Oracle® Database Appliance

X5-2 Deployment and User's Guide

ORACLE®

Oracle Database Appliance X5-2 Deployment and User's Guide, Release 18.2 for Linux x86-64

E98177-01

Primary Author: Aparna Kamath

Contents

4   Deploying Oracle Software on Oracle Database Appliance

5   Oracle Database Appliance Postinstallation Tasks

6   Managing Oracle Databases

7   Managing Storage

8   Oracle Appliance Manager Command-Line Interface

9   Validating and Troubleshooting Oracle Database Appliance

A   Oracle Database Appliance Software Configuration Defaults

B   Database Templates for Oracle Database Appliance

Index

List of Figures

List of Tables

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 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 Getting Started Guide*

- *Oracle Database Appliance Administration and Reference 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*

The following My Oracle Support Notes contain additional information:

- https://support.oracle.com/CSP/main/article?cmd=show&type=NOT&id=888888.1

- https://support.oracle.com/CSP/main/article?cmd=show&type=NOT&id=2144642.1

The following documents are published in the Oracle Database Appliance Plug-ins for Oracle Enterprise Manager online documentation library at http://docs.oracle.com/cd/E70264_01/index.htm:

- *Oracle Database Appliance Plug-in for Oracle Enterprise Manager 13c User's Guide*

- *Oracle Database Appliance Plug-in for Oracle Enterprise Manager 12c User's 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

About Oracle Database Appliance

Oracle Database Appliance enables you to take advantage of Oracle Database in an easy-to-deploy and manage system. The complete package of software, server, storage, and networking saves time and money by simplifying deployment, maintenance, and support of database and application workloads.

- Oracle Database Appliance Software
  View the Oracle software that is available for download for Oracle Database Appliance.
- Overview of Oracle Database Appliance Deployment
  Review the steps you must complete to deploy Oracle Database Appliance.

1.1 Oracle Database Appliance Software

View the Oracle software that is available for download 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 18.2.0.0.0

Patch	Description
Oracle Database Appliance GI Clone	Use to perform an initial deployment of Oracle Database Appliance.
	The bundle contains the latest Grid Infrastructure. If you reimage Oracle Database Appliance with the Bare Metal ISO Image, download the GI Clone patch to deploy Oracle Database Appliance.
RDBMS Clone	Use the RDBMS Software Clone files to get the RDBMS clone binaries for Oracle Database 18.2.0.0.0 for Oracle Database Appliance. The RDBMS clone file is needed to create Oracle databases and database homes.
Bare Metal ISO Image	Use to reimage the appliance for Oracle Database Appliance 18.2.0.0.0.

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

1.2 Overview of Oracle Database Appliance Deployment

Review the steps you must complete to deploy Oracle Database Appliance.

To complete these tasks, refer to topics in this book and in the *Oracle Database Appliance Owner's Guide*.

1. Prepare for Oracle Database Appliance.

   a. Register your Support Identifier (SI) for Oracle Database Appliance with My Oracle Support to obtain software and support from Oracle.

   b. Plan your configuration options and gather network and related information.

   c. Set up the server site.

   d. Configure network names and addresses on your Domain Name System (DNS) server.

   e. Download the Oracle Database Appliance software to a local computer on the network.

2. Ready Oracle Database Appliance for deployment.

   a. Mount Oracle Database Appliance hardware into a rack at the server site.

   b. Connect power and required cables to Oracle Database Appliance.

   c. Connect the keyboard and mouse to USB ports and video display to VGA port.

   d. Create an initial network configuration to load external files.

   e. Start up the system.

   f. Plumb the network.

3. Install and deploy software on Oracle Database Appliance.

   a. Download the Oracle Database Appliance Single Instance Software Bundles to a system on the network.

   b. Copy the Oracle Database Appliance Single Instance Software Bundles to Oracle Database Appliance.

   c. Run the `update-image` command to install the bundles.

4. Deploy Oracle Database Appliance.

   a. Log into the Oracle Database Appliance Web Console.

   b. Click **Create Appliance**.

   c. Enter the configuration details.

   d. Click **Submit** to start the deployment.

   e. Monitor the progress on the **Activity** tab.

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
  Use these topics to help you to make decisions about your Oracle Database Appliance configuration.
- Gathering System Requirement Information
  Use these checklists to collect information before deploying Oracle Database Appliance.

2.1 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.

2.2 Planning Oracle Database Appliance Configuration Options

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

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

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

Topics:

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

- Selecting Database 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.

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

- Selecting 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.

2.2.1 Selecting Database Deployment Options for Oracle Database Appliance

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

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

Options:

- **Enterprise Edition**: Oracle Database 18*c* Enterprise Edition (no automated failover), with the following characteristics:

  – Single-instance Oracle Database Enterprise Edition home

  – Oracle Database software installation on both nodes

- **Oracle Real Application Clusters (Oracle RAC) One Node**: Oracle RAC One Node 18*c*, with the following characteristics:

  – Oracle RAC One Node has a designated Oracle Database Appliance home node

  – Oracle RAC One Node software is installed on both servers

- Automated failover is configured

- Enterprise Edition license is required

- Oracle RAC One Node license on each server is required

  Exception: If you designate one server as a backup server, then you can use that server without a license, in accordance with the 10-day rule.

- **Oracle RAC**: Oracle Real Application Clusters 18*c*, with the following characteristics:

  - Oracle RAC home

  - Oracle RAC software is installed on both servers

  - Enterprise Edition license is required

  - Oracle RAC license on each server is required (not eligible for the 10-day rule)

> **Note:**
>
> For information about the 10-day rule, see the *Oracle Software Investment Guide* at `http://www.oracle.com/us/corporate/pricing/sig-070616.pdf`.

2.2.2 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.

2.2.3 Calculating Required Cores

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

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

- Generic templates

- Online analytic transaction templates (OLTP)

- Decision support services templates (DSS)

- In-Memory database templates

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

2.2.4 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

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.

2.3 Gathering System Requirement Information

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

- [List of Information You Need Before Deployment](#)
  Collect storage and network information required to prepare for deploying Oracle Database Appliance.

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

- Checklist for Custom Node Network Address Configuration
  Use the checklists in this topic to identify the IP addresses required for Oracle
  Database Appliance and for information about requirements for nonstandard
  public IP addresses.

2.3.1 List of Information You Need Before Deployment

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

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

Security Requirements

- What root password should you use for Oracle Database Appliance? Root
  passwords should comply with your system security requirements.

- Secure operating systems are an important basis for general system security.
  Ensure that your operating system deployment is in compliance with common
  security practices.

Storage Administration Requirements

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

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

Data and database redo log files are stored on shared disks:

- On Oracle Database Appliance X5-2, data files are stored in the storage shelf and
  the optional storage expansion shelf. Database redo log files are stored on solid-
  state drives (SSDs) in the storage shelf, and on the optional storage expansion
  shelf.

Oracle Database Appliance X5-2 contains four 400 GB SSDs, which are configured as
an ASM disk group, using ACFS for an additional database cache. Also, on Oracle
Database Appliance X5-2, four 200 GB SSDs are used for attribute caching, in
addition to the database redo logs.

> **Note:**
>
> Oracle Database Appliance X5-2 ships with 4 TB shared disks. Disk
> hardware capacity is measured using the formula that 1 KB equals 1,000
> bytes; software storage requirements are based on 1 KB equals 1,024 bytes.
> This difference of 24 bytes means that a disk that has a rated capacity of 4
> TB actually has about 3.725 TB of available space for software storage.

Network Administration Requirements

Ensure that the names and addresses that you provide for network configuration are configured in your Domain Name System (DNS) servers. With Patch Set 1 and later, 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.

If you are deploying Oracle Database Appliance X5-2, then you have the option to connect either to a copper, or to a fiber public network. To connect to a fiber network on Oracle Database Appliance X5-2, you must also replace the InfiniBand cards with 10 GbE SFP+ fiber cards. Ensure that your network planning is based on the correct type of public network.

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

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

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

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

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

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

If you select a Custom installation, then provide names and addresses for the following optional interfaces that you need:

- `bond1` (Ethernet bond): This applies to all Oracle Database Appliance platforms.
- `bond2` (Ethernet bond): This applies only to Oracle Database Appliance Version 1.
- `xbond0` (for high capacity transfers, such as backups): This applies only to Oracle Database Appliance Version 1.

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

Also determine answers to the following questions:

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

If you have NTP servers, and you want to synchronize time between Oracle Database Appliance nodes using NTP, then be prepared to provide the addresses for the servers. If you do not provide addresses for NTP servers, then Oracle Grid Infrastructure software configures time synchronization between nodes using Cluster Time Synchronization Service (CTSS).

• Do you want to plug in the public IP address cables to redundant switches, so that you can avoid a single point of failure for Oracle Database Appliance? Oracle recommends that you use redundant switches for High Availability.

IP Address Questions to Ask Your Network Administrator

Confirm with your network administrator that the IP addresses that you configure for Oracle Database Appliance meet these three criteria:

1. They are static IP addresses.

2. They are on the same subnet as all other IP addresses, virtual IP (VIP) addresses (used for Oracle Real Application Clusters communication), and SCAN addresses.

3. They include the following:

   • One public IP address configured on the DNS server for each node and resolvable to that node before installation.

   • A VIP address for each node configured on the DNS server that is not currently in use.

   • SCANs for Oracle Database Appliance with the following characteristics:

     – Configured on the DNS server before installation, so that the two IP addresses are associated with the name provided as the SCAN, and both addresses are returned in random order to the requester by the DNS server

     – Configured on the DNS server before installation to resolve to addresses that are not currently in use

     – Have names that do not begin with a numeral

> ⚠ **Caution:**
>
> Do not change the IP addresses and subnet for the private network.

> ✎ **Note:**
>
> Configuring SCANs in a Network Information Service (NIS) is not supported.

Additional Information

See *Oracle Database Appliance Owner's Guide* for information about replacing the InfiniBand cards with 10 GbE SFP+ fiber cards. For a comprehensive introduction to SCANs, see "Oracle Single Client Access Name (SCAN)", a technical paper on Oracle Technology, and *Oracle Grid Infrastructure Installation Guide for Linux*.

Related Topics

- *Oracle Grid Infrastructure Installation Guide for Linux*

2.3.2 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
Oracle Database Appliance System Name	Provide the name for the cluster running on Oracle Database Appliance. This name is also used as the default root word for Oracle Database Appliance network addresses. The name must be unique across your enterprise, must be at least one character long and no more than 13 characters in length, must be alpha-numeric, cannot begin with a numeral, and may contain hyphens (-). Underscore characters (_) are not allowed.
	The name you choose will become the default first part of the names for the following items. The default (generated names) can be changed.
	• Oracle ILOM host names for Nodes 1 and 2 (*systemname*1-ilom and *systemname*2-ilom respectively)
	• SCAN host name (*systemname*-scan)
	• Node 0 and Node 1 Public IP addresses (*systemname*1 and *systemname*2 respectively)
	• Node 0 and Node 1 Virtual IP addresses (*systemname*1-vip and *systemname*2-vip respectively)
	The name should comply with the host name specifications described in the RFC 952 standard.
Type of Configuration	Typical, which has the most default values.
	Custom (recommended by Oracle), which allows you to override default values for any or all of the following:
	• Database block size, language, territory, backup file location, or disk redundancy level for the DATA and RECO disk groups
	• Oracle Integrated Lights Out Manager (Oracle ILOM) server
	• Oracle Auto Service Request (Oracle ASR) configuration
	• Oracle Cloud File System mount point and file system size
	• Network Time Protocol (NTP) service server
Mode	Bare metal
Region	Select 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.
Initial Database Details (if you want to create one during deployment)	• Database name
	• Normal or container database
	• Class (database template)
	• Database language
	• Database deployment (Oracle Enterprise Edition single instance, Oracle RAC One Node, or Oracle RAC)
	• (Container databases only) Data file size, in gigabytes (GB)
Root password	You are prompted to provide a root password for the system. Ensure that the root password you provide is in compliance with common security practices.

> **Note:**
>
> Oracle recommends that you use all lowercase characters for the host name. The names are generated from the system name. For example, if you use `mysystem` as the name of your system, then the derived host names are `mysystem0` and `mysystem1`; the derived host virtual IP names are `mysystem0-vip` and `mysystem1-vip`; and the ILOM names are `mysystem0-ilom` and `mysystem1-ilom`.

2.3.3 Checklist for Custom Node Network Address Configuration

Use the checklists in this topic to identify the IP addresses required for Oracle Database Appliance and for information about requirements for nonstandard public IP addresses.

By default, names for network interfaces are derived from the Oracle Database Appliance system name, which you provide during installation. You can retain the default values, or you can use addresses provided by your system administrator to perform a custom configuration. Ensure that all addresses listed as "Yes" in the "Same Subnet" column are on the same subnet as each other.

Minimum IP Address Requirements for Oracle Database Appliance Bare Metal Deployment

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

Type of IP	Minimum IP Address Counts	IP Address Default Values	Your Values As Applicable	Same Subnet
Host Public Addresses	2	No default	No default	Yes
Host Private Addresses	4	192.168.16.24 192.168.16.25 192.168.17.24 192.168.17.25	Not applicable: the private addresses are defined before deployment and should not be changed. If you are using InfiniBand on Oracle Database Appliance X5-2, IP addresses 192.168.17.24 and 192.168.17.25 are not used.	Yes
Oracle RAC VIP	2	No default	No default	Yes
Single Client Access Name (SCAN)	2	No default	No default	Yes
Oracle Integrated Lights Out Manager (ILOM)	2	No default	No default	No
User Virtual Machine	Not Applicable	No default	No default	No

3

Readying Oracle Database Appliance for Deployment

Complete these tasks to prepare to deploy Oracle Database Appliance.

Topics:

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

- **Attaching Supplied Cables for Oracle Database Appliance**
  If you are using Oracle Database Appliance with a single storage shelf, attach the interconnect cables.

- **Attaching a Storage Expansion Shelf to Oracle Database Appliance**
  Review these topics to install and cable a storage expansion shelf for Oracle Database Appliance.

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

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

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

- **Attaching Power Cords and Initializing Components**
  Attach power cords for Oracle Database Appliance.

- **Configuring an Initial Network Connection**
  Configure a temporary network configuration framework to build your network information during deployment.

- **Validating Oracle Appliance Manager Software Version**
  Before deploying Oracle Database Appliance, you should have the current version of the Oracle Appliance Manager software installed.

3.1 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.

3.2 Attaching Supplied Cables for Oracle Database Appliance

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

Topics:

- Attaching Cables for Oracle Database Appliance X5-2
  Use the diagram in this topic to understand how to attach cable connections between ports on Oracle Database Appliance model X5-2 with a single storage shelf:

- Cabling Oracle Database Appliance to Connect to Fiber Public Networks (Optional)
  You can configure X5-2 appliances to use fiber connections for the public network.

3.2.1 Attaching Cables for Oracle Database Appliance X5-2

Use the diagram in this topic to understand how to attach cable connections between ports on Oracle Database Appliance model X5-2 with a single storage shelf:

Figure 3-1   Interconnects and Cables for a Single Storage Shelf on Oracle Database Appliance X5-2
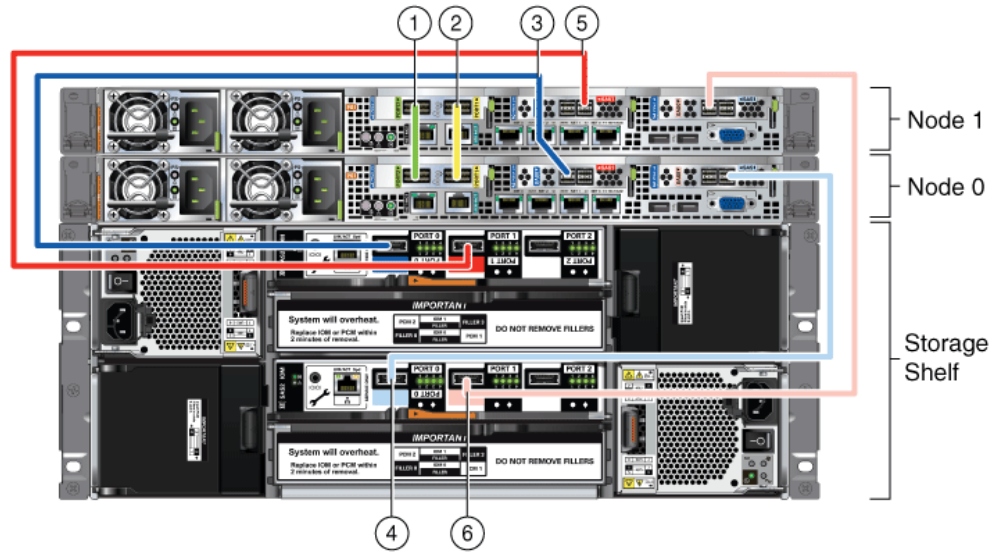
Table 3-1   Description of Callouts for Cabling Oracle Database Appliance X5-2 With Single Storage Shelf

Callout Number	Description
1	Green InfiniBand Cable (Oracle Database Appliance X5-2) • From: Node 0, PCIe slot 1, PORT2 • To: Node 1, PCIe slot 1, PORT2
2	Yellow InfiniBand Cable (Oracle Database Appliance X5-2) • From: Node 0, PCIe slot 1, PORT1 • To: Node 1, PCIe slot 1, PORT1
3	Dark blue SAS cable: • From: Node 0, PCIe slot 2, SAS0 • To: Storage shelf, top I/O port 0
4	Light blue SAS cable: • From: Node 0, PCIe slot 3, SAS1 • To: Storage shelf, bottom I/O port 0
5	Dark red SAS cable: • From: Node 1, PCIe slot 2, SAS1 • To: Storage shelf, top I/O port 1
6	Light red SAS cable: • From: Node 1, PCIe slot 3, SAS0 • To: Storage shelf, bottom I/O port 1

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

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

You can configure X5-2 appliances to use fiber connections for the public network.

For Oracle Database Appliance X5-2 installations, if you want to use fiber connections between Oracle Database Appliance and your public network, then you must cable the interconnect by using the green and yellow copper ports (onboard ports `net0` and `net1`). The green and yellow Category 6 (`Cat 6`) interconnect cables for these ports ship with the base system.

For Oracle Database Appliance X5-2, if you want to use a fiber port connection, then you must replace the InfiniBand cards with 10 GbE SFP+ (fiber) cards. Fiber ports do not exist in the base configuration for X5-2. You must re-image Oracle Database Appliance X5-2 after you replace the PCIe cards. After you replace the cards, Oracle Database Appliance auto-detects the network configuration changes.

> **Caution:**
>
> If you replace the InfiniBand interconnect cards on Oracle Database Appliance X5-2, then you disable the Oracle Database Appliance in-memory fault tolerance feature. Also, interconnect bandwidth is reduced from 40 GB to 10 GB. If you have Oracle RAC databases, then you may experience slower intercommunication speeds, depending on the system workload.

In the following figure, callouts 1 and 2 show how to cable the interconnect between Node 1 and Node 0 using the green and yellow copper ports (onboard ports `net0` and `net1`) to use a fiber public network. Note that the illustration shows the rear panel of an Oracle Database Appliance X4-2. The rear panel of the Oracle Database Appliance X5-2 is slightly different, but the interconnect cabling is the same.

Figure 3-2   Interconnects When Using Fiber Connections to the Public Network on Oracle Database Appliance Models X5-2
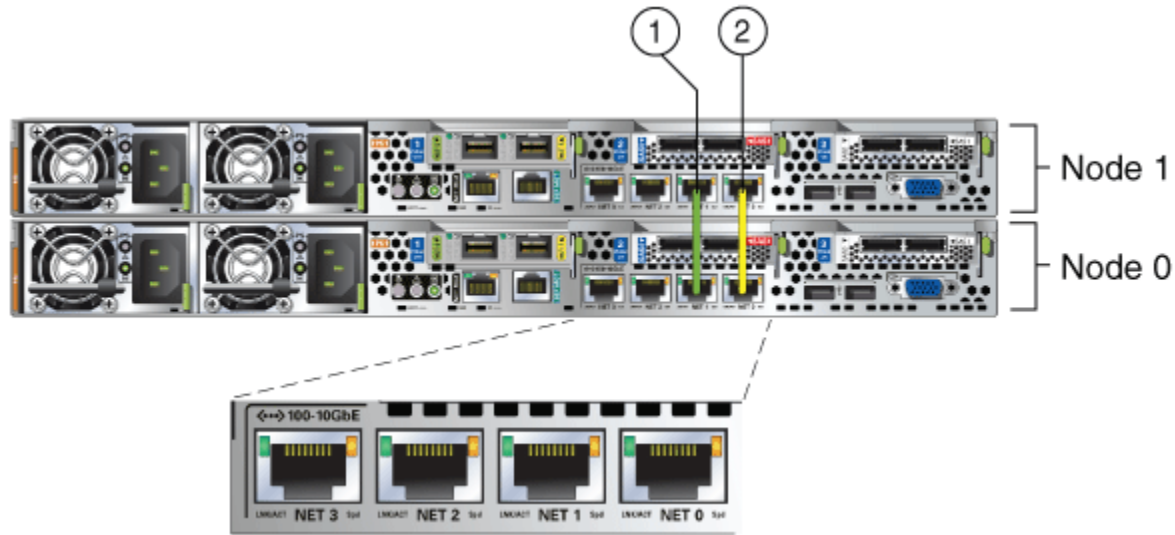
The following sections show the cabling options for 10 GbE SFP+ PCI cards.

Fiber Cables

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

Name	Oracle Sun 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 Sun. These cables have built-in SFP+ connectors:

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

3.3 Attaching a Storage Expansion Shelf to Oracle Database Appliance

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

Topics:

- About Attaching and Cabling Storage Shelves
  Review these options and best practices for adding storage shelves for Oracle Database Appliance X6-2-HA, X5-2, X3-2, and X4-2.

- Installing and Cabling a Storage Expansion Shelf
  Use this procedure to install and cable a storage expansion shelf for Oracle Database Appliance

3.3.1 About Attaching and Cabling Storage Shelves

Review these options and best practices for adding storage shelves for Oracle Database Appliance X6-2-HA, X5-2, X3-2, and X4-2.

Storage Shelf Options for Oracle Database Appliance X6-2-HA, X5-2, X3-2, and X4-2

Oracle Database Appliance models X6-2-HA, X5-2, X3-2, and X4-2 can be shipped with one or two storage shelves. You can obtain the second shelf at a later time to double your storage capacity.

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

Best Practice Guidelines for Adding Storage Expansion Shelves

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

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

3.3.2 Installing and Cabling a Storage Expansion Shelf

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

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

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

2. Install the extension storage shelf in exactly the same manner as the original storage shelf.

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

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

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

Figures Showing How to Cable a Storage Expansion Shelf

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

The cables are color-coded. Match the colors of the labels at the ends of each cable with the colored line shown in the following illustration. Also match the cable colors to the background colors of the socket identification labels.

You can also use the callouts in the diagrams and the callout table that follows the diagrams to identify the cables and ports. Because all cables with the same terminations are interchangeable, you can ignore the color coding.

> ✎ **Note:**
>
> The back panel of each node contains three PCIe generation 3 terminal slots, with two sockets in each slot. The PCIe slots are labeled *X* **PCIe3**, where *X* is the PCIe slot number. Review the callout table that follows the figures for more information.

Figure 3-3   Cables for Storage Expansion Shelf on Oracle Database Appliance X5-2
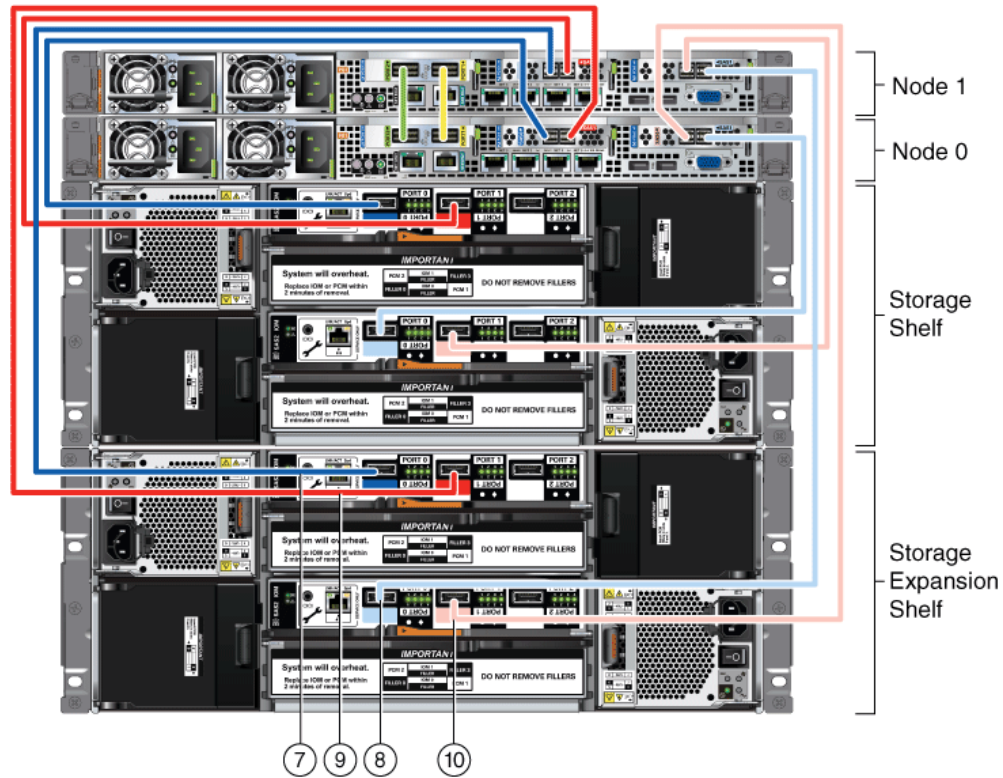
The cables identified with callout numbers in the preceding figures are included with each shipped Oracle Database Appliance storage expansion shelf. These cables are all black, but have colored labels at each end that match the references to cable colors in the text and the label colors on the back panels.

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

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

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

> 📝 **See Also:**
>
> Attaching Power Cords and Initializing Components
>
> To review information about installing optional components for Oracle Database Appliance, see the section "Optional Component Installation" in Chapter 4 of *Oracle Database Appliance Owner's Guide*.

3.4 Attaching Peripheral Devices

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

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

Attach a monitor to the graphics card port, and attach a keyboard and a mouse to the USB ports. Refer to the figure and table to identify the ports.
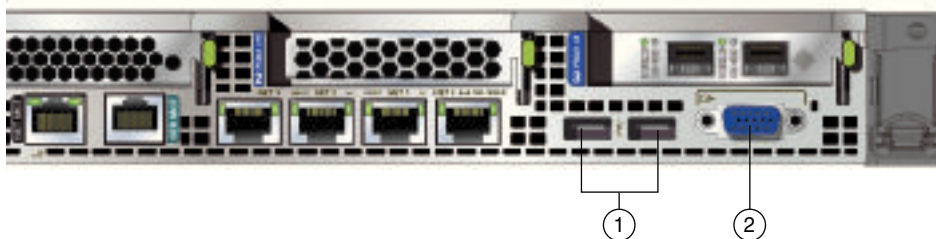
In the figure, callout 1 identifies the ports for the keyboard and mouse. Callout 2 identifies the monitor port.

Table 3-3   Peripheral Device Connections for Oracle Database Appliance

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

3.5 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.

- Defining Your Public Network Interface Type (X4-2)
  For Oracle Database Appliance X4-2, after system startup, you are prompted to indicate if you are using copper or fiber network interfaces for your public network.

3.5.1 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*.

3.5.2 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 3-4   Front of Oracle Database Appliance Power Panel for X6-2S and X6-M
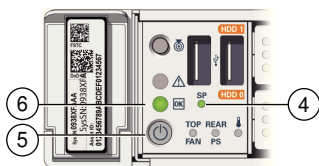
Table 3-4   Description of Callouts for Powering On Oracle Database Appliance

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.

3.5.3 Defining Your Public Network Interface Type (X4-2)

For Oracle Database Appliance X4-2, after system startup, you are prompted to indicate if you are using copper or fiber network interfaces for your public network.

After you power on Oracle Database Appliance X4-2 for the first time, a short script runs on each node. Use an attached keyboard to answer questions that the script displays on the local monitor.

> **Note:**
>
> This procedure applies only to Oracle Database Appliance X4-2. When you power on 5-2 for the first time, the system automatically defines your public network interface based on the interconnect. On Oracle Database Appliance X5-2, the InfiniBand network is used for the interconnect if InfiniBand cards are used. If InfiniBand cards are replaced with 10 GbE SFP+ (fiber) cards, then the onboard 10GBase-T (Copper) ports are used for the interconnect.

1. Oracle Database Appliance displays the following message to prompt you to indicate your public interface connection type:

   ```
   Do you want to use Fiber or Copper card for public network? Please Choose
   [C]opper or [F]iber.
   ```

   If you are connecting to a copper-based public network, then enter `C`. If you are connecting to a fiber-based public network, then enter `F`. The script then prompts you to confirm your choice.

2. Proceed with system configuration.

   If you make a mistake, or if you want to change your public interface type later, then you can do the following to change your public network interface type:

   a. Log into Node 0 as root.

   b. Run the following script:

      ```
      /opt/oracle/oak/lib/setupX4network.pl
      ```

   c. Repeat steps a and b on Node 1.

> **Note:**
>
> If you have already deployed the End-User Bundle (Bare Metal installation) or the ODA_BASE template (Virtualized Platform installation), then you must redeploy that software after running `setupX4network.pl`.

3.6 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"
```

3.7 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*.

3.8 Configuring an Initial Network Connection

Configure a temporary network configuration framework to build your network information during deployment.

Oracle Database Appliance X6-2S has two highly available networks and Oracle Database Appliance X6-2M and X6-2L have three available networks. Use either the 10GBase-T or the 10GbE SFP+ network interface. Use the initial network connection to transfer deployment software to Oracle Database Appliance and deploy the appliance with the Web Console.

> ✎ **Note:**
>
> The initial network configuration is temporary. It is replaced during the final image deployment.

> ⚠ **Caution:**
>
> Oracle recommends using the `configure-firstnet` command only one time on Oracle Database Appliance. Subsequent use after configuring the initial network can cause unpredictable changes to your network settings.

1. Log in to Oracle Database Appliance as `root`, using the password `welcome1`.

2. Run the command `configure-firstnet` to configure the initial network.

3. Complete the network information, as prompted. Refer to the network configuration information that you collected in preparation for deployment.

   See configure-firstnet for more information on the `configure-firstnet` command and an example.

3.9 Validating Oracle Appliance Manager Software Version

Before deploying Oracle Database Appliance, you should have the current version of the Oracle Appliance Manager software installed.

Run the following command to find the installed version on your appliance:

```
oakcli show version
```

Confirm that you have the most current version of Oracle Appliance Manager.

4

Deploying Oracle Software on Oracle Database Appliance

Complete these tasks to deploy the Oracle Database Appliance software.

- About Deploying Oracle Database Appliance 18.2
  Review this information to understand how to deploy Oracle Database Appliance 18.2.

- Re-imaging Oracle Database Appliance with an Oracle Database 18.2 Image
  Use Oracle Integrated Lights Out Manager (ILOM) to re-image Oracle Database Appliance with an Oracle Database 18.2 image.

- Updating the Repository with the GI and RDBMS Files
  Download the Oracle Database Appliance GI and RDBMS Software Clone File from My Oracle Support and update the patch repository.

- Deploying Bare Metal Platforms on Oracle Database Appliance
  Configure the system, network, user groups, and database and deploy Oracle Database Appliance.

4.1 About Deploying Oracle Database Appliance 18.2

Review this information to understand how to deploy Oracle Database Appliance 18.2.

Oracle Database Appliance ships from the factory with a bare metal configuration, default ISO image, and Appliance Manager installed. To deploy Oracle Database Appliance to use Oracle Database 18.2, you must re-image the machine with the 18.2 image. Re-imaging uses ILOM to install Oracle Database Appliance software for Oracle Database 18.2 on the local (boot) drive.

After imaging is completed, redeploy the End User image, then restore from backup, as needed.

Re-imaging does not patch the firmware or update the component versions, it only re-images the local system disk from an OS perspective. Re-imaging with older release of Oracle Database Appliance software does not rollback the firmware version.

To reimage the Oracle Database Appliance node, use the Oracle Integrated Lights Out Manager (ILOM) interface that you configured as part of readying the system for deployment .

To complete the first part of the deployment, you can either connect a monitor and keyboard to the system or connect a laptop to the serial port. If you use the serial port, ensure that the baud rate speeds match. After the first network is configured, you can perform the remaining deployment steps on the Oracle Database Appliance system or from a remote system.

Re-imaging and deploying Oracle Database Appliance requires a direct connection to the system to configure the Oracle Integrated Lights Out Manager (ILOM) and the first network.

The procedure to deploy software consists of the following steps:

1. Ready the system, including configuring the ILOM interface.

2. If you are re-imaging an appliance that is already deployed, create a backup, if needed.

3. Download the Oracle Database Appliance 18.2 image.

4. Re-image the system with Oracle Database Appliance 18.2.

5. Download the Oracle Database Appliance GI and DB software.

6. Update the repository with Oracle Database Appliance GI and DB software.

7. Launch the Web Console to deploy your configuration. The Web Console provides all of the fields necessary to deploy Oracle Database Appliance, including configuring the system, network, database, and optionally, Oracle Auto Service Request (Oracle ASR).

8. Restore from backup, if needed.

> **✎ Note:**
>
> Oracle Database Appliance 18.2 is only available for bare metal DCS platforms. When you deploy Oracle Database Appliance 18.2, the only database version available is Oracle Database 18.2.0.0.0.

4.2 Re-imaging Oracle Database Appliance with an Oracle Database 18.2 Image

Use Oracle Integrated Lights Out Manager (ILOM) to re-image Oracle Database Appliance with an Oracle Database 18.2 image.

Before downloading the image, ensure that the initial network connection is configured. To use `scp` or `sftp`, you must first set up a static IP address (for example, `oda_host`) and configure Oracle Database Appliance with that address by using the `configure-firstnet` command. This command ensures the system is available in your network, enabling you to use the Oracle Appliance Manager Web Console to deploy Oracle Database Appliance.

1. From an external client machine, log on to My Oracle Support. Locate the ISO patch for the Oracle Database Appliance18.2 ISO Image for your hardware model.

   See the *Oracle Database Appliance Release Notes* for patch information and links to download the patch for your hardware model.

2. Select the patch version for Oracle Appliance Kit 18.2, then click **Download** to download the zip file onto your external client.

3. Use either a Secure Copy (scp) command or a USB storage device to copy the file from the external client to Oracle Database Appliance.

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

4. Unzip the patch bundle.

5. Open a browser and connect to Oracle Integrated Lights Out Manager (ILOM) on Node0 as root.

   https://*ilom-ip-address*

6. 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.

7. Add the Oracle Database 18.2 for Oracle Database Appliance ISO 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.

8. 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**.

9. 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.

10. If the machine is a multi-node server, then repeat the steps for Node1.

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.

4.3 Updating the Repository with the GI and RDBMS Files

Download the Oracle Database Appliance GI and RDBMS Software Clone File from My Oracle Support and update the patch repository.

Update the patch repository with the following patch files:

- GI Clone: Contains the latest Oracle Grid Infrastructure components needed to deploy, or create, an Oracle Database Appliance.

- RDBMS 18.2.0.0.0 Software Clone file: Contains the components needed to create database homes and databases in Oracle Database Appliance.

The patches are available for download in My Oracle Support. You must download the GI and DB software files to an external client and then copy the files from the external client to a /tmp directory on the appliance. In some cases, there might not be sufficient space in the /tmp directory. Consider creating a /tmp directory in the /u01 directory.

Copy the file using a Secure Copy (scp) or Secure File Transfer Protocol (sftp) protocol. To use scp or sftp, you must first set up a static IP address (for example, oda_host) and configure Oracle Database Appliance with that address by using the configure-firstnet command. This command ensures the system is available in your network, enabling you to use the Oracle Appliance Manager Web Console to deploy Oracle Database Appliance.

1. From an external client machine, log on to My Oracle Support.

2. Locate and download the GI patch.

   See the *Oracle Database Appliance Release Notes* for patch information and download links. Select 18.2.0.0.0 from the release drop-down menu.

   a. Download the GI patch to a temporary location on the external client.

   b. Unzip the file. For example, a file named **p27604593_18.zip**.

3. Locate and download the 18.2.0.0.0 RDBMS Clone patch to a temporary location on the external client.

   See the *Oracle Database Appliance Release Notes* for patch information and download links. Select 18.2.0.0.0 from the release drop-down menu.

4. Upload the files from the external client to the appliance. You can use the scp protocol, sftp protocol, or a USB storage device to copy the files.

5. Navigate to the directory and unzip each patch.

6. Run the command odacli update-repository to unpack the bundle to the correct locations in the file system. You must include the fully qualified directory.

   If you have more than one bundle, you can use a comma-separated list. Spaces are not allowed between the filenames.

   ```
   # odacli update-repository -f /u01/tmp/patch_file_name.zip
   ```

7. Run the command `odacli list-jobs` to check the status.

```
# odacli list-jobs
```

After the GI and DB Clone files are in the patch repository, you can deploy the appliance.

4.4 Deploying Bare Metal Platforms on Oracle Database Appliance

Configure the system, network, user groups, and database and deploy Oracle Database Appliance.

Use the checklists that you completed earlier as a reference for the configuration settings needed to deploy the appliance. When you launch the Web Console 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.

> ✎ **See Also:**
>
> Your browser determines how you log into the Web Console. In some cases, you must accept credentials for the DCS-controller on port 7093, and DCS-agent on port 7070.

Before deploying Oracle Database Appliance, complete the tasks in "Preparing for Oracle Database Appliance Installation" and "Readying Oracle Database Appliance for Deployment".

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

   The URL must include the host name or IP address of the first node (Node0).

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

2. Enter the user name `oda-admin` and the password.

3. Click **Create Appliance**.

   If **Create Appliance** is disabled, ensure that you are launching the console on the first node (Node0).

4. Enter the following system information to configure the system:

   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**: This field appears when the Web Console detects that the system has at least five (5) NVMe storage devices. Select **Normal** or **High**.

The redundancy level is for DATA, RECO, and FLASH. If you select High redundancy, then DATA, RECO, and FLASH are all High redundancy.
If the system has less than five (5) NVMe storage devices, redundancy is automatically set to Normal and this field does not appear.

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. **Master Password** and **Confirm Password**: Enter the master password in both fields.

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

5. Enter the following information to configure the network:

This page enables you to configure the primary client access network, virtual networks, and an Oracle Integrated Lights Out Manager (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.

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. **Client Access Network Subnet Mask**: Enter the subnet mask address for the primary client access network.

d. **Client Access Network Gateway**: Enter the gateway address for the primary client access network.

e. **Client Access Network Interface**: Enter the interface for the primary client access network.

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

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

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

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

j. (Optional) **ILOM Host Name**: Enter the name of the Oracle ILOM host.

k. (Optional) **ILOM Network IP Address**: Enter the IP address for the ILOM.

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

m. (Optional) **ILOM Network Gateway**: Enter the gateway address for the ILOM.
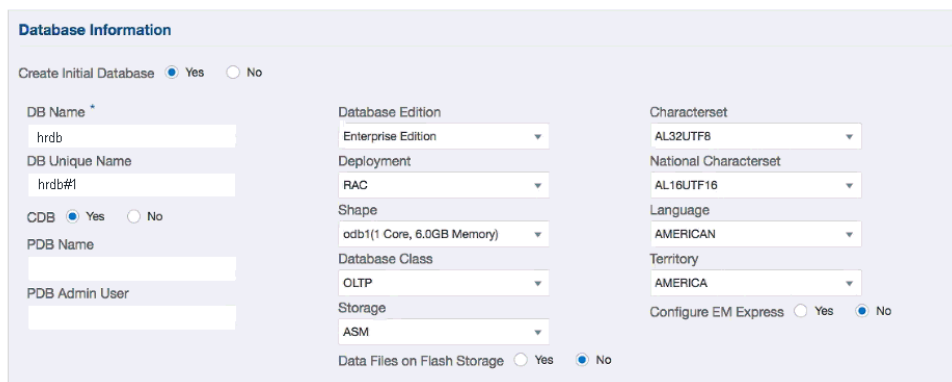
6. Determine how you want to configure your users and groups and whether or not you want to allow operating system role separation:

   • 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.

7. Do you want to create an initial database? Select **Yes** and go to Step 8 or select **No** and go to Step 9.

8. Enter the following information to configure an initial database:
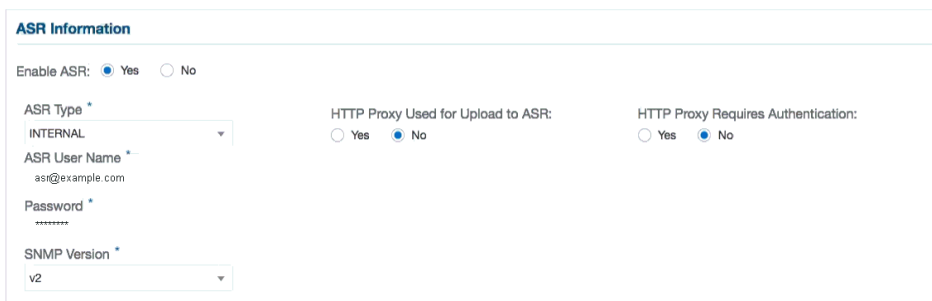
a. **DB Name**: Enter a name for the database.

   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.

h. **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.

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

j. **Database Class**: Select a database class from the list. The options are OLTP, DSS, or IMDB.

k. **Storage**: Select **ACFS** or **ASM**.

   ASM is the default.

l. **Date Files on Flash Storage**: Select **Yes** or **No**.

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

m. **Configure EM Express**: Select **Yes** to configure the Oracle Enterprise Manager Database Express (EM Express) console.

n. **Characterset**: Select a characterset.

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

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

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

9. (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 Web Console 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**. V2 is the default and recommended version.

   d. **HTTP Proxy used for Upload to ASR**: Select **Yes** or **No**.

   e. **Proxy User Name**: If you are using a proxy for upload, enter the proxy user 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. **(Optional) Proxy Password**: If you are using a proxy for upload and require authentication, enter the proxy password.

10. Click **Submit**. When prompted, click **Yes** to confirm that you want to start the job to deploy the appliance.

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 master 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.

- Changing the Oracle Installation Owner Passwords
  You must change the default administrative account passwords after installation to secure your system.

- Changing the Web Console Password
  After your initial log in, change the Oracle Database Appliance Web Console password to secure your system.

- Changing the Password
  Change the administrative account passwords to secure your system.

5.1 Changing the Oracle Installation Owner Passwords

You must change the default administrative account passwords after installation to secure your system.

During deployment, the `root` and database users `SYS`, `SYSTEM` and `PDBADMIN` are set to the master password. After deployment, the `oracle` and `grid` passwords are also set to the master 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.

5.2 Changing the Web Console Password

After your initial log in, change the Oracle Database Appliance Web Console password to secure your system.

The administrator user name for the Web Console is `oda-admin`. A default password (`welcome1`) enables first-time access to the Web Console.

To build a secure environment, you must change the default password. You can change the password in the Web Console or by using the command `odacli-adm set-credential`.

1. Log into the Web Console using the user name (`oda-admin`.

2. Click **About**, then **User Settings** in the upper right corner of the Web Console.

3. Enter the password in the Password field and the Password Confirmation field, then click **Submit**.

The password must begin with an alpha character and cannot contain quotation marks. Password should contain no fewer than 9 characters and no more than 30 characters.

A confirmation message appears.

4. Click **About**, then click **Sign Out**.

5. Log back into the Web Console with the new password.

Related Topics

- odacli-adm set-credential
  Use the `odacli-adm set-credential` command to change the `oda-admin` user credentials.

5.3 Changing the Password

Change the administrative account passwords to secure your system.

During deployment, the `root` and database users `SYS`, `SYSTEM` and `PDBADMIN` are set to the master password. After deployment, the `oracle` and `grid` passwords are also set to the master password.

To log into the Web Console, the default user name is `oda-admin` and the default password is `welcome1`.

> **Note:**
>
> 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.

1. Log in to the appliance as `root`.

   The default password is `welcome1`.

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
   ```

6

Managing Oracle Databases

Manage the Oracle Databases on your Oracle Database Appliance. For an Oracle Database Appliance Virtualized Platform, see the `oakcli` commands for managing the databases.

- Administrative Groups and Users on Oracle Database Appliance
  Oracle Database Appliance Web Console deployment creates operating system groups and users whose members are granted system administration privileges on the appliance.

- Data Migration and Management and Oracle Database Appliance
  Oracle Database Appliance supports the use of standard Oracle Database loading and migration tools.

- Working with Databases
  Use the Web Console to display a list of databases, database details, and create and delete databases.

- Working with Database Homes
  Use the Web Console 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.

6.1 Administrative Groups and Users on Oracle Database Appliance

Oracle Database Appliance Web Console 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 6-1   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 Web Console 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 Web Console.

To change the Group Name and GID from the default values on the Oracle Database Appliance X7-2-HA 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.

6.2 Data Migration and Management and 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.

6.3 Working with Databases

Use the Web Console to display a list of databases, database details, and create and delete databases.

- **Viewing Databases**
  Use the Oracle Appliance Manager Web Console 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 Web Console to create a database in Oracle Database Appliance.

- **Creating an Instance Only Database**
  Create an instance only database from the command-line interface.

- **Deleting a Database**
  Use the Oracle Appliance Manager Web Console to delete an Oracle database.

6.3.1 Viewing Databases

Use the Oracle Appliance Manager Web Console 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 Web Console:

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

2. Click the **Database** tab.

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.

6.3.2 Creating a Database

Use the Oracle Appliance Manager Web Console to create a database in Oracle Database Appliance.

The Web Console provides a quick and easy method of creating new databases. The Create New Database page in the Web Console 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.

> **Note:**
>
> You cannot mix Oracle Database Standard Edition and Enterprise Edition databases on the same appliance. Your license determines the determines the database edition that you are eligible to create in the appliance.

Oracle Database 18.2 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 Web Console adjust, depending on the database version you select.

1. Log into the Web Console:

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

2. Click the **Database** tab.

3. Verify that **Auto Refresh Disabled** appears on the page.

4. Click **Create Database** to display the Create New Database page.

5. Enter the following information on the Create New 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 clone file.

e. For the **CDB** option on Oracle Database version 18.2, 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**.

i. 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 (1 Core, 8 GB Memory).

j. 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.

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

l. 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 18.2. Selecting **Yes** enables you to use the console to manage the database.

m. 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.

n. In the Confirm Password field, enter the password again to confirm.

o. In the **Characterset** field, select an option from the drop-down list. The default is AL32UTF8.

p. In the **National Characterset** field, select an option from the drop-down list. The default is AL16UTF16.

q. In the **Language** field, select a database language from the drop-down list. The default is American.

r. In the **Territory** field, select a territory or location for the database from the drop-down list. The default is America.

The image shows the fields completed to create a new database. The DB Name is `db1` and the DB Unique Name is `db1-1`. Use Existing DB Home is No and the DB version is `18.2.0.0.0-180417`. The Database Edition is Enterprise Edition, the shape is odb1 (1 Core, 6.0 GB Memory), the Database Class is OLTP, and the

Storage is ACFS. database is a container database. The pluggable database (PDB) name is `pdb1` and the PDB Admin User is `pdbadmin`. The Characterset is AL32UTF8, the National Characterset is AL16UTF16, the Language is American, the Territory is America. The database is not configured for EM Console.

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. If you are creating other configuration or provisioning jobs, do not turn on auto refresh. When auto refresh is turned on, your input is lost if the page refreshes before you submit your configuration.

6.3.3 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 new Oracle home. If the version of the database home is different from the migrated database, create a new 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 18.2.0.0.0-180417 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  18.2.0.0.0

(continued)
Home Location
----------------------------------------
/u01/app/orauser/product/18.2.0.0.0/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 18.2.0.0.0.

   ```
   # odacli  create-dbhome -v 18.2.0.0.0
   ```

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 18.2.0.0.0 that uses an existing database home with ID b727bf80-c99e-4846-ac1f-28a81a725df6:

   ```
   #odacli create-database -n PRODDB -v 18.2.0.0.0 -io -m -dh b727bf80-c99e-4846-ac1f-28a81a725df6
   ```

   To create an instance only database named PRODDB with database version 18.2.0.0.0 and a database home:

   ```
   #odacli create-database -n PRODDB -v 18.2.0.0.0 -io -m
   ```

6.3.4 Deleting a Database

Use the Oracle Appliance Manager Web Console to delete an Oracle database.

1. Log into the Web Console:

   ```
   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.

6.4 Working with Database Homes

Use the Web Console 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 Web Console to display a list of database homes and database home details, including databases associated with a DB home.

- Creating a Database Home
  Use the Web Console to create database homes in Oracle Database Appliance.

- Deleting a Database Home
  Use the Web Console to delete an Oracle database home.

6.4.1 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 Web Console 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 Web Console 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 Web Console 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 Web Console.

> ⚠️ **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.

6.4.2 Viewing Database Homes

Use the Web Console to display a list of database homes and database home details, including databases associated with a DB home.

1. Log in to the Web Console:

   ```
   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.

6.4.3 Creating a Database Home

Use the Web Console to create database homes in Oracle Database Appliance.

The Create New Database page in the Web Console 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.

Before you can create a database home, the Oracle Database Appliance RDBMS Clone file image must be in the repository.

1. Log in to the Web Console:

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

2. Click the **Database** tab, then click **Database Home**.

3. Click **Create Database Home**.
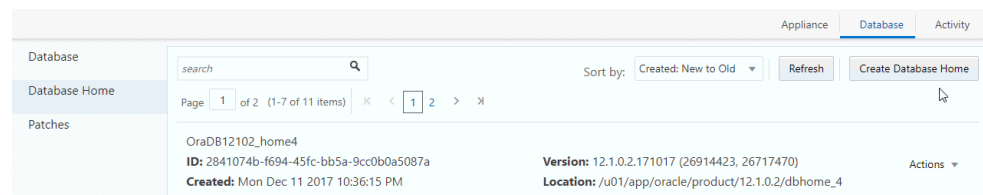
4. Select a database version from the list of available versions, then select the database edition, either **Enterprise Edition** or **Standard Edition**, per your licensing agreement.

5. Click **Create**. When prompted, click **Yes** to confirm that you want to start the job.

6.4.4 Deleting a Database Home

Use the Web Console 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 Web Console:

   ```
   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.

6.5 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.

6.5.1 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.

   - If you have a bare metal platform, use the command `odacli list-jobs` and the command `odacli describe-job` to verify the status.

ORACLE®

- • If you have a virtualized platform, use the command `oakcli list-jobs` and the command `oakcli describe-job` to verify the status.

2. **Create an instance only database from the command-line interface.**

   - • If you have a bare metal platform, use the command `odacli create-database` with the `instanceonly` flag on an Oracle Database Appliance machine. The new database is the target database.

   - • If you have a virtualized platform, use the command `oakcli 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.**

6.5.2 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/18.2.0.0.0/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 a 18.2.0.0.0 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/18.2.0.0.0/dbhome_2)
       (SID_NAME=PRODDB)
            (ENVS="TNS_ADMIN=/u01/app/oracle/product/18.2.0.0.0/dbhome_2/network/
admin"))
 )
```

4. Save the file.

5. Restart the listener.

```
srvctl stop listener -l listener
srvctl start listener -l listener
```

6.5.3 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: November 22, 2016 12:07:12 PM SGT
UpdatedTime: November 22, 2016 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;
}
```

6.5.4 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:**
>
> For a standby database, open the standby database in READ ONLY mode before executing the `odacli register-database` command.

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, 2016 05:55:49 AM EDT",
  "description" : "Database service registration with
                   db service name: proddb.example.com",
  "updatedTime" : "August 08, 2016 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, 2016 5:55:49 AM EDT
       Message:

Task Name                        Start Time
---------------------------- ------------------------------
restore control file             November 23, 2016 5:55:49 AM EDT
move spfile to right location  November 23, 2016 5:56:08 AM EDT
register DB with clusterware   November 23, 2016 5:56:13 AM EDT
reset db parameters              November 23, 2016 5:57:05 AM EDT
Running DataPatch                November 23, 2016 5:57:36 AM EDT

(Continued)
   End Time                      Status
------------------------------- --------
November 23, 2016 5:56:08 AM EDT    Success
November 23, 2016 5:56:13 AM EDT    Success
November 23, 2016 5:57:05 AM EDT    Success
November 23, 2016 5:57:36 AM EDT    Success
November 23, 2016 5:57:49 AM EDT    Success
```

4. Use the `odacli list-databases` command to view the registered database.

6.6 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.

6.7 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 18.2.0.0.0, 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.

ORACLE

7

Managing Storage

You can add storage to fully populate the base storage shelf and add a storage expansion shelf to your Oracle Database Appliance.

Topics:

- **About Managing Storage**
  You can add storage at any time without shutting down your databases or applications.
- **Preparing for Storage Expansion**
  Review and perform these best practices before adding storage to the base shelf or adding the expansion shelf.

7.1 About Managing Storage

You can add storage at any time without shutting down your databases or applications.

Oracle Database Appliance uses raw storage to protect data in the following ways:

- Flash or Fast Recovery Area (FRA) backup. Flash or fast recovery area is a storage area (directory on disk or Oracle ASM diskgroup) that contains redo logs, control file, archived logs, backup pieces and copies, and flashback logs.

- Mirroring. Double or triple mirroring provides protection against mechanical issues.

The amount of available storage is determined by the location of the FRA backup (external or internal) and if double or triple mirroring is used.

Oracle Database Appliance uses storage shelves, a base shelf and an optional storage expansion shelf. You can expand the base storage by adding a pack of solid-state drives (SSDs) to fully populate the base storage. You can further expand the storage by adding a second storage shelf. External NFS storage is supported for online backups, data staging, or additional database files.

> **✐ Note:**
>
> You must fully populate the base storage shelf before adding the expansion shelf.

When you add storage, Oracle Automatic Storage Management (Oracle ASM) automatically rebalances the data across all of the storage including the new drives. Rebalancing a disk group moves data between disks to ensure that every file is evenly spread across all of the disks in a disk group and all of the disks are evenly filled to the same percentage. Oracle ASM automatically initiates a rebalance after storage configuration changes, such as when you add disks.

About Expanding Storage

If you need additional storage after fully populating the base shelf, you can add a storage expansion shelf. The expansion shelf is hot-pluggable, enabling you to expand storage without database downtime. After cabling and powering up the expansion shelf, the system automatically configures Oracle ASM storage and data is automatically distributed to the new shelf.

> **Note:**
>
> The process of rebalancing the data might impact performance until the new storage is correctly balanced across all drives. If possible, add a storage expansion shelf during a non-peak or non-production time period to minimize the performance impact of the automatic storage balancing.

The addition of the storage expansion shelf includes checks across both nodes. It is important to confirm that SSH does work across the nodes and all users can connect as expected using their shared password.

The following are the high level steps to expand storage:

1. Review the Oracle Database Appliance storage options.

2. Prepare for a storage upgrade by running checks to verify that the configuration is ready before adding storage to the base shelf or adding the expansion shelf.

3. Add storage if the base configuration is not full.

4. Add the storage expansion shelf, then log in to each server node and validate the cabling. After you confirm that the cabling is correct, power on the shelf and validate the storage.

> **Caution:**
>
> Review cabling instructions carefully to ensure that you have carried out cabling correctly. Incorrect connections can cause data loss when adding a storage expansion shelf to Oracle Database Appliance with existing databases.

7.2 Preparing for Storage Expansion

Review and perform these best practices before adding storage to the base shelf or adding the expansion shelf.

1. Update Oracle Database Appliance to the latest Patch Bundle before expanding storage.

2. Confirm both nodes are at the same version and patch bundle level for software and firmware.

   ```
   # odaadmcli show version -detail
   ```

```
# odaadmcli inventory -q
```

> **Note:**
>
> If oakd is not running in the foreground mode, on either node, fix the problem before adding storage.

3. Check the disk health of the existing storage disks.

   Run the check on both nodes and use the default checks option to check the NetworkComponents, OSDiskStorage, SharedStorage, and SystemComponents.

   ```
   #  odaadmcli validate -d
   ```

4. Run the odaadmcli show diskgroup command on each node to display and review Oracle Automatic Storage Management (Oracle ASM) disk group information. Verify that all disks are listed, are online, and are in a good state.

   ```
   # odaadmcli show diskgroup data

   # odaadmcli show diskgroup reco

    # odaadmcli show diskgroup redo
   ```

5. Confirm Oracle ASM and CRS health on both nodes.

   Run the odaadmcli orachk command on each node. If there is a problem connecting to either node, then check the /etc/bashrc file and remove (or remark out) any values in the profile for root, oracle, grid users.

   Run odaadmcli orachk on Node 0:

   ```
   # odaadmcli orachk
   ...

   Checking Status of Oracle Software Stack - Clusterware, ASM, RDBMS

   . . . . . . . . . .
   ---------------------------------------------------------------------------------------------------------
   Oracle Stack Status
   ---------------------------------------------------------------------------------------------------------
   Host Name CRS Installed  ASM HOME   RDBMS Installed    CRS UP     ASM UP    RDBMS UP DB Instance Name
   ---------------------------------------------------------------------------------------------------------
   odax3rm1       Yes          No           Yes            No        No         No        ........
   ---------------------------------------------------------------------------------------------------------

    ...
   ```

   Run odaadmcli orachk on Node 1:

   ```
   # odaadmcli orachk
   ...

   Checking Status of Oracle Software Stack - Clusterware, ASM, RDBMS

   . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . .
   ---------------------------------------------------------------------------------------------------------
   Oracle Stack Status
   ---------------------------------------------------------------------------------------------------------
   Host Name CRS Installed  ASM HOME   RDBMS Installed    CRS UP     ASM UP    RDBMS UP DB Instance Name
   ---------------------------------------------------------------------------------------------------------
   odax3rm2       Yes          Yes          Yes            Yes       Yes        Yes     b22S2 b23S2 b24S2
   ---------------------------------------------------------------------------------------------------------

    ...
   ```

6. Confirm communications between the nodes and that SSH is working using the same password for oracle, root, and grid.

7-4

From each node:

    a. ssh to both nodes.

    b. Ping both nodes.

7. Confirm there is at least 10 GB of space available on each node.

```
[root@oda]# df -h

[root@odb]# df -h
```

8

Oracle Appliance Manager Command-Line Interface

Oracle Appliance Manager Command-Line Interface has different classes of tools to manage Oracle Database Appliance.

Topics:

- **About Oracle Appliance Manager Command-line Interface**
  Three classes of tools are available to perform configuration, 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.

- **Configure Command**
  Use the `configure` and `update` commands to configure the appliance.

- **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.

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

- **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.

- **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 Hardware Monitoring Commands**
  Use the `hardware monitoring` commands to display hardware configurations.

- **odaadmcli Storage Commands**
  Use the `odaadmcli storage` commands to perform storage diagnostics.

- **odaadmcli VLAN Management Commands**
  Use the odaadmcli VLAN commands to list and manage virtual local area networks (VLANs) for Oracle Database Appliance bare metal platform.

- **odacli-adm set-credential**
  Use the `odacli-adm set-credential` command to change the `oda-admin` user credentials.

8.1 About Oracle Appliance Manager Command-line Interface

Three classes of tools are available to perform configuration, lifecycle management, and system administration on Oracle Database Appliance.

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 command-line 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 in-frequent administration activities needed to manage appliance hardware components.

You can perform the following deployment and configuration tasks:

- Configure the first network in the appliance

- Unzip and copy the Oracle Database Appliance Single Instance Software Bundle 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)

- Locate disks

- 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`.

ODACLI Command Location and Path Configuration

The Oracle Appliance Manager command-line interface is in the following directory:

`/opt/oracle/dcs/bin/odacli`

Configure the root user account on your Oracle Database Appliance servers to have the PATH variable defined to search for `odacli` commands in the path `/opt/oracle/oda/bin/odacli`.

ODACLI Syntax

Oracle Appliance Manager command-line interface commands and parameters are case-sensitive.

An odacli command uses the following command syntax:

`odacli command [options]`

- *command* is an action you want to perform on the appliance. For example: `list-networks`, `create-appliance`, or `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. 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 8-1   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
```

8.2 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.

> ✏️ **See Also:**
>
> The SUDO man pages for more information about configuring and using SUDO:
>
> http://www.sudo.ws/sudo.html

Example 8-2   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/oak/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:

```
$ sudo odacli create database -db newdb

INFO: 2015-08-05 14:40:55: Look at the logfile  '/opt/oracle/oak/log/scaoda1011/
tools/18.2.0.0.0/createdb_newdb_91715.log' for more details

INFO: 2015-08-05 14:40:59: Database parameter file is not provided. Will be using
default parameters for DB creation
Please enter the 'SYSASM'  password :
Please re-enter the 'SYSASM' password:

INFO: 2015-08-05 14:41:10: Installing a new home: OraDb18200_home3 at
/u01/app/oracle/product/18.2.0.0.0/dbhome_3

Please select one of the following for Database type  [1 .. 3]:
1     => OLTP
2     => DSS
3     => In-Memory
```

Example 8-3   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/oak/bin/odacli list-databases

Sorry, user jdoe2 is not allowed to execute '/opt/oracle/oak/bin/odacli list-databases' as root on servernode1.
```

8.3 Configure Command

Use the `configure` and `update` commands to configure the appliance.

- configure-firstnet
  Use the `configure-firstnet` command to configure the first network in the appliance after racking and connecting the power and network cables.

8.3.1 configure-firstnet

Use the `configure-firstnet` command to configure the first network in the appliance after racking and connecting the power and network cables.

File Path

`$ORACLE_HOME/opt/oracle/oak/bin/configure-firstnet`

Syntax

```
configure-firstnet
```

Example 8-4   Configuring the First Network

This command ensures that the system is available in the network, enabling you to manage the deployment through the Oracle Appliance Manager Web Console.

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.

```
# configure-firstnet

Select the Interface to configure the network on (btbond1 sfpbond1): 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 btbon1:
bonding: btbond1: Removing slave em1.
bonding btbon1: Warning: the permanent HWaddr of em1 - <mac> - is still in use by
btbon1. Set the HWaddr of em1 to a different address to avoid conflicts.
bonding: btbond1: releasing active interface em1
bonding: btbond1: making interface em2 the new active one.
bonding: btbond1: Removing slave em2.
bonding: btbond1: releasing active interface em2
::::::::::
bonding: btbond1: Setting em1 as primary slave.
::::::::::
bonding: btbond2: Setting em3 as primary slave.
::::::::::
bonding: sfpbond1: Setting p3p1 as primary slave.
```

8.4 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 update-dcsagent
  Use the `odacli update-dcsagent` command to update the agent.

- **update-image**
  Use the `odacli update-repository` command to unzip the Single Instance Software Bundle (SIB). For releases earlier than 12.1.2.9.0, use the `update-image` command to unzip and copy the Single Instance Software Bundle to the appropriate locations so that the system is ready for deployment.

- **odacli update-repository**
  Use the `odacli update-repository` command to unzip and copy the patch bundle and update the repository with the new patches.

- **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.

8.4.1 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 will display 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

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

Syntax

odacli describe-component [-d][-j][-h][-s][-v]

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	(Optional) Describes the components for the local node. Use to display details on the local node of multi-node high availability (HA) systems. This option is not needed to display component details on single node systems.
--node, -v	(Optional) Describes the components for a specific node on multi-node 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.

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 8-5   Displaying Patch Details for Components

```
# odacli describe-component
System Version
--------------
12.2.1.1.0

Component                              Installed Version    Available Version
-------------------------------------- -------------------- --------------------
OAK                                    12.2.1.1.0           up-to-date
GI                                     12.2.0.1.170814      up-to-date
DB {
[ OraDB12102_home1 ]                   12.1.0.2.170814      up-to-date
[ OraDB11204_home1 ]                   11.2.0.4.170814      up-to-date
}
ILOM                                   4.0.0.22.r120818     up-to-date
BIOS                                   41017100             up-to-date
OS                                     6.8                  up-to-date
```

Example 8-6   List DB Home Details

```
# odacli describe-component -d

System Version
--------------
12.2.1.1.0

Component             Installed Version    Available Version
---------------------- -------------------- --------------------
DB {
[ OraDB12201_home1 ]   12.2.0.1.170814      up-to-date
[ OraDB12102_home1 ]   12.1.0.2.170814      up-to-date
[ OraDB11204_home1 ]   11.2.0.4.170814      up-to-date
}
```

Example 8-7   List the Server Components and Versions

```
# odacli describe-component -s
System Version
--------------
12.2.1.1.0

Component        Installed Version    Available Version
---------------- -------------------- --------------------
OAK              12.2.1.1.0           up-to-date
GI               12.2.0.1.170814      up-to-date
ILOM             4.0.0.22.r119604     4.0.0.22.r120818
BIOS             41016500             41017100
OS               6.8                  up-to-date
```

8.4.2 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 8-8   Listing the Latest Supported Versions

```
#  odacli describe-latestpatch

componentType   availableVersion
--------------- --------------------
gi              12.1.0.2.170117
db              11.2.0.4.161018
db              12.1.0.2.170117
oak             12.1.2.10.0
ilom            3.2.8.24.114611
bios            39070000
os              6.8
```

8.4.3 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 attempting to patch, and ensure all components are ready for updates.

File Path

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

Syntax

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

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.
--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.
--node, -n	(Optional) Runs patch pre-checks on specified nodes.

Parameter	Description
`--server, -s`	(Optional) Specify this option to run the patch pre-checks for the server components.
`--version, -v`	(Optional) Specifies the version for running the pre-checks.

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 8-9   Creating Pre-Check Report

```
# odacli create-prepatchreport -v 18.2 -s
Job details
----------------------------------------------------------------
                    ID:   e54ff307-84d1-40e4-b604-4b3e47f315de
           Description:   Run pre-checks for patching
                Status:   Created
               Created:   May 18, 2018 6:14:18 AM GMT
               Message:
Task Name         Start Time      End Time        Status
------------------------------------- ------------------------------------
----------------------------
```

8.4.4 odacli describe-prepatchreport

Use the `odacli describe-prepatchreport` command to display the pre-check report, with a list of pre-checks run with status and comments.

Patching pre-checks help identify and remedy any problems before attempting to patch, and ensure all components are ready for updates.

File Path

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

Syntax

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

Parameters

Parameter	Description
`--help, -h`	(Optional) Displays help for using the command.
`--json, -j`	(Optional) Displays JSON output. The default is false.
`--jobid, -i`	Specifies the Job ID for the pre-check report.

Usage Notes

Use the `odacli describe-prepatchreport` command to display the pre-check report.

Example 8-10   Displaying the Patch Pre-Checks Report

```
# odacli describe-prepatchreport -i 39ef1eeb-70d3-47ad-b3f5-48960ca0607b
Patch pre-check report
------------------------------------------------------------------
            Job ID:  39ef1eeb-70d3-47ad-b3f5-48960ca0607b
       Description:  Pre-Check report for patching [GI, ILOM, OS]
            Status:  COMPLETED
            Result:  One or more pre-checks failed for [GI]

  Node Name
---------------
node n1
Pre-Check                       Status     Comments
----------------------------- ---------- ------------------------------------
  __OS__
Validate patching tag           Success    Validated patching tag: 12.2.1.2.0
Is patch location available     Success    Patch location is available
Verify OS patch                 Success    There are no packages available
                                           for an update

  __ILOM__
Validate patching tag           Success    Validated patching tag: 12.2.1.2.0
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__
Is clusterware running          Success    Clusterware is running
Validate patching tag           Success    Validated patching tag: 12.2.1.2.0
Validate available space        Success    Validated free space under /u01
Is system provisioned           Success    Verified system is provisioned
Validate minimum agent version  Success    GI patching enabled in current
                                           DCSAGENT version
Validate GI patch metadata      Failed     Internal error encountered:
                                           patchmetadata for 12.2.1.2.0
                                           missing target version for GI.
Is patch location available     Success    Patch location is available
Patch location validation       Failed     Internal error encountered:
                                           specified location
Patch verification              Failed     Internal error encountered: Unable
                                           to get patch number on node
                                           n1.
Opatch updation                 Success    Successfully updated the opatch in
                                           GiHome /u01/app/12.2.0.1/grid on
                                           node n1
Patch conflict check            Failed     Internal error encountered:
                                           Invalid patch location in metadata.
```

Example 8-11   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
```

8.4.5 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.

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 8-12   Updating the Agent

To update the `dcs-agent` to version 18.212.1.2.10:

```
# odacli update-dcsagent -v 18.2
{
  "jobId" : "77e454d3-eb68-4130-a247-7633f8d6192b",
  "status" : "Created",
```

```
    "message" : null,
    "reports" : [ ],
    "createTimestamp" : "July 26, 2018 14:09:24 PM CST",
    "description" : "DcsAgent patching",
    "updatedTime" : "July 26, 2018 14:09:24 PM CST"
}
```

8.4.6 update-image

Use the `odacli update-repository` command to unzip the Single Instance Software Bundle (SIB). For releases earlier than 12.1.2.9.0, use the `update-image` command to unzip and copy the Single Instance Software Bundle to the appropriate locations so that the system is ready for deployment.

> **Note:**
>
> The `update-image` command is discontinued. It is used for earlier releases and is only included for backward compatibility.

Syntax

To update an image:

```
update-image --image-files  absolute file names
```

Parameters

Parameter	Description
`--image-files` `file1,file2,file3`	Identifies the file names. Use a comma separated list of absolute file names. Ensure that there are no spaces after the comma.
`--help, -h`	(Optional) Displays help for using the command.

Example 8-13   Updating the Image

To update the Single Instance Software Bundle:

```
#  update-image --image-files file1,file2,file3
```

8.4.7 odacli update-repository

Use the `odacli update-repository` command to unzip and copy the patch bundle and update the repository with the new patches.

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

> **Note:**
>
> Before updating the repository, ensure that you do not have any jobs running or pending during the update window.

Example 8-14   Updating the Repository

To update the `dcs-repository` with the latest patches:

```
# odacli update-repository -f /root/12.1.2.8/oda-sm-12.1.2.8.0-160719-GI-12.1.0.2.zip
{
  "jobId" : "d3510276-da05-447b-990e-6d30964f8f79",
  "status" : "Created",
  "message" : null,
  "reports" : [ ],
  "createTimestamp" : "August 08, 2016 03:45:39 AM EDT",
  "description" : "Repository Update",
  "updatedTime" : "August 08, 2016 03:45:39 AM EDT"
}
```

8.4.8 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
`--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.

Usage Notes

The `update-server` command applies the patches to various infrastructure components and Oracle Clusterware. Before executing the `update-server` command , use the `update-dcsagent` command to update the agent to the current version.

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 for the job to complete 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 8-15   Updating the Server

Run the odacli update-server command to update the server to version 12.2.1.2.

```
# odacli update-server -v 12.2.1.2
{
  "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" : "November 7, 2017 14:13:45 PM CST",
  "resourceList" : [ ],
  "description" : "Server Patching",
  "updatedTime" : "November 7, 2017 14:13:45 PM CST"
}
```

8.5 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-appliance
  Use the `odacli describe-appliance` command to display appliance details.

8.5.1 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.

8.5.2 odacli describe-appliance

Use the `odacli describe-appliance` command to display appliance details.

File Path

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

Syntax

```
odacli describe-appliance [-d|-no-d][-j][-h]
```

Parameters

Parameter	Description
`--details, -d`	(Optional) Displays the agent CLI build details.
`--help, -h`	(Optional) Displays help for using the command.
`--json, -j`	(Optional) Displays JSON output.
`--no-details, -no-d`	(Optional) Displays no detailed information. Use this flag if you do not want to display details.

Example 8-16   Displaying Appliance Details

```
# odacli describe-appliance -d

Appliance Information
----------------------------------------------------------------
ID: 78e9a6b8-c4f8-42b2-9e72-7d23c2636544
Platform: OdaliteL
```

```
Data Disk Count: 6
CPU Core Count: 20
Created: November 17, 2016 5:14:41 AM EST

System Information
----------------------------------------------------------------
Name: rwsoda6f002
Domain Name: example.com
Time Zone: America/New_York
DB Edition: EE
DNS Servers: 10.204.32.1
NTP Servers: 10.68.0.41 10.68.0.42

Disk Group Information
----------------------------------------------------------------
DG Name      Redundancy      Percentage
-----------  -------------  -----------
Data         High            80
Reco         High            20
```

8.6 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, or Longterm backup configuration.

- **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-backupconfig` to list a backup configuration.

- **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 a list of the scheduled backups.

- **odacli list-schedule**
  Use the command `odacli list-schedule` to display details for a specific schedule.

- **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 create 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.

8.6.1 odacli create-backup

Use the command `odacli create-backup` to create a Level 0, Level 1, or Longterm backup configuration.

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}`	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).

- 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 8-17   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 8-18   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
```

8.6.2 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|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, -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 8-19   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
```

8.6.3 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

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

Syntax

```
# odacli create-objectstoreswift -e swift end point URL [-h] [-j] -n Object Store
Swift name [-p] swiftpassword -t Object Store tenant name -u Object Store user name
```

Parameters

Parameter	Description
--endpointurl, -e	Defines the swift end point URL.
--help, -h	(Optional) Displays help for using the command.
--json, -j	(Optional) Displays JSON output. The default is false.
--name, -n	Defines the Object Store Swift name.
--swiftpassword, -p	(Optional) Defines the Object Store Swift password.
--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.

8.6.4 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 Web Console or use the command odacli list-databases.

Example 8-20   Delete a Level 0 or Level 1 Backup

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

Example 8-21   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
```

8.6.5 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.

Parameter	Description
`--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 8-22   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
```

8.6.6 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 8-23   Deleting the Oracle Object Store Credentials

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

8.6.7 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.
--json, -j	(Optional) Displays JSON output. The default is false.
--id, -i	Defines the backup report ID.

Example 8-24   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"
}
```

8.6.8 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 8-25   Display Schedule Details

```
# odacli describe-schedule -i scheduleid
```

8.6.9 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

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

Syntax

```
  odacli recover-database -iDatabase Resource ID [-bp] [-r] [-cl] [-co] [-s] [-dr]
[-y] [-h] [-j] [-c] [-oid] [-tp] [-tf]
```

Parameters

Parameter	Description
`--backupPassword(s), -bp`	(Optional) Defines the RMAN password for recovery. You can provide more than one password, but the passwords must be separated by a comma(,).
`--backupReport, -r`	JSON input for a backup report.
`--dbClass, -cl` {EE: OLTP/DSS/IMDB, SE: OLTP}	(Optional) Defines the Database class.
`--dbConsoleEnable, -co`	(Optional) Enables the Database Console.
`--dbShape, -s` {odb1,odb2, and so on}	(Optional) Defines the database shape.
`--dbStorage, -dr` {ACFS|ASM}	(Optional) Defines the database storage. Database Storage {ACFS|ASM} (non case-sensitive). The default is ASM.
`--dbType, -y`	(Optional) Defines the type of database. The default is single instance (SI).
`--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
`--sysPassword, -m`	Defines the password for the SYS user.
`--tdePassword, -tp`	(Optional) Defines the password for the TDE Wallet.
`--tdefilesLocation, -tf`	(Optional) Identifies the TDE Wallet location in Objectstore.

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 8-26   Restoring a Database to the Same System

To restore to the same system, delete the source database, then use the backup report to restore.

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 8-27   Restoring a Database to a Different System

To restore to a different system, copy the backup report to the other machine's `\bin` folder, 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
```

8.6.10 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 8-28   Display a List of all Backup Reports

```
#  odacli  list-backupreports
```

8.6.11 odacli list-backupconfigs

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

File Path

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

Syntax

```
 odacli  list-backupconfig  [-h] [-j]
```

Parameters

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

Parameter	Description
--json, -j	(Optional) Displays JSON output. The default is false.

Example 8-29   Displaying a List of Backup Configuration

Display a list of backup configurations.

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

8.6.12 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 8-30   Displaying a List of ObjectStore Swift Credentials

```
# odacli list-objectstoreswifts
```

8.6.13 odacli list-schedules

Use the command `odacli list-schedules` to display a list of the scheduled backups.

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.

Parameter	Description
`--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 8-31   Display a List of Scheduled Database Backups

Display a list of all scheduled database backups and details.

```
# odacli list-schedules
```

8.6.14 odacli list-schedule

Use the command `odacli list-schedule` to display details for a specific schedule.

File Path

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

Syntax

```
# odacli describe-schedule [-e] [-h] [-j] [-i]
```

Parameters

Parameter	Description
`--executionid, -e`	(Optional) Displays the execution ID.
`--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 8-32   Display a List of Executed Schedules

```
# odacli list-schedule
```

8.6.15 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

Chapter 8
odacli Backup and Recovery Commands

Syntax

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

Parameters

Parameter	Description
`--backupReport, -br`{Regular-L0|Regular-L1|Longterm}	(Optional) JSON input for a backup report.
`--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).
`--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 datafile loss or controlfile loss.

Example 8-33   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 8-34   Recovering a Database to the Latest

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

Example 8-35   Recovering a Database to an SCN

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

ORACLE®
8-32

Chapter 8
odacli Backup and Recovery Commands

8.6.16 odacli update-backupconfig

Use the command `odacli update-backupconfig` to create 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 8-36   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
```

ORACLE®

8-33

8.6.17 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 backup configuration ID [-i database resource ID] [-h] [-j] [-hrp hidden RMAN backup password] [-rp RMAN backup password]
```

Parameters

Parameter	Description
--backupconfigid, -bi	(Optional) Defines the Backup Config ID.
--backupconfign, -bin	(Optional) Defines the Backup Config Name.
--dbid, -i	Defines the Database Resource ID.
--dbin, -in	Defines the Database Name.
--help, -h	(Optional) Displays help for using the command.
--json, -j	(Optional) Displays JSON output. The default is false.
--hiddenrmanbkuppassword, -hrp	(Optional) Defines the Rman backup password.
--rmanbkuppassword, -rp	(Optional) Defines the RMAN backup password.

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 8-37   Associating a Backup Configuration with a Database

```
# odacli  update-database  -i database resource ID -bi backup configuration ID -hrp hidden RMAN backup password
```

Example 8-38   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 8-39   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
```

8.6.18 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 8-40   Changing the Oracle Casper ObjectStore Password

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

Example 8-41   Changing the Oracle ObjectStore User Name

```
# odacli  update-objectstoreswift -i Object Store Swift id -u Object Store user name
```

8.6.19 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 8-42   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 * ? *
```

Example 8-43   Disable Scheduled Database Backups

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

8.7 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.

8.7.1 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 8-44   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
```

8.7.2 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 8-45   Displaying the Current Core Configuration

```
# odacli describe-cpucore

Node  Cores  Modified                     Job Status
-----  ------  ----------------------------  ---------------
0      8      July 25, 2016 9:39:59 AM SGT   Configured
```

8.7.3 update-cpucore

Use the `odacli update-cpucore` command to enable the number of CPU cores in the system.

File Path

$ORACLE_HOME/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 8-46   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
}
```

8.8 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 register-database
  Use the `odacli register-database` command to register a migrated database with the appliance.

- odacli update-tdekey

- odacli delete-database
  Use the `odacli delete-database` command to delete a database.

8.8.1 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 8-47   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     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
```

8.8.2 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 8-48   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: 12.1.0.2
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: Jun 14, 2016 6:21:14 PM
```

8.8.3 odacli create-database

Use the `odacli create-database` command to create a new database.

File Path

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

Syntax

```
odacli create-database -n database_name -m -cs characterset -cl {OLTP|DSS|IMDB}
-l dblanguage -s dbshape -r {ACFS|ASM} -dt dbterritory
-y dbtype -ns nlscharacterset -d pdbadmin -p pdbname -v version
[-u databaseUniqueName] [-dh Database Home ID] [-c|-no-c] [-co|-no-co]
[-bi backupconfigid] [-io] [-j] [-h]
```

Parameters

Parameter	Description
--adminpassword, -m	Defines the password for SYS, SYSTEM, and PDB Admin. Use this option to specify the password interactively. When using this option, do not enter the password in the command-line.
--backupconfigid, -bi	(Optional) Defines the backup configuration identifier for future use.
--cdb, -c	(Optional) Creates the database as a container database. Use the -c flag to create a container database and use the -no-c flag to create a non-CDB database. The default is -no-c.
--characterset, -cs	Defines the character set. The default is AL32UTF8.
--databaseUniqueName, -u	(Optional) Defines a unique name for the database.
--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.
--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.

ORACLE

Parameter	Description
`--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.
`--nlscharacterset, -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 11.2.0.4 or 12.1.0.2. The default version is 12.1.0.2. To specify a specific supported bundle, use the 5 digit format. For example, 12.1.0.2.170814 or 11.2.0.4.170814.

Usage Notes

- Flash cache is disabled by default.

- You cannot mix Oracle Database Standard Edition and Enterprise Edition databases on the same appliance.

- 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 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 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, either 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. The following values are supported:
    - 12.2.0.1
    - 12.2.0.1.171017
    - 12.2.0.1.170814
    - 12.1.0.2
    - 12.1.0.2.171017
    - 12.1.0.2.170718
    - 12.1.0.2.170418
    - 12.1.0.2.161018
    - 12.1.0.2.160719
    - 12.1.0.2.160419
    - 11.2.0.4
    - 11.2.0.4.171017
    - 11.2.0.4.170718
    - 11.2.0.4.170418
    - 11.2.0.4.161018
    - 11.2.0.4.160719

> **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 8-49   Creating a Database in Interactive Mode

This example creates an 12.1.0.2 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" : "July 26, 2018 03:54:03 AM EDT",
   "description" : "Database service creation with db name: hrdb",
   "updatedTime" : "July 26, 2018 03:54:03 AM EDT"
}
```

Example 8-50   Creating a Database in Non-Interactive Mode

This example creates an 12.1.0.2 OLTP database named `crmdb` with shape `odb2` and enables you to specify the password in the command-line. To define the password in the command-line, use the `-hm` option and define the password. Because the container database flag (`-c`) is not used, the database created is not a container database.

```
# odacli create-database -n crmdb -hm WelCome__12 -cl OLTP -s odb2
{
   "jobId" : "30b5e2a6-493b-4461-98b8-78e9a15f8cdd",
   "status" : "Created",
   "message" : null,
   "reports" : [ ],
   "createTimestamp" : "July 26, 2018 03:59:22 AM EDT",
   "description" : "Database service creation with db name: crmdb",
   "updatedTime" : "July 26, 2018 03:59:22 AM EDT"
}
```

Example 8-51   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 12.1.0.2
# odacli create-database -m -n hrmsdb2 -v 12.1.0.2.170718
```

The following statement creates a new database against a home with Oracle Database Bundle patch 170814:

```
# odacli create-database -m -n hrmsdb3 -v 12.1.0.2.170814
```

8.8.4 odacli register-database

Use the `odacli register-database` command to register a migrated database with the appliance.

File Path

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

Syntax

```
odacli register-database  -c {OLTP|DSS|IMDB} -s dbshape -t dbtypeSI
-o hostname -sn servicename -p syspassword[-bi backupconfigid] [-co|-no-co] [-h][-j]
```

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-coflag 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. The database type is Single Instance. The default is SI.
--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 -coflag 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.
--syspassword, -p	Defines the proxy user password for SYS.

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
> ```

- To execute the command in non-interactive mode, use the hidden parameter `-hp` to specify the password in the command line instead of using the `-p` parameter to specify the password.

- 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.

- 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. Depending on the database role, the database is registered as Primary or Standby database with Oracle Clusterware.

- If you are registering the database as a standby database, then open the database in **read-only** mode before executing the `odacli register-database` command.

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" : "March 08, 2018 05:55:49 AM EDT",
  "description" : "Database service registration with db service name:
crmdb.example.com",
  "updatedTime" : "March 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:
crmdb.example.com
              Status: Success
             Created: March 8, 2018 5:55:49 AM EDT
             Message:

Task Name                       Start Time
--------------------------  ------------------------------
restore control file            March 8, 2018 5:55:49 AM EDT
move spfile to right location   March 8, 2018 5:56:08 AM EDT
register DB with clusterware    March 8, 2018 5:56:13 AM EDT
reset db parameters             March 8, 2018 5:57:05 AM EDT
Running DataPatch               March 8, 2018 5:57:36 AM EDT

(Continued)
  End Time                      Status
------------------------------- --------
March 8, 2018 5:56:08 AM EDT    Success
March 8, 2018 5:56:13 AM EDT    Success
March 8, 2018 5:57:05 AM EDT    Success
March 8, 2018 5:57:36 AM EDT    Success
March 8, 2018 5:57:49 AM EDT    Success
```

8.8.5 odacli update-tdekey

Use the `odacli update-tdekey` command to update the Transparent Data Encryption (TDE) parameters for Oracle Database Appliance.

File Path

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

Syntax

odacli update-tdekey -i *databaseId* -p -n *pdbNames* -t *tagName* -r *dbStorage* [-r|-no-r] [-h][-j]

Parameters

Parameter	Description
--databaseId, -i	Identifies the database home identifier (ID) for which the key is to be rotated.
--help, -h	(Optional) Displays help for using the command.
--json, -j	(Optional) Displays JSON output.

Parameter	Description
`--no-rootDatabase,-no-r`	Rotates the key for a non-root container database. For a root container database, use the `-r` flag.
`--password, -p, --hiddenPassword, -hp`	Defines the Transparent Data Encryption (TDE) Admin wallet password. To use non-interactive mode, use the `-p` option. To specify the password interactively, use the `-hp` option.
`--pdbNames, -n`	Defines the names of the Pluggable Databases (PDB) to be rotated.
`--rootDatabase, -r`	Rotates the key for a root database if it is a container database. Use `-no-r` to rotate the key for a non-root container database.
`--tagName, -t`	Defines the name used to backup the wallet. The default tag name is OdaRotateKey.

Example 8-52   Updating a TDE Key for a Root Container Database

```
# odacli -i a3f4a6c0-a0c9-4c79-bad7-898afcf9de46 -r -p -t
TDE Admin wallet password: <enter the pwd here>
{
"jobId" : "d47bd867-6ee6-45f6-82ed-ba99352856ec",
"status" : "Created",
"message" : null,
"reports" : [ ],
"createTimestamp" : 1467869434888,
"description" : "TDE update",
"updatedTime" : 1467869434888
}
```

8.8.6 odacli delete-database

Use the `odacli delete-database` command to delete a database.

File Path

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

Syntax

To delete a database:

```
odacli delete-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`.
`--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 8-53   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
```

8.9 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.

8.9.1 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 8-54   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
```

8.9.2 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.
`-vdbversion`	(Optional) Identifies the Database Home Version. Use the `odacli list-dbhomes -v` command to get the *dbversion*.

Example 8-55   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
```

8.9.3 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, either 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, 12.1.0.2.161018. If you use the database version without specifying the bundle patch number, then the latest bundle patch is used.

The following values are supported:

- 12.2.0.1
- 12.2.0.1.170814
- 12.1.0.2
- 12.1.0.2.170718
- 12.1.0.2.170418
- 12.1.0.2.161018
- 12.1.0.2.160719
- 12.1.0.2.160419
- 11.2.0.4
- 11.2.0.4.170718
- 11.2.0.4.170418
- 11.2.0.4.161018
- 11.2.0.4.160719

> **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 8-56   Creating an Oracle Database Home

The following example creates an Oracle Database Home version 12.1.0.2.170718.

```
# odacli  create-dbhome -v 12.1.0.2.170718
```

8.9.4 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 8-57   Deleting an Empty Database Home

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

8.10 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.

8.10.1 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 8-58   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
```

8.10.2 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 8-59   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 8-60   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
```

8.10.3 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.

Parameter	Description
`--databaseUniqueName, -u`	(Optional) Defines a unique name for the database. Specify only if the database unique name is different than the database name. The command creates the following mount point: `/u02/app/oracle/oradata/`*db unique name*
`--dbstorage, -r [ASM|ACFS]`	(Optional) Defines the type of database storage, either ASM or ACFS. When you select ASM, the command only creates the supporting directory structure for storing non-database files. The default is: ASM
`--help, -h`	(Optional) Displays help for using the command.

Usage Notes

- The `odacli create-dbstorage` command registers the storage metadata with the Appliance Manager.

- Oracle Database is supported on both Oracle Automatic Storage Management (Oracle ASM) and Oracle ASM Cluster file system (ACFS). The default is Oracle ASM.

- When you create ACFS database storage, the command creates a separate ACFS file system and creates the directory structure for other database files, such as archives and online logs.

- When you create ASM database storage, the command only creates the corresponding directories for non-database files.

Example 8-61   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"
}
```

8.10.4 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 8-62   Deleting Empty Database Storage

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

8.11 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.

8.11.1 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]
```

Parameters

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

Example 8-63   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, 2016 10:19:23 AM

(Continued)
Status
-------
Success
```

8.11.2 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 8-64   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
```

8.12 odacli Network Commands

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

- • 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.

8.12.1 odacli list-networks

Use the `odacli list-networks` command to display networks.

File Path

$ORACLE_HOME/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.

Example 8-65   Displaying a List of Networks

Use the `odacli list-networks` command to display a list of networks:

```
# odacli list-networks

ID                                      Name              NIC       IP Address
-----------------------------------      ----------------  -------   -----------
7e3fd7e7-0975-4c74-9720-a01a2a7a838d    Private-network   priv0     192.0.2.1
e37b0ae9-1420-4e05-943b-7a8ee912cafb    Public-network    btbond1   10.20.30.100

(Continued)
Subnet Mask        Gateway
-----------------  ---------
255.255.255.240
255.255.252.0      10.20.30.1
```

8.12.2 odacli describe-network

Use the `odacli describe-network` command to display the details of a specific network.

File Path

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

Syntax

To display the details of a specific network:

```
odacli  describe-network -i id [-j][-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.

Example 8-66   Displaying Network Details

Enter the following command to display the details of network ID 9e5ba92b-3f64-4ca7-9067-48be0952510a:

```
# odacli describe-network -i 9e5ba92b-3f64-4ca7-9067-48be0952510a

Network details
--------------------------------------------------------------
ID: 9e5ba92b-3f64-4ca7-9067-48be0952510a
Name: Public-network
NIC: btbond1
IP Address: 192.0.2.1
Subnet Mask: 255.255.252.0
Gateway: 10.20.30.1
Type: Public
Default: true
Created: July 28, 2016 10:10:49 AM EDT
```

8.12.3 odacli create-network

Use the `odacli create-network` command to create a network.

File Path

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

Syntax

```
odacli create-network [-d|-no-d] -n interface -p ipaddress
 -w {Public|Private|Dataguard|Backup|Other} -s subnetmask -g gateway[-h] [-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.
--ipaddress, -p	Defines the network IP address.
--json, -j	(Optional) Displays JSON output.
--networktype, -w	Defines the type of network. Options are: {Public|Private|Dataguard|Backup|Other}
--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.

Usage Notes

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.

Example 8-67   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
```

8.12.4 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] [-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.
--json, -j	(Optional) Displays JSON output.
--networktype, -w [Public|Dataguard|Backup|Other]	(Optional) Defines the type of network.
subnetmask, -s	(Optional) Defines the Network Subnet Mask.
--help,-h	(Optional) Displays help for using the command.

Usage Notes

You cannot modify the Public and Private-interfaces after the system is deployed.

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 8-68   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
```

8.12.5 odacli delete-network

Use the command odacli delete-network to delete a network.

File Path

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

Syntax

To delete a network:

```
odacli  delete-network -i id [-j] [-h]
```

Parameters

Parameter	Description
--id, -i	Defines the network identity.
--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.

Example 8-69   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" : "July 26, 2018 23:14:32 PM EDT",
    "endTime" : "July 26, 2018 23:14:32 PM EDT",
    "status" : "Running",
    "taskDescription" : null,
    "parentTaskId" : "TaskSequential_135",
    "jobId" : "c26d217e-419b-4a91-8680-7b06bcfe9828",
    "tags" : [ ],
    "reportLevel" : "Info",
    "updatedTime" : "July 26, 2018 23:14:32 PM EDT"
  },{
    "taskId" : "TaskZJsonRpcExt_142",
    "taskName" : "Setting up Network",
    "taskResult" : "Network setup success",
    "startTime" : "July 26, 2018 23:14:32 PM EDT",
    "endTime" : "July 26, 2018 23:14:32 PM EDT",
    "status" : "Success",
    "taskDescription" : null,
    "parentTaskId" : "TaskParallel_141",
    "jobId" : "c26d217e-419b-4a91-8680-7b06bcfe9828",
    "tags" : [ ],
    "reportLevel" : "Info",
    "updatedTime" : "July 26, 2018 23:14:32 PM EDT"   } ],
  "createTimestamp" : "July 26, 2018 23:14:32 PM EDT",
  "description" : "Network service delete",
  "updatedTime" : "July 26, 2018 23:14:32 PM EDT"
 }
```

8.13 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

8.13.1 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 [V2|V3]	(Optional) Defines Simple Network Management Protocol (SNMP) Version 2 or SNMP Version 3. The default is V2.
--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 8-70   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 8-71   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.

8.13.2 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 [v2|v3]`	(Optional) Defines Simple Network Management Protocol (SNMP) Version 2 or SNMP Version 3. The default is v2.
`--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 8-72   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
---------------- ---------------- ----------------- ----------
```

8.13.3 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 8-73   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
```

8.13.4 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 8-74   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
---------------------------- -------------------- ---------------- ----------
```

8.13.5 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 8-75   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
}
```

8.14 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.

8.14.1 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 8-76   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
```

8.14.2 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 8-77   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
```

8.15 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.

8.16 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.

8.16.1 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.

8.16.2 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 8-78   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
```

8.16.3 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 8-79   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
```

8.16.4 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 8-80   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
```

8.16.5 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 8-81   Showing Network Details

```
# odaadmcli show network
NAME             HEALTH   HEALTH_DETAILS LOCATION PART_NO  MANUFACTURER
Ethernet_NIC_0   OK       -              NET0     X540     INTEL
Ethernet_NIC_1   OK       -              NET1     X540     INTEL
Ethernet_NIC_2   -        -              NET2     X540     INTEL
Ethernet_NIC_3   -        -              NET3     X540     INTEL

(Continued)
MAC_ADDRESS        LINK_DETECTED    DIE_TEMP
00:10:e0:95:98:ec  yes (em1)        61.250 degree C
00:10:e0:95:98:ed  yes (em2)        61.250 degree C
```

```
90:e2:ba:ae:1e:ad   no (em4)        -
90:e2:ba:ae:1e:ac   no (em3)        -
```

8.16.6 odaadmcli show power

Use the `odaadmcli show power` command to display power supply details.

File Path

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

Syntax

To show power supply details:

```
odaadmcli show power [-h]
```

Parameters

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

Example 8-82   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
```

8.16.7 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 8-83   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
```

8.16.8 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 8-84   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
```

8.17 odaadmcli Storage Commands

Use the `odaadmcli storage` commands to perform storage 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 iraid**
  Use the `odaadmcli show iraid` command to display details of the internal RAID sub-system.

- **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 manage diagcollect**
  Use the `odaadmcli manage diagcollect` command to collect diagnostic logs for storage components.

- **odaadmcli power disk**
  Use the `odaadmcli power disk` command to power a disk on or off.

8.17.1 odaadmcli expand storage

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

File Path

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

Syntax

To expand storage:

```
odaadmcli expand storage [-h]
```

Parameters

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

8.17.2 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 8-85   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 8-86   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
```

8.17.3 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 8-87   Listing All Diskgroups

```
# odaadmcli show diskgroup

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

Example 8-88   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
```

8.17.4 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 8-89   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
```

8.17.5 odaadmcli show iraid

Use the `odaadmcli show iraid` command to display details of the internal RAID sub-system.

File Path

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

Syntax

To display details of the internal RAID subsystem:

```
odaadmcli show iraid [-h]
```

Parameters

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

Example 8-90　Displaying Details of the Internal RAID Sub-system

To display details of the internal RAID sub-system:

```
# odaadmcli show iraid

 NAME        CTRL#  PRODUCT    SERIAL_NO  BIOS_VER    FW_VER
IR_0_0_0 0  LSI    MegaRAID   9361-8i    SV52756042  6.17.04.2_4.16.08.00_0x06060A
IR_0_0_1 0  LSI    MegaRAID   9361-8i    SV52756042  6.17.04.2_4.16.08.00_0x06060A


VDISK_TYPE       VDISK_STATE  PDISK_MODEL
4.230.40-3739    RAID1          Optl MS4SC2JH2ORA480G
4.230.40-3739    RAID1          Optl MS4SC2JH2ORA480G


EID:SLT   PDISK_STATE  SIZE          CV_MODEL  CV_STATE  CV_TEMP
252:0     Onln         446.102 GB    CVPM02    Optimal   25C
252:1     Onln         446.102 GB    CVPM02    Optimal   25C
```

8.17.6 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 8-91   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%
```

8.17.7 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 8-92   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 =========
```

8.17.8 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 8-93   Displaying NVMe Details

To display detailed information for NVMe `pd_00`:

```
# odaadmcli stordiag pd_00
```

8.17.9 odaadmcli manage diagcollect

Use the `odaadmcli manage diagcollect` command to collect diagnostic logs for storage components.

File Path

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

Syntax

To collect diagnostic logs for storage components:

```
odaadmcli manage diagcollect --storage [-h]
```

Parameters

Parameter	Description
--storage	Collects storage logs.
--help, -h	(Optional) Displays help for using the command.

Example 8-94   Collecting Storage Logs

```
# odaadmcli manage diagcollect --storage
Collecting storage log data. It will take a while, please wait...
Collecting oak data. It will take a while, please wait...
tar: Removing leading `/' from member names
tar: /opt/oracle/oak/onecmd/tmp/OakCli-Command-Output.log: file changed as we read it

Logs are collected to : /opt/oracle/oak/log/rwsoda6f002/oakdiag/oakStorage-
rwsoda6f002-20161120_2217.tar.gz
```

8.17.10 odaadmcli power disk

Use the `odaadmcli power disk` command to power a disk on or off.

File Path

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

Syntax

To power a disk on or off:

```
odaadmcli power disk {on|off|status} disk_name [-h]
```

Parameters

Parameter	Description
disk_name	Defines the disk resource name. The resource name format is pd_[0..3].
{on|off|status}	Power on a disk, power off a disk, display status.
--help, -h	(Optional) Displays help for using the command.

Example 8-95   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 8-96   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
```

8.18 odaadmcli VLAN Management Commands

Use the odaadmcli VLAN commands to list and manage virtual local area networks (VLANs) for Oracle Database Appliance bare metal platform.

Topics:

- odaadmcli create vlan
  Use the `odaadmcli create vlan` command to create a virtual local area network (VLAN).

- odaadmcli delete vlan
  Use the `odaadmcli delete vlan` command to delete a VLAN.

- odaadmcli show vlan
  Use the `odaadmcli show vlan` command to display a list of virtual local area networks (VLANs) and details.

8.18.1 odaadmcli create vlan

Use the `odaadmcli create vlan` command to create a virtual local area network (VLAN).

File Path

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

Syntax

```
odaadmcli create vlan vlanname -vlanid identifier -if {bond0|bond1} -node {0|1} -
setuptype type {backup | management | public | custom} -ip address -netmask address -
gateway address [-h] [-j]
```

Parameters

Parameter	Description
-gateway	Defines the gateway address. Define the gateway as `0.0.0.0` when the VLAN interface does not require a gateway.
--help, -h	(Optional) Displays help for using the command.
-if {bond0|bond1}	Defines the name of the interface on which the VLAN network is created. The options are bond0 or bond1.
--json , -j	(Optional) Displays JSON output.
-netmask	Defines the netmask address.

Parameter	Description
`-node {0|1}`	Defines the node for the VLAN. The options are 0 or 1. The default is 0.
`-setuptype {backup	management	public	custom}`	Defines the setup type. For example, management. The default is public.
`-vlanid`	Defines the VLAN identifier (ID) to which the VLAN network belongs. The VLAN ID must be unique for a single node platform. For a multi-node platform, you can use the same ID to create a network on Node0 and Node1.

Usage Notes

- Two physical ports, either copper or fiber, are bonded as bond0. When you create a VLAN, you create it on bond0 of a specific node, Node0 or Node1.

- Use the `odaadmcli show vlan` command to obtain the existing VLAN names and details.

- When naming the VLAN, use a logical name for the network. The name must be unique in a given node. However, you can create the same named network on both Node0 and Node1 of a multi-node platform.

- Because a virtual machine (VM) that resides on a shared repository can be started on either node, create a VLAN network with the same name on both nodes. If the needed network is not available, then the VM cannot be started on that node.

- The supported setup types are as follows:

  – Backup: Configure for backup operations.

  – Management: Configure for management traffic, such as Oracle Enterprise Manager, and access to the management capabilities of a switch. You must provide an IP address and default gateway for the Management VLAN. A best practice is that the Management VLAN is not the primary VLAN (VLAN1) and does not carry user data traffic.

  – Public: Configure for the public access. This is the default public interface. Only one VLAN should be a public VLAN.

  – Custom: Configure for VLAN for other uses.

- Dynamic Host Configuration Protocol (DHCP) is not supported.

Example 8-97   Creating a VLAN on Node0

Use the `odaadmcli create vlan` command to create a VLAN named `vlan105` on Node0:

```
# odaadmcli create vlan vlan105 -vlanid 105 -if bond0 -node 0 -setuptype management -
ip 10.0.2.254 -netmask 255.255.0.0 -gateway 10.214.0.1
Created Vlan : vlan105
```

Example 8-98   Creating a VLAN on Node1

Use the `odaadmcli create vlan` command to create a VLAN named `vlan105` on Node1:

```
# odaadmcli create vlan vlan105 -vlanid 105 -if bond0 -node 1 -setuptype management -
ip 10.0.2.254 -netmask 255.255.0.0 -gateway 10.214.0.1
Created Vlan : vlan105
```

8.18.2 odaadmcli delete vlan

Use the `odaadmcli delete vlan` command to delete a VLAN.

File Path

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

Syntax

odaadmcli delete vlan *vlanname* -node {0|1} [-h]

Parameters

Parameter	Description
--help, -h	(Optional) Displays help for using the command.
--json , -j	(Optional) Displays JSON output.
-node {0|1}	Defines the node for the VLAN. The options are 0 or 1.

Usage Notes

Use the `odaadmcli show vlan` command to obtain the VLAN name and node location.

Example 8-99   Deleting a VLAN

Use the `odaadmcli delete vlan` command to delete a VLAN named `vlan105` on Node0:

```
# odaadmcli delete vlan vlan105 -node 0
Deleted Vlan : vlan105
```

Example 8-100   Deleting a VLAN on Node1

Use the `odaadmcli delete vlan` command to delete a VLAN named `vlan105` on Node1:

```
# odaadmcli delete vlan vlan105 -node 1
Deleted Vlan : vlan105
```

8.18.3 odaadmcli show vlan

Use the `odaadmcli show vlan` command to display a list of virtual local area networks (VLANs) and details.

File Path

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

Syntax

```
odaadmcli show vlan [-h]
```

Parameters

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

Example 8-101   Displaying VLANs

Use the `odaadmcli show vlan` command to display a list of VLANs:

```
# odaadmcli show vlan
NAME      ID    INTERFACE   CONFIG_TYPE  IP_ADDRESS    NETMASK       GATEWAY      NODENUM
vlan101 101    bond1       management   10.0.2.254  255.255.0.0  10.214.0.1   0
vlan101 101    bond1       management   10.0.2.254  255.255.0.0  10.214.0.1   1
vlan102 102    bond1       management   10.0.2.254  255.255.0.0  10.214.0.1   0
vlan102 102    bond1       management   10.0.2.254  255.255.0.0  10.214.0.1   1
vlan103 103    bond0       management   10.0.2.254  255.255.0.0  10.214.0.1   0
vlan103 103    bond0       management   10.0.2.254  255.255.0.0  10.214.0.1   1
```

8.19 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 Web Console.
--username, -u	User name required to access the Oracle Appliance Manager Web Console. 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 8-102   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
```

9

Validating and Troubleshooting Oracle Database Appliance

This chapter contains information about how to validate changes and troubleshoot Oracle Database Appliance problems.

Topics:

- Validate the Host Name
  The host name at the log in prompt should be `oak1` for Node 0 and `oak2` for Node 1.

- Oracle Database Appliance Configuration Error Messages
  If you encounter errors while configuring Oracle Database Appliance, then review the following messages and actions:

- Preparing Log Files for Oracle Support Services
  If necessary, use the command `odaadmcli manage diagcollect` to collect diagnostic files to send to Oracle Support Services.

- Additional Troubleshooting Tools and Commands
  This section describes additional tools and commands for diagnosing and troubleshooting problems with Oracle Database Appliance.

- 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 nodes.

9.1 Validate the Host Name

The host name at the log in prompt should be `oak1` for Node 0 and `oak2` for Node 1.

When a default manufacturing host name, such as `mtnk4t1-d05-01-host`, appears in the log in prompt instead of `oak1` or `oak2`, there is an issue that can cause problems when you configure Oracle Database Appliance.

The most likely cause of unexpected host names is that the storage cabling is incorrect or cables are not properly seated in the ports.

Verify the Storage Cabling for Oracle Database Appliance

Review the cabling instructions for your Oracle Database Appliance model and verify that the color-coded cables are in the correct ports. Also, verify that connections are secure. The SAS cables must be locked in place. Gently pull on each cable to confirm that it is properly seated. If you can pull the cable out, push it into the port until it clicks into place.

Verify the Storage Cabling for Models Earlier than X5-2

How you connect the storage tray to the appliance determines which Server is Node 0 and which is Node 1. This is important as all installation and configuring of software going forward is done from Node 0. In most cases the Server on the bottom is Node 0.

Ensure that the Node Files Exist and are Accurate

If the cabling appears to be correct and you still have unexpected host names, then confirm that the `/opt/oracle/oak/conf/node_num.conf` file exists for each node. Ensure that the `NODENUM` parameter is properly defined for each node. Set the parameter to `NODENUM=0` for Node 0 and `NODENUM=1` for Node 1. Create or edit the files, as needed.

9.2 Oracle Database Appliance Configuration Error Messages

If you encounter errors while configuring Oracle Database Appliance, then review the following messages and actions:

Error Encountered in Step 11 Validation VIP appears to be up on the network
Cause: This message is most likely to occur when you attempt to redeploy the End-User Bundle without cleaning up a previous deployment. This error occurs because an existing VIP is configured for the addresses assigned to Oracle Database Appliance.

Action: Run cleanupDeploy.pl on Node 0, and then restart Oracle Appliance Manager.

Error "CRS-4402: The CSS daemon was started in exclusive mode but found an active CSS daemon on node oda2-1, number 1, and is terminating"
Cause: This error occurs when the Oracle Grid Infrastructure CSS daemon attempts to start the node as a standalone cluster node, but during startup discovers that the other cluster node is running, and changes to cluster mode to join the cluster.

Action: Ignore this error.

Installation requires partitioning of your hard drive
Cause: This message occurs on a node if one of the two operating system disks is not installed, but you are attempting to reimage the operating system.

Action: Ensure that both operating system disks are installed and are available.

Machine Check Exception ...This is not a software problem
Cause: There is a hardware system error.

Action: Log in to the Oracle ILOM Remote Console to determine the specific hardware error.

No volume control GStreamer plug-ins and/or devices found
Cause: Operating system plug-ins required for sound cards for the Oracle ILOM remote redirection console are not installed.

Action: Ignore this message. You do not require volume control for the console.

Reboot and select proper boot device or insert boot media in selected boot device and press a key
Cause: One or both operating system disks are not available. This message occurs if you select "Default hard disk" during reimaging the system, but that disk is not available.

Action: Ensure that both operating system disks are installed and are available.

The AoDB Linux installation tree in that directory does not seem to match your boot media
Cause: If you select "Default (use BIOS settings)" as your imaging option, but one or both of the disks is not available, this message occurs on a node if both operating disks are installed, and you choose to reimage the operating system disks.

Action: Ensure that both operating system disks are available for use.

ERROR: Gateway IP is not pingable
Cause: On Windows platforms, the Oracle Appliance Manager configurator uses the echo service on port 7 to contact the gateway. If the echo service is disabled, possibly for security reasons, the ping fails.

Action: Run the native platform ping command. If the ping is successful, then the configurator validation output can be ignored.

ACFS resources failed to start after applying 2.2 INFRA patch
Cause: Oracle Database Appliance operating system upgrade includes upgrade of Oracle Linux to Unbreakable Enterprise Kernel (UEK). Because Oracle Automatic Storage Management Cluster File System (Oracle ACFS) is not supported on all versions of Oracle Linux, a successful upgrade of the operating system may effectively disable Oracle ACFS.
Upgrade to Oracle Database Appliance 2.2 has three options: `-infra`, `-gi`, and `-database`. The `-infra` option includes upgrade from Oracle Linux to UEK. Before the `-infra` upgrade to 2.2, the operating system is Oracle Linux with 11.2.0.2.*x* Grid Infrastructure. After the `-infra` upgrade, the operating system is UEK and 11.2.0.2.*x* Oracle ACFS, which is not compatible with UEK.
For example, upgrade to Oracle Linux 2.6.32-300.11.1.el5uek causes `reco.acfsvol.acfs` and `ora.registry.acfs` to temporarily go to an OFFLINE state, because 2.6.32-300.11.1.el5uek does not support Oracle 11.2.0.2.*x* ACFS. However, when Oracle Grid Infrastructure is upgraded to 11.2.0.3.2, these components are online again.

Action: Upgrade to Oracle Database Appliance 2.2 with the `-gi` option. This version of the software includes Oracle Grid Infrastructure 11.2.0.3.2, which includes Oracle ACFS modules that work with UEK.
For more information, see My Oracle Support note 1369107.1:
https://support.oracle.com/CSP/main/article?cmd=show&type=NOT&id=1369107.1

9.3 Preparing Log Files for Oracle Support Services

If necessary, use the command `odaadmcli manage diagcollect` to collect diagnostic files to send to 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.

Collect log file information by running the command `odaadmcli manage diagcollect`. This 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.

9.4 Additional Troubleshooting Tools and Commands

This section describes additional tools and commands for diagnosing and troubleshooting problems with Oracle Database Appliance.

Although some of these tools are specific to Oracle Database Appliance, others are tools for all clustered systems.

Topics:

- ORAchk Health Check Tool
  Use the ORAchk Health Check Tool to audit configuration settings and check system health.

- Trace File Analyzer Collector
  Trace File Analyzer (TFA) Collector simplifies diagnostic data collection on Oracle Grid Infrastructure and Oracle Real Application Clusters systems.

9.4.1 ORAchk Health Check Tool

Use the ORAchk Health Check Tool to audit configuration settings and check system health.

The ORAchk utility performs proactive heath checks for the Oracle software stack and scans for known problems.

The ORAchk Configuration Audit Tool audits important configuration settings for Oracle RAC two-node deployments in the following categories:

- Operating system kernel parameters and packages

- RDBMS

- Database parameters, and other database configuration settings

- Oracle Grid Infrastructure, which includes Oracle Clusterware and Oracle Automatic Storage Management

ORAchk is aware of the entire system. It checks the configuration to indicate if best practices are being followed.

> ✎ **See Also:**
>
> For more information about ORAchk, see My Oracle Support note 1268927.2, "ORAchk Health Checks for the Oracle Stack" at https://support.oracle.com/CSP/main/article?cmd=show&type=NOT&id=1268927.2

1. Open the command-line interface as root.

2. Navigate to the ORAchk tool in the `/suptools` directory.

   ```
   /u01/app/12.2.0.1/grid/suptools/orachk
   ```

3. Run the utility.

   ```
   ./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.

4. 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. 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.

Oracle Database Appliance Assessment Report

System Health Score is 98 out of 100 (detail)

Cluster Summary

Cluster Name	myhostc
OS/Kernel Version	LINUX X86-64 OELRHEL 6 4.1.12-94.4.1.el6uek.x86_64
CRS Home - Version	/u01/app/12.2.0.1/grid - 12.2.0.1.0
DB Home - Version - Names	/u01/app/oracle/product/12.2.0.1/dbhome_1 - 12.2.0.1.0 - 2 /u01/app/oracle/product/12.1.0.2/dbhome_1 - 12.1.0.2.0 - tb12 /u01/app/oracle/product/11.2.0.4/dbhome_1 - 11.2.0.4.0 - sam11
Number of nodes	1
Database Servers	1
orachk Version	12.1.0.2.7_20160526
Collection	orachk_myhost 003_PDB1_110117_132904.zip
Duration	2 mins, 38 seconds
Executed by	root
Arguments	-noupgrade
Collection Date	01-Nov-2017 13:29:28

Table of Contents

- Database Server
- Top 10 Time Consuming Checks

Report Feature

- ☐ Show Failed checks only

- Show checks with the following status:
  ☑ Fail ☑ Warning ☑ Info ☐ Pass

- Show details of the following regions:
  ☑ Top 10 Time Consuming Checks

- Show details of the checks:
  ○ Expand All ⦿ Collapse All

9.4.2 Trace File Analyzer Collector

Trace File Analyzer (TFA) Collector simplifies diagnostic data collection on Oracle Grid Infrastructure and Oracle Real Application Clusters systems.

TFA behaves in a similar manner to the ion utility packaged with Oracle Clusterware. Both tools collect and package diagnostic data. However, TFA is much more powerful than ion, because TFA centralizes and automates the collection of diagnostic information.

TFA 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, RDBMS, 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)

> **See Also:**
>
> Refer to My Oracle Support note 1513912.1 "TFA Collector - Tool for Enhanced Diagnostic Gathering" for more information. https://support.oracle.com/CSP/main/article?cmd=show&amp;type=NOT&amp;id=1513912.1

9.5 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 nodes.

The tool is implemented with the Trace File Analyzer collector. Use the tool both on bare-metal and on virtualized systems.

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
```

> **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.

ORACLE®

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.

A

Oracle Database Appliance Software Configuration Defaults

Oracle Database Appliance software configuration defaults.

- Directory Paths for Oracle Database Appliance
  Oracle homes on Oracle Database Appliance follow Optimal Flexible Architecture guidelines.

- Oracle Groups and Users Configuration for Oracle Database Appliance
  Review the table to see the groups and default users created when you deploy the appliance. All passwords are set to the Master password that you define during deployment.

- Database Disk Group Sizes for Oracle Database Appliance
  The table in this section shows the sizes for DATA, RECO, REDO, and FLASH disk groups on various configurations of Oracle Database Appliance.

- Usable Storage on Oracle Database Appliance X5-2
  The table shows the usage storage available for various configurations of Oracle Database Appliance X5-2.

- Storage on Oracle Database Appliance
  Review this section to understand Oracle Database Appliance storage architecture and options and how to determine usable storage.

A.1 Directory Paths for Oracle Database Appliance

Oracle homes on Oracle Database Appliance follow Optimal Flexible Architecture guidelines.

Table A-1   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/dbhome`*`_release-specific_namesequence_number`*
Oracle base	`/u01/app/`*`rdbms owner`*
Oracle Inventory	`/u01/app/oraInventory`

A.2 Oracle Groups and Users Configuration for Oracle Database Appliance

Review the table to see the groups and default users created when you deploy the appliance. All passwords are set to the Master password that you define during deployment.

Oracle Groups and Users Configurations

Table A-2   Oracle 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

A.3 Database Disk Group Sizes for Oracle Database Appliance

The table in this section shows the sizes for DATA, RECO, REDO, and FLASH disk groups on various configurations of Oracle Database Appliance.

Each table row has values for either normal or for high redundancy levels. The disk capacities shown in the tables vary, because they are derived by converting disk hardware terabytes (based on 1 kilobyte equals 1,000 bytes) into data storage terabytes (based on 1 kilobyte equals 1,024 bytes).

The space calculated with a storage expansion shelf approximately doubles the space mentioned in these tables.

> ✎ **Note:**
>
> The storage expansion shelf can only be used with Oracle Database Appliance X6-2-HA, X5-2, X4-2, and X3-2.

Table A-3   Approximate Database Disk Group Sizes for Oracle Database Appliance X5-2 and X6-2-HA

Sizing	X5-2 (GB), 4 TB	X5-2 (GB), 8 TB	X6-2-HA (GB), 8 TB
HDD Size	3,816	7,631	7,631
Total HDD	61,056	122,096	122,096
Total SSD (REDO Disk Group)	744	744	744
Total SSD (FLASH Disk Group)	1,492	1,492	1,492
Total HDD with **High** Redundancy	20,352	40,699	40,699
Total HDD with **Normal** Redundancy	30,528	61,048	61,048
DATA Disk Group with **High** Redundancy - External Backup	15,315	30,626	30,626
RECO Disk Group with **High** Redundancy - External Backup	2,493	4,986	4,986
DATA Disk Group with **High** Redundancy - Local Backup	7,473	16,407	16,407
RECO Disk Group with **High** Redundancy - Local Backup	9,906	21,748	21,748
DATA Disk Group with **Normal** Redundancy - External Backup	24,513	49,220	49,220
RECO Disk Group with **Normal** Redundancy - External Backup	4,007	8,013	8,013
DATA Disk Group with **Normal** Redundancy - Local Backup	12,307	24,610	24,610
RECO Disk Group with **Normal** Redundancy - Local Backup	15,920	32,623	32,623
REDO Disk Group	248	248	248
FLASH Disk Group	746	746	746

> **Note:**
>
> 1. For non-CDB databases, the REDO disk group has 50% free disk space.
>
> 2. For CDB databases, an Oracle ACFS mount point is created per CDB database, based on the template log file size. If this is a Single Instance (SI) database, then multiply by 3. If the is an Oracle RAC database, then multiply by 4.
>
> 3. Accelerator volume size is 0.4% of the database DATA Oracle ACFS file system size and shared REPO Oracle ACFS file system size.

> **Note:**
>
> High Redundancy is triple-mirroring and Normal Redundancy is double-mirroring. The REDO Disk Group is always High Redundancy. The FLASH Disk Group is always Normal Redundancy.

ORACLE

> ✎ **See Also:**
>
> *Oracle Automatic Storage Management Administrator's Guide*, "Managing Capacity in Disk Groups" for more information about determining the amount of free space in your Oracle Database Appliance disk groups for Oracle ASM. The tables in this topic only provide the raw disk information.

A.4 Usable Storage on Oracle Database Appliance X5-2

The table shows the usage storage available for various configurations of Oracle Database Appliance X5-2.

The reserved storage is the amount of 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 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. Refer to *Oracle Automatic Storage Management Administrator's Guide* for more information about ASM disk group capacity.

Table A-4   Usable Storage on Oracle Database Appliance X5-2

Sizing	Raw Value (GB)	Reserve (GB)	Usable (GB)
Total SSD (REDO Disk Group) (based on an estimated 190,780 GB) See the Note.	764	191	191
Total SSD (FLASH Disk Group) (based on an estimated 3,816 GB)	1,528	382	573
HDD Size: 8 TB	7,631		
External Backup/**Normal** Redundancy (86%/14% split)			
DATA Disk Group with **Normal** Redundancy - External Backup	105,003	6,563	49,220
RECO Disk Group with **Normal** Redundancy - External Backup	17,093	1,068	8,013
External Backup/**High** Redundancy			
DATA Disk Group with **High** Redundancy - External Backup	105,003	13,125	30,626
RECO Disk Group with **High** Redundancy - External Backup	17,093	2,137	4,986
Internal Backup/**Normal** Redundancy (43%/57% split)			
DATA Disk Group with **Normal** Redundancy - Internal Backup	52,501	3,281	24,610
RECO Disk Group with **Normal** Redundancy - Internal Backup	69,595	4,350	32,623
Internal Backup/**High** Redundancy			
DATA Disk Group with **High** Redundancy - Internal Backup	52,501	3,281	16,407
RECO Disk Group with **High** Redundancy - Internal Backup	69,595	4,350	21,748

ORACLE

Table A-4   (Cont.) Usable Storage on Oracle Database Appliance X5-2

Sizing	Raw Value (GB)	Reserve (GB)	Usable (GB)
HDD Size: 4 TB (Total: HDD Raw: 59,584 GB)	3,816		
External Backup/**Normal** Redundancy (86%/14% split)			
DATA Disk Group with **Normal** Redundancy - External Backup	52,508	3,282	24,613
RECO Disk Group with **Normal** Redundancy - External Backup	8,548	534	4,007
External Backup/**High** Redundancy			
DATA Disk Group with **High** Redundancy - External Backup	52,508	6564	15,315
RECO Disk Group with **High** Redundancy - External Backup	8,548	1,068	2,493
Internal Backup/**Normal** Redundancy (43%/57% split)			
DATA Disk Group with **Normal** Redundancy - Internal Backup	26,254	1,641	12,307
RECO Disk Group with **Normal** Redundancy - Internal Backup	33,963	2,123	15,920
Internal Backup/**High** Redundancy			
DATA Disk Group with **High** Redundancy - Internal Backup	25,621	3,203	7,473
RECO Disk Group with **High** Redundancy - Internal Backup	33,963	4,245	9,906

Related Topics

- Administering Oracle ASM Disk Groups

A.5 Storage on Oracle Database Appliance

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.

- Oracle ACFS Mount Points and Storage Space
  Review Oracle ASM Cluster file system (ACFS) mount points for Oracle Database Appliance.

- Oracle ACFS Space Management
  The Oracle ACFS file systems are automatically created when you create a database on Oracle Database Appliance.

A.5.1 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.

ORACLE®

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.

A.5.2 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 A-5   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/datdbname-nnn` For example: `/dev/asm/datodacn-123`	`/u02/app/oracleuser/oradata/dbname` For example: `/u02/app/example/oradata/odacn`

Table A-5   (Cont.) Oracle ACFS Mount Points and Related Oracle ASM Disk Groups and Volume Information

File System	Oracle ASM Disk Group	Oracle ASM Dynamic Volume	Mount Point
RECO	+RECO	`/dev/asm/reco-`*nn*	`/u03/app/`*oracleuser* This mount point is shared by all databases for `fast_recovery_area` and `redo` logs. For `fast_recovery_area`, the path is: `/u03/app/`*oracleuser*`/fast_recovery_area/`*db_name* For redo logs, the path is: `/u03/app/`*oracleuser*`/redo/`*db_name*

Example A-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
```

A.5.3 Oracle ACFS Space Management

The Oracle ACFS file systems are automatically created when you create a database on Oracle Database Appliance.

When you use Oracle ACFS for database storage, the following is created:

*   A 100G ACFS is created from +DATA diskgroup for each database. This Oracle ACFS automatically extends the space on demand.

- A common Oracle ACFS with 25% of +RECO diskgroup is created with auto extension on. This file system is used for fast recovery area and redo logs for all databases.

When the Oracle ACFS file systems are created, they do not initially consume all of the storage in the appliance. Space is preserved for additional repositories, or in some cases, database files stored directly in Oracle ASM. You can check for available storage space in your file systems by running the operating system command df -k as shown in the following example.

```
# df -k
Filesystem                            1K-blocks    Used        Available  Use%
Mounted on
/dev/mapper/VolGroupSys-LogVolRoot    30963708     14203568    15187276   49%    /
tmpfs                                 65952292     647800      65304492
1%      /dev/shm
/dev/sda1                             495844       43872       426372     10%    /
boot
/dev/mapper/VolGroupSys-LogVolOpt     61927420     18594420    40187272   32%    /
opt
/dev/mapper/VolGroupSys-LogVolU01     103212320    49621560    48347880   51%    /
u01
/dev/asm/reco-62                      76546048     1469676     75076372
2%      /u03/app/oracle
/dev/asm/datrdb2-268                  104857600    3872368     100985232
4%      /u02/app/oracle/oradata/rdb2
/dev/asm/datndb11-268                 104857600    247160      104610440
1%      /u02/app/oracle/oradata/ndb11
/dev/asm/datndb12-268                 104857600    247160      104610440
1%      /u02/app/oracle/oradata/ndb12
```

B

Database Templates for Oracle Database Appliance

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

Topics:

- Types of Database Templates for Oracle Database Appliance
  Choose a database template that best meets your database workload and hardware.

B.1 Types of Database Templates for Oracle Database Appliance

Choose a database template that best meets your database workload and hardware.

About Database Templates for Oracle Database Appliance

Oracle Database Appliance enables you to consolidate many databases into a single system. Consolidation can minimize idle resources, maximize efficiency, and lower costs. By using instance caging in conjunction with Oracle Database Resource Manager (the Resource Manager), you can provide desired levels of service across multiple instances on a single Oracle Database Appliance.

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

The Oracle Appliance Manager Configurator refers to the database sizing templates as *classes* of databases.

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

Use the following tables to help select the best templates 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.

- Container databases are created on Oracle ACFS.

- I/O per second (IOps) values are derived from an 8-kilobyte random read-write response time of 10 to 12 milliseconds for Hard Disk Drives (HDDs), and less than 1 millisecond for Flash, for Oracle Database Appliance X5-2; 5 to 7 milliseconds for Oracle Database Appliance X4-2 and X3-2; and 5 milliseconds for Oracle Database Appliance Version 1 to service an online transaction processing (OLTP) I/O request. The rates are not based on the number of CPUs and assume that the system is running at capacity.

- Throughput, in megabytes per second (MBps) is based on a 1 MB sequential read/ write for a data warehousing system. As with IOps, the MBps is a measure of throughput when the system is at capacity. With just a single small database running, the MBps would be the maximum available on the system for a large database.

- The log file size assumes four redo log groups for each instance with a log switch every 15 minutes when the system is running at full capacity.

- Storage is shared between the servers on Oracle Database Appliance.

About Improved Oracle Database Appliance Template Options

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

The improved Oracle Database templates replace the generic database templates from previous releases that only provided sizing parameters for OLTP workloads. The database sizing tables provide updated template names and sizing based on the number of CPUs and memory attributes for each type of database workload. The table "Oracle Database Appliance Database Template Name Conversions" provides a reference between the generic database template names and the database template names based on CPU cores.

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

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

- Use Oracle Database Appliance DSS database templates if your database workload is primarily decision support services (DSS) or data warehousing.

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

- Use Oracle Database Appliance X5-2 generic database templates if your database is on Oracle Database Appliance X5-2.

- Use Oracle Database Appliance X4-2 generic database templates if your database is on Oracle Database Appliance X4-2.

- Use Oracle Database Appliance X3-2 generic database templates if your database is on Oracle Database Appliance X3-2.

- Use Oracle Database Appliance Version 1 generic database templates if your appliance is the original model of Oracle Database Appliance.

The templates provide general guidelines about the maximum number of databases on a fully deployed Oracle Database Appliance. Base the memory and CPU sizing on the number of instances per server, not the number of databases. Memory and CPUs are shared by all databases and the number of databases impacts performance. For example, when you have one database, the database receives full I/O throughput. If you have 9 databases, then each database has only 1/9th of the available I/O throughput for all disks.

When you have multiple databases, they share and compete over available CPU resources. When choosing a template, do not have more CPU_COUNTs distributed than available threads in the system. Oracle recommends partitioning, where every database has exclusive CPUs. If you choose to exceed the recommended maximum number of databases on Oracle Database Appliance (over-provision), be aware of your I/O results and performance degradation. With the over-provisioned approach, the sum of the CPU_COUNT across all instances can exceed the number of CPUs. Better resource utilization is provided with over-provisioning; however, it is possible for contention to occur when multiple databases are heavily loaded at the same time. Over-provisioning is best used for systems running non-critical applications. Avoid using over-provisioning for databases with high I/O requirements or those with high transaction rates. If you choose to over-provision, then do not exceed twice the number of total CPUs. Twice the allocation of total CPUs is based on hyper-threading of 2 CPU threads per core.

Table B-1   Oracle Database Appliance Database Generic Template Name Conversions

CPU Core-Based Database Template Names	odb-01s	odb-01	odb-02	odb-04	odb-06	odb-12	odb-16	odb-24
Generic Database Template Names	Very, very small	Very Small	Small	Medium	Large	Extra Large	Extra Extra Large	Extra Extra Extra Large

> **Note:**
>
> Extra Extra Large is applicable to Oracle Database Appliance X3-2 and Oracle Database Appliance X4-2. Extra Extra Extra Large is applicable to Oracle Database Appliance X4-2 only.

Table B-2   Oracle Database Appliance OLTP Database Template Sizes

Template	CPU Cores	SGA	PGA	Flash	Processes	LOG buffer, Redo Log
odb-01s (X5-2, X4-2, X3-2, and V1)	1	2 GB	1 GB	6 GB	200	16 MB, 1 GB
odb-01 (X5-2, X4-2, X3-2, and V1)	1	4 GB	2 GB	12 GB	200	16 MB, 1 GB

Table B-2 (Cont.) Oracle Database Appliance OLTP Database Template Sizes

Template	CPU Cores	SGA	PGA	Flash	Processes	LOG buffer, Redo Log
odb-02 (X5-2, X4-2, X3-2, and V1)	2	8 GB	4 GB	24 GB	400	16 MB, 1 GB
odb-04 (X5-2, X4-2, X3-2, and V1)	4	16 GB	8 GB	48 GB	800	32 MB, 1 GB
odb-06 (X5-2, X4-2, X3-2, and V1)	6	24 GB	12 GB	72 GB	1200	64 MB, 2 GB
odb-12 (X5-2, X4-2, X3-2, and V1)	12	48 GB	24 GB	144 GB	2400	64 MB, 4 GB
odb-16 (X5-2, X4-2, X3-2 Only)	16	64 GB	32 GB	192 GB	3200	64 MB, 4 GB
odb-24 (X5-2, X4-2 Only)	24	96 GB	48 GB	192 GB	4800	64 MB, 4 GB
odb-32 (X5-2 Only)	32	128 GB	64 GB	256 GB	6400	64 MB, 4 GB
odb-36 (X5-2 Only)	36	128 GB	64 GB	256 GB	7200	64 MB, 4 GB

> **Note:**
>
> Flash is applicable to Oracle Database Appliance X5-2 only.

Table B-3 Oracle Database Appliance DSS Database Template Sizes

Template	CPU Cores	SGA (GB)	PGA (GB)	Processes	Redo log file size (GB)	Log buffer (MB)
odb-01s (X5-2, X4-2, X3-2, and V1)	1	1	2	200	1	16
odb-01 (X5-2, X4-2, X3-2, and V1)	1	2	4	200	1	16
odb-02 (X5-2, X4-2, X3-2, and V1)	2	4	8	400	1	16
odb-04 (X5-2, X4-2, X3-2, and V1)	4	8	16	800	1	32
odb-06 (X5-2, X4-2, X3-2, and V1)	6	12	24	1200	2	64
odb-12 (X5-2, X4-2, X3-2, and V1)	12	24	48	2400	4	64
odb-16 (X5-2, X4-2, X3-2 Only)	16	32	64	3200	4	64
odb-24 (X5-2, X4-2 Only)	24	48	96	4800	4	64
odb-32 (X5-2 Only)	32	64	128	6400	4	64
odb-36 (X5-2 Only)	36	64	128	7200	4	64

Table B-4   Oracle Database Appliance In-Memory Database Template Size

Template	CPU Cores	SGA (GB)	PGA (GB)	In-Memory (GB)	Processes	Redo log file size (GB)	Log buffer (MB)
odb-01s (X5-2, X4-2, X3-2, and V1)	1	2	1	1	200	1	16
odb-01 (X5-2, X4-2, X3-2, and V1)	1	4	2	2	200	1	16
odb-02 (X5-2, X4-2, X3-2, and V1)	2	8	4	4	400	1	16
odb-04 (X5-2, X4-2, X3-2, and V1)	4	16	8	8	800	1	32
odb-06 (X5-2, X4-2, X3-2, and V1)	6	24	12	12	1200	2	64
odb-12 (X5-2, X4-2, X3-2, and V1)	12	48	24	24	2400	4	64
odb-16 (X5-2, X4-2, X3-2 Only)	16	64	32	32	3200	4	64
odb-24 (X5-2, X4-2 Only)	24	96	48	48	4800	4	64
odb-32 (X5-2 Only)	32	128	64	64	6400	4	64
odb-36 (X5-2 Only)	36	128	64	64	7200	4	64

Table B-5   Oracle Database Appliance X5-2 Database Template Size Storage Performance

Template	Number of databases that you can deploy using this template	Container Database ACFS Size on DATA Disk Group (GB)	I/Ops with single storage shelf (HDD/FLASH)	Throughput (MBps) with single storage shelf (HDD/FLASH)	I/Ops with storage shelf plus storage expansion shelf (HDD/FLASH)	Throughput (MBps) with storage shelf plus storage expansion shelf (HDD/FLASH)	Log generation (MBps)
odb-01s	36	100	42/4167	83/83	83/8333	167/167	6.83
odb-01	36	100	42/4167	83/83	83/8333	167/167	6.83
odb-02	18	200	83/8.3K	167/167	167/16.7K	333/333	6.83
odb-04	9	400	167/16.7K	333/333	333/33.3K	667/667	13.65
odb-06	6	800	250/25K	500/500	500/50K	1000/1000	27.3
odb-12	3	1600	500/50K	1000/1000	1000/100K	2000/2000	27.3
odb-16	2	1600	750/75K	1500/1500	1500/150K	3000/3000	27.3
odb-24	1	1600	1500/150K	3000/3000	3000/300K	6000/6000	27.3
odb-32	1	1600	1500/150K	3000/3000	3000/300K	6000/6000	27.3
odb-36	1	1600	1500/150K	3000/3000	3000/300K	6000/6000	27.3

> **Note:**
>
> The number of databases that you can deploy using this template is for the entire Oracle Database Appliance.
>
> Actual I/O per second (I/Ops) and throughput for a database depends on the percentage of I/O operations that are serviced through the FLASH, compared with the operations serviced through the hard disk drives (HDDs). The I/Ops weighting in these tables assumes an OLTP workload calculated as a mixed workload (80 percent reads, serviced through the FLASH cache, and 20 percent writes serviced through the HDDs).

Table B-6   Oracle Database Appliance X4-2 Database Template Size Storage Performance

Template	Number of databases that you can deploy using this template	Container Database ACFS Size on DATA Disk Group (GB)	I/Ops with single storage shelf	Throughput (MBps) with single storage shelf	I/Ops with storage shelf plus storage expansion shelf	Throughput (MBps) with storage shelf plus storage expansion shelf	Log generation (MBps)
odb-01s	24	100	138	146	275	229	6.83
odb-01	24	100	138	146	275	230	6.83
odb-02	12	200	275	292	550	458	6.83
odb-04	6	400	550	583	1100	917	13.65
odb-06	4	800	825	875	1650	1375	27.3
odb-12	2	1600	1650	1750	3300	2750	27.3
odb-16	1	1600	3300	3500	6600	5500	27.3
odb-24	1	1600	3300	3500	6600	5500	27.3

Table B-7   Oracle Database Appliance X3-2 Database Template Size Storage Performance

Template	Number of databases that you can deploy using this template	Container Database ACFS Size on DATA Disk Group (GB)	I/Ops with single storage shelf	Throughput (MBps) with single storage shelf	I/Ops with storage shelf plus storage expansion shelf	Throughput (MBps) with storage shelf plus storage expansion shelf	Log generation (MBps)
odb-01s	16	100	206	219	413	344	6.83
odb-01	16	100	206	219	413	344	6.83
odb-02	8	200	413	438	825	688	6.83
odb-04	4	400	825	875	1650	1375	13.65
odb-06	2	800	1650	1750	3300	2750	27.3
odb-12	1	1600	3300	3500	6600	5500	27.3
odb-16	1	1600	3300	3500	6600	5500	27.3

Table B-8   Oracle Database Appliance Version 1 Database Template Size Storage Performance

Template	Number of databases that you can deploy using this template	Container Database ACFS Size on DATA Disk Group (GB)	I/Ops	Throughput (MBps)	Log generation (Mps)
odb-01s	12	100	333	250	6.83
odb-01	12	100	333	250	6.83
odb-02	6	200	667	500	6.83
odb-04	3	400	1333	1000	13.65
odb-06	2	800	2000	1500	27.3
odb-12	1	1600	4000	3000	27.3

> **Note:**
>
> For a single database, select a template that best fits your expected workload (the CPU and I/Ops capabilities you require) on the hardware that you are using. When creating multiple databases, calculate the overall workload; available system resources for any new database are affected by the CPU and I/Ops consumed by the existing databases that are already on the system.

Index

ORACLE®