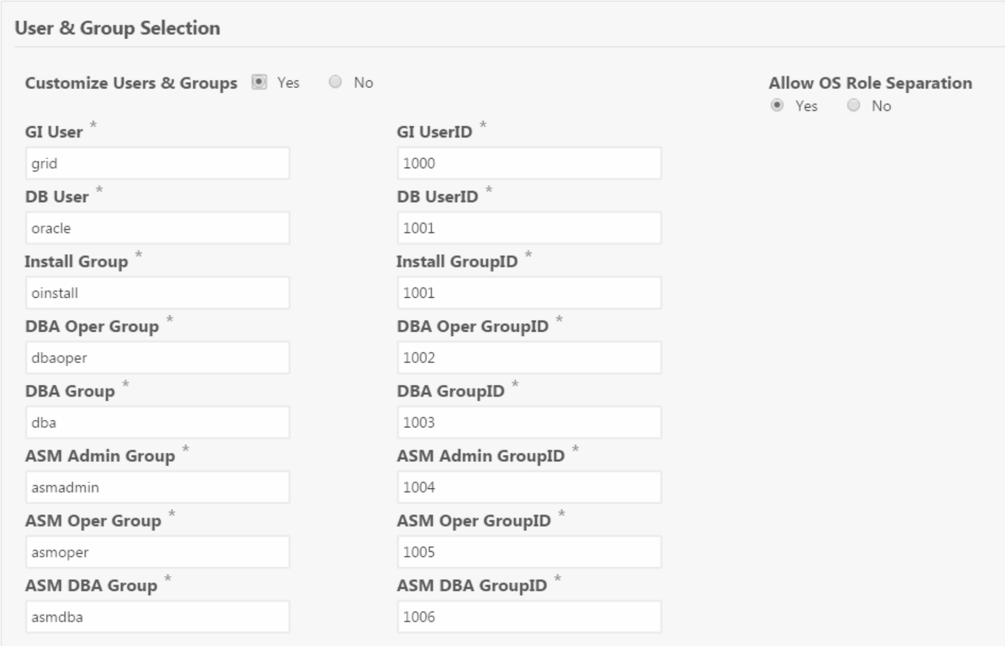
You can customize the configuration to create two custom users and six custom groups.

To configure two users, allow operating system role separation. The users are populated with the default values, `oracle` and `grid`, which you can edit.

To configure six groups, select the option to customize users and groups. The groups are populated with the default values, which you can edit. The default groups are `oinstall`, `dbaoper`, `dba`, `asmadmin`, `asmoper`, and `asmdba`.

The figure shows an example of a custom configuration with the default values populated.

Figure 2-1 Two Custom Users with Six Custom Groups



User & Group Selection

Customize Users & Groups ● Yes ○ No

Allow OS Role Separation ● Yes ○ No

GI User *	GI UserID *
grid	1000
DB User *	DB UserID *
oracle	1001
Install Group *	Install GroupID *
oinstall	1001
DBA Oper Group *	DBA Oper GroupID *
dbaoper	1002
DBA Group *	DBA GroupID *
dba	1003
ASM Admin Group *	ASM Admin GroupID *
asmadmin	1004
ASM Oper Group *	ASM Oper GroupID *
asmoper	1005
ASM DBA Group *	ASM DBA GroupID *
asmdba	1006

Single Custom User with Six Custom Groups

You can customize the configuration to create a single operating system database user and with six custom groups. The database user can deploy both the grid infrastructure and RDBMS (relational database management system) stacks. You can edit the user name and user ID and you can customize the group names and IDs. Use this option when you deploy SAP.

To configure a single `oracle` database user with the Oracle User (`oracleUser`) role, do not allow OS role separation.

To configure six groups, select the option to customize users and groups. The following default groups are populated: `oinstall`, `dbaoper`, `dba`, `asmadmin`, `asmoper`, and `asmdba`. You can customize the groups.

Single User with Two Groups

To configure a single `oracle` user with the Oracle User (`oracleUser`) role, do not allow OS role separation.

To configure two groups, `oinstall` and `dba`, do not select the option to customize users and groups.

Selecting Database Deployment Options

See the Oracle Database editions that are available for deployment.

Oracle Appliance Manager installs Oracle Database software on mirrored disks that are internal to Oracle Database Appliance. You specify the database edition in the Web Console during the initial deployment. You cannot use both Oracle Database Enterprise Edition and Standard Edition on the same appliance.

The following Oracle Database editions are available:

- **Oracle Database Enterprise Edition**

  Oracle Database Enterprise Edition provides the performance, availability, scalability, and security required for mission-critical applications such as high-volume online transaction processing (OLTP) applications, query-intensive data warehouses, and demanding Internet applications.

  - Single-instance Oracle Database Enterprise Edition home
  - Oracle Database options are available

- **Oracle Database Standard Edition 2**

  Oracle Database Standard Edition 2 delivers unprecedented ease of use, power, and performance for workgroup, department-level, and Web applications.

- **Oracle Database Standard Edition**

  Oracle Database Standard Edition delivers the unprecedented ease of use, power, and performance of Standard Edition One, with support for larger machines and clustering of services with Oracle Real Application Clusters (Oracle RAC).

- **Oracle Database Standard Edition One**

  Oracle Database Standard Edition One delivers unprecedented ease of use, power, and performance for workgroup, department-level, and Web applications.

> **Note:**
>
> Review the Oracle Database licensing guide for supported options and products.

Selecting Database Shapes for Oracle Database Appliance

Oracle Database Appliance software includes preconfigured templates, known as shapes, 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 shapes are not supported on all models.

Each Oracle Database shape 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

Oracle Database Appliance shapes are tuned for the size of each database instance workload and are designed to run on a specific number of cores.

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

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 Network Address Configuration
  Use the checklist 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 X6-2S, X6-2M, and X6-2L use Oracle Automatic Storage Management Cluster File System (Oracle ACFS) or Oracle Automatic Storage Management (Oracle ASM) and include the following:

- Integrated storage for operational files (operating system, Oracle Grid Infrastructure home, Oracle Database homes, tools). Operational files are stored on mirrored internal system disks.
- DATA (user data and database files)

- RECO (database redo logs, archive logs, and recovery manager backups)
- Operational files are stored on mirrored internal system disks.

You can configure for External, Internal, or Custom backup location. Depending on backup location, you can select one of the following configuration options to divide the storage capacity between DATA diskgroup and RECO diskgroup:

- External: Storage capacity is split between 80% for DATA and 20% for RECO.
- Internal: Storage capacity is split between 40% for DATA and 60% for RECO.
- Custom: Storage capacity is configurable from 10% to 90% for DATA and the remainder for RECO.

> **Note:**
>
> Oracle Database Appliance X6-2S and X6-2M ship with two 3.2 TB non-volatile memory express (NVMe) drives for a total of 6.4 TB of NVMe storage. With Oracle Database Appliance X6-2M, you have the option to expand the system to a 4 disk configuration, which doubles the NVMe storage capacity. Oracle Database Appliance X6-2L ships with six 3.2 TB non-volatile memory express (NVMe) drives with the option to add three (3) disks for a total of nine (9) NVMe disks.

Network Administration Requirements

The network administration requirements and recommendations are as follows:

- Determine the type of network interface for your public network and know the details for your generic and public network.
- Oracle recommends that you resolve addresses using Domain Name System (DNS) servers.
- 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. The following are the public interfaces:
  - Oracle Database Appliance X6-2S: `btbond1` or `sfpbond1`
  - Oracle Database Appliance X6-2M: `btbond1`, `btbond2` and `sfpbond1`
  - Oracle Database Appliance X6-2L: `btbond1`, `btbond2` and `sfpbond1`

Depending on your network setup, you can use one of the following available bonds:

- `btbond` are bonded interface based on onboard NIC 10GBase-T (copper) ports
- `sfpbond` is bonded interface based on the 10GbE SFP+ (fiber) PCIe card

When you use the `configure-first` command during the initial setup, you can choose one of the bonded interfaces for the public network. Use one of the remaining bonded interfaces for management, backup, data guard, or other network. Be prepared to provide a netmask and gateway for each network, as both are required when you configure a network connection for Oracle Database Appliance.

Answer These Questions

Determine the answers to the following questions:

- What is your domain name?

  For example: `example.com`.

- Do you want to use DNS?

  (Optional) Ensure that the names and addresses that you provide for network configuration are configured in your Domain Name System (DNS) servers. DNS is optional, but recommended. If you want to use DNS, then obtain your DNS server addresses. 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.

- Do you have a Network Time Protocol (NTP) service configured for each server, so that the local system time for each server is synchronized?
- Which network interface do you want to use for your public network?
  - 10GBase-T (copper)
  - 10GbE SFP+ (fiber)
- What are the details for your public network? To connect to the system, you require the following information:
  - Host name

    For example: `myhost`

  - IP address

    For example: `192.0.2.18`

  - Netmask for the public network

    For example: `255.255.252.0`

  - Gateway for the public network

    For example: `192.0.2.1`

- Do you want the ability to configure additional networks?
- Do you want to use Oracle Integrated Lights Out Manager (Oracle ILOM) to manage Oracle Database Appliance independent of the operating system?

  (Optional) Collect the following ILOM details from your network administrator:

  - Oracle ILOM host name

    For example: `myilom1`

  - Oracle ILOM IP address

    For example: `10.0.0.3`

  - Netmask for the Oracle ILOM network

    For example: `255.255.255.0`

  - Gateway for the Oracle ILOM network

    For example: `10.0.0.1`

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 Network Address Configuration

Use the checklist to identify the IP addresses required for Oracle Database Appliance.

> **Note:**
>
> Oracle does not recommend changing the default Host Private Address. You cannot change the private network after deploying the appliance.

Table 2-2 Default IP Address Requirements for Oracle Database Appliance

Type of IP	IP Address Default Values	Your Values As Applicable
Client Access Network	No default	No default
Additional Network	No default	No default
Oracle Integrated Lights Out Manager (ILOM)	No default	No default
Host Private Addresses	InfiniBand has bonded interface `ibbond0` . The system configures `icbond0` on non-InfiniBand High-Availability systems. The subnet 192.168.16.0/24 is configured.	Not applicable: the private addresses are defined before deployment and should not be changed

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 Network Cables to Oracle Database Appliance
  Connect Oracle Database Appliance X6-2S, X6-2M, or X6-2L to either a 10GBase-T (copper) or 10GbE SFP+ (fiber) network.
- 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 Network Cables to Oracle Database Appliance

Connect Oracle Database Appliance X6-2S, X6-2M, or X6-2L to either a 10GBase-T (copper) or 10GbE SFP+ (fiber) network.

Use standard Cat-6 network cables to connect to the on-board 10GBase-T (copper) network ports. The following sections show the cabling options for 10GbE SFP+ (fiber) network ports. In the figures, callouts 4 and 5 identify the ports for the 10GBase-T (copper) network. Callout 6 identifies the ports for the 10GbE SFP+ (fiber) network.

Figure 3-1 Connect the Fiber and Copper Network Cables for Oracle Database Appliance X6-2S or X6-2M

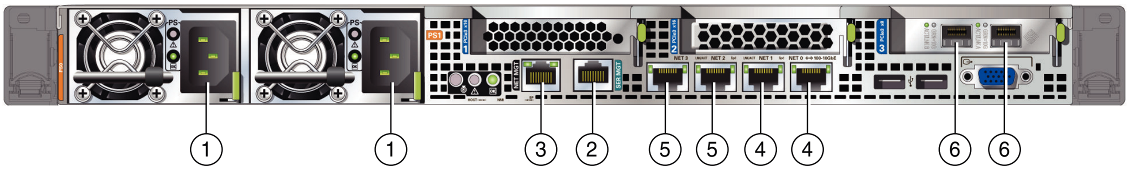


Figure 3-2 Connect the Fiber and Copper Network Cables for Oracle Database Appliance X6-2L

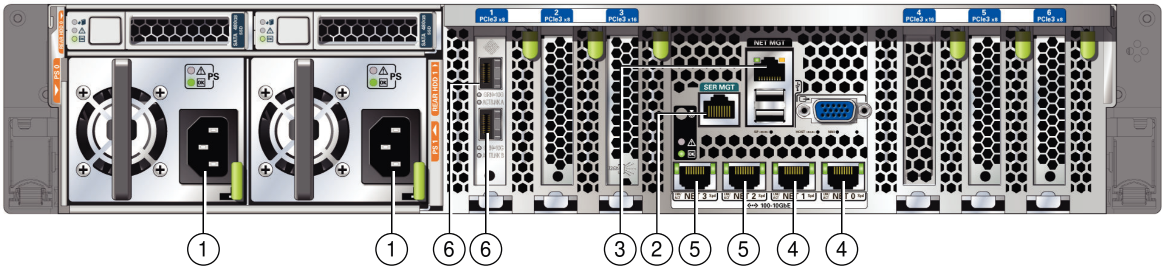


Table 3-1 Location of Network Ports and Power Cabling for Oracle Database Appliance

Callout Number	Description
1	Power cables
2	(Optional) ILOM SER MGT port. Service processor RJ-45 serial port
3	ILOM NET MGT port. Service processor 10/100/1000Base-T network interface
4	10 GbE network interface port with RJ-45 connector (btbond1)
5	10 GbE network interface port with RJ-45 connector (btbond2) These ports are not available on Oracle Database Appliance X6-2S.

Table 3-1 (Cont.) Location of Network Ports and Power Cabling for Oracle Database Appliance

Callout Number	Description
6	10 GbE dual-rate SFP+ (fiber network) ports (sfpbond1)

For 10 GbE SFP+ PCI cards, you can use fiber cables or copper cables.

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:

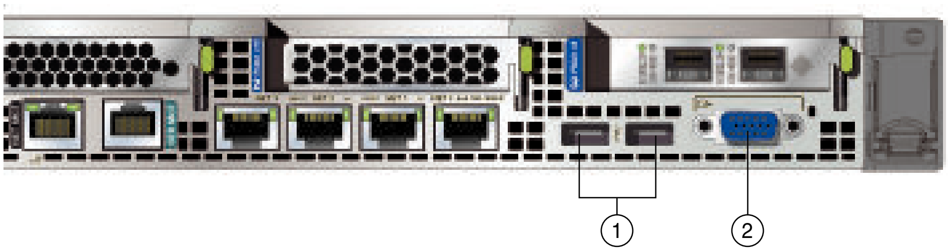
Name	Length	Part Number
TwinAx 1m	1m	X2130A-1M-N
TwinAx 3m	3m	X2130A-3M-N
TwinAx 5m	5m	X2130A-3M-N

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 3-2 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. Push the recessed power button to turn on the appliance.

   > **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 power button and the system initialization status indicator lights are located on the power panel. The following figure is an example of the location on the X6-2S and X6-2M. The layout on the X6-2L is slightly different.

Figure 3-3 Front of Oracle Database Appliance Power Panel for X6-2S and X6-M

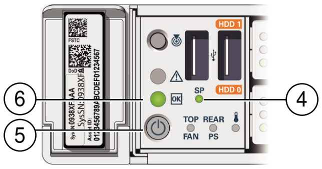


Table 3-3 Description of Callouts for Powering On Oracle Database Appliance

Callouts for X6-2S and X6-2M	Function
4	SP OK LED light, located on the front panel of the appliance.
5	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.
6	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.

2. 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 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 Baremetal System

Understand the process to configure Oracle Database Appliance baremetal 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 19.7:

   ```
   p30403673_197000_Linux-x86-64.zip
   p30403662_197000_Linux-x86-64.zip
   ```

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

   ```
   unzip p30403673_197000_Linux-x86-64.zip
   unzip p30403662_197000_Linux-x86-64.zip
   ```

   The GI and RDBMS Clone files for release 19.7 are extracted.

   ```
   odacli-dcs-19.7.0.0.0-200511-GI-19.7.0.0.zip
   odacli-dcs-19.7.0.0.0-200511-DB-19.7.0.0.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 19.7:

```
put odacli-dcs-19.7.0.0.0-200511-GI-19.7.0.0.zip
put odacli-dcs-19.7.0.0.0-200511-DB-19.7.0.0.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 19.7:

   ```
   [root@oda1 opt]# /opt/oracle/dcs/bin/odacli update-repository -f /tmp/
   odacli-dcs-19.7.0.0.0-200511-DB-19.7.0.0.zip,/tmp/odacli-
   dcs-19.7.0.0.0-200511-GI-19.7.0.0.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.

To select the database redundancy as Flex for Oracle ACFS storage, you must create the database using the `odacli create-database` command. Use the Browser User Interface and create only the appliance, without creating the starter database. Then, create the database using the `odacli create-database` command.

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.

   Only Oracle 18c, 12.2, and 12.1 databases can use Oracle ASM storage. Oracle Database 11.2 is only supported on Oracle ACFS.

m. If you select the storage as **ASM**, and the Database Version is 12.2 or later, and you specified the disk group redundancy as **Flex**, then you can select the **Database Redundancy** value as **Mirror** or **High**.

   You can choose Oracle ACFS storage for all database versions, but if you select Oracle ACFS storage, then you cannot specify the database redundancy using the Browser User Interface. If your disk group redundancy is Flex, and you choose Oracle ACFS storage for the database, then the database redundancy is set to Mirror.

   To select the database redundancy as Flex for Oracle ACFS storage, you must create the database using the `odacli create-database` command. Use the Browser User Interface and create only the appliance, without creating the started database. Then, create the database using the `odacli create-database` command.

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.

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

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.
- Securing Oracle ILOM Service Processors
  Change the Oracle ILOM default password after completing Oracle Database Appliance deployment.
- Changing Oracle Database Appliance Passwords
  After deploying your appliance, ensure that you change the following passwords for securing your system.

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.

6 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 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 Using the CLI
  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 to the Latest Release Using the Browser User Interface
  Use the Browser User Interface to patch database homes to the latest release.
- Applying Additional Patches and Updates
  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 Development Kit (JDK)
- 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.

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`

Check	Component Verified
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.

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 31220620) 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 19.7:

   ```
   p31220620_197000_Linux-x86-64_1of2.zip
   p31220620_197000_Linux-x86-64_2of2.zip
   ```

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

   ```
   unzip p31220620_197000_Linux-x86-64_1of2.zip
   unzip p31220620_197000_Linux-x86-64_2of2.zip
   ```

   The zip file contains the following software files:

   ```
   oda-sm-19.7.0.0.0-200520-server1of2.zip
   oda-sm-19.7.0.0.0-200520-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 19.7:

   ```
   # /opt/oracle/dcs/bin/odacli update-repository -f /tmp/oda-
   sm-19.7.0.0.0-200520-server1of2.zip,/tmp/oda-sm-19.7.0.0.0-200520-
   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
   19.7.0.0.0
   ```

7. Update DCS admin:

   ```
   [root@oda1 opt]# /opt/oracle/dcs/bin/odacli update-dcsadmin -v
   19.7.0.0.0
   ```

8. Update the DCS components:

   ```
   [root@oda1 opt]# /opt/oracle/dcs/bin/odacli update-dcscomponents -v
   19.7.0.0.0
   ```

   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 19.7:

```
[root@oda1 opt]# /opt/oracle/dcs/bin/odacli create-prepatchreport -s -v
19.7.0.0.0
```

10. Apply the server update:

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

    For example, for 19.7:

    ```
    [root@oda1 opt]# /opt/oracle/dcs/bin/odacli update-server -v 19.7.0.0.0
    ```

11. Confirm that the server update is successful:

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

12. 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 19.7:

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

13. **To patch existing Oracle Database Homes to release 19.7:**

    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 19.7.0.0.0
       [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 19.7:

       ```
       [root@oda1 opt]# /opt/oracle/dcs/bin/odacli update-dbhome --
       dbhomeid 7c67c5b4-f585-4ba9-865f-c719c63c0a6e -v 19.7.0.0.0
       ```

14. Confirm that the patch jobs are successful:

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

15. 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 to the Latest Release Using the Browser User Interface
  Use the Browser User Interface to patch database homes to the latest release.

Related Topics

- Oracle Database Appliance Release Notes

Patching Oracle Database Appliance 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.

> **Note:**
>
> To patch your deployment to Oracle Database Appliance release 19.7, you must upgrade your operating system to Oracle Linux 7. You cannot upgrade your operating system to Oracle Linux 7 using the Browser User Interface. Perform the operating system upgrade using CLI commands as described in the topic *Upgrading Oracle Linux on Oracle Database Appliance Before Patching the Server* and then patch your Oracle Database Appliance server components as described in this topic.

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
   19.7.0.0.0
   ```

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
   19.7.0.0.0
   ```

Updating Oracle Database Appliance Repository with Database Clone Files Using the CLI

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_197000_Linux-x86-64.zip`, and extract the RDBMS Clone software:

   For example, download the RDBMS Clone software patch for 19.7:

   ```
   unzip /tmp/p30403662_197000_Linux-x86-64.zip
   odacli-dcs-19.7.0.0.0-200511-DB-19.7.0.0.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 19.7:

   ```
   [root@oda1 opt]# /opt/oracle/dcs/bin/odacli update-repository -f /tmp/
   odacli-dcs-19.7.0.0.0-200511-DB-19.7.0.0.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 to the Latest Release Using the Browser User Interface

Use the Browser User Interface to patch database homes to the latest release.

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

Applying Additional Patches and Updates

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.
- Adding Repositories for Patch Updates
  Add patch repositories to update operating system RPMs.
- 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

Adding Repositories for Patch Updates

Add patch repositories to update operating system RPMs.

Patching of operating system is included in the Oracle Database Patch Bundle. If you want to update other RPMs, then you can configure any private or public repository. Oracle public YUM channels are already configured by default.
Add operating system RPM repositories as follows:

1. Run the following command to add a repository:

   ```
   # odacli update-agentconfig-parameters -n OSPatchRepos -v 'http://
   public-yum.oracle.com/repo/OracleLinux/OL6/latest/$basearch/' -a
   ```

   Provide the public location within quotation marks(")

   For adding RPMs stored on a local disk:

   ```
   # odacli update-agentconfig-parameters -n OSPatchRepos -v /tmp/OSimage/
   OL6.9_x86_64 -a
   ```

2. List all repositories:

   ```
   odacli list-agentconfig-parameters -n OSPatchRepos
   ```

3. When you update the server, the operating system patching job uses all repositories to update the operating system RPMs.

   ```
   odacli update-server -v 19.7.0.0.0
   ```

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*.

Related Topics

- 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.

7

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 7-1   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 7-1 (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 7-1 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

8

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.
- 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 8-1 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 Master 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 19.7

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.

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
  Use the Oracle Appliance Manager Browser User Interface to create a database in Oracle Database Appliance.
- Creating an Instance-Only Database
  Create an instance-only 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.
- 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

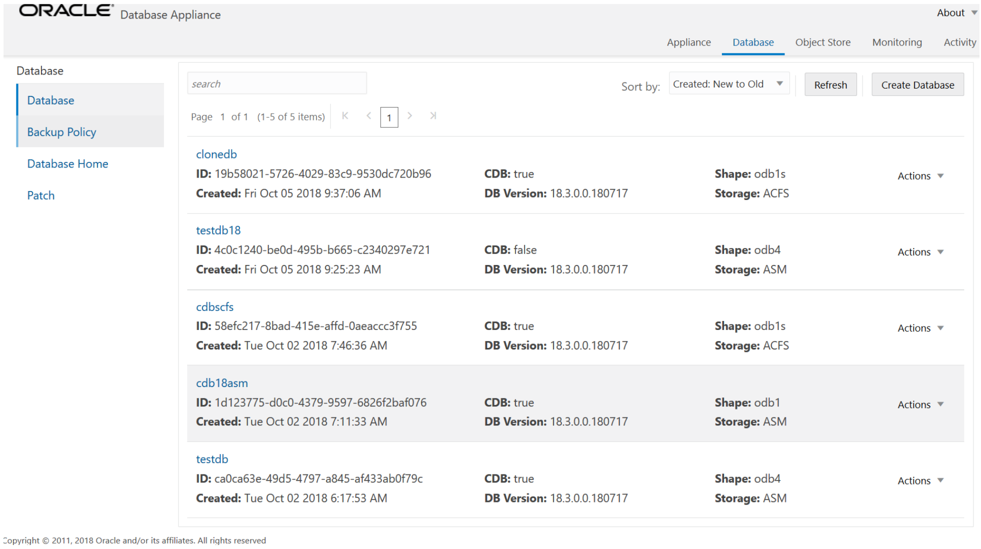
Use the Oracle Appliance Manager Browser User Interface to display a list of Oracle databases and database details, create, upgrade, and delete a database in Oracle Database Appliance.

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.



clonedb
ID: 19b58021-5726-4029-83c9-9530dc720b96 **CDB:** true **Shape:** odb1s Actions
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 Actions
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 Actions
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 Actions
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 Actions
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

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 19.7 is supported on both Oracle Automatic Storage Management (Oracle ASM) and Oracle ASM Cluster file system (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 version 19.7, 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 you select the storage as **ASM**, and the Database Version is 12.2 or later, and the disk group redundancy was set to **Flex** during the appliance creation, then you can select the **Database Redundancy** value as **Mirror** or **High**.

   For Oracle ACFS storage, you can set the Flex disk group redundancy only if you create the database using the `odacli create-database` command.

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 19.7. 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.

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 an Instance-Only Database

Create an instance-only 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.

This example creates an instance only database named PRODDB with database version 19.7 and a new database home.

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 greater details about a specific database home.

   ```
   # odacli list-dbhomes
   ID                                     Name                 DB Version
   ------------------------------------ -----------------  ----------
   b727bf80-c99e-4846-ac1f-28a81a725df6 OraDB12102_home1  19.7.0.0.0

   (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 19.7.0.0.0.

   ```
   # odacli  create-dbhome -v 19.7.0.0.0
   ```

3. Create an instance only database. You can use an existing database home ID or you can create a database home when creating the database.

   To create an instance only database named PRODDB with database version 19.7.0.0.0 that uses an existing database home with ID b727bf80-c99e-4846-ac1f-28a81a725df6:

   ```
   # odacli create-database -n PRODDB -v 19.7.0.0.0 -io -m -dh b727bf80-
   c99e-4846-ac1f-28a81a725df6
   ```

To create an instance only database named `PRODDB` with database version `19.7.0.0.0` and a database home:

```
# odacli create-database -n PRODDB -v 19.7.0.0.0 -io -m
```

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.
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:

   a. Select Backup Destination as **ObjectStore**.

   b. Select your **Object Store Credential Name**.

   c. 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):

   a. Select Backup Destination as **External FRA**.

   b. Specify the **External FRA Mount Point**.

   c. 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. Click **Create**.

10. 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.

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.

    ```
    # 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.

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. Enter the password in the **SYS User Password** field and the **Confirm SYS User Password** field.
10. Click **Create**.
11. 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.
12. 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.

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 the primary database.
- 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.

> **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.

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**.

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 19.7.0.0.0 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.

9

Managing Storage

Understand the storage options and how to manage storage for your Oracle Database Appliance deployment.

- About Storage Expansion Options for Oracle Database Appliance X6-2
  You can add 6.4TB Intel NVMe storage disks to X6-2 Oracle Database Appliance, with some configuration changes.
- Adding NVMe Storage Disks
  Depending on the available drives, you can expand Oracle Database Appliance X6-2S, X6-2M, or X6-2L storage to add NVMe disks or replace existing NVMe disks.

About Storage Expansion Options for Oracle Database Appliance X6-2

You can add 6.4TB Intel NVMe storage disks to X6-2 Oracle Database Appliance, with some configuration changes.

Oracle Database Appliance X6-2S, X6-2M, and X6-2L use 3.2 TB NVMe disks. When you order for Oracle Database Appliance storage, you receive the default 6.4 TB NVMe disks. The 3.2 TB NVMe disks are no longer available. Oracle Database Appliance uses special commands to add or remove NVMe storage.

When you expand storage with the 6.4 TB NVMe disks, they are formatted to match the 3.2 TB drives that are delivered with Oracle Database Appliance X6-2S, X6-2M, and X6-2L. If you want to be able to utilize the full 6.4 TB drives, you must remove the 3.2 TB drives and re-image your Oracle Database Appliance. The re-image process removes all databases and files on the system. Ensure that you backup your databases and files, so that you can restore them after the re-image process.

> **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.

The following table explains the base configuration and storage expansion options for Oracle Database Appliance X6-2S, X6-2M, and X6-2L.

Table 9-1 Storage Addition Options for Oracle Database Appliance X6-2S, X6-2M, and X6-2L

Configuration	Oracle Database Appliance X6-2S and X6-2M	Oracle Database Appliance X6-2L
Base Configuration	Two (2) 3.2TB NVMe drives, populated in slots 0 and 1, providing 6.4TB raw storage.	3.2TB NVMe drives populated in slots 0, 1, 3, 4, 6, and 7, providing 19.2TB NVMe raw storage.
Base Shelf Expansion	Additional 6.4TB NVMe drives in slots 2 and 3 to expand the capacity to 12.8TB raw storage. Order Qty 2 - 7120558 and upgrade to Oracle Database Appliance release 18.5 or later.	Additional 6.4TB NVMe drives in slots 2, 5, and 8. 6.4TB NVMe drives are partitioned to 3.2TB, providing 28.8TB raw storage. Order Qty 3 - 7120558 and upgrade to Oracle Database Appliance release 18.5 or later.

Adding NVMe Storage Disks

Depending on the available drives, you can expand Oracle Database Appliance X6-2S, X6-2M, or X6-2L storage to add NVMe disks or replace existing NVMe disks.

Use ODAADMCLI commands to perform appliance storage maintenance tasks, including perform storage diagnostics and collect diagnostic logs for storage components.

NVMe Storage Expansion

The default configuration for Oracle Database Appliance X6-2S or X6-2M includes two (2) NVMe disks. You can expand storage by adding two (2) additional disks for a total of four (4) NVMe disks. When you expand storage, you must add both NVMe drives, adding just one is **not** supported.

The default configuration for Oracle Database Appliance X6-2L includes six (6) NVMe disks. You can expand storage by adding three (3) disks for a total of nine (9) NVMe disks. When you expand storage, you must add all three NVMe drives, adding just one or two is **not** supported.

> **WARNING:**
>
> Pulling a drive before powering it off will crash the kernel, which can lead to data corruption. Do not pull the drive when the LED is an amber or green color. When you need to replace an NVMe drive, use the software to power off the drive before pulling the drive from the slot. If you have more than one disk to replace, complete the replacement of one disk before starting replacement of the next disk.

Drive LED Indicators

Each NVMe drive slot has a light-emitting diode (LED) indicator indicating the disk status:

- Green LED: OK/Activity. Disk is working normally. It is not safe to pull the drive when the green indicator light is on.
- Amber LED: Service needed or there is a critical warning. It is not safe to pull the drive when the amber indicator light is on.
- Blue LED: The disk is powered off and it is safe to remove the drive from the system.

Adding NVMe Storage Disks

Follow these steps to add NVMe storage disks:

1. Before adding the NVMe disks, ensure that the current disks are online in `oakd` and Oracle ASM. Otherwise, the prechecks fail. For example, for 2-disks expansion for Oracle Database Appliance X6-2M and X6-2S from slots 2 to 3, the disks in slots 0 and 1 must be online in Oracle ASM and `oakd`. For 3-disks expansion for Oracle Database Appliance X6-2L in slots 2, 5, and 8, the disks in slots 0, 1, 3, 4, 6, and 7 must be online in Oracle ASM and `oakd`.
2. Insert disks one at a time in the slots and power on the device.
   For example, to add two (2) NVMe disks to Oracle Database Appliance X6-2M and X6-2S, insert the disks in slots 2 and 3. To add three (3) NVMe disks to Oracle Database Appliance X6-2L, insert the disks in slots 2, 5, and 8.

   ```
   # odaadmcli power disk on slot_number
   ```

   Allow at least one minute between inserting each disk.
3. Run the `odaadmcli expand storage` command to add the new storage drives:

   ```
   # odaadmcli expand storage
   ```

   For example, to add NVMe drives to Oracle Database Appliance X6-2S/M/L:

   ```
   #odaadmcli expand storage
   Precheck passed.
   Check the progress of expansion of storage by executing 'odaadmcli show
   disk'
   Waiting for expansion to finish ...
   ```
4. Run the `odaadmcli show disk` command to ensure that all disks are listed, are online, and are in a good state.

   ```
   # odaadmcli show disk
   ```

10 Managing Networks

View the public and private networks that are configured on your Oracle Database Appliance.

- About Network Infrastructure and VLANs on Oracle Database Appliance
  Oracle Database Appliance supports multiple VLANs on the same network port or bond.
- Viewing Configured Networks
  Use the Browser User Interface to display a list of configured networks and network details.
- Creating a Network
  Use the Browser User Interface to create networks in Oracle Database Appliance.
- Updating a Network
  Use the Browser User Interface to update an existing network configuration.
- Deleting a Network
  Use the Browser User Interface to delete a specific network.

Related Topics

- odacli Network Commands
  Use the `odacli network` commands to list and describe network interfaces.

About Network Infrastructure and VLANs on Oracle Database Appliance

Oracle Database Appliance 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.

The physical ports in the system at deployment (either copper or fiber) are bonded as `btbond0` in single node platforms. The VLAN is created on `btbond0`.

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.

> **Note:**
>
> You cannot modify the Public and Private-interfaces after the system is deployed. To use VLANs with Oracle Database Appliance, you must configure them before you deploy the appliance.

Use the Browser User Interface to display all physical and virtual networks. Use the command-line interface to create, list, and delete VLANs.

Viewing Configured Networks

Use the Browser User Interface to display a list of configured networks and network details.

1. Log into the Browser User Interface.
2. Click the **Network** tab.

   You can view network details, create a new network, update an existing network, and delete a network.

Creating a Network

Use the Browser User Interface to create networks in Oracle Database Appliance.

The Browser User Interface provides a quick and easy method of creating networks. You can create the following types of networks: Public, Private, Dataguard, Backup, and Other.

1. Open a browser and enter the following URL to launch the Browser User Interface:

   `https://`*`ip-address`*`:7093/mgmt/index.html`
2. Login as `oda-admin`.
3. Click the **Network** tab.
4. Click **Create Network** to display the Create New Network page.
5. Enter the following information on the Create New Network page to configure the network:
   a. In the**IP Address** field, enter the network’s IP address.
   b. In the **Interface** field, select an interface from the menu.
   c. In the **Subnet Mask** field, enter the subnet mask.
   d. In the **Network Type** field, select an option from the drop-down list. The options are: Public, Private, Dataguard, Backup, and Other.
   e. In the **Gateway** field, enter the gateway. The gateway is required for the default network.
   f. For the Default Network, select **Yes** or **No** to identify whether or not the network is the default network.
6. Click **Create**. When prompted, click **Yes** to confirm that you want to start the job to create the network.

Updating a Network

Use the Browser User Interface to update an existing network configuration.

1. Open a browser and enter the following URL to launch the Browser User Interface:

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

2. Login as `oda-admin`.
3. Click the **Network** tab.
4. Select **Update** from the Actions menu next to the network you want to update.
5. Edit the fields, as needed, on the Update Network page to update the network configuration:
   a. In the **IP Address** field, enter the network's IP address.
   b. In the **Interface** field, enter the name of the network interface.
   c. In the **Subnet Mask** field, enter the subnet mask.
   d. In the **Network Type** field, select an option from the drop-down list. The default is Other.
   e. In the **Gateway** field, enter the gateway. The gateway is required for the default network.
   f. For the Default Network, select **Yes** or **No** to identify whether or not the network is the default network.
6. Click **Update**. When prompted, click **Yes** to confirm that you want to start the job to update the network.

Deleting a Network

Use the Browser User Interface to delete a specific network.

> **Note:**
>
> You can only delete networks that are not public or private networks. The delete option is disabled for the private and public networks.

1. Open a browser and enter the following URL to launch the Browser User Interface:

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

2. Login as `oda-admin`.
3. Click the **Network** tab.
4. Select **Delete** from the Actions menu next to a network entry.

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.

> **Note:**
>
> You cannot backup databases that use Transparent Data Encryption (TDE).

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, data 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).

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 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.

  > **Note:**
  >
  > Save the password that you use during backups in a safe location, you must provide the password during recovery operations.

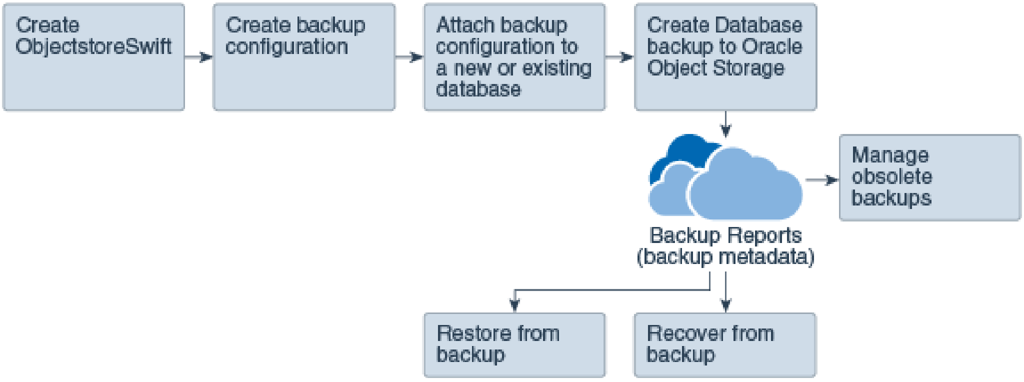
- Quick recovery from backups. With the Oracle Object Storage, you can safely and securely use the Browser User Interface to store or retrieve data directly from within the cloud platform, at any time.
- Automate management of recovery related files (like archived logs)
- Oracle Object Storage is not 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:
   a. Create a sharable location on the source machine and give full permissions to this directory.

      ```
      # mkdir /tmp/nfs_test
      chmod 777 /tmp/nfs_test
      ```

b. 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)
```

c. Restart the NFS server on the host.

```
# service nfs  restart
```

d. 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:

   a. Create a client location on the client machine as the `oracle` user.

```
# sudo -E -u oracle mkdir /tmp/client_location
```

   b. 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
```

   c. 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-agentconfigParameters` command.

   ```
    # odacli update-agentConfigParameters -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 `agentconfigParameters` 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

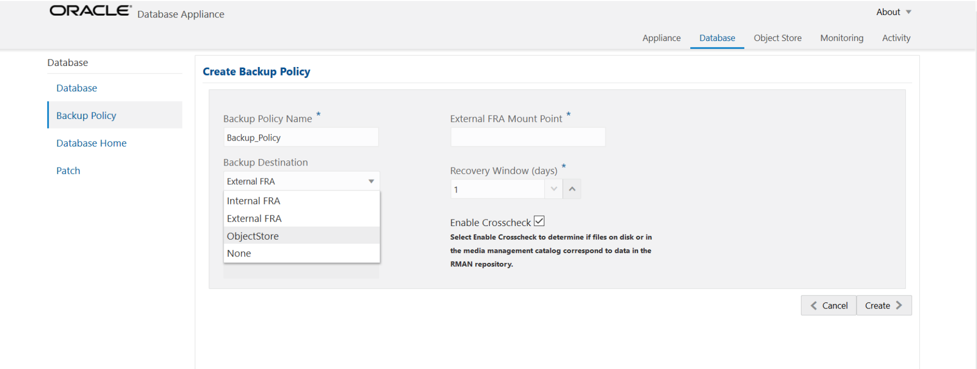
Understand how to create a policy to backup a database to an internal or external Oracle Fast Recovery Area (FRA) location or to the Object Store using the Browser User Interface.

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.

   The following figure shows the Create Backup Policy page.



Create Backup Policy

Backup Policy Name *: Backup_Policy

External FRA Mount Point *:

Backup Destination: External FRA
Internal FRA
External FRA
ObjectStore
None

Recovery Window (days) *: 1

Enable Crosscheck ☑

Select Enable Crosscheck to determine if files on disk or in the media management catalog correspond to data in the RMAN repository.

5. 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**. 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**.
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**.
5. 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
  Restore a database to a system from Oracle Object Storage 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 update-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 update-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 `mkg1dailydisk`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  update-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 update-database -in mydb -bin mybcfg -bp
```

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 update-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, by using the command `odacli create-backup`.

   Use the Database Resource ID 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
   ```

Related Topics

- 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.

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.

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 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/system_namec1n1/
   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/system_namec1n1/
   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/system_namec1n1/
   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"
}
```

3. To recover from a backup report, based on PITR, 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.

Related Topics

- 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.

Restoring a Database with the CLI

Restore a database to a system from Oracle Object Storage 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 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/system_namec1n1/
   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/system_namec1n1/
   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/
   system_namec1n1/
   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"
}
```

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
   ```

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 -ijobId
   ```

Related Topics

- 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.

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
   ```

Related Topics

- 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.

12 Managing Oracle Database Appliance KVM Virtualization

Review the concepts and procedures for Oracle Database Appliance Virtualized Platform.

- About KVM Virtualization
  KVM virtualization uses a kernel-based virtual machine (KVM) to create a virtualized environment for your Linux applications.

About KVM Virtualization

KVM virtualization uses a kernel-based virtual machine (KVM) to create a virtualized environment for your Linux applications.

Beginning with Oracle Database Appliance 12.1.2.11.0, the required RPMs are included in the Oracle Database Appliance patch bundle. When you upgrade to Oracle Database Appliance 12.1.2.12.0 or later, the Oracle Linux KVM hypervisor is installed as part of the Oracle Linux kernel and uses CPU extensions (HVM) for virtualization. The Linux KVM is a Type II hypervisor, which means that it is one layer above the operating system. When you run your Linux applications in a virtualized environment, you can isolate your database from your applications. One of the advantages to isolating the applications is that you can update your Oracle Database without impacting the applications, which enables you to deploy both the database and application on the same system to create a Solution-in-a-Box.

The following are limitations with using KVM:

- All virtual machines (VM), or guests, are Oracle Linux operating systems and only Linux applications are supported in the KVM.
- You cannot deploy an Oracle Database in the KVM. Oracle Databases must run on the base Oracle Linux operating system.
- KVM on Oracle Linux does not support hard partitioning. This means that all enabled cores/sockets on Oracle Database Appliance are licensed for databases and applications running on the appliance using the appropriate licensing metric for the database edition and application. Using KVM does not limit licensing, capacity on demand for Oracle Database Appliance still applies.

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.

13 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.
- odacli CPU Core Commands
  Use the CPU Core commands to enable CPU cores and display current and historical CPU core configurations.
- 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 13-1 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 13-2 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 13-3   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 list-networks
  Use the odacli list-networks command to display networks.
- odacli describe-network
  Use the odacli describe-network command to display the details of a specific network.
- odacli create-network
  Use the odacli create-network command to create a network.
- odacli update-network
  Use the odacli update-network command to update an existing network configuration.
- odacli delete-network
  Use the command odacli delete-network to delete a network.
- odacli describe-networkinterface
  Use the odacli describe-networkinterface command to display the details of any network interface.
- odacli list-networkinterfaces
  Use the odacli list-networkinterfaces command to display network interfaces.
- odacli delete-networkinterface
  Use the command odacli delete-networkinterface to delete a network interface on Oracle Database Appliance X8-2 hardware models.

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 13-4 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 13-5 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 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 13-6 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 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 13-7 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 13-8 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 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 13-9 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 13-10 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 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.

Parameter	Description
`--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 13-11   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 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.
`--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 13-12   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" : "May 18, 2020 23:14:32 PM EDT",
     "endTime" : "May 18, 2020 23:14:32 PM EDT",
     "status" : "Running",
     "taskDescription" : null,
     "parentTaskId" : "TaskSequential_135",
     "jobId" : "c26d217e-419b-4a91-8680-7b06bcfe9828",
     "tags" : [ ],
     "reportLevel" : "Info",
     "updatedTime" : "May 18, 2020 23:14:32 PM EDT"
   },{
   "taskId" : "TaskZJsonRpcExt_142",
     "taskName" : "Setting up Network",
     "taskResult" : "Network setup success",
     "startTime" : "May 18, 2020 23:14:32 PM EDT",
     "endTime" : "May 18, 2020 23:14:32 PM EDT",
     "status" : "Success",
    "taskDescription" : null,
    "parentTaskId" : "TaskParallel_141",
    "jobId" : "c26d217e-419b-4a91-8680-7b06bcfe9828",
    "tags" : [ ],
    "reportLevel" : "Info",
    "updatedTime" : "May 18, 2020 23:14:32 PM EDT"   } ],
  "createTimestamp" : "May 18, 2020 23:14:32 PM EDT",
  "description" : "Network service delete",
  "updatedTime" : "May 18, 2020 23:14:32 PM EDT"
}
```

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.
`--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 13-13   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-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 13-14 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 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 13-15   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" : "May 18, 2020 00:01:09 AM UTC",
"resourceList" : ,
"description" : "Network Interface Deletion with name btbond4",
"updatedTime" : "May 18, 2020 00:01:09 AM UTC"
}
```

Example 13-16   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 13-17 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 Apply Patch and Update Commands

Use the commands `odacli update` and `apply patch` to apply patches and update the appliance.

- 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 create-prepatchreport
  Use the `odacli create-prepatchreport` command to run pre-checks for patching.
- 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-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 cleanup-patchrepo
  Use the `odacli cleanup-patchrepo` command to delete obsolete or old patches from the repository.
- odacli list-availablepatches
  Use the `odacli list-availablepatches` command to display all available patches for Oracle Database Appliance.
- odacli delete-prepatchreport
  Use the `odacli delete-prepatchreport` command to delete any pre-check report.
- odacli list-agentconfig-parameters
  Use the `odacli list-agentconfig-parameters` command to list configuration variables used by the appliance.
- 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-dcscomponents
  Use the `odacli update-dcscomponents` command to update the DCS components such as the DCS agent and Zookeeper.
- odacli update-dcsagent
  Use the `odacli update-dcsagent` command to update the agent.
- 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.
- odaadmcli orachk
  Use the `odaadmcli orachk` command to check configuration settings for Oracle Database Appliance components.
- odacli update-storage
  Use the `odacli update-storage` command to update the storage.

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.

Parameter	Description
`--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 13-18 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 13-19 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 13-20 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.
`--json`, `-j`	(Optional) Displays JSON output. The default is false.

Example 13-21   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 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.

Parameter	Description
`--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 13-22 Creating Pre-Check Report

```
# odacli create-prepatchreport -v 19.7.0.0.0 -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 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.

Parameter	Description
`--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 13-23 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 13-24 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-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.
`--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 13-25 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 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 13-26 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 13-27   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 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 13-28   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 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 13-29 Deleting A Patch Pre-Checks Report

```
# odacli delete-prepatchreport -i 741f635b-7c75-4832-8813-782367f1e6fd
```

odacli list-agentconfig-parameters

Use the `odacli list-agentconfig-parameters` command to list configuration variables used by the appliance.

File Path

$ORACLE_HOME`/opt/oracle/dcs/bin/odacli`

Syntax

```
odacli list-agentconfig-parameters [-h] [-j] [-n]
```

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.

Usage Notes

Use the `odacli list-agentconfig-parameters` command to list configuration variables used by the appliance.

Example 13-30 Example Command

```
./odacli list-agentconfig-parameters -n HttpProxyPort



Name       Value      Description      Updated

------------------------------------------------------

HttpProxyPort  Http proxy server port    June 24, 2018 4:14:10 AM
UTC
./odacli list-agentconfig-parameters

Name          Value     Description   Updated

------------------------------
-----------------------------------------------------------------
HttpProxyHost   Http proxy server host  June 24, 2018 4:14:10 AM UTC

HttpProxyPort   Http proxy server port   June 24, 2018 4:14:10 AM
UTC

HttpsProxyHost   Https proxy server host  June 24, 2018 4:14:10 AM
UTC

HttpsProxyPort  Https proxy server port  June 24, 2018 4:14:10 AM
UTC

OSPatchRepos Repo list for OS patching June 24, 2018 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 update-agentconfig-parameters

Use the `odacli update-agentconfig-parameters` command to modify configuration variables used by the appliance.

File Path

$ORACLE_HOME/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`. The default is false.
`--comment`, `-c`	(Optional) Specifies the comment for the parameter.
`--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`. The default is false.
`--update`, `-u`	Replaces the parameter with the specified value. For example: `-n p1 -v v1 -n p2 -v v2 -u`. The default is false.
`--value`, `-v`	Specifies the value of the parameter. Provide multiple parameter values in the format `-n p1 -v v1 -n p2 -v v2`.

Usage Notes

Use the `odacli update-agentconfig-parameters` command to modify configuration variables used by the appliance. The supported configuration parameters are `HttpsProxyHost`, `HttpsProxyPort`, and `OSPatchRepos`.

Multiple values can be specified. For High-Availability models, the command sets the parameter values on both nodes in the cluster.

Example 13-31 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 13-32 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 
19.7.0.0.0
```

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 13-33 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-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.
`--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 13-34   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-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 13-35 Updating the Agent

To update the `dcs-agent` to version 19.7:

```
# odacli update-dcsagent -v 19.7
{
  "jobId" : "77e454d3-eb68-4130-a247-7633f8d6192b",
  "status" : "Created",
  "message" : null,
  "reports" : [ ],
  "createTimestamp" : "May 18, 2020 14:09:24 PM CST",
  "description" : "DcsAgent patching",
  "updatedTime" : "May 18, 2020 14:09:24 PM CST"
}
```

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.
`--json`, `-j`	(Optional) Displays JSON output.

Usage Notes

The `update-registry` command updates the registry of components when you apply patches manually..

Example 13-36 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 13-37 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-19.7.0.0.0-200520-server1of2.zip,/tmp/oda-sm-19.7.0.0.0-200520-
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" : "May 18, 2020 14:13:45 AM CST",
  "description" : "Repository Update",
  "updatedTime" : "May 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   May 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  -v version [-j] [-h]
```

Parameters

Parameter	Description
`--precheck, –p`	Analyzes the patch.
`--version, –v`	Defines the version to update.
`--local,–l`	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 13-38 Updating the Server

Run the odacli update-server command to update the server to 19.7.0.0.0. On a multi-node HA system, you must run the command on both nodes to update the server version.

```
# odacli update-server -v 19.7.0.0.0
{
  "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" : "May 18, 2020 14:13:45 PM CST",
  "resourceList" : [ ],
  "description" : "Server Patching",
  "updatedTime" : "May 18, 2020 14:13:45 PM CST"
}
```

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 13-39 Running odaadmcli orachk

```
[root@oak bin] # ./odaadmcli orachk
INFO: 2019-09-04 16:41:26: Running orachk under /opt/oracle.SupportTools/
orachk
```

Example 13-40 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 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.

Parameter	Description
`--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 13-41 Updating the Storage

```
# odacli update-storage -v 19.7.0.0.0
```

odacli Appliance Commands

Use the `odacli appliance` commands to perform lifecycle activities for the appliance.

- 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.

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 13-42   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 13-43 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-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 13-44 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 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 delete-objectstoreswift
  Use the command `odacli delete-objectstoreswift` to delete the credentials for the ObjectStore account.
- odacli describe-backupreport
  Use the command `odacli describe-backupreport` to display details of a specific backup report.
- 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 ObjectStore based on a LongTerm BackupReport.
- odacli list-backupreports
  Use the command `odacli list-backupreports` to display a list of all backup reports.
- odacli list-backupconfigs
  Use the command `odacli list-backupconfigs` to list all backup configurations.
- 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 recover-database
  Use the `odacli recover-database` command to recover or restore a database from backup.
- odacli update-backupconfig
  Use the command `odacli update-backupconfig` to update a backup configuration.
- odacli update-database
  Use the command `odacli update-database` to associate a backup configuration to a database.
- 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

$ORACLE_HOME/opt/oracle/dcs/bin/odacli

Syntax

```
  odacli  create-backup -iDatabase 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}`	(Optional) Defines the component. Database is the only supported option.
`--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.
`--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.

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 13-45 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 13-46 Create a Level 0 Database Backup

Create a Level 0 backup named `2017Dec22ProductionLevel0` for resource ID `20576eb1-bc32-4e34-bf97-fda0b60ca15b`

```
# odacli  create-backup -i20576eb1-bc32-4e34-bf97-fda0b60ca15b -bt Regular-
L0 -t 2017Dec22ProductionLevel0
```

odacli create-backupconfig

Use the command `odacli create-backupconfig` to create a backup configuration.

File Path

`$ORACLE_HOME``/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]
```

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.
`--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.

Parameter	Description
`--objectstoreswiftId`, `-o`	(Optional) Defines the swift object store credential ID.
`--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

- 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 13-47 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 13-48 Create a Backup Configuration for NFS Location

Create a backup configuration named `production` that backs up to NFS with a 2 day recovery window.

```
odacli create-backupconfig -d NFS -n NfsPolicy1 -c /tmp/Nfsbackps -w 2
```

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.

Parameter	Description
`--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 13-49 Delete a Level 0 or Level 1 Backup

```
# odacli delete-backup -i20576eb1-bc32-4e34-bf97-fda0b60ca15b
```

Example 13-50 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 13-51 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 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 13-52 Deleting the Oracle Object Store Credentials

```
# odacli  delete-objectstoreswift -i Object Store Swift id
```

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 13-53 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 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 13-54 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 ObjectStore based on a LongTerm BackupReport.

File Path

/opt/oracle/dcs/bin/odacli

Syntax

```
  odacli  irestore-database -iDatabase Resource ID [-bp] [-r] [-cl] [-nn]
[-co] [-s] [-dr] [-y] [-h] [-j] [-c] [-oid] [-tf] [-bl] [-rDBID] [-sh|-no-
sh]
```

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(,).

Parameter	Description
`--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 type of database. The default is single instance (SI).
`--databaseHome`, `-dh`	(Optional) Defines the database home.
`--dbName`, `-dh`	(Optional) Defines the database name.
`--dbUniqueName`, `-u`	(Optional) Defines the database unique name.
`--dbDomainName`, `-dn`	Defines the database domain name.
`--help`, `-h`	(Optional) Displays help for using the command.
`--json`, `-j`	(Optional) Displays JSON output. The default is false.
`--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`	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.
`--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

- The command `odacli irestore-database` restores a database to a system using the Backup Report of a long term backup that is in the Oracle Object Store. 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.

Example 13-55 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 -m
```

Example 13-56 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
```

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 13-57 Display a List of all Backup Reports

```
#  odacli  list-backupreports
```

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 13-58 Displaying a List of Backup Configuration

Display a list of backup configurations.

```
# odacli list-backupconfigs -d Disk -n production -w 14
```

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 13-59 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 13-60 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 recover-database

Use the `odacli recover-database` command to recover or restore a database from backup.

File Path

$ORACLE_HOME`/opt/oracle/dcs/bin/odacli`

Syntax

```
  odacli  recover-database -iDatabase Resource ID [-br] [-i] [-h] [-j] [-
r] [-t] [-p] [-s] [-in]
```

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.
`--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).

Parameter	Description
`--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.

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.

Example 13-61 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 13-62 Recovering a Database to the Latest

```
# odacli recover-database -i b5fc646e-01a6-4c8b-8286-7633346c4 -t Latest -p
```

Example 13-63 Recovering a Database to an SCN

```
# odacli recover-database -i b5fc646e-01a6-4c8b-8286-7633346c4 -t SCN -s
392375947
```

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
-d backup destination{Disk|ObjectStore|None} [-c] [-cr] [-h] [-j] [-no-cr]
[-o][-w]
```

Parameters

Parameter	Description
`--backupdestination`, –d{Disk|ObjectStore|None}	Defines the backup destination. The options are not case sensitive
`--container`, `-c`	(Optional) Defines the object store container.
`--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.

`--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.

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 13-64 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-database

Use the command `odacli update-database` to associate a backup configuration to a database.

File Path

$ORACLE_HOME`/opt/oracle/dcs/bin/odacli`

Syntax

```
  odacli update-database  [-bi] [-i] [-h] [-j] [-bp] [-in] [-bin] [-id] [-
lb] [-no-bkp]
```

Parameters

Parameter	Description
`--backupconfigid`, `-bi`	(Optional) Defines the Backup Config ID.
`--backupconfigname`, `-bin`	(Optional) Defines the Backup Config Name.
`--dbid`, `-i`	Defines the Database Resource ID.
`--dbName`, `-in`	Defines the Database Name.
`--help`, `-h`	(Optional) Displays help for using the command.
`--json`, `-j`	(Optional) Displays JSON output. The default is false.
`--bkuppassword`, `-bp`	(Optional) Defines the RMAN backup encryption password.
`--databaseid`, `-id`	(Optional) Defines the database identifier stored in database file headers.
`--levelzerobackupday`, `-lb`	(Optional) Specifies the Level zero Backup Day. For example, Monday|Tuesday|Wednesday...|Sunday
`--no-backup`, `-no-bkp`	(Optional) Disables database backups. This command also removes the database backup and archivelog backup schedulers. To enable database backups again, you must update the database with a backupconfig object.

Usage Notes

For backup to the Oracle Object Store, you can set an RMAN backup password. The password is encrypted and stored in an Oracle wallet. The password is used when using the command `odacli create-backup` to create a database backup.

Example 13-65   Associating a Backup Configuration with a Database

```
# odacli  update-database  -i database resource ID -bi backup
configuration ID
```

Example 13-66   Updating an Existing Database Using the Resource ID

Update an existing database to attach the backup configuration to the database using the Database Resource ID.

```
 # odacli update-database -i d3c4d8f6-5eb7-4f9e-ab27-7bdd5013ac90 -bi
9d942e0a-ba00-4cbc-9bfb-0de83ed279e5 -bp
```

Example 13-67 Updating an Existing Database Using the Resource Name

Update an existing database to attach the backup configuration to the database using the Database Resource Name.

In the following example, the Database Resource Name is mydb:

```
# odacli update-database -in mydb -bi 9d942e0a-ba00-4cbc-9bfb-0de83ed279e5
-bp
```

In the following example, the Database Resource Name is mydb and the backup configuration name is mybcfg:

```
# odacli update-database -in mydb -bin mybcfg -bp
```

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 13-68 Changing the Oracle Casper ObjectStore Password

```
# odacli  update-objectstoreswift -i Object Store Swift id -p swift
password
```

Example 13-69 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 13-70 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 13-71 Disable Scheduled Database Backups

```
#  odacli  update-schedule -i scheduleid  -d
```

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 13-72 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 13-73 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 13-74 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 Database Commands

Use the `odacli database` commands to perform database lifecycle operations.

- odacli list-databases
  Use the `odacli list-databases` command to list all databases on the appliance.
- odacli describe-database
  Use the `odacli describe-database` command to display database details.
- odacli create-database
  Use the `odacli create-database` command to create a new database.
- odacli clone-database
  Use the `odacli clone-database` command to clone a new database from a source database.
- 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 delete-database](#)
  Use the `odacli delete-database` command to delete a database.

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 13-75   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     19.7.0.0.0    true
fb4d02f3-2413-47ca-8584-a768e23ec2e7   ee12db      19.7.0.0.0    false

(Continued)
Class    Shape  Storage  Status
------ -------  ----------
OLTP    odb1   ACFS     Configured
IMDB    odb1   ASM      Configured
```

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 13-76

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 13-77 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: 19.7.0.0.0
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: May 18, 2020, 2016 6:21:14 PM
```

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]
```

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.

Parameter	Description
`--databaseUniqueName`, `-u`	(Optional) Defines a unique name for the database.
`--dbdomainname`, `-dn`	Defines the database domain name.
`--dbEdition`, `-de`	Defines the Database Edition.
`--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,...).
`--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.

- 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.
- Use the following option to specify the adminpassword:
  - Interactive mode: Use the -m option and enter the password when prompted.
- For the version, you can specify the database version, such as 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.

Example 13-78 Creating a Database in Interactive Mode

This example creates a 19.7.0.0.0 OLTP container database named `hrdb` with shape `odb2` and enables you to provide the password interactively.

> **Note:**
>
> To provide a password interactively, use the `-m` option, but do not provide the password until prompted.

```
# odacli create-database -n hrdb -c -m -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" : "May 18, 2020 03:54:03 AM EDT",
   "description" : "Database service creation with db name: hrdb",
   "updatedTime" : "May 18, 2020 03:54:03 AM EDT"
}
```

Example 13-79 Creating a Database Against a Different Version

Either of the following statements creates a database against a home with Oracle Database Bundle (170718) applied:

```
# odacli create-database -m -n hrmsdb1 -v 19.7.0.0.0
# odacli create-database -m -n hrmsdb2 -v 19.7.0.0.200414
```

The following statement creates a new database against a home with a specific Oracle Database Bundle:

```
# odacli create-database -m -n hrmsdb3 -v 19.7.0.0.200414
```

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] [-y|SI|RAC|RACONE] [-j] [-f] [-nn] [-
h] [-sh|-no-sh]
```

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, -y [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
`--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

- 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)

Example 13-80 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
```

Related Topics

- Cloning an Oracle ACFS Database Using Command Line Interface
  Create a database from an existing Oracle ACFS database using CLI commands.

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] [-s] [-an] [-bi] [-bin] [noab] [-bp] [-id] [-in] [-y]  [-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`.
`--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`, `-bn`	(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*.

Parameter	Description
`--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.
`--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.
`--help`, `-h`	(Optional) Displays help for using the command.
`--json`, `-j`	(Optional) Displays JSON output.

Example 13-81 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 13-82 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 13-83   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
```

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 13-84   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 13-85 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" : "May 18, 2020 05:55:49 AM EDT",
  "description" : "Database service registration with db service name: 
crmdb.example.com",
  "updatedTime" : "May 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: May 18, 2020 5:55:49 AM EDT
                Message:

Task Name                        Start Time
----------------------------- ------------------------------
restore control file           May 18, 2020 5:55:49 AM EDT
move spfile to right location  May 18, 2020 5:56:08 AM EDT
register DB with clusterware   May 18, 2020 5:56:13 AM EDT
reset db parameters            May 18, 2020 5:57:05 AM EDT
Running DataPatch              May 18, 2020 5:57:36 AM EDT

(Continued)
  End Time                     Status
------------------------------- --------
May 18, 2020 5:56:08 AM EDT   Success
May 18, 2020 5:56:13 AM EDT   Success
May 18, 2020 5:57:05 AM EDT   Success
May 18, 2020 5:57:36 AM EDT   Success
May 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 13-86 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 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 13-87 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 DBHome Commands

Use the `odacli DBHome` commands to manage database Home operations.

- odacli list-dbhomes
  Use the `odacli list-dbhomes` command to display a list of Oracle Home directories.
- odacli describe-dbhome
  Use the `odacli describe-dbhome` command to display Oracle Database Home details.
- 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 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 13-88   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 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 13-89   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 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, 19.7.0.0.200414. 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 13-90 Creating an Oracle Database Home

The following example creates an Oracle Database Home version 19.7.0.0.200414.

```
# odacli  create-dbhome -v 19.7.0.0.200414
```

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 13-91 Deleting an Empty Database Home

```
# odacli delete-dbhome -i 0ce547ca-3df2-4178-a7e6-eefa613aeab4
```

odacli Database Storage Commands

Use the Database Storage commands to list, describe, create, and delete Oracle database storage.

- odacli list-dbstorages
  Use the `odacli list-dbstorages` command to display a list of all of the database storage configured in the appliance.
- odacli describe-dbstorage
  Use the `odacli describe-dbstorage` command to display storage configuration details.
- 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-dgstorage
  Use the `odacli describe-dgstorages` command to display the disk group information.
- odacli list-dgstorages
  Use the `odacli list-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.

File Path

$ORACLE_HOME/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 13-92 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 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 13-93 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 13-94 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 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`*

Parameter	Description
`--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 13-95 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 13-96 Deleting Empty Database Storage

```
# odacli delete-dbstorage  -i 9fe39332-cc1a-4b4b-8393-165524a6ef6b
```

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 13-97 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-dgstorages

Use the `odacli list-dgstorages` command to display the disk group information.

File Path

`$ORACLE_HOME``/opt/oracle/dcs/bin/odacli`

Syntax

```
odacli list-dgstorages  -r redundancy -h
```

Parameters

Parameter	Description
`--redundancy`, `-r`	Specifies the disk group redundancy.
`--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 EXTERN | NORMAL | HIGH. Use any of these options to specify the 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 13-98   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 Job Commands

Use the `odacli list-jobs` and `odacli describe-job` commands to display job details.

- 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 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-scheduled-executions

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`
`--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`

Parameter	Description
`--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 13-99 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 13-100 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 13-101 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 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 13-102 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-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 13-103 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 list-logspaceusage
  Use the `odacli list-logspaceusage` command to display the log file usage.
- odacli create-logcleanjob
  Use the `odacli create-logcleanjob` command to create a job to purge log files for a specified time period.
- odacli list-logcleanjobs
  Use the `odacli list-logcleanjobs` command to list the jobs to purge log files.
- odacli describe-logcleanjob
  Use the `odacli describe-logcleanjobcommandto` describe a log cleanup job.
- 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 list-auto-logclean-policy
  Use the `odacli list-auto-logclean-policy` command to list the jobs to purge log files.

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 13-104   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 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 13-105   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 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 13-106   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 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 13-107 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 describe-logcleanjob

Use the `odacli describe-logcleanjob`commandto 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 13-108 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 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.

Parameter	Description
`--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 13-109 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 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 13-110   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 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 update-asr
- odacli describe-asr
- odacli test-asr
- odacli delete-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 13-111 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 13-112   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 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.

Parameter	Description
`--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 13-113 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 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 13-114 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 13-115 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 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 13-116 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 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 13-117 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.
`--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 13-118 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 13-119 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 13-120 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 13-121 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 13-122 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

$ORACLE_HOME`/opt/oracle/dcs/bin/odaadmcli`

Syntax

Run this command on the master 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 13-123 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 13-124   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 13-125   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.
- 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 controller
  Use the `odaadmcli show controller` command to display details of the controller.
- 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 power disk
  Use the `odaadmcli power disk` command to power a disk on or off for NVMe drives only.
- 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 expand storage

Use the `odaadmcli expand storage` command to expand storage.

File Path

`$ORACLE_HOME/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.
`--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 master 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.

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 13-126 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 13-127 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 13-128   Listing All Diskgroups

```
# odaadmcli show diskgroup

DiskGroups
----------
DATA
RECO
```

Example 13-129   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 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 13-130   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 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 13-131 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 13-132   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

$ORACLE_HOME`/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 13-133 Displaying NVMe Details

To display detailed information for NVMe `pd_00`:

```
# odaadmcli stordiag pd_00
```

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.

Parameter	Description
`--help`, `-h`	(Optional) Displays help for using the command.

Example 13-134 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 13-135 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
```

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.

14 Configuring and Using Oracle Auto Service Request (ASR)

Configure and use Oracle ASR to automatically generate a service request for specific hardware faults.

Topics:

- Configuring Oracle ASR in the Web Console
  Use the Web Console to configure Oracle ASR.
- Testing Oracle ASR
  Use the `odacli test-asr` command to confirm that your Oracle ASR configuration is working.
- Managing an Oracle ASR Configuration
  Use the command-line to review an existing configuration, make changes to a configuration, or delete a configuration.
- Additional Resources for Oracle ASR
  Refer to these sections for more information about Oracle ASR.

Configuring Oracle ASR in the Web Console

Use the Web Console to configure Oracle ASR.

- About Configuring Oracle ASR
  Configure Oracle Auto Service Request (Oracle ASR) to automatically generate service requests for specific hardware faults.
- Configuring Internal Oracle ASR
  Use the Oracle Appliance Manager Web Console to configure Oracle Auto Service Request (Oracle ASR) in Oracle Database Appliance.
- Registering with External Oracle ASR Manager
  Use the Oracle Appliance Manager Web Console to register Oracle Database Appliance with an existing Oracle Auto Service Request (Oracle ASR) Manager.

About Configuring Oracle ASR

Configure Oracle Auto Service Request (Oracle ASR) to automatically generate service requests for specific hardware faults.

Oracle ASR is a secure support feature that can improve system availability through expedited diagnostics and priority service request handling. 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.

You can configure Oracle ASR as part of deploying the appliance, or you can use the Oracle Appliance Manager Web Console or command-line interface to configure or edit an Oracle ASR after deployment.

You need the following items to support Oracle ASR:

- Oracle Database Appliance hardware must be associated with a Support Identifier (SI) in My Oracle Support.
- If a proxy server is required for Internet access to Oracle, then you must also provide the name of the proxy server. You can optionally configure Oracle ASR to use Simple Network Management Protocol (SNMP) Version 2 or SNMP Version 3.
- To configure an internal Oracle ASR Manager, you need a My Oracle Support account user name (e-mail address) and password associated with the My Oracle Support account under which the server is registered.
- To register with an external Oracle ASR Manager, you need the IP address of the Oracle ASR Manager.

Related Topics

- Configuring Internal Oracle ASR
  Use the Oracle Appliance Manager Web Console to configure Oracle Auto Service Request (Oracle ASR) in Oracle Database Appliance.
- Configuring External Oracle ASR
  Use the Oracle Appliance Manager Web Console to register Oracle Database Appliance with an existing Oracle Auto Service Request (Oracle ASR) Manager.
- odacli configure-asr

Configuring Internal Oracle ASR

Use the Oracle Appliance Manager Web Console to configure Oracle Auto Service Request (Oracle ASR) in Oracle Database Appliance.

You can register with an internal Oracle ASR Manager at any time, or edit an existing registration. Before configuring, verify that the Oracle Database Appliance hardware is associated with a Support Identifier (SI) in My Oracle Support.

You need the following information to configure Oracle ASR:

- The e-mail address associated with the My Oracle Support account under which the server is registered
- The password associated with the My Oracle Support account under which the server is registered
- If a proxy server is required for Internet access to Oracle, then you must also provide the name of the proxy server

1. Open a browser and enter the following URL to launch the Web Console:

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

2. Login as `oda-admin`.
3. Click the **Appliance** tab.
4. Click the Oracle ASR menu.
5. If Oracle ASR is already configured,
6. Click **Configure ASR**.
7. Select **Internal** from the ASR Type menu.
8. In the ASR User Name field, enter e-mail address associated with the My Oracle Support account under which the server is registered.
9. In the Password field, enter the password associated with the My Oracle Support account under which the server is registered.
10. Select **V2** or **V3** from the SNMP Version menu.
11. (Optional) If you are using an HTTP Proxy for upload to Oracle ASR, complete the following:
    a. **HTTP Proxy used for Upload to ASR**: Select **Yes**.
    b. **Proxy User Name**: If you are using a proxy for upload, enter the proxy user name.
    c. **Proxy Port**: If you are using a proxy for upload, enter the proxy port.
    d. **(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**.
    e. **(Optional) Proxy Password**: If you are using a proxy for upload and require authentication, enter the proxy password.
12. Click **Create**.

Registering with External Oracle ASR Manager

Use the Oracle Appliance Manager Web Console to register Oracle Database Appliance with an existing Oracle Auto Service Request (Oracle ASR) Manager.

You can register with an external Oracle ASR Manager at any time.

Before configuring, verify that the Oracle Database Appliance hardware is associated with a Support Identifier (SI) in My Oracle Support.

To configure Oracle ASR, you need the IP Address for the Oracle ASR Manager:

1. Open a browser and enter the following URL to launch the Web Console:

   `https://`*`ip-address`*`:7093/mgmt/index.html`
2. Login as `oda-admin`.
3. Click the **Appliance** tab.
4. Click the Oracle ASR menu.
5. If Oracle ASR is already configured,
6. Click **Configure ASR**.

7. Select **External** from the ASR Type menu.
8. Enter the IP Address for the Oracle ASR Manager in the ASR Manager IP field.
9. Select **V2** or**V3** from the SNMP Version menu.
10. Click **Create**.

Testing Oracle ASR

Use the `odacli test-asr` command to confirm that your Oracle ASR configuration is working.

The command internally invokes the SNMP test trap by invoking `/SP/alertmgmt/rules/1 testrule=true`. Attempting to test the configuration outside of the `odacli test-asr` command might not provide the expected test result.

1. Log in as root user.
2. Run the `odacli test-asr` command.

```
# 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
------------------------------ -------------------- ----------------
----------
```

3. If the results are not as expected, use the `odacli show-asr` command to review your Oracle ASR configuration.

Managing an Oracle ASR Configuration

Use the command-line to review an existing configuration, make changes to a configuration, or delete a configuration.

You can view and edit the configuration details, but you cannot change the Oracle ASR type. For example, from internal to external. To change the Oracle ASR type, delete the existing configuration and then re-configure Oracle ASR.

All log files for Oracle ASR are located in the `/var/opt/asrmanager/log/` directory.

1. To display Oracle Auto Service Request (Oracle ASR) configuration details, use the `odacli describe-asr` command.

```
# 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, 2017 8:53:54 AM PST
Updated: July 15, 2017 8:53:54 AM PST
```

2. (Optional) To make changes to Oracle ASR configuration details after deploying the appliance, use the `odacli update-asr` command.
3. (Optional) To remove the Oracle ASR configuration from the system, use the `odacli delete-asr`command.

```
# odacli delete-asr
{
"jobId" : "5d70bd17-ec4a-48da-8196-1364105db99d",
"status" : "Running",
"message" : null,
"reports" : [ ],
"createTimestamp" : 1469409622451,
"description" : "Delete ASR",
"updatedTime" : 1469409622458
}
```

Related Topics

- 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.

Additional Resources for Oracle ASR

Refer to these sections for more information about Oracle ASR.

- Oracle ASR product page:

  http://www.oracle.com/asr

- Oracle Database Appliance products qualified for Oracle ASR:
  - Oracle ASR Qualified Oracle Database Appliance Products
  - **IMPORTANT**: Oracle ASR Qualifed Product and Fault Rule Coverage Supplement (Doc ID 2142295.1)
- Oracle ASR user documentation:

  http://docs.oracle.com/cd/E37710_01/index.htm

15 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.
- 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 15-1 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 15-2 Example Command to View the Bill of Materials from the Command Line for Virtualized Platforms

```
# oakcli describe-system -b
```

Example 15-3 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.

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 19.7.
- 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 19.7.

When you provision or patch your appliance to Oracle Database Appliance release 19.7, 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 19.7, 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 19.7 Baremetal Systems for New Installation

When you provision or upgrade to Oracle Database Appliance 19.7, 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.

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 19.7, 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 15-1 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.

Table 15-1 (Cont.) Command Options for tfactl Tool

Option	Description
`-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.
`-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.

Table 15-1 (Cont.) Command Options for tfactl Tool

Option	Description
`-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.
`-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 15-4   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 15-5   Block dumps after redaction

```
14A533F40 ******** ******** ******** ******** [****************]
14A533F50 ******** ******** ******** ******** [****************]
14A533F60 ******** ******** ******** ******** [****************]
```

Example 15-6   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 15-7   Redo dumps after redaction

```
col 74: [ 1] **
col 75: [ 5] ** ** ** ** **
col 76: [ 7] ** ** ** ** ** ** **
```

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 15-8 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 15-9 Sanitizing Sensitive Information in Specific Collection IDs

```
orachk -sanitize comma_delimited_list_of_collection_IDs
```

Example 15-10 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 15-11 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 15-12 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 15-13 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 15-14 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 Master 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

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 Master 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
  Use Oracle Automatic Storage Management (Oracle ASM) or Oracle Automatic Storage Management Cluster File System (Oracle ACFS) for database files storage.
- Determining Usable Disk Capacity on Oracle Database Appliance for X6-2S, X6-2M, and X6-2L
  Review the usable disk capacity available for Oracle Database Appliance X6-2S, X6-2M, and X6-2L and how capacity is derived.

About Oracle Database Appliance Storage

Use Oracle Automatic Storage Management (Oracle ASM) or Oracle Automatic Storage Management Cluster File System (Oracle ACFS) for database files storage.

Database file systems are used exclusively for storing database files, and they include a DATA file system for database data files and a RECO file system for storing archive files and backups. Oracle Database Appliance supports Oracle ACFS and Oracle ASM database file storage. You determine the type of database storage when you create the database.

About Oracle ASM Database Storage

With Oracle ASM, database data files are stored in DATA diskgroup. Redo and archive files are in RECO diskgroup.

About Oracle ACFS Database Storage

With Oracle ACFS, an Oracle ACFS file system is created from DATA diskgroup for each database to store data files, and an Oracle ACFS file system is created from RECO diskgroup for redo and fast recovery area for all databases.

- About Database File Storage
  Understand how database file storage is configured for Oracle Database Appliance X6-2.
- 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.

About Database File Storage

Understand how database file storage is configured for Oracle Database Appliance X6-2.

Database file systems are used exclusively for storing database files, and they include a DATA file system for database data files and a RECO file system for storing archive files and backups. Oracle Database Appliance supports Oracle Automatic Storage Management Cluster File System (Oracle ACFS) or Oracle Automatic Storage Management (Oracle ASM) database file storage. You determine the type of database storage when you create the database.

About Oracle ASM Database Storage

With Oracle ASM, database datafiles are stored in DATA diskgroup. Redo and archive files are in RECO diskgroup.

Reserved storage is the amount of Oracle Automatic Storage Management (Oracle ASM) storage required to maintain redundancy in the event of a disk failure. If you use the reserve storage capacity, then the system continues to run, and it is protected through Oracle ASM mirroring. However, in the event of a second disk failure, the system is then running in a non-protected and degraded mode. In this event, you must replace disks immediately.

About Oracle ACFS Database Storage

With Oracle ACFS, an Oracle ACFS file system is created from DATA diskgroup for each database to store datafiles, and an Oracle ACFS file system is created from RECO diskgroup for redo and fast recovery area for all databases.

Storage Configuration Options

When Oracle Database Appliance X6-2 is deployed, you can select one of the following configuration options to divide the storage capacity between DATA diskgroup and RECO diskgroup:

- External: Storage capacity is split between 80% for DATA and 20% for RECO.
- Internal: Storage capacity is split between 40% for DATA and 60% for RECO.
- Custom: Storage capacity is configurable from 10% to 90% for DATA and the remainder for RECO.

When you configure Oracle Database Appliance to use Custom data storage, the amount of usable storage is determined by the percentage configured for DATA.

You can run the `lsdg` command to determine the usable storage on the DATA disk group.

Oracle ACFS Mount Points and Storage Space

Review Oracle ASM Cluster file system (ACFS) mount points for Oracle Database Appliance.

If you select Oracle Automatic Storage Management (Oracle ASM) for database storage when you create a database, then an Oracle ASM Cluster file system (ACFS) is not created. All files are in an Oracle ASM diskgroup.

If you select Oracle ACFS for database storage, then each database has its own Oracle ACFS mount point:

- DATA diskgroup: `/u02/app/`*`oracleuser`*`/oradata/`*`db_name`*
- RECO diskgroup: `/u03/app/`*`oracleuser`*.

With Oracle ACFS, the following are 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.

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`
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 Disk Capacity on Oracle Database Appliance for X6-2S, X6-2M, and X6-2L

Review the usable disk capacity available for Oracle Database Appliance X6-2S, X6-2M, and X6-2L and how capacity is derived.

Oracle Database Appliance X6-2S, X6-2M, and X6-2L use 3.2 TB raw NVMe flash Solid-State Drives. The usable data capacity in the following tables varies because it is derived by converting terabytes reported in decimal (based on 1 kilobyte equals 1,000 bytes) into terabytes reported in binary (based on 1 kilobyte equals 1,024 bytes) and splitting the usable capacity into Oracle Automatic Storage Management (Oracle ASM) disk groups.

In summary, each NVMe SSD usable storage is approximately 2.91TB. This is calculated by the storage usable capacity of the drive converted to TB. 3.2 TB divided by 1.024^4= 2.91TB.

Usable Disk Capacity on Oracle Database Appliance X6-2S and X6-2M

The following table provides the approximate amount of usable space for the Oracle Database Appliance X6-2S and X6-2M.

Table B-2   Usable Disk Capacity on Oracle Database Appliance X6-2S and X6-2M

Description	Sizing for X6-2S and X6-2M with 2 NVMe Drives	Sizing for X6-2S and X6-2M with 4 NVMe Drives
Number of NVMe Drives	2	4
Total Usable Space	5.8TB	11.6TB
Reserved Space Normal Redundancy	0TB	2.9TB
Total Usable Normal (Double Mirror) Oracle ASM Redundancy	2.9TB	4.4TB
DATA Disk Group (90% Usable)	2.6TB	3.96TB
RECO Disk Group (10% Usable)	0.3TB	0.44TB
Reserved Space High Redundancy	NA. Triple mirroring is not applicable for the X6-2S and X6-2M.	0TB
Total Usable High (Triple Mirror) Oracle ASM Redundancy	NA. Triple mirroring is not applicable for the X6-2S and X6-2M.	3.9TB
DATA Disk Group (90% usable)	NA. Triple mirroring is not applicable for the X6-2S and X6-2M.	3.51TB
RECO Disk Group (10% usable)	NA. Triple mirroring is not applicable for the X6-2S and X6-2M.	0.39TB
Reserved Space Flex Redundancy	0TB	0TB
Total Usable Oracle ASM Flex Redundancy	2.9TB	3.9TB to 4.4TB
DATA Disk Group (90% usable)	2.6TB	3.51TB to 3.96TB
RECO Disk Group (10% usable)	0.3TB	0.39TB to 0.44TB

Usable Disk Capacity on Oracle Database Appliance X6-2L

Based on the calculations of the capacity of the storage drives and including the reserved space for redundancy, the following table reflects the approximate usable storage of the Oracle Database Appliance X6-2L.

Table B-3   Usable Storage on Oracle Database Appliance X6-2L

Description	Sizing for X6-2L with 6 NVMe Drives	Sizing for X6-2L with 9 NVMe Drives
Number of NVMe Drives	6	9
Total Usable Space	17.4TB	26.1TB
Reserved Space Normal Redundancy	3.4TB	4.1TB
Total Usable Normal (Double Mirror) Oracle ASM Redundancy	7TB	11.0TB
DATA Disk Group (90% usable)	6.3TB	9.9TB
RECO Disk Group (10% usable)	0.7TB	1.1TB
Reserved Space High Redundancy	5.8TB	6.1TB
Total Usable High (Triple Mirror) Oracle ASM Redundancy	3.8TB	6.7TB

Table B-3 (Cont.) Usable Storage on Oracle Database Appliance X6-2L

Description	Sizing for X6-2L with 6 NVMe Drives	Sizing for X6-2L with 9 NVMe Drives
DATA Disk Group (90% usable)	3.4TB	6.0TB
RECO Disk Group (10% usable)	0.4TB	0.7TB
Reserved Space Flex Redundancy	5.8TB	6.1TB
Total Usable Oracle ASM Flex Redundancy	3.8TB to 7TB	6.7TB to 11TB
DATA Disk Group (90% usable)	3.4TB to 6.3TB	6.0TB to 9.9TB
RECO Disk Group (10% usable)	0.4TB to 0.7TB	0.7TB to 1.1TB

The Reserved Space values represent the amount of storage required to maintain full redundancy in case of disk failure.

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. For Oracle Database Appliance X6-2S or X6-2M with 2 or 4 NVMe drives, this reserved space is not required. 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-4 Oracle ASM Calculations

Number of Drives	Redundancy	Total_MB	Free_MB	Req_mir_free_MB	Usable_file_MB	Name
2	NORMAL	4894016	4893372	0	1220644	RECO/
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-5 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-5 (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.	Total usable storage after formatting to Oracle ASM disk groups. For example, for 2 NVMe drives, total usable storage is 5.8TB.
`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.

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
}
```

D

Database Shapes for Oracle Database Appliance

Use the information in this appendix to select database shapes, or templates, for your planned databases.

- About Database Shapes
  Review this information to help determine the database shape to use.
- OLTP Database Shapes
  Use Oracle Database Appliance OLTP Database Shapes if your database workload is primarily online transaction processing (OLTP).
- In-Memory Database Shapes
  Use Oracle Database Appliance In-Memory (IMDB) database shapes if your database workload can fit in memory, and can benefit from in-memory performance capabilities.
- DSS Database Shapes
  Use DSS database shapes if your database workload is primarily decision support services (DSS) or data warehousing.

About Database Shapes

Review this information to help determine the database shape to use.

Oracle Database Appliance shapes define databases with parameters selected specifically to optimize performance on Oracle Database Appliance. In addition, these shapes help you to set up appropriate instance caging and to acquire an appropriate license.

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 shapes 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 shape, enabling multiple databases to run concurrently with no performance degradation, up to the capacity of Oracle Database Appliance. You can select database shape 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 shapes as *classes* of databases.

Note:

Oracle strongly recommends that you use the Oracle Database Appliance shapes, because they implement best practices and are configured specifically for Oracle Database Appliance.

Choosing a Database Shape

Database shapes are configured specifically for the type of database workload that you want to carry out on your databases on Oracle Database Appliance. Choose the shape that best matches the common workload your databases perform (OLTP, DSS, In-Memory).

The database sizing tables provide shape names and sizing based on the number of CPUs and memory attributes for each type of database workload.

Identify the shape type that is appropriate to your database workload and hardware:

- Use Oracle Database Appliance OLTP Database Shapes if your database workload is primarily online transaction processing (OLTP).
- Use Oracle Database Appliance DSS database shapes if your database workload is primarily decision support services (DSS) or data warehousing.
- Use Oracle Database Appliance In-Memory (IMDB) database shapes if your database workload can fit in memory, and can benefit from in-memory performance capabilities.

Use the database shape tables to help select the best shapes for your databases. When using these 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.
- The log file size assumes three (3) REDO log groups for each instance with a log switch every 15 minutes when the system is running at full capacity.

OLTP Database Shapes

Use Oracle Database Appliance OLTP Database Shapes if your database workload is primarily online transaction processing (OLTP).

Table D-1 Oracle Database Appliance OLTP Database Shape Sizes

Shape	CPU Cores	SGA (GB)	PGA (GB)	Processes	Redo log file size (GB)	Log buffer (MB)
odb1s	1	2	1	200	1	16
odb1	1	4	2	200	1	16
odb2	2	8	4	400	1	16

Table D-1 (Cont.) Oracle Database Appliance OLTP Database Shape Sizes

Shape	CPU Cores	SGA (GB)	PGA (GB)	Processes	Redo log file size (GB)	Log buffer (MB)
odb4	4	16	8	800	1	32
odb6	6	24	12	1200	2	64
odb08	8	32	16	1600	2	64
odb10	10	40	20	2000	2	64
odb12 (X6-2M and X6-2L only)	12	48	24	2400	4	64
odb16 (X6-2M and X6-2L only)	16	64	32	3200	4	64
odb20 (X6-2M and X6-2L only)	20	80	40	4000	4	64

In-Memory Database Shapes

Use Oracle Database Appliance In-Memory (IMDB) database shapes if your database workload can fit in memory, and can benefit from in-memory performance capabilities.

Table D-2 Oracle Database Appliance In-Memory Database Shape Size

Shape	CPU Cores	SGA (GB)	PGA (GB)	In-Memory (GB)	Processes	Redo log file size (GB)	Log buffer (MB)
odb1s	1	2	1	1	200	1	16
odb1	1	4	2	2	200	1	16
odb2	2	8	4	4	400	1	16
odb4	4	16	8	8	800	1	32
odb6	6	24	12	12	1200	2	64
odb08	8	32	16	16	1600	2	64
odb10	10	40	20	20	2000	2	64
odb12 (X6-2M and X6-2L only)	12	48	24	24	2400	4	64
odb16 (X6-2M and X6-2L only)	16	64	32	32	3200	4	64
odb20 (X6-2M and X6-2L only)	20	80	40	40	4000	4	64

DSS Database Shapes

Use DSS database shapes if your database workload is primarily decision support services (DSS) or data warehousing.

Table D-3 Oracle Database Appliance DSS Database Shape Sizes

Shape	CPU Cores	SGA (GB)	PGA (GB)	Processes	Redo log file size (GB)	Log buffer (MB)
odb1s	1	1	2	200	1	16
odb1	1	2	4	200	1	16
odb2	2	4	8	400	1	16
odb4	4	8	16	800	1	32
odb6	6	12	24	1200	2	64
odb8	8	16	32	1600	2	64
odb10	10	20	40	2000	2	64
odb12 (X6-2M and X6-2L only)	12	24	48	2400	4	64
odb16 (X6-2M and X6-2L only)	16	32	64	3200	4	64
odb20 (X6-2M and X6-2L only)	20	40	80	4000	4	64

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- *See* Oracle ASM

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