

Oracle® Database Appliance

Administration and Reference Guide

Release 12.1.2.5.0 for Linux x86-64

E65862-01

October 2015

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Preface

Oracle Database Appliance is an optimized, prebuilt and ready-to-use clustered 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

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

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

This does not include information about Oracle Database architecture, tools, management, or application development that is covered in the main body of Oracle Documentation unless there are features 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 and Oracle Real Application Clusters 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

The following documents are published in the Oracle Database Appliance online documentation library, available at <http://www.oracle.com/goto/oda/docs>. From the Oracle Help Center at <http://docs.oracle.com>, click the Engineered Systems tile, scroll to Oracle Database Appliance, and select the appropriate release number.

- *Oracle Database Appliance Setup Poster* (a full-size printed copy ships with Oracle Database Appliance)
- *Oracle Database Appliance Getting Started Guide*
- *Oracle Database Appliance Release Notes*
- *Oracle Database Appliance Owner's Guide*
- *Oracle Database Appliance Service Manual*
- *Oracle Database Appliance Safety and Compliance Guide*
- *Oracle Database Appliance Licensing Information*
- *Oracle Database Appliance Security Guide*
- *Oracle Enterprise Manager Plug-in for Oracle Database Appliance User's Guide*

For information about Oracle Database, click the Database tile on the Oracle Documentation home page (<http://docs.oracle.com>), scroll to **Oracle Database**, and select **All Oracle Database Documentation**. The following documents may be of interest:

- *Oracle Database Concepts*
- *Oracle Database Administrator's Guide*
- *Oracle Database SQL Language Quick Reference*
- *Oracle Database Reference*
- *Oracle Database 2 Day + Real Application Clusters Guide*
- *Oracle Real Application Clusters Administration and Deployment Guide*
- *Oracle Clusterware Administration and Deployment Guide*

For more details about other Oracle products that are mentioned in Oracle Database Appliance documentation, such as Oracle VM and Oracle Integrated Lights Out Manager, see the Oracle Documentation home page at the following address:

<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.
<i>italic</i>	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, and text that appears on the screen.
<i>monospace italic</i>	Monospace italic type indicates text that you enter.

Convention	Meaning
#	The pound (#) prompt precedes a Linux command.

Updating Oracle Database Appliance Software

To keep Oracle Database Appliance running with the latest software, check for and apply Oracle Database Appliance patch bundles when they are released. As well as offering new features, patches may improve the functionality of existing features.

Oracle Database Appliance patch bundles are released on a quarterly schedule. My Oracle Support note 888888.1 provides information about the latest Oracle Database Appliance patch bundle.

About the Oracle Database Appliance Patch Bundle

All patching of Oracle Database Appliance is done using the quarterly Oracle Database Appliance patch bundle. The patch bundle provides all relevant patches for the entire system, including:

- BIOS
- Hardware drivers, management pack, and firmware drivers for various components
- Oracle Appliance Manager
- Oracle Linux
- Oracle VM
- Java Development Kit (JDK)
- Oracle Integrated Lights Out Manager (Oracle ILOM)
- Oracle Database Patch Set Update (PSU)
- Oracle Auto Service Request (Oracle ASR)
- Oracle Grid Infrastructure
- Intelligent Platform Management Interface (IPMI)

The patch bundle is comprised of three logical parts or groups of patches:

Patch Component	Components to Be Patched
Infrastructure (INFRA)	Disk firmware, Controller Firmware, Linux Operating System, Oracle ILOM, BIOS, Hardware Management Pack, IPMI, OAKCLI, Oracle ASR For the virtualized platform, this component also includes Dom0 updates.
Oracle Grid Infrastructure (GI)	Oracle Grid Infrastructure stack

Patch Component	Components to Be Patched
Database (DB)	RDBMS stack

Important: The patch bundle must be applied to first patch Infrastructure components (INFRA) followed by the Oracle Grid Infrastructure (GI) and then the Oracle Database (DB).

Patching Oracle Database Appliance Software

Here are the basic steps for patching Oracle Database Appliance Software:

[Step 1: Download the Oracle Database Appliance Patch Bundle from My Oracle Support](#)

[Step 2: Copy and Unpack the Patch Bundle](#)

[Step 3: Verify Components that Require Patching](#)

[Step 4: Patch the Infrastructure \(INFRA\)](#)

[Step 5: Patch the Grid Infrastructure \(GI\) Components](#)

[Step 6: Patch the Oracle Database](#)

[Step 7: Validate the Installation](#)

Read the specific patch readme file and any help information for details on how to apply each particular patch.

Note: Read the My Oracle Support note 888888.1 for information about patching and known issues. To find information specific to a given patch, read the readme file for the patch.

Infrastructure patches (OS, Firmware, Oracle ILOM, and so on) will require a short downtime of Oracle Database Appliance while the patch is being applied. Oracle Appliance Manager verifies that a patch meets all prerequisites to prevent you from installing patches in the wrong order. For example, you can't patch the Oracle Grid Infrastructure without first updating the Infrastructure.

When applied, most new patches will automatically install themselves on both nodes. The output displayed by the patch process advises you if the patch is being installed on one or both nodes. For older patches that only install on a single node, you'll need to run the `oakcli update -patch` command on the second node. See [oakcli update](#) for more details.

Step 1: Download the Oracle Database Appliance Patch Bundle from My Oracle Support

1. From an external client machine, log on to My Oracle Support and access note 888888.1 at
<https://support.oracle.com/CSP/main/article?cmd=show&type=NOT&id=888888.1>
2. Under Patch Search, select **Oracle Database Appliance** from the Product list.
3. Select the patch release number from the Select a Release list.
4. Click **Search**.
5. Select the patch or patches and click **Download**.

Caution: You must use an Oracle Database Appliance patch bundle or SAP patch bundle (downloaded from the SAP Service Marketplace) to patch Oracle Database Appliance. Do not use individual patches for Oracle Grid Infrastructure, Oracle Database, or Oracle Linux. If you use patches that are not intended for Oracle Database Appliance, or if you use Opatch or a similar patching tool, then Oracle Database Appliance inventory is not updated, and you cannot complete future patch updates.

Step 2: Copy and Unpack the Patch Bundle

1. Log in to Oracle Database Appliance as root.
2. Move the patch to a temporary directory (for example /tmp) on each node of Oracle Database Appliance.

Note: On Oracle Database Appliance Virtualized Platform, copy the patch bundle to ODA_BASE (Dom1)

3. To prepare the patch for installation, use the `oakcli unpack -package` command to unpack the patch files on each node. This command will extract (unzip) the patch bundle and copy the contents of the patch bundle into the patch repository. Use the following syntax to specify the complete path to the patch bundle file, where *path* is the absolute path to the patch file:

```
# oakcli unpack -package path
```

Example

To prepare the patch files for Oracle Database Appliance release 12.1.2.5.0:

1. Copy the patch files (p21645601_121250_Linux-x86-64_1of2.zip and p21645601_121250_Linux-x86-64_2of2.zip) into the /tmp directory on each node.
2. Run the following `oakcli unpack -package` commands:

On Node 0:

```
# oakcli unpack -package /tmp/p21645601_121250_Linux-x86-64_1of2.zip
# oakcli unpack -package /tmp/p21645601_121250_Linux-x86-64_2of2.zip
```

On Node 1:

```
# oakcli unpack -package /tmp/p21645601_121250_Linux-x86-64_1of2.zip
# oakcli unpack -package /tmp/p21645601_121250_Linux-x86-64_2of2.zip
```

Step 3: Verify Components that Require Patching

Before installing the patch, run the `oakcli validate -c ospatch -ver patch_version` command on Node 0 to identify any possible problems in your environment such as missing dependencies or other conflicts that may have been introduced due to any changes or customization of the standard configuration. This command shows a report that lists the components that require patching. If a component is listed as "Up-to-date" for the Supported Version, then that component will not be patched.

For example, use the following command to check for any possible problems in applying the 12.1.2.5.0 patch bundle on your system:

```
# oakcli validate -c ospatch -ver 12.1.2.5.0
```

The command output will inform you whether the patch will succeed in your environment. If the output indicates a possible problem (for example, if there are missing RPM dependencies), then you might want to defer applying the patch until you have addressed the identified issue.

Step 4: Patch the Infrastructure (INFRA)

When you are upgrading to a newer patch version than what is currently installed on Oracle Database Appliance, you need to patch the Infrastructure (INFRA) to the version level you are deploying in order to get the correct version of the Oracle Appliance Manager.

Patching the Infrastructure requires downtime when shared components are being patched. If a failure occurs, then you can restart the patching process by reissuing the same command.

To patch the Infrastructure, start the patching process by running the following command **ONLY** on Node 0. The command will patch both nodes at the same time:

```
#/opt/oracle/oak/bin/oakcli update -patch version --infra
```

version is the patch update version number, as in the following example:

```
#/opt/oracle/oak/bin/oakcli update -patch 12.1.2.5.0 --infra
```

The Infrastructure patch will automatically install itself on both nodes. The output displayed by the patch process advises you of the installation progress.

Step 5: Patch the Grid Infrastructure (GI) Components

Important: You must patch the Infrastructure (INFRA) before you attempt to patch the Grid Infrastructure (GI).

The Grid Infrastructure patching process is a rolling upgrade that automatically patches Node 1 after patching Node 0. This allows the Oracle Grid Infrastructure stack to be up and running on one of the nodes during patching.

To start the Grid Infrastructure patching process, run the `oakcli update -patch --gi` command:

```
#/opt/oracle/oak/bin/oakcli update -patch version --gi
```

version is the patch bundle version number, as in the following example:

```
#/opt/oracle/oak/bin/oakcli update -patch 12.1.2.5.0 --gi
```

Step 6: Patch the Oracle Database

See ["Updating and Upgrading the Oracle Database on Oracle Database Appliance"](#) and follow the steps for patching your specific deployment:

- ["Example 1: Updating to Oracle Database 12.1.0.2.5 from Previous Oracle Database 12.1.0.2.x Releases"](#)
- ["Example 2: Upgrading to Oracle Database 12.1.0.2.5 from Oracle Database 11.2.0.4.x Releases"](#)

Important: You must patch the Infrastructure (INFRA) before you attempt to patch the Grid Infrastructure (GI)

Step 7: Validate the Installation

Run the `oakcli version -detail` command to verify that all components of the Oracle Database Appliance patch installation have a version that is up-to-date.

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

Reimaging Oracle Database Appliance

Oracle Database Appliance ships from the factory with a default iso image preinstalled. To use Oracle Database Appliance Virtualized Platform, you will need to reimage Oracle Database Appliance.

To reimage Oracle Database Appliance, check MOS Note 888888.1, download the required ISO image and refer to the included readme file for detailed installation instructions.

Managing Oracle Database on Oracle Database Appliance

This chapter describes how to create and manage databases on Oracle Database Appliance. It also covers how to use Oracle Database Appliance solid-state drives (SSDs) and how to update and upgrade Oracle Database on Oracle Database Appliance.

Managing and Maintaining Oracle Database

Many tasks related to managing Oracle Databases, described in the Oracle Database documents on the Oracle Help Center page at <http://docs.oracle.com>, are also required with databases on Oracle Database Appliance. However, Oracle Database Appliance provides its own command-line tool (OAKCLI), to manage all components on the system. This includes commands to create, upgrade, and patch databases; create and upgrade Oracle homes, and create and modify database creation parameter files.

To simplify database creation and related tasks, Oracle Database Appliance combines the capabilities of the database administrator role into its `root` user. Therefore, these tasks should always be performed using OAKCLI. See "[Oracle Appliance Manager Command-Line Interface](#)" for detailed syntax and usage information of all OAKCLI commands.

Oracle Database Appliance Plug-in for Oracle Enterprise Manager

The Oracle Database Appliance plug-in allows you to monitor Oracle Database Appliance targets using Oracle Enterprise Manager Cloud Control 12c. The plug-in provides configuration and monitoring information about any Oracle Database Appliance target running Appliance Manager 12.1.2.2 or later.

See the *Oracle Enterprise Manager Plug-in for Oracle Database Appliance User's Guide* for more information about the plug-in.

Oracle Enterprise Manager Database Express

You can also manage your database with Oracle Enterprise Manager Database Express. Oracle Enterprise Manager Database Express is a web-based tool for managing Oracle Database 12c. Built inside the database server, it offers support for basic administrative tasks such as storage and user management. Oracle Enterprise Manager Database Express also provides comprehensive solutions for performance diagnostics and tuning. In addition, Oracle Enterprise Manager Database Express provides an interface for performance advisors and for Oracle Database utilities such as SQL*Loader and Oracle Recovery Manager (RMAN).

See Also

- *Oracle Database 2 Day DBA* for an introduction to Oracle Enterprise Manager Database Express.

Data Migration and Management

If you are loading data or migrating data from an existing database to Oracle Database Appliance, then you can use tools such as SQL*Loader, Oracle Data Pump, transportable tablespaces, and RMAN. You can also use the RMAN utility to back up and recover databases on Oracle Database Appliance.

See Also

- *Oracle Database Backup and Recovery User's Guide*
- *Oracle Database Backup and Recovery Reference*
- *Oracle Database Utilities* for information about data loading
- "Performing Oracle ASM Data Migration with RMAN" in *Oracle Automatic Storage Management Administrator's Guide* for an overview of how to migrate data to Oracle Automatic Storage Management (Oracle ASM).

Oracle Clusterware

Oracle Clusterware provides the cluster technology required for Oracle Real Application Clusters (Oracle RAC). In addition, Oracle Clusterware manages applications and processes as resources that you register with Oracle Clusterware. The number of resources that you register with Oracle Clusterware to manage an application depends on the application. Applications that consist of only one process are usually represented by only one resource. More complex applications that were built on multiple processes or components might require multiple resources.

See Also

- *Oracle Clusterware Administration and Deployment Guide* for information about making applications highly available with Oracle Clusterware

Oracle RAC One Node

Oracle Real Application Clusters One Node (Oracle RAC One Node) is a single instance of an Oracle RAC database that runs on one node in a cluster. Instead of stopping and starting instances, you can use the Oracle RAC One Node online database relocation feature to relocate an Oracle RAC One Node instance to another server.

You administer Oracle RAC One Node databases a bit differently than Oracle RAC or single-instance Oracle Databases. For Oracle RAC One Node databases, one node is the primary node, and the other node is a candidate node, which is available to accommodate services if the primary node fails or is shut down for maintenance. The nodes, databases, and database services reside in the generic server pool.

See Also

- *Oracle Real Application Clusters Administration and Deployment Guide* for more information about administering Oracle RAC One Node

Oracle Real Application Clusters

Oracle Real Application Clusters (Oracle RAC) provides technology that links two or more individual computers so that they function as one system. Oracle RAC deployed on Oracle Database Appliance enables each node to share access to a database. If one node fails or is taken offline, then the other node continues operating and the entire Oracle RAC database remains available.

Oracle Database Appliance currently supports only administrator-managed databases, where the database administrator allocates each instance of the database to a specific node in the cluster. Policy-managed databases, where the database administrator defines the number of database instances required, but not the nodes where they will run, are not available on Oracle Database Appliance.

When you review the database resource for an administrator-managed database, you see a server pool defined with the same name as the Oracle database. This server pool is part of a special Oracle-defined server pool called Generic. Oracle RAC manages the Generic server pool to support administrator-managed databases. When you add or remove an administrator-managed database using either the Server Control (SRVCTL) utility or Oracle Database Configuration Assistant (DBCA), Oracle RAC creates or removes the server pools that are members of Generic. You cannot use SRVCTL or Oracle Clusterware Control (CRSCTL) utility commands to modify the Generic server pool.

See Also

- *Oracle Clusterware Administration and Deployment Guide*
- *Oracle Real Application Clusters Administration and Deployment Guide*

Administrative Groups and Users

During configuration, two administrative accounts are created for Oracle Database Appliance: the user `grid`, with a user ID (UID) of 1000, and the user `oracle`, with a UID of 1001. The user `grid` is the Oracle Grid Infrastructure installation owner and the user `oracle` is the Oracle Database installation owner and the owner of all Oracle Database homes. By default, these users belong to groups shown in the following table.

Group Name	Group ID (GID)	<i>grid</i> is a member	<i>oracle</i> is a member
<code>oinstall</code>	1001	yes (primary group)	yes (primary group)
<code>dba</code>	1002	no	yes
<code>racoper</code>	1003	yes	yes
<code>asmdba</code>	1004	yes	yes
<code>asmoper</code>	1005	yes	no
<code>asmadmin</code>	1006	yes	no

If you create an initial database during deployment, then the password for the `SYS` and `SYSTEM` users is `welcome1`. You should change this password for both users as soon as possible to prevent unauthorized access to your database using these privileged accounts.

See Also

- *Oracle Grid Infrastructure Installation Guide for Linux* for information about operating system privileges groups
- *Oracle Automatic Storage Management Administrator's Guide* for information about Oracle ASM system privileges

Creating and Converting Databases

Use the Oracle Appliance Manager commands described in "[Oracle Appliance Manager Command-Line Interface](#)" to create and manage databases on Oracle Database Appliance. This will help you avoid using commands and parameters that could reduce the functionality of your databases, such as changing parameters associated with database file locations (for example, `control_files`, `db_create_file_dest`, `db_recovery_file_dest`).

Creating Databases with Oracle Appliance Manager Commands

Use the `oakcli create database` command to create additional databases on Oracle Database Appliance.

When you run this command, respond to each prompt by entering the number that corresponds with the option you want to apply to your database. When a default is supplied and is the value you want to use (typically shown as option 1), then press the Enter key to accept that value. When there are many options and the value you want isn't displayed, press 0 to reveal all of the options.

Creating Database Configuration Files with Oracle Appliance Manager Commands

Use the `oakcli create db_config_params params_file` command to create a configuration file for configuring multiple databases on Oracle Database Appliance. `params_file` is the name of the configuration file that you generate.

When you run this command, respond to each prompt by entering the number that corresponds with the option you want to apply to your database. When a default is supplied and is the value you want to use (typically shown as option 1), press Enter to accept that value. When there are many options, you might need to press 0 to reveal all of the options if the value you want is not displayed.

To see your existing database configuration files, use the `oakcli show db_config_params` command, as in the following example:

```
# oakcli show db_config_params
Available DB configuration files are:
default
eurodb
4kblockdb
mytest.params
```

Note that only nondefault extensions are included in the output. The default extension, `.dbconf`, is not shown.

To use a database configuration file to create a database, or many databases with identical profiles, use the `oakcli create database -db db_name -params params_file` command. `db_name` is the name of the database you want to create and `params_file` is the name of the configuration file (for example, `oakcli create database -db myxldb -params myxldb.dbconf`).

Remove unwanted database configuration files with the `oakcli delete db_config_params params_file` command, providing the name of the configuration file name as the `params_file` value. As with other Oracle Database Appliance Manager commands related to database configuration files, you do not need to include the extension if your file has the default extension value, which is `.dbconf`.

Creating Snapshot Databases

An Oracle snapshot database is created by taking a snapshot of the Oracle ASM Cluster File System (Oracle ACFS) where the source data files reside. The source database can be a single instance, Oracle RAC, or Oracle RAC One Node. Compared to other methods of creating copies of databases, snapshot databases require less time and storage space and involve no downtime of the source database. Additionally, you can create any database type and class from any other type and class. For example, you can create an Oracle RAC database from an Oracle RAC One Node database. Similarly, you can create a database that is different in size than the source database.

On Oracle Database Appliance, you can create snapshot databases from any Oracle Database instance stored on Oracle ACFS. Beginning with Oracle Database Appliance release 12.1.2.0.0, this includes any Oracle Database 11g release 11.2.0.4 or later database created or upgraded on the system. Additional requirements for a database to be used as the source for a snapshot database include:

- Must not be a standby or container database
- Must not be running in read-only mode, or in restricted mode, or in online backup mode
- Must be in ARCHIVELOG mode
- Must have all defined data files available and online

Also, ensure that the system clocks on the two Oracle Database Appliance nodes are synchronized before you create a snapshot database. If the clocks are significantly different, then the command might fail.

To create a snapshot database, use the `oakcli create snapshotdb` command. The following example creates a snapshot database named `snapprod` from the database named `prod`.

```
oakcli create snapshotdb -db snapprod -from prod
```

Caution: Oracle Database Appliance does not support centralized wallets with Transparent Data Encryption. Recovery of encrypted data might fail in the snapshot database if the source database relies on an external, centralized wallet.

Converting Single-Instance Databases to Oracle RAC or Oracle RAC One Node

Use the `rconfig` command-line utility as described in the Oracle Real Application Clusters Administration and Deployment Guide to convert a single-instance database to either Oracle RAC or Oracle RAC One Node. The contents of a `ConvertToRAC_AdminManaged.xml` file determine the type and other characteristics of the converted database.

See Also

- *Oracle Real Application Clusters Installation and Configuration Guide*, "Converting to Oracle RAC and Oracle RAC One Node from Single-Instance Oracle Databases"

Managing Multiple Databases on Oracle Database Appliance

An Oracle home is the directory in which you install Oracle Database binaries, and from which Oracle Database runs. Use Oracle Appliance Manager (through `oakcli` commands) 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 the Optimal Flexible Architecture (OFA) standards.

Oracle Database Appliance supports multiple Oracle homes including different versions for Oracle Database 11g Release 2 and Oracle Database 12c Release 1. The exact releases differ from version to version. Check the related readme files or Release Notes for specific versions.

Refer to My Oracle Support note 888888.1, at <https://support.oracle.com/CSP/main/article?cmd=show&type=NOT&id=888888.1>, for more details about the available database versions.

When you use `oakcli` commands to create multiple homes on Oracle Database Appliance, the commands start the cloning process used by Oracle Grid Infrastructure. In the current release, the user `oracle` owns all of the Oracle homes.

Note: If you are not upgrading from an earlier release, then download the Oracle Database Appliance End-User Bundle for the Oracle Database version that you want to install. See My Oracle Support note 888888.1 for more details:

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

Use `oakcli` commands to create, manage, patch, and upgrade multiple databases on Oracle Database Appliance. The `oakcli create database` command enables you to create a database with minimal user input. When used without any additional options, the command creates a new database home. Alternatively, create a database in an existing home by using the `-oh` option. Note that Oracle does not recommend applying RDBMS patches directly. Instead, you should only use Oracle Database Appliance patch bundles, which are tested to work across the whole software stack.

Note: Use `oakcli` commands to create new databases in either existing Oracle homes or in new Oracle homes.

Managing Multiple Database Instances Using Instance Caging

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 and Oracle Database Resource Manager (the Resource Manager) collaborate 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.

Tip: The Oracle Database Appliance Manager interface refers to the database sizing templates as *classes* of databases.

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 no plan is specified with this parameter, then the Resource Manager is not enabled and instance caging will not be 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.

See Also

- *Oracle Database Administrator's Guide* for more information about enabling and configuring instance caging and the Resource Manager

Using Oracle Database Appliance SSDs

Oracle Database Appliance includes solid-state drives (SSDs) to enhance the performance of certain operations. SSDs are used for:

- [Accelerating Redo Log Writes](#)
- [Caching Database Data](#)
- [Improving I/O Performance for Database Files](#)

Accelerating Redo Log Writes

Oracle Database Appliance contains four dedicated SSDs in slots 20 through 23 specifically for database redo logs. An Oracle ASM disk group named `+REDO` with High Redundancy is provisioned during the deployment process to accelerate database redo log write operations and improve latency. Databases automatically utilize these SSDs, and no other files can be hosted on them.

Caching Database Data

Oracle Database Appliance X5-2 introduces four additional 400 GB SSDs in slots 16 through 19 that can be used to host database files, or as a database flash cache in addition to the buffer cache.

An Oracle ASM disk group named `+FLASH` with Normal Redundancy is provisioned on these SSDs. All of the storage in the `+FLASH` disk group is allocated to an Oracle ASM Dynamic Volume (flashdata), and formatted as an Oracle ACFS file system. Storage in this flashdata file system is then made available as an Oracle ACFS file system and is used to create database flash cache files that accelerate read operations.

The file that contains the flash cache is automatically created for each database and is specified using the database `init.ora` parameter `db_flash_cache_file`. By default, `db_flash_cache_size` is set to 3 times the size of SGA, up to 196 GB, unless there is not enough space, in which case the size parameter is set to 0. After you change the `db_flash_cache_size` parameter, you must restart the database to use the newly sized flash cache.

See Also

- *Oracle Database Administrator's Guide* for information about configuring a database smart flash cache

Improving I/O Performance for Database Files

Oracle Database Appliance Manager configurator and the `oakcli create database` command provide the option to store entire databases in flash memory using the flashdata Oracle ACFS file system on the 400 GB SSDs (also used for the database flash cache).

If there is not enough space available in the FLASH disk group, the `oakcli create database` command will not prompt you with an option to store databases in flash, and the databases files will automatically be created in the +DATA disk group. You can also store database data files on both flash and hard disk drives but this must be manually managed. It requires a thorough understanding of database usage patterns and is only recommended for advanced administrators.

The limitations of this strategy are:

- Oracle Database must be release 11.2.0.4 or later
- Database type must be OLTP
- Only non-container databases (CDBs) can be completely stored in flash
- There must be 160 GB of available space in the +FLASH disk group

See Also

- ["Storage on Oracle Database Appliance"](#) for information about Oracle ACFS storage architecture on Oracle Database Appliance
- `oakcli create database` command reference

Updating and Upgrading the Oracle Database on Oracle Database Appliance

To patch Oracle Database, use the appropriate Oracle Database Appliance patch bundle. Typically, you would update or upgrade your Oracle Database using the latest Oracle Database Appliance patch bundle listed in MOS note 888888.1. Refer to the readme file for obtaining the patch for upgrading Infratructure (INFRA) and Grid Infrastructure (GI) components.

Here are instructions for applying each of the available database patches. The patches perform rolling upgrades that automatically patch Node 1 after patching Node 0.

The following examples outline the steps required to update or upgrade the Oracle Database on Oracle Database Appliance.

- [Example 1: Updating to Oracle Database 12.1.0.2.5 from Previous Oracle Database 12.1.0.2.x Releases](#)

- [Example 2: Upgrading to Oracle Database 12.1.0.2.5 from Oracle Database 11.2.0.4.x Releases](#)

Example 1: Updating to Oracle Database 12.1.0.2.5 from Previous Oracle Database 12.1.0.2.x Releases

Run the `oakcli show databases` command, on Node 0 only, to confirm that you have a database with the appropriate release number for this update. The command and output should look similar to the following example:

```
#oakcli show databases
```

Name	Type	Storage	HomeName	HomeLocation	Version
db1	RAC	ACFS	OraDb12102_home1	/u01/app/oracle/product/12.1.0.2/dbhome_1	12.1.0.2.4(20831110,20831110)
db2	SINGLE	ACFS	OraDb12102_home2	/u01/app/oracle/product/12.1.0.2/dbhome_2	12.1.0.2.4(20831110,20831110)
db3	RACOneNode	ACFS	OraDb12102_home3	/u01/app/oracle/product/12.1.0.2/dbhome_3	12.1.0.2.5(21359755,21359758)
db4	RAC	ACFS	OraDb12102_home4	/u01/app/oracle/product/12.1.0.2/dbhome_4	12.1.0.2.5(21359755,21359758)

Note: You cannot perform individual database updates for databases running in the same home. All databases running in the homes that you update, such as the two databases listed in the example in Step 1, will be patched to Oracle Database 12.1.0.2.5.

Run the `oakcli update -patch 12.1.2.5.0 --database` command, on Node 0 only. The command automatically patches both nodes. If you have more than one database home that could be patched, then the software provides a select list from which you pick one, some, or all of the database homes to update.

After the command completes on both nodes, check your database version with the `oakcli show databases` command on Node 0. The command and output should now look similar to the following example.

```
#oakcli show databases
```

Name	Type	Storage	HomeName	HomeLocation	Version
db1	RAC	ACFS	OraDb12102_home1	/u01/app/oracle/product/12.1.0.2/dbhome_1	12.1.0.2.5(21359755,21359758)
db2	SINGLE	ACFS	OraDb12102_home2	/u01/app/oracle/product/12.1.0.2/dbhome_2	12.1.0.2.5(21359755,21359758)
db3	RACOneNode	ACFS	OraDb12102_home3	/u01/app/oracle/product/12.1.0.2/dbhome_3	12.1.0.2.5(21359755,21359758)
db4	RAC	ACFS	OraDb12102_home4	/u01/app/oracle/product/12.1.0.2/dbhome_4	12.1.0.2.5(21359755,21359758)

Example 2: Upgrading to Oracle Database 12.1.0.2.5 from Oracle Database 11.2.0.4.x Releases

Download the 12.1.0.2.5 RDBMS Clone Patch 19520042 (file name `p19520042_121200_Linux-x86-64.zip`) from My Oracle Support and create a 12.1.0.2.5 database home on Node 0:

```
# /opt/oracle/oak/bin/oakcli create dbhome -version 12.1.0.2.5
```

Run the command `oakcli show dbhomes`. The output appears similar to the result in this example:

```
oakcli show dbhomes -detail
```

Oracle HomeName	Oracle Home Version	Oracle HomeLocation	Database Name	Database Type
OraDb11203_home1	11.2.0.3.15(20760997,17592127)	/u01/app/oracle/product/11.2.0.3/dbhome_1	no DB available	

```

OraDb11204_home1 11.2.0.4.8(21352635,21352649) /u01/app/oracle/product/11.2.0.4/dbhome_1 no DB available
OraDb12102_home1 12.1.0.2.5(21359755,21359758) /u01/app/oracle/product/12.1.0.2/dbhome_1 one43 RACOneNode
OraDb12102_home1 12.1.0.2.5(21359755,21359758) /u01/app/oracle/product/12.1.0.2/dbhome_1 ee120 SINGLE
OraDb12102_home1 12.1.0.2.5(21359755,21359758) /u01/app/oracle/product/12.1.0.2/dbhome_1 one311 RACOneNode
OraDb12102_home1 12.1.0.2.5(21359755,21359758) /u01/app/oracle/product/12.1.0.2/dbhome_1 ee311 SINGLE
OraDb12102_home1 12.1.0.2.5(21359755,21359758) /u01/app/oracle/product/12.1.0.2/dbhome_1 rac311 RAC
OraDb12102_home1 12.1.0.2.5(21359755,21359758) /u01/app/oracle/product/12.1.0.2/dbhome_1 ee43 SINGLE
OraDb12102_home1 12.1.0.2.5(21359755,21359758) /u01/app/oracle/product/12.1.0.2/dbhome_1 one120 RACOneNode
OraDb12102_home1 12.1.0.2.5(21359755,21359758) /u01/app/oracle/product/12.1.0.2/dbhome_1 odacn RAC
OraDb12102_home1 12.1.0.2.5(21359755,21359758) /u01/app/oracle/product/12.1.0.2/dbhome_1 rac43 RAC
OraDb12102_home1 12.1.0.2.5(21359755,21359758) /u01/app/oracle/product/12.1.0.2/dbhome_1 rac120 RAC
    
```

Run the `oakcli show databases` command, on Node 0 only, to confirm that you have a database with the appropriate release number for this upgrade. The command and output should look similar to the following example, which shows two databases that are candidates to be upgraded.

```
#oakcli show databases
```

Name	Type	Storage	HomeName	HomeLocation	Version
db1	RAC	ACFS	OraDb12102_home1	/u01/app/oracle/product/11.2.0.4/dbhome_1	11.2.0.4.7(20760982,20831122)
db2	SINGLE	ACFS	OraDb12102_home2	/u01/app/oracle/product/12.2.0.4/dbhome_2	11.2.0.4.7(20760982,20831122)
db3	RACOneNode	ACFS	OraDb12102_home3	/u01/app/oracle/product/12.1.0.2/dbhome_3	12.1.0.2.5(21359755,21359758)
db4	RAC	ACFS	OraDb12102_home4	/u01/app/oracle/product/12.1.0.2/dbhome_4	12.1.0.2.5(21359755,21359758)

Upgrade a database by running the `oakcli upgrade database` command, on Node 0 only, providing the name of the database to upgrade and the name of the database home containing the version (12.1.0.2.5) to which you want to upgrade. The following example shows how to upgrade the `tpcc` database, listed in Step 4, using the `dbhome12102_home1` identified in the example shown in Step 3:

```
# oakcli upgrade database -db tpcc -to dbhome12102_home1
```

After the command completes, verify your database version with the `oakcli show databases` command on Node 0 again. The command and output should now look similar to the following example:

```
#oakcli show databases
```

Name	Type	Storage	HomeName	HomeLocation	Version
db1	RAC	ACFS	OraDb12102_home1	/u01/app/oracle/product/12.1.0.2/dbhome_1	12.1.0.2.5(21359755,21359758)
db2	SINGLE	ACFS	OraDb12102_home2	/u01/app/oracle/product/12.1.0.2/dbhome_2	12.1.0.2.5(21359755,21359758)
db3	RACOneNode	ACFS	OraDb12102_home3	/u01/app/oracle/product/12.1.0.2/dbhome_3	12.1.0.2.5(21359755,21359758)
db4	RAC	ACFS	OraDb12102_home4	/u01/app/oracle/product/12.1.0.2/dbhome_4	12.1.0.2.5(21359755,21359758)

Managing Oracle Database Appliance Virtualized Platform

This chapter provides an overview of the Oracle Database Appliance Virtualized Platform architecture followed by procedures for how to deploy a guest virtual machine, manage high availability, manage CPU pools, and configure network settings for Oracle Database Appliance Virtualized Platform. It also includes information about resizing your Oracle Database domain (ODA_BASE), a privileged virtual machine.

About Oracle Database Appliance Virtualized Platform

Oracle Database Appliance provides the option of deploying a virtualized platform based on Oracle VM. With Oracle Database Appliance Virtualized Platform, you can use the capabilities of Oracle VM to effectively allocate resources to databases and applications running on the same physical Oracle Database Appliance. Rather than simply disabling unnecessary server cores, you can use the excess capacity to host other workloads. This enables consolidation of both databases and applications, while retaining the ease of deployment and management associated with Oracle Database Appliance.

Oracle Database Appliance Virtualized Platform is supported on all versions of Oracle Database Appliance hardware. All templates and operating systems supported by Oracle VM are also supported on Oracle Database Appliance Virtualized Platform. Supported operating systems include Linux, Windows, and Solaris/86.

Note: If you are currently on the nonvirtualized deployment of Oracle Database Appliance (all new systems are currently shipped from the factory with the nonvirtualized ISO image), then you must reimage the servers with the Oracle Database Appliance Virtualized Platform ISO image in order to use Oracle Database Appliance as a virtualized platform. Refer to MOS Note 888888.1 for a link to download the Oracle Database Appliance Virtualized Platform ISO image.

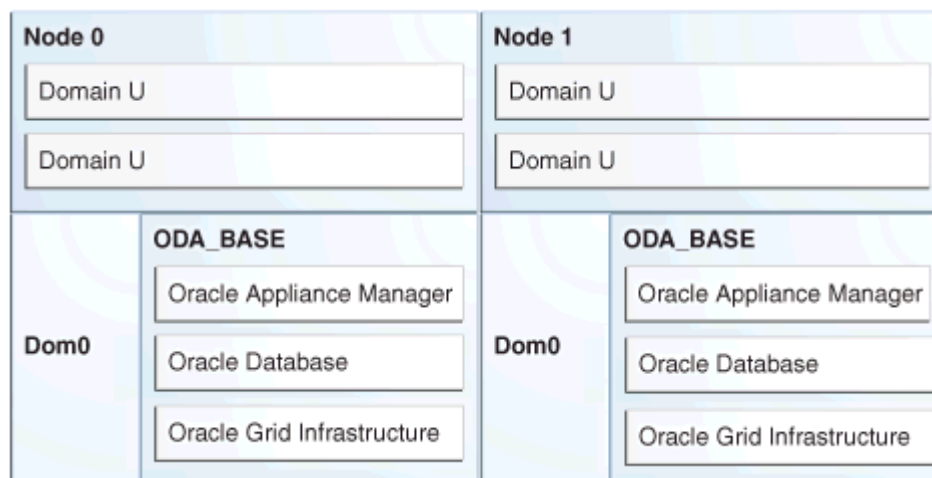
Oracle Database Appliance Virtualized Platform Architecture

Oracle Database Appliance Virtualized Platform provides virtualization technology that enables multiple isolated databases and applications to share the same physical server. The Oracle Database Appliance Virtualized Platform ISO image is engineered specifically to leverage the Oracle Database Appliance hardware capabilities.

The Oracle Database Appliance Virtualized Platform architecture uses the following virtual machine components as illustrated in [Figure 3-1](#):

- **Oracle Database Appliance Base Domain (ODA_BASE):** A privileged virtual machine domain, specifically for databases, that provides database performance similar to bare metal deployments. A PCI pass-through driver provides ODA_BASE direct access to the shared storage.
- **Domain 0 (Dom0):** Default domain that initiates Oracle Database Appliance Virtualized Platform provisioning processes and hosts virtual machine templates. Most of the responsibility of hardware detection in an Oracle Database Appliance Virtualized Platform environment is passed to the management domain, referred to as domain zero (or Dom0). On x86-based servers, the Dom0 kernel is actually a small-footprint Linux kernel with support for a broad array of devices, file systems, and software RAID and volume management. In Oracle Database Appliance Virtualized Platform, Dom0 provides access to much of the system hardware, creating, deleting and controlling guest operating systems, and presenting those guests with a set of common virtual hardware.
- **Guest Domains (Domain U):** Virtual machines which are provisioned to host non-database workloads such as applications and middleware. Guest operating systems each have their own management domain called a *user domain*, abbreviated to "Domain U". These domains are unprivileged domains with no direct access to the hardware or device drivers. Each Domain U starts after Dom0 is running on Oracle Database Appliance Virtualized Platform.

Figure 3-1 Oracle Database Appliance Virtualized Platform Architecture



Virtual Machine Templates

Virtual machines can be created from a template or assembly containing preconfigured virtual machines. The creation of a virtual machine from a template is based on cloning: the template is imported as an archive, unpacked, and stored as a virtual machine configuration file with disk images. These disk images are cloned to create a new instance in the form of a virtual machine. In the same way, an existing virtual machine can be cloned to create a new virtual machine, or cloned to create a new template.

See ["Managing Virtual Machine Templates."](#)

Virtual Machine Assemblies

Virtual machine assemblies are often described as a template of a group of virtual machines, or a collection of virtual machine templates. An assembly can contain a single virtual machine or a collection of virtual machine templates.

Virtual Machines

Oracle Database Appliance Virtualized Platform is designed to run and deploy virtual machines. Virtual machines can be configured to use CPU pool, memory, and shared repository resources.

See "[Managing Virtual Machines](#)."

Shared Repositories

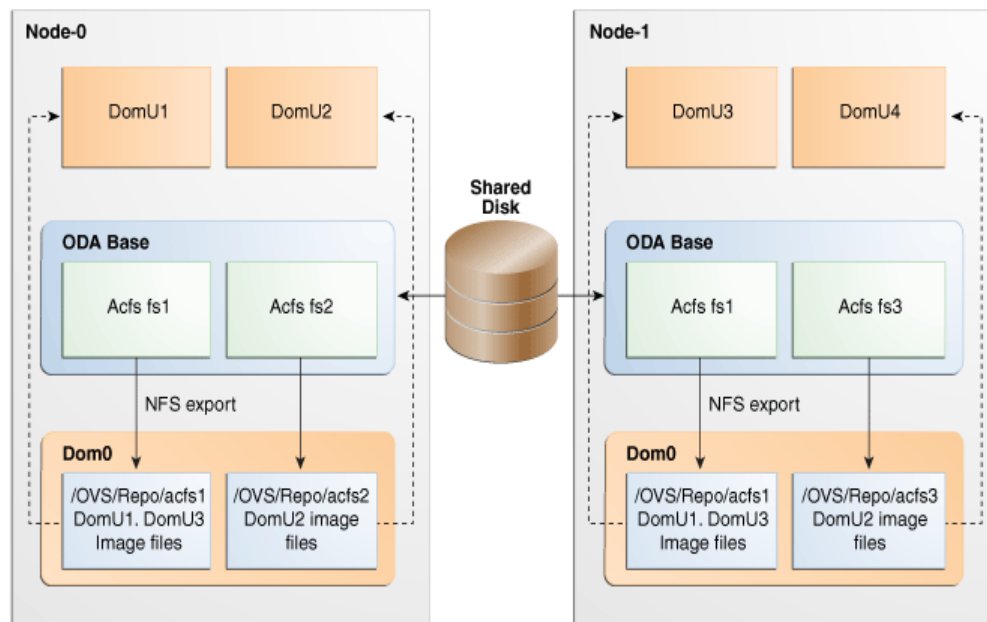
A shared repository is a central location for storing resources that are essential to creating and managing virtual machines. These resources include virtual machine templates and assemblies, ISO files (virtual DVD images), virtual machine configuration files, and virtual disks. Shared repositories are configured on an Oracle Automatic Storage Management Cluster File System (Oracle ACFS) and then presented to the Oracle Database Appliance nodes that need access to those resources.

Oracle Database Appliance Virtualized Platform uses shared repositories to optimize available disk space usage in the environment, and for easy reallocation of virtual machines if a physical server fails. The virtual machine files can be stored on shared disks, providing shared storage for the virtual machines. Additionally, you can configure CPU pools and a resizeable Oracle Database domain (ODA_BASE) to ensure that the virtual machines do not consume cycles from each other or from your assigned database CPU cores.

[Figure 3–2](#) illustrates the Oracle Database Appliance shared repository architecture as follows:

- The shared disks on Oracle Database Appliance Virtualized Platform are connected directly to ODA_BASE.
- ODA_BASE contains three shared repositories named fs1, fs2, and fs3.
- Each shared repository is an Oracle ACFS in ODA_BASE created on top of the Oracle Automatic Storage Management (Oracle ASM) disk group (DATA or RECO) chosen by the user when creating the shared repository.
- The process that creates a shared repository also performs a network file system (NFS) export of the shared repository to the respective Dom0 by using the private network.
- The export enables shared storage for the virtual machine files.

Figure 3–2 Architecture Overview of Oracle Database Appliance Virtualized Platform Shared Repositories



With the configuration shown in the illustration, you can:

- Create multiple repositories.
- Mount these repositories either on the nodes where the virtual machine needs to run (such as fs2 and fs3 in the illustration), or on both the nodes (such as fs1 in the illustration).
- Create one or more virtual machines or virtual machine templates on the shared repositories.
- Use OAKCLI commands to create and manage shared repositories, virtual disks, and their virtual machines, and the underlying architecture shown in the illustration.

For more information, see ["Creating and Managing Shared Repositories."](#)

Virtual Disks

In addition to virtual machines, you can create virtual disks in shared repositories. Virtual disks provide additional storage options for virtual machines by allowing you to attach additional block storage to your virtual machines. Similarly, you can detach the storage if you no longer need the additional space. You can use virtual disks to expand existing file system storage inside the virtual machine by extending the storage volume onto a virtual disk or by creating a new file system on a virtual disk. Your virtual disks can also share multiple virtual machines running on the same shared repository.

See ["Managing Virtual Disks in Shared Repositories."](#)

Domains

The terms *domain*, *guest*, and *virtual machine* are often used interchangeably, but they have subtle differences. A *domain* is a configurable set of resources, including memory, virtual CPUs, network devices, and disk devices, in which virtual machines run. A

guest is a virtualized operating system running within a domain. Multiple guests can run on the same instance of Oracle Database Appliance Virtualized Platform, each within its own domain. A *virtual machine* is granted virtual resources and can be started, stopped, and restarted independently.

Deploying Oracle Database Appliance Virtualized Platform

When you deploy Oracle Database Appliance Virtualized Platform, your system will have two domains on each server node: Dom0 and ODA_BASE (also known as Dom1). You can use the CPU cores not assigned to Oracle Database (ODA_BASE) for virtual machines, each of which is referred to as a Domain U.

Overview of Guest Virtual Machine Deployments

Here are the main steps to deploy a guest virtual machine:

1. Create a new repository, if necessary. See ["Creating and Managing Shared Repositories."](#)
2. Import the required template or assembly. See ["Managing Virtual Machine Templates."](#)
3. Configure the template or assembly. See ["Configuring a Virtual Machine Template."](#)
4. Clone the template or assembly. See ["Creating Clones and Snap Clones of a Template."](#)
5. Update the virtual machine as required. See ["Modifying a Virtual Machine Template Configuration."](#)
6. Start the virtual machine. See ["oakcli start commands."](#)
7. Manage the virtual machine using the virtual machine console. See ["oakcli show vmconsole."](#)

Oracle Appliance Manager Command-Line Interface

The Oracle Appliance Kit Command-Line Interface, also known as OAKCLI, is used when deploying Oracle Database Appliance Virtualized Platform. See ["Oracle Appliance Manager Command-Line Interface"](#) for the current set of OAKCLI commands along with their syntax and usage notes.

Creating and Managing Shared Repositories

Use the `oakcli create repo` command to create a shared repository. This command identifies the repository name, the disk group to use for its storage (DATA or RECO), and its size in gigabytes or megabytes (the default size unit is gigabytes.)

Other Oracle Appliance Manager shared repository commands, including commands to show and to stop (dismount) existing repositories, are similar to those used for nonshared repositories. Unlike the default repositories, which are permanent, you can delete a shared repository that has no active (mounted) virtual machines.

Example

The following command creates a shared repository named `repo1` in the ASM DATA disk group with 30 gigabytes of available storage:

```
oakcli create repo repo1 -dg data -size 30
```

Showing the Status of Shared Repositories

Use the `oakcli show repo` command to display information about virtual machine repositories. To see all repositories, omit the repository name and node number. To see a specific shared repository, include the repository name and node number.

Showing the Status of All Shared Repositories

To show the status of **all** shared repositories, use the `oakcli show repo` command:

```
oakcli show repo
```

NAME	TYPE	NODENUM	FREE SPACE	STATE
odarepo1	local	0	N/A	N/A
odarepo2	local	1	N/A	N/A
repo1	shared	0	68.25%	ONLINE
repo1	shared	1	68.25%	ONLINE
repo2	shared	0	N/A	OFFLINE
repo2	shared	1	89.83%	ONLINE

Showing the Status of a Selected Shared Repository

To display information for a particular node in a shared repository, specify the repository name and node number as part of the command syntax. In the following example, information is displayed for Node 1 in the `repo1` shared repository:

```
oakcli show repo repo1 -node 1
```

```
Resource: repo1_1
  AutoStart      : restore
  DG             : DATA
  Device         : /dev/asm/repo1-286
  ExpectedState  : Online
  FreeSpace      : 87.703125M
  MountPoint     : /u01/app/repo1
  Name           : repo1_0
  Node           : all
  RepoType       : shared
  Size           : 30720
  State          : Online
  Version        : 2
```

Starting a Shared Repository

Before you can assign a virtual machine to a shared repository, use the `oakcli start repo` command to start the repository and make the storage available. Note that the `oakcli start repo` command will also start any virtual machines assigned to the repository that are defined to be automatically started.

Example

Start the shared repository named `repo1` on Node 1:

```
oakcli start repo repo1 -node 1
```

Stopping a Shared Repository

Use the `oakcli stop repo` command to stop a shared repository on a node.

Example

Stop the shared repository named `repo1` on Node 0:

```
oakcli stop repo repo1 -node 0
```

Note: Do not issue an `oakcli stop repo` command while virtual machines are still active in the repository for the selected node.

Deleting a Shared Repository

Use the `oakcli delete repo` command to delete a shared repository. The shared repository must be offline (stopped) on both nodes before it can be deleted.

Example

Delete the shared repository named `repo1` nodes:

```
oakcli delete repo repo1
```

Increasing the Size of a Shared Repository

Use the `oakcli configure repo` command to increase the size of a shared repository.

Example

Change the size of the `repo1` shared repository by 2 gigabytes:

```
# oakcli configure repo repo1 -incsize 2G
```

```
Configured Shared Repo : repo1 with new size 3712.0.
```

Managing Virtual Disks in Shared Repositories

Use the OAKCLI commands to create, view, clone, attach, and delete virtual disks.

Creating a Virtual Disk for Use in a Shared Repository

Use the `oakcli create vdisk` command to create a virtual disk within a shared repository. The command defines the size of the virtual disk, the shared repository in which it will reside, a unique name within that shared repository, and whether the virtual disk can be shared by multiple virtual machines.

Example

Create a virtual disk named `sdisk1` in the `repo2` shared repository with a size of 1 gigabyte and the ability to be shared by virtual machines:

```
oakcli create vdisk sdisk1 -repo repo2 -size 1G -type shared
```

Viewing Information About Virtual Disks

Use the `oakcli show vdisk` command to view information about virtual disks. To see details about an individual virtual disk, include the virtual disk name and a `-repo repository_name` clause to name the shared repository where you created the virtual disk.

Examples

Display the Information for All Vdisks

Display information about all virtual disks on Oracle Database Appliance:

```
# oakcli show vdisk
```

NAME	SIZE	TYPE	REPOSITORY
----	----	----	-----
myvdisk	10G	local	vdiskrepo
newv	1G	local	vdiskrepo

Display Information for a Single Vdisk

Display information for the virtual disk named *myvdisk1*:

```
# oakcli show vdisk myvdisk1
Resource: myvdisk_vdiskrepo
  Name      : myvdisk_vdiskrepo
  RepoName  : vdiskrepo
  Size      : 10G
  Type      : local
  VmAttached : 0
```

Cloning Virtual Disks

Use the `oakcli clone vdisk` command to create clones of virtual disks.

```
oakcli clone vdisk new_vdisk_name -repo repo_name -src source_vdisk_name [-h]
```

new_vdisk_name is the name to assign to the cloned virtual disk.

repo_name is the repository where the original virtual disk resides.

src_vdisk_name is the name of the virtual disk that you are cloning.

Example

Clone a virtual disk named *my_vdisk2* from an existing virtual disk named *vdisk1* that is stored in the repository named *vrepo1*:

```
oakcli clone vdisk my_vdisk2 -repo vrepo1 -src vdisk1
```

Attaching a Virtual Disk to a Virtual Machine

Use the `oakcli modify vm` command to attach a virtual disk to a virtual machine.

Example

Attach the virtual disk named *sdisk1* to the virtual machine named *myol6u_test*:

```
oakcli modify vm myol6u_test -attachvdisk sdisk1
```

Deleting a Virtual Disk

Use the `oakcli delete vdisk` command to remove a virtual disk from a shared repository.

Example

Remove a virtual disk named *t2g* from the shared repository named *repoprod1*:

```
oakcli delete vdisk t2g -repo repoprod1
```

Managing Virtual Machine Templates

Import and configure virtual machine templates as the source for the virtual machines deployed on Oracle Database Appliance Virtualized Platform. If you have created

shared repositories, then import templates into the desired repository. Otherwise, import templates into the local repository on the desired node.

You can import assemblies that contain one or more templates. When you import a template or assembly into a shared repository, identify the node that will perform the operation. Select the node carefully to avoid overloading. The repository will be available to both nodes no matter which node performs the import.

Templates imported into local nodes use the repository name supplied in the import command to identify the node that will complete the import and provide the storage. On Node 0, the local repository is named *odarepo1* and on Node 1, the local repository is named *odarepo2*. If you want to import a template to both local repositories, then you must provide a different template name when you import the template into the second node.

Note: You cannot create or clone templates directly on Oracle Database Appliance Virtualized Platform. Find virtual machine templates at <http://edelivery.oracle.com/linux>.

If you import an assembly that contains more than one template, then the command automatically modifies the template name that you provide so that all template names remain unique. The first template will have the number "1" appended to the name, the second template will have the number "2" appended, and so on.

After you import a virtual machine template, you can customize the template with OAKCLI commands.

Listing Virtual Machine Templates

Use the `oakcli show vmtemplate` command to display the name and repository for each virtual machine template as well as the default number of CPUs and default amount of memory that Oracle Database Appliance Virtualized Platform would assign to a virtual machine created from the template.

Example

Display information about the *sample1_odarepo1* virtual template:

```
oakcli show vmtemplate sample_odarepo1
Resource: sample1_odarepo1
      CPUPriority      :      100
      Disks             :      |file:/OVS/Repositories/odarepo1/Te
                           mplates/otml_sample1_odarepo1/Syste
                           m.img,xvda,w||file:/OVS/Repositorie
                           s/odarepo1/Templates/otml_sample1_o
                           darepo1/u01.img,xvdb,w|
      Domain            :      XEN_PVM
      Keyboard          :      en-us
      MaxMemory         :      2048
      MaxVcpu           :      2
      Memory            :      2048
      Mouse             :      OS_DEFAULT
      Name              :      sample1_odarepo1
      Networks          :      |bridge=priv1||bridge=net1||bridge=
                           net2|
      NodeNum           :      0
      OS                :      OL_5
      ProcessorCap      :      100
```

```
RepoName      :      odarepo1
Vcpu           :          2
```

Importing Virtual Machine Templates

Use the `oakcli import vmtemplate` command to import virtual machine templates and assemblies contained in an external repository assembly file. Use the name of the shared repository and include a clause to identify the node where you want to import a template or an assembly.

```
oakcli import vmtemplate vmtemplatename -files image_files | -assembly assembly_  
file -repo repo_name [- node 0 | 1 ]
```

You can import virtual machine templates and assemblies directly from a remote repository using a URL to identify the source of the files. Optionally, use a remote copy command to copy files from the remote repository into your Dom0 /OVS directory and then import the files using the path and names to identify the downloaded files.

Note: When importing templates or assemblies to a local repository, do not use the `-node` clause. The target node is implicit in the name of the repository.

Importing Virtual Machine Templates from an External Repository Assembly File

Use the `oakcli import vmtemplate` *vmtemplatename* -assembly *assembly_file* -repo *repo_name* command to import virtual machine templates contained in an external template repository assembly file.

Example

Import the template in an external template repository assembly file located at the URL 'http://example.com/assemblies/OEL6/OVM_OL6U1_x86_PVHVM.ova' to a new template named *OL6U1* in a new repository named *odarepo1*.

```
oakcli import vmtemplate OL6U1 -assembly  
'http://example.com/assemblies/OEL6/OVM_OL6U1_x86_PVHVM.ova' -repo  
odarepo1
```

Note the single quotation marks that enclose the URL.

Importing a Virtual Machine Template from Dom0

Use the command to import a virtual machine template from the /OVS file system on Dom0.

```
oakcli import vmtemplate vmtemplatename -files image_files -repo repo_name
```

Example

Import the virtual machine template named *OVM_OL5U7_X86_64_PVM_10GB.tgz* from the /OVS directory in Dom0 into the *odarepo1* repository. The template is assigned the name *OL5U7*.

```
oakcli import vmtemplate OL5U7 -files /OVS/OVM_OL5U7_X86_64_PVM_10GB.tgz -repo  
odarepo1
```

Importing a Virtual Machine Template Using an External Repository URL

Use the `oakcli import vmtemplate` command to import a virtual machine template file from an external template repository.

Example

Import a virtual machine template named `OVM_OL5U7_X86_64_PVM_10GB.tgz` from an external template repository at the URL `'http://example.com/assemblies/OEL6/OVM_OL6U1_x86_PVHVM.tgz'`. Note the single quotation marks that enclose the URL. The template is assigned the name `OL5U7` and is imported into the `odarepo1` repository.

```
oakcli import vmtemplate OL5U7 -files 'http://example.com/assemblies/OEL6/OVM_OL6U1_x86_PVHVM.tgz' -repo odarepo1
```

Configuring a Virtual Machine Template

Use the `oakcli configure vmtemplate` command to configure a virtual machine template on Oracle Database Appliance Virtualized Platform. These values will become the default values for any virtual machine cloned from this template. You can change any or all them later with the `oakcli configure vm` command.

Example

Set values for the virtual machine template named `myol5u7_10gb`:

```
oakcli configure vmtemplate myol5u7_10gb -vcpu 2 -maxvcpu 4 -cpucap 40
-memory 1536M -maxmemory 2G -os OTHER_LINUX
```

- `-vcpu 2` sets the number of CPUs to be assigned when the virtual machine starts up to 2.
- `-maxvcpu 4` sets the maximum number of CPUs that can be assigned to the virtual machine to 4.
- `-cpucap 40` sets the maximum percentage of a CPU's capacity that can be assigned to the virtual machine to 40%.
- `-memory 1536M` sets the amount of memory to be assigned when the virtual machine starts up to 1536 MB.
- `-maxmemory 2G` sets the maximum amount of memory that can be assigned to the virtual machine to 2GB.
- `-os OTHER_LINUX` sets OTHER_LINUX as the operating system used by the virtual machine.

Showing Configured Values for a Virtual Machine Template

Use the `oakcli show vmtemplate` command to show values for the configurable options in a virtual machine template.

Example

Display information about the `sample1_odarepo1` virtual template:

```
oakcli show vmtemplate sample_odarepo1
Resource: sample1_odarepo1
          CPUPriority      :      100
          Disks             :      |file:/OVS/Repositories/odarepo1/Te
                               mplates/otml_sample1_odarepo1/Syste
                               m.img,xvda,w|file:/OVS/Repositorye
```

```

s/odarepo1/Templates/otml_sample1_o
darepo1/u01.img,xvdb,w|
Domain      : XEN_PVM
Keyboard    : en-us
MaxMemory   : 2048
MaxVcpu     : 2
Memory      : 2048
Mouse       : OS_DEFAULT
Name        : sample1_odarepo1
Networks    : |bridge=priv1||bridge=net1||bridge=
              net2|
NodeNum     : 0
OS          : OL_5
ProcessorCap : 100
RepoName    : odarepo1
Vcpu        : 2
```

Modifying a Virtual Machine Template Configuration

After you import a virtual machine template to a storage repository, examine the template configuration parameters with the `oakcli show vmtemplate` command. If you need to reconfigure the template for specific requirements, then use the `oakcli configure vmtemplate` command. This is useful if you plan to deploy multiple virtual machines with the same characteristics from a single template. If you will be deploying only one virtual machine or many virtual machines but with different characteristics, then set required values in the virtual machines with the `oakcli configure vm` command after you deploy the template.

When you are satisfied with the configuration of your virtual machine template, use the `oakcli modify` command to assign a new network to the virtual machine template.

Example

Replace the network assigned to the `gc_11g` virtual machine template with the `net1` network:

```
oakcli modify vmtemplate gc_11g -addnetwork net1
```

Removing a Virtual Machine Template

If you no longer need a template that you previously stored, then remove the template from the repository with the `oakcli delete vmtemplate` command.

Example

Remove the virtual machine template named `my016u_15gb3` from Oracle Database Appliance Virtualized Platform:

```
oakcli delete vmtemplate my016u_15gb3
```

Creating Clones and Snap Clones of a Template

You can create or *clone* virtual machines from imported templates (or assemblies) or from an existing virtual machine. A virtual machine can be a complete clone of the template or assembly, or it can be a snap clone, which contains only the metadata defined for the virtual machine.

Note: Creating snap clones is a very fast operation compared to cloning the entire template or assembly. However, if you update the contents of a snap clone, your system will require additional storage for the clone to retain the original content as well as the changed content, unless the changes are on shared virtual disks.

Cloning a Template

You can clone virtual machines that have attached virtual disks. In such cases, a clone of a virtual machine will contain the contents of virtual disks attached locally but not of virtual disks attached in shared mode. If needed, clone the virtual disks required by a cloned virtual machine in a separate step.

Use the `oakcli clone vm` command to create a virtual machine from a virtual machine template. Use the name of the shared repository in the `-repo` clause and include a `-node` clause to identify the node on which you want to perform the cloning process.

Example

Create a virtual machine named `myol6u_test` from the virtual machine template named `myol6u_15gb1`, which is stored in shared repository named `repo2` on `Node 0`.

```
oakcli clone vm myol6u_test -vmtemplate myol6u_15gb1 -repo repo2 -node 0
```

Note: The `-node` clause identifies the node where the cloning activity will occur. Also, the node value does not assign the default startup node for the virtual machine. This assignment is set by the `oakcli configure vm` command.

Creating a Snap Clone from a Template

Use the `oakcli clone vm` command to create a snap clone of a virtual machine template.

Example

Create a snap clone named `myol15u_snap` from the virtual machine template named `myol15u`:

```
oakcli clone vm myol15u_snap -vmtemplate myol15u -snap
```

Creating a Snap Clone of an Existing Virtual Machine

Use the `oakcli clone vm` command to create a snap clone of an existing virtual machine.

Example

Create a snap clone named `myol15u_test1` from a virtual machine named `myol15u_test`:

```
oakcli clone vm myol15u_test1 -vm myol15u_test1 -snap
```

Managing Virtual Machines

Deploy virtual machines on Oracle Database Appliance Virtualized Platform to run other workloads that are independent of databases running in ODA_BASE. Use

OAKCLI commands to create and manage virtual machines, including starting and stopping them, and opening consoles for graphical user interface (GUI) access.

Note: You can use a Virtual Network Computing (VNC) session to open a GUI console for a virtual machine.

Although it is possible to reconfigure an active virtual machine, your changes will not take effect until you stop and restart the virtual machine. You can display high-level information about all of your virtual machines or detailed information about the configuration of single virtual machines. When you no longer have use for a particular virtual machine, delete the virtual machine to regain storage.

Listing the Virtual Machines in Your Repositories

Use the `oakcli show vm` command to display a list of your existing virtual machines.

The command displays the name, the repository, and the current state (online or offline) for each virtual machine. The output also contains the default number of CPUs and default amount of memory that Oracle Database Appliance Virtualized Platform will assign to each virtual machine.

Examples

Displaying Details for All Virtual Machines

Display the virtual machine names, memory and vCPU allocations, status, virtual disks, and repository name for all virtual machines:

```
oakcli show vm
```

NAME	MEMORY	VCPU	STATE	REPOSITORY
----	-----	----	-----	-----
sample5_odarepo1	2048	2	OFFLINE	odarepo1
sample6_odarepo1	2048	2	OFFLINE	odarepo2
test1_odarepo1	2048	2	OFFLINE	odarepo1
test2_odarepo2	2048	2	OFFLINE	odarepo2
vm1_odarepo1	4096	4	ONLINE	odarepo1
vm2_odarepo2	2048	2	OFFLINE	odarepo2
win_vm1	1500	1	ONLINE	odarepo1

Displaying Information for a Single Virtual Machine

Display information about the `vm1_odarepo1` virtual machine:

```
oakcli show vm vm1_odarepo1
```

```
Resource: vm1_odarepo1
  AutoStart      : restore
  CPUPriority    : 100
  Disks          : |file:/OVS/Repositories/odarepo1/VirtualMachines/vm1_odarepo1/System.img,xvda,w|
                  |file:/OVS/Repositories/odarepo1/VirtualMachines/vm1_odarepo1/u01.img,xvdb,w|
  Domain        : XEN_PVM
  ExpectedState  : online
  FailOver       : false
  IsSharedRepo   : false
  Keyboard       : en-us
  MaxMemory      : 3000
```

```

MaxVcpu      :      4
Memory       :      4096
Mouse        :      OS_DEFAULT
Name         :      vm1_odarepo1
Networks     :      |mac=00:21:F6:00:00:E4|
NodeNum      :      0
NodeNumStart :
OS           :      OL_5
PrivateIP    :      None
ProcessorCap :      100
RepoName     :      odarepo1
State        :      Online
TemplateName :      otml_sample1_odarepo1
Vcpu         :      4
cpupool      :      twocpu
vncport      :      5901

```

Creating a Virtual Machine

You can create or *clone* virtual machines from imported templates (or assemblies) or from an existing virtual machine. A virtual machine can be a complete clone of the template or assembly, or it can be a snap clone, which contains only the metadata defined for the virtual machine.

See ["Creating Clones and Snap Clones of a Template"](#) for more details.

Configuring a Virtual Machine

Use the `oakcli configure vm` command to configure a virtual machine on Oracle Database Appliance Virtualized Platform.

Include a `-prefnode` clause, to identify the node where you want the virtual machine to run by default and a `-failover` clause to indicate if you want the virtual machine to use the other node when the preferred node is not available (either at startup or while already active).

If you reconfigure a virtual machine that is currently running, then your changes will not take effect until you stop and restart the virtual machine. See ["Starting and Stopping a Virtual Machine."](#)

For the complete command syntax, see `oakcli configure vm`.

Example

Set values for specific resources in the virtual machine named `myol15u_test`:

```

oakcli configure vm myol15u_test
-vcpu 2 -cpuprio 150 -cpucap 20 -memory 1G
-cpupool linpool -keyboard en-us -mouse USB_MOUSE

```

Parameter	Description
<code>-vcpu 2</code>	Sets two (2) as the number of CPUs to be assigned to the virtual machine when started
<code>-cpuprio 150</code>	Sets the CPU access priority to 150
<code>-cpucap 20</code>	Sets the maximum percentage of a CPU's capacity that will be assigned to the virtual machine to 20%
<code>-memory 1G</code>	Sets the amount of memory assigned when the virtual machine starts to 1 GB

Parameter	Description
<code>-cpupool linpool</code>	Specifies <code>linpool</code> as the CPU pool to be assigned to the virtual machine
<code>-keyboard en-us</code>	Defines the keyboard type used to access the virtual machine as <code>en-us</code>
<code>-mouse USB_MOUSE</code>	Defines the mouse type used to access the virtual machine as a USB mouse

These values will override values assigned to these same parameters in the virtual machine template from which this virtual machine was derived. The virtual machine will use default values for parameters that are not defined in either the parent template or in a configuration command.

Note: CPU capacity is controlled by the CPU pool assigned to a virtual machine by either the `-cpupool` parameter or by the default `unpinned_pool` (if the virtual machine is not configured with a `-cpupool` parameter). Values for `-vcpu` and `-maxvcpu` parameters that are larger than the number of CPUs in the assigned CPU pool are ignored.

See ["Managing CPU Pools on Oracle Database Appliance Virtualized Platform"](#) for more details.

Starting and Stopping a Virtual Machine

Use the `oakcli start vm` command to start a virtual machine on Oracle Database Appliance Virtualized Platform. Similarly, use the `oakcli stop vm` command to stop a virtual machine.

Note: If you reconfigure a virtual machine that is currently running, then your changes will not be effective until you stop and restart the virtual machine.

Externally Configuring a Virtual Machine

You can initially configure your virtual machines externally without connecting to the virtual machine console. This is done using Oracle VM Guest Additions by passing key-value pairs to the virtual machine. Use the `oakcli modify vm -s` command to pass parameters to the virtual machine:

```
# oakcli modify vm vmname-s 'key1:value1;key2:value2...'
```

Example

The following example has two value pairs:

```
oakcli modify vm vm016u3 -s
'com.oracle.linux.network.device.0:eth0;com.oracle.linux.network.ipaddr.0:192.1.2.18'
```

See Also

- Refer to the section *"Using the Oracle VM Guest Additions"* in the *Oracle VM Utilities Guide for x86* for more information about Oracle VM Guest Additions.

- Refer to the whitepaper *Oracle Database Appliance: Automated Virtual Machine Provisioning* for more information.

<http://www.oracle.com/technetwork/database/database-appliance/overview/oda-automatedvmprovisioning-2348232.pdf>

Opening a Virtual Machine Console for a Virtual Machine

To open a virtual machine console window for an active virtual machine, run the Oracle Appliance Manager `oakcli show vmconsole` command. If the console does not display correctly, then close the console, set the `DISPLAY` environment variable to an appropriate value for your monitor, and then rerun the `oakcli show vmconsole` command.

You can also configure your virtual machine (using `oakcli modify vm` command with the `-s` parameter) to allow access from the OAKCLI command line instead of a GUI virtual machine console.

Example

Open a console for the virtual machine named `vm1_odarepo1`:

```
oakcli show vmconsole vm1_odarepo1
```

Creating an Image for a New Virtual Machine

Use the `oakcli clone vm` command to create an image for a new virtual machine on Oracle Database Appliance Virtualized Platform. By default, the image inherits the content and configuration information from the template or from the virtual machine that you are cloning and resides in the same repository as the source. Unless you are using local repositories for your virtual machines, include the `-node` clause in the `oakcli clone` command to identify the node that should run the cloning process. To create a snap clone, which will only contain the configuration metadata, include the `-snap` clause in the `oakcli clone` command.

See Also

[oakcli clone commands](#)

Setting Up a Virtual Machine for Access from eth0 Using an IP Address

The following set of commands configures the virtual machine `vmol6u3` (which has `ovmd`) with the IP address `192.168.16.51` for the `eth0` interface and sets the root password to `password123a`.

```
oakcli clone vm vmol6u3 -vmtemplate ol6u3 -repo shrepo -node 0
oakcli modify vm vmol6u3 -addnetwork priv1
oakcli start vm vmol6u3
oakcli modify vm vmol6u3 -s 'com.oracle.linux.network.device.0:eth0'
oakcli modify vm vmol6u3 -s 'com.oracle.linux.network.onboot.0:yes'
oakcli modify vm vmol6u3 -s 'com.oracle.linux.network.bootproto.0:static'
oakcli modify vm vmol6u3 -s 'com.oracle.linux.network.ipaddr.0:192.168.16.51'
oakcli modify vm vmol6u3 -s 'com.oracle.linux.network.netmask.0:255.255.255.0'
oakcli modify vm vmol6u3 -s 'com.oracle.linux.root-password:password123'
oakcli modify vm myol5u_test -attachvdisk sdisk1
oakcli delete vm myol5u_test
```

Adding or Removing a Virtual Disk to or from a Virtual Machine

To add or remove a virtual disk, use the `oakcli modify vm vm_name` command with an `-attachvdisk` or a `-detachvdisk` clause that names the virtual disk.

Removing a Virtual Machine from a Shared Repository

When you no longer have use for a particular virtual machine, use the `oakcli delete vm` command to delete the virtual machine to reclaim storage and resources.

Example

Delete the `ovu22` virtual machine from node 1:

```
oakcli delete vm ovu22 -server 1
```

Performing a Live Migration for an Oracle Database Appliance Virtual Machine

Live Migration refers to the process of moving a running virtual machine between physical machines without disconnecting the client or application running in the virtual machine. Memory, storage, and network connectivity of the virtual machine are transferred from the original host machine to the destination.

Here are the requirements for performing a live migration:

- The virtual machine must be on a shared repository and the repository must be online on both nodes.
- The virtual machine must be running.
- The destination host must have the required resources (memory, CPUs and so on) for successful migration.
- The destination host must have a CPU pool with the same name as the CPU pool of the virtual machine that is being migrated.

Migrating a Virtual Machine from the Currently Running Node to Another Node

Use the `oakcli migrate vm vmname` command to migrate a virtual machine from the currently running node to another node. `vmname` is the name of the virtual machine to be migrated.

When you run this command, the virtual machine must be online and corresponding, and the shared repository must be online on both nodes. If a virtual machine is in the migration process, then OAKCLI will display the virtual machine state as `MIGRATING`.

Managing High Availability on Oracle Database Appliance Virtualized Platform

A system that is highly available is designed to provide uninterrupted computing services during essential time periods, during most hours of the day, and during most days of the week throughout the year. Reliability, recoverability, timely error detection, and continuous operations are primary characteristics of a highly available solution. Two essential parts of high availability are automatic restart and failover.

Unless you are using local repositories, you can set high availability options for your virtual machines. High availability options identify the node where the virtual machine should be started by default and whether the virtual machine should be failed over to the other node. Failover can occur if the node where the virtual machine

is already running fails or if the preferred node is not available when the virtual machines attempt to start.

Configuring Automatic Restart for High Availability

A virtual machine automatically restarts after a hardware or software failure or whenever your database host computer restarts. Use the `oakcli configure vm` command to start a virtual machine on a preferred node by setting the `-prefnode` parameter.

Configuring Failover for High Availability

Failover lets the virtual machine be restarted on the other node with no manual intervention in the event of an unplanned node failure. Use the `-failover` parameter with the `oakcli configure vm` command to enable a virtual machine to fail over from one node to another.

Managing CPU Pools on Oracle Database Appliance Virtualized Platform

Workloads are isolated by creating CPU pools and assigning (pinning) virtual machines to a specific CPU pool. When you pin a virtual machine to a CPU pool, you ensure that the virtual machine will use CPUs in only that CPU pool.

When you initially configure Oracle Database Appliance Virtualized Platform, a default-unpinned-pool is created on each node. The size of this pool depends on the hardware model as follows:

- On Oracle Database Appliance X5-2 Virtualized Platform, the default-unpinned-pool contains 72 CPUs.
- On Oracle Database Appliance X4-2 Virtualized Platform, the default-unpinned-pool contains 48 CPUs.
- On Oracle Database Appliance X3-2 Virtualized Platform, the default-unpinned-pool contains 32 CPUs.
- On Oracle Database Appliance Version 1 Virtualized Platform, the default-unpinned-pool contains 24 CPUs.

When you create the ODA_BASE domain, a new CPU pool, named `odaBaseCpuPool`, is created on both nodes and the required CPUs are removed from the default-unpinned-pool. ODA_BASE is the only domain allowed to use the CPUs in the `odaBaseCpuPool`. When you start other virtual machines, they run on CPUs that were left in the default-unpinned-pool, effectively removing ODA_BASE from the work being done by other virtual machines.

You might also cage groups of virtual machines by creating additional CPU pools. These additional pools enable you to pin a virtual machine, or a set of virtual machines, to its own CPU pool. Virtual machines running in a specific CPU pool do not share CPU cycles with virtual machines running in other CPU pools. Define as many CPU pools as you want, up to the number of available CPUs on your system.

If your application requirements change over time, then you should resize, add, or drop CPU pools as needed. Resize ODA_BASE if necessary, although this requires a special command that also updates your Oracle Database Appliance Virtualized Platform license. See "[Resizing ODA_BASE](#)" for details.

A CPU pool can have a different size on each node (except for the `odaBaseCpuPool`), as shown by the following `oakcli show cpupool` commands, one for each node:

```
oakcli show cpupool -node 0
      Pool                               Cpu List
default-unpinned-pool  [14, 15, 16, 17, 18, 19, 20, 2
                               1, 22, 23]
      twocpu                               [12, 13]
odaBaseCpuPool         [0, 1, 2, 3, 4, 5, 6, 7, 8, 9,
                               10, 11]

oakcli show cpupool -node 1
      Pool                               Cpu List
default-unpinned-pool  [12, 13, 14, 15, 16, 17, 18, 1
                               9, 20, 21, 22, 23]
odaBaseCpuPool         [0, 1, 2, 3, 4, 5, 6, 7, 8, 9,
                               10,11]
```

For commands to manage CPU pools, other than `odaBaseCpuPool`, see ["Creating a New CPU Pool on Oracle Database Appliance Virtualized Platform Nodes."](#)

Over-Subscribing CPU Pools

A CPU can belong to one and only one CPU pool, although you can assign multiple virtual machines to a CPU pool. A CPU pool becomes oversubscribed when the virtual machines that are active in the pool require more CPUs than you configured for the pool. For example, if a CPU pool has four CPUs, then you might start two virtual machines that have been defined to use four CPUs each. In this case, the CPU pool is oversubscribed because each of the four CPUs is supporting two virtual machines. Similarly, if you stop one of those virtual machines but start another one that requires two CPUs, then the CPU pool is still oversubscribed because two of the CPUs are supporting both virtual machines. When oversubscribing a CPU pool, you need to assess the performance of the virtual machines in that pool. You should be prepared to reassign one or more virtual machines to a different CPU pool if sharing an oversubscribed pool degrades performance to unacceptable levels.

Creating a New CPU Pool on Oracle Database Appliance Virtualized Platform Nodes

Use the `oakcli create cpupool` command to create a CPU pool.

Example

Create a CPU pool named `winpool` with 4 CPUs on Node 0:

```
oakcli create cpupool winpool -numcpu 4 -node 0
```

Changing the Number of CPUs Assigned to a CPU Pool on Oracle Database Appliance Virtualized Platform Nodes

Use the `oakcli configure cpupool` command to change the number of CPUs assigned to a CPU pool.

Example

Change the number of CPUs assigned to the CPU pool named `linpool` on Node 1. After the command runs, the new number of CPUs will be six.

```
oakcli configure cpupool linpool -numcpu 6 -node 1
```


Showing the CPU Pools Configured on Oracle Database Appliance Virtualized Platform Nodes

Use the `oakcli show cpupool` command to display the CPUs assigned to each defined CPU pool. The command also lists the virtual machines, if any, assigned to each CPU pool.

Example

Show the CPUs assigned to each defined CPU pool on Node 0.

```
oakcli show cpupool -node 0
```

Assigning a Virtual Machine to a CPU Pool on Oracle Database Appliance Virtualized Platform

Use the `oakcli configure vm` command to assign a virtual machine to a CPU pool.

Example

Pin the virtual machine named `wintest` to the CPU pool named `winpool`:

```
oakcli configure vm wintest -cpupool winpool
```

Note: If your virtual machine is assigned to a specific CPU pool and is allowed to fail over, then the virtual machine will try to use the same CPU pool on the secondary node. If the CPU pool exists but is a different size, then the performance of your virtual machine might be affected when it runs on the secondary node. If the assigned CPU pool does not exist on the secondary node, then the virtual machine will not fail over.

Note: Do not manage `odaBaseCpuPool` with `oakcli cpupool` commands. Instead, use commands that configure `ODA_BASE`, as discussed in ["Resizing ODA_BASE."](#)

About Network Infrastructure and Virtual Local Area Networks on Oracle Database Appliance Virtualized Platform

To specify which network should access a virtual machine, you employ network infrastructure components of Oracle Database Appliance Virtualized Platform. This section describes these infrastructure components.

Oracle Database Appliance Virtualized Platform manages all the high-level network infrastructure components for you by precreating the bonds and bridges for all networks. The front-end point for accessing a virtual machine will be one of the bridges defined for `Dom0`.

The following tables show the default network interfaces categorized by hardware as listed here:

- [Table 3–1](#) and [Table 3–2](#) list the default network interfaces for Oracle Database Appliance Virtualized Platform on Oracle Database Appliance X3-2 and later (systems with an external storage shelf).

- [Table 3–3](#) lists the default network interfaces for Oracle Database Appliance Virtualized Platform on Oracle Database Appliance version 1 (systems without an external storage shelf).

In all cases, connections to user domains are through the selected interfaces.

Table 3–1 Oracle Database Appliance Virtualized Platform Dual Port 10-GbE Network Interfaces (Oracle Database Appliance X3-2 and later)

Interfaces at Dom0	Bond Devices at Dom0	Bridge in Dom0	Interfaces in ODA_BASE Domain
1. eth0	icbond0	priv1	eth0
2. eth1			

Table 3–2 Oracle Database Appliance Virtualized Platform On Board Quad Port 10-GbE Network Interfaces (Oracle Database Appliance X3-2 and Later)

Interfaces at Dom0	Bond Devices at Dom0	Bridge in Dom0	Interfaces in ODA_BASE Domain
1. eth2	bond0	net1	eth1
2. eth3			
1. eth4	bond1	net2	eth2
2. eth5			

Note: If you define a fiber (instead of copper) public network connection, then bond0 is configured on PCIe boards.

Table 3–3 Oracle Database Appliance Version 1 Virtualized Platform Network Interfaces

Type	Interfaces at Dom0	Bond Devices at Dom0	Bridge in Dom0	Interfaces in ODA_BASE Domain
Private	eth0 eth1	bond0	priv1	eth0
On Board Public	eth2 eth3	bond1	net1	eth1
1st Pair Quad Port	eth4 eth5	bond2	net2	eth2
2nd Pair Quad Port	eth6 eth7	bond3	net3	eth3
10-GbE Interface	eth8 eth9	xbond0	net4	eth4

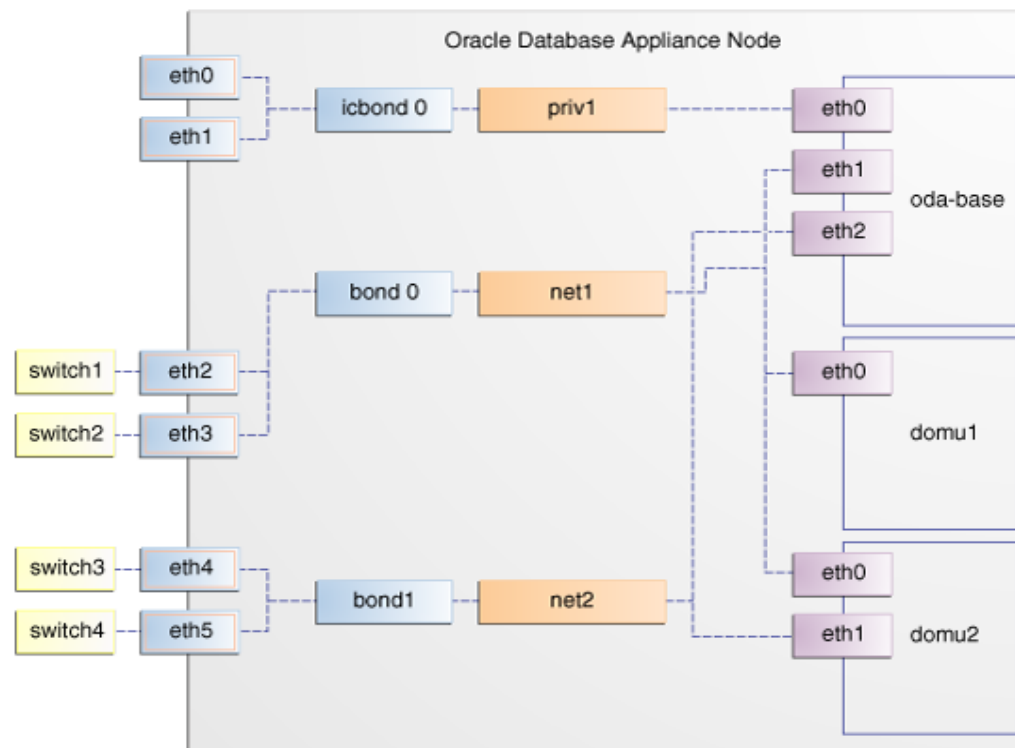
Note: If you define a fiber (instead of copper) public network connection, then bond0 is configured on PCIe boards.

When you configure a virtual machine, you define which network the virtual machine should use by identifying the related bridge. For example, to connect a virtual machine named `myvm1` to the `net1` network, you would use the following command:

```
oakcli modify vm myvm1 -addnetwork net1
```

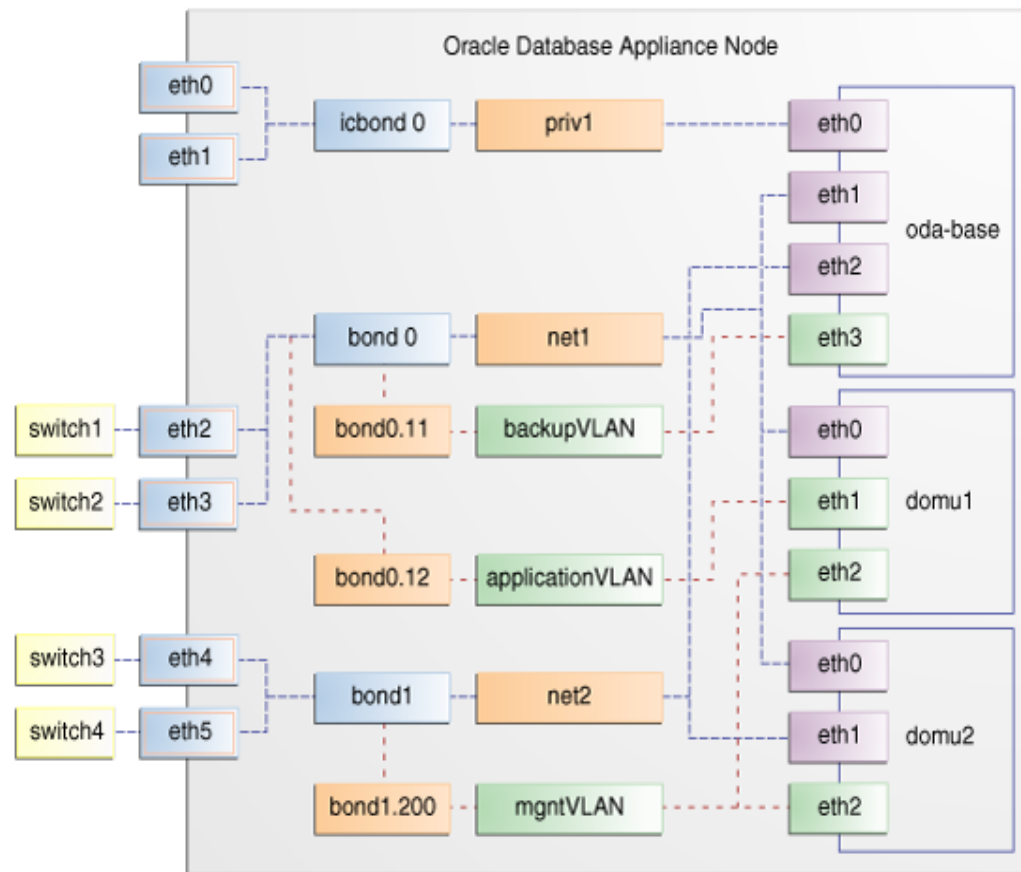
Figure 3–3 shows a typical Oracle Database Appliance configuration based on the preceding information.

Figure 3–3 Basic Virtual Machine Local Area Network



You assign default Virtual Local Area Networks (VLANs) to ODA_BASE during the installation and configuration of Oracle Database Appliance Virtualized Platform. Figure 3–4 shows a typical Oracle Database Appliance configuration using VLANs. The illustration shows the same configuration as Figure 3–3 but with three tagged VLANs added for backups (backup), for applications (application), and for management (mgnt).

Figure 3–4 Oracle Database Appliance Virtualized Platform with Virtual Local Area Networks



See "Managing Virtual Local Area Networks on User Domains and on ODA_BASE," for instructions on how to create new or remove existing VLANs in ODA_BASE and in your user domains respectively.

Managing Virtual Local Area Networks on User Domains and on ODA_BASE

To manage VLANs for user domains, log in to ODA_BASE; to manage VLANs for ODA_BASE, log in to Dom0. The examples in this section use a VLAN named sample10.

Note: You can create VLANs from Dom0 only before your deployment of Oracle Database Appliance or Oracle Database Appliance Virtualized Platform.

Creating a Virtual Local Area Network

Use the `oakcli create vlan` command to create a VLAN. Provide the following information:

- A VLAN name that is unique on the node where the VLAN is created (but which can be the same as a VLAN name on the other node of Oracle Database Appliance Virtualized Platform).

- A VLAN tag number between 2 to 4096 inclusive that is unique on the node where the VLAN is created (but which can be the same as a VLAN tag number on the other node of Oracle Database Appliance Virtualized Platform).
- The name of the interface on which the VLAN is to be created. Find the available interfaces for your hardware listed in the *Bond Devices at Dom0* column in either [Table 3-2](#) or [Table 3-3](#).
- The node on which to create the VLAN

Note: Create the same VLAN on both nodes, if needed, by issuing the `oakcli create vlan` command twice, once for node 0 and once for node 1.

Example

Create the `sample10` VLAN on node 0:

```
oakcli create vlan sample10 -vlanid 10 -if bond0 -node 0
```

Caution: If you are planning to use a VLAN with a virtual machine created in a shared repository, then you should create that VLAN on both nodes. A virtual machine fails if an assigned network is not available on the node where the virtual machine is trying to run by default or following a failover.

Assigning and Removing a Virtual Local Area Network for a User Domain

Use the `oakcli modify vm` command with an `-addnetwork` clause to assign an existing VLAN to a virtual machine and with a `-deletenetwork` clause to remove a VLAN from a virtual machine. The clauses must also contain the name of the VLAN.

Example

Assign the `sample10` VLAN to the `myol5u_test` virtual machine:

```
oakcli modify vm myol5u_test -addnetwork sample10
```

Assigning and Removing a Virtual Local Area Network for ODA_BASE

Use the `oakcli configure oda_base` command to add an existing VLAN to ODA_BASE or to remove a VLAN from ODA_BASE. Note that this command will also let you resize ODA_BASE and domain memory size. If you only want to manage VLANs, then enter the number that corresponds to the number of your current CPU cores and the current number for your memory.

In the following partial example, the CPU core count and default memory values are left unchanged, while the `test01` VLAN is assigned to ODA_BASE. Note that the current CPU core count, 6, corresponds to selection number 3 in the Core Licensing Options list of values.

```
# oakcli configure oda_base
Core Licensing Options:
  1. 2 CPU Cores
  2. 4 CPU Cores
  3. 6 CPU Cores
  4. 8 CPU Cores
  5. 10 CPU Cores
  6. 12 CPU Cores
Current CPU Cores      :6
```

```
Selection[1 : 6](default 12 CPU Cores) : 3
ODA base domain memory in GB(min 8, max 88) (Current Memory 48G) [default
64]      : 48
INFO: Using default memory size i.e. 64 GB
Additional vlan networks to be assigned to oda_base? (y/n) [n]: y
Select the network to assign (test00,test01,test02,test03): test01
Additional vlan networks to be assigned to oda_base? (y/n) [n]:
Vlan network to be removed from oda_base (y/n) [n]:
INFO: . . .
```

Viewing Virtual Local Area Networks

To see what VLANs currently exist in ODA_BASE, run the `oakcli show vlan` command.

Example

Show VLANs in addition to the `sample10` VLAN used in previous examples:

```
oakcli show vlan
```

NAME	ID	INTERFACE	NODENUM
----	--	-----	-----
net1	1	bond0	0
net1	1	bond0	1
net2	1	bond1	0
net2	1	bond1	1
net3	2	bond1	0
net3	4	bond0	1
net10	20	bond1	0
net10	20	bond1	1

Deleting Virtual Local Area Networks

To remove an unwanted VLAN from a node, use the `oakcli delete vlan` command and provide the VLAN name and the node number.

Example

Remove the `sample10` VLAN from node 0 (where the VLAN was assigned in the earlier `oakcli create vlan` example):

```
oakcli delete vlan sample10 -node 0
```

Note: You cannot delete a native VLAN, that is, a virtual local area network configured during the deployment of Oracle Database Appliance Virtualized Platform software.

Resizing ODA_BASE

Increase the number of CPU cores assigned to the ODA_BASE domain on Oracle Database Appliance Virtualized Platform if you need more computing power or memory for your installed Oracle databases. Alternatively, decrease the CPU cores if you need more CPUs assigned to your virtual machine domains. You must increase or decrease the assigned CPU core count on each node by two or multiples of two.

Oracle recommends that you use templates to size the databases that you deploy in ODA_BASE, following the guidelines in *Appendix A* of the Oracle Database Appliance Getting Started Guide. Sum the number of CPUs that these databases require, using

the tables in that appendix, and divide the value by two to determine the number of CPU cores you will need for ODA_BASE.

Plan to change your ODA_BASE core count when there is no critical activity running on your Oracle databases. This is because the ODA_BASE domain shuts down during the resizing process. When you are ready to proceed, complete these steps:

1. Log in to Dom0 and run the `oakcli configure oda_base` command as shown in this example, which changes the CPU core count from six to eight in ODA_BASE:

```
# oakcli configure oda_base
Core Licensing Options:
  1. 2 CPU Cores
  2. 4 CPU Cores
  3. 6 CPU Cores
  4. 8 CPU Cores
  5. 10 CPU Cores
  6. 12 CPU Cores
Current CPU Cores      :6
Selection[1 : 6](default 12 CPU Cores) : 10
ODA base domain memory in GB(min 8, max 88)(Current Memory 64G)[default
32]      :
INFO: Using default memory size i.e. 32 GB
Additional vlan networks to be assigned to oda_base? (y/n) [n]:
Vlan network to be removed from oda_base (y/n) [n]
INFO: Node 0:Configured oda base pool
INFO: Node 1:Configured oda base pool
INFO: Node 0:ODA Base configured with new memory
INFO: Node 0:ODA Base configured with new vcpus
INFO: Changes will be incorporated after the domain is restarted on Node 0
INFO: Node 1:ODA Base configured with new memory
INFO: Node 1:ODA Base configured with new vcpus
INFO: Changes will be incorporated after the domain is restarted on Node 1
```

2. Perform any actions listed in the output from the command. Not all versions of the software, such as the one shown in the preceding example, require any additional actions before restarting ODA_BASE.
3. Restart the domain to implement the changed configuration for ODA_BASE by running the following restart command on Dom0 of both nodes:

```
oakcli restart oda_base
```

Oracle Appliance Manager Command-Line Interface

This chapter describes the content and use of the Oracle Appliance Manager command-line interface known as OAKCLI. The current set of `oakcli` commands along with their syntax and usage notes are included, as well as examples of many of the commands.

About Oracle Appliance Manager Command-Line Interface

OAKCLI is a command line interface (CLI) dedicated to Oracle Database Appliance that allows you to:

- List the hardware components
- Validate and diagnose the hardware components
- Install and upgrade software
- Apply software patches
- Create and drop databases
- Install and uninstall Oracle Homes
- Deploy and manage virtual machines

Depending on your version of Oracle Appliance Manager and your hardware, some of the commands described in this chapter may not be available to you. To see which `oakcli` commands are supported on your version of Oracle Appliance Manager and your hardware, enter the following command: `oakcli -h`.

Oracle Appliance Manager Command-Line Interface Operational Notes

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

```
/opt/oracle/oak/bin/oakcli
```

The `root` user account should have the `oakcli` `PATH` variable defined as the path to the directory where `oakcli` is located.

Oracle Database Appliance maintains logs of `oakcli` command executions and output in the following directory.

```
/opt/oracle/oak/log/hostname/client/oakcli.log
```

Syntax

Oracle Appliance Manager command-line interface commands and parameters are not case-sensitive. An `oakcli` command uses the following command syntax:

```
oakcli command object [parameters]
```

In `oakcli` syntax:

- *command* is a verb such as `show`, `locate`, `apply`, and so on
- *object* (also known as a noun) is the target or object on which the `oakcli` command performs the operation, such as a disk or controller. You can also use object abbreviations.
- *parameters* extend the use of a preceding command combination to include additional options for the command. Parameter names are preceded with a dash. `-h`, which is the help parameter, is available with every command.

Using Oracle Appliance Manager Command-Line Interface Help

Run the following command to see the usage information for all `oakcli` commands:

```
oakcli -h
```

Run the following command to see detailed help about a specific `oakcli` command:

```
oakcli command -h
```

Run the following command to see detailed help about a specific `oakcli` command's objects and its options:

```
oakcli command object -h
```

Privileges and Security

You should typically use Oracle Appliance Manager command-line interface when logged in to Oracle Database Appliance as the `root` user. If you are not logged in as `root`, then you will be unable to complete particular tasks. For example, you could view storage information but not modify the storage configuration.

Allowing Root User Access in SUDO

In environments where the system administration is handled by a different group than the database administration or where security is a large concern, you may want to limit access to the `root` user account and password. SUDO allows a system administrator to give certain users (or groups of users) the ability to run commands as `root` while logging all commands and arguments.

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 SUDO administration.

Caution: Configuring SUDO to allow a user to perform any operation is equivalent to giving that user `root` privileges. Consider carefully if this is appropriate for your security needs.

SUDO Example 1: Allow a User to Perform Any OAKCLI Operation

To configure SUDO to allow a user to perform any OAKCLI operation, add lines to the commands section in the `/etc/sudoers` file as follows:

```
## The commands section may have other options added to it.
##
Cmd_Alias OAKCLI_CMDS=/opt/oracle/oak/bin/oakcli *
jdoe ALL = OAKCLI_CMDS
```

In this example, `jdoe` is the user name. `ALL= OAKCLI_CMDS` grants the `jdoe` user permission to run all `oakcli` commands defined in the command alias `OAKCLI_CMDS`. The `sudoers` file is designed so that one `sudoers` file can be copied to multiple hosts with different rules on each host.

Note: Note the SSH equivalent must already be set up or the root password will be required during database creation.

After you configure the `sudoers` file with the user, the `oakcli` commands can be run by `jdoe` as follows:

```
[jdoe@servernode1 ~]$ sudo /opt/oracle/oak/bin/oakcli create database -db newdb

INFO: 2015-08-05 14:40:55: Look at the logfile
'/opt/oracle/oak/log/scaoda1011/tools/12.1.2.4.0/createdb_newdb_91715.log' for
more details
INFO: 2015-08-05 14:40:59: Database parameter file is not provided. Will be using
default parameters for DB creation

Please enter the 'SYSASM' password : (During deployment we set the SYSASM
password to 'welcome1'):
Please re-enter the 'SYSASM' password:
INFO: 2015-08-05 14:41:10: Installing a new home: OraDb12102_home3 at
/u01/app/oracle/product/12.1.0.2/dbhome_3

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

SUDO Example 2: Allow a User to Perform Only Selected OAKCLI Operations

To configure SUDO to allow a user to perform only selected OAKCLI operations, add lines to the commands section in the `/etc/sudoers` file as follows:

```
[jdoe2@servernode1 ~]$ sudo /opt/oracle/oak/bin/oakcli create database -db test
INFO: 2015-09-30 15:49:07: Look at the logfile
'/opt/oracle/oak/log/servernode1/tools/12.1.2.4.0/createdb_test_59955.log' for
more details
INFO: 2015-09-30 15:49:12: Database parameter file is not provided. Will be using
default parameters for DB creation

Please enter the 'SYSASM' password : (During deployment we set the SYSASM
password to 'welcome1'):
Please re-enter the 'SYSASM' password:
INFO: 2015-09-30 15:49:27: Installing a new home: OraDb12102_home2 at
/u01/app/oracle/product/12.1.0.2/dbhome_2

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

Here the user `jdoe2` tries to run the `oakcli show databases` command and gets an error message:

```
[jdoe2@servernode1 ~]$ sudo /opt/oracle/oak/bin/oakcli show database
Sorry, user jdoe2 is not allowed to execute '/opt/oracle/oak/bin/oakcli
show database' as root on servernode1.
```

Note: The SSH equivalent must already be set up or the root password will be required during database creation.

See Also

For more information about configuring and using SUDO, refer to the SUDO man pages at <http://www.sudo.ws/sudo.html>

oakcli Commands

The remainder of this chapter contains syntax and other details about the `oakcli` commands available in this release, sorted alphabetically.

Here is a list of the commands in this release.

oakcli add disk -local

Adds a local disk to the system after the physical replacement of a failed disk. This command is available only for Oracle Database Appliance V1, X4-2, and X3-2.

oakcli apply

Reconfigures Oracle Database Appliance core capacity. This command applies only to bare metal implementations.

oakcli clone commands

Commands to clone virtual machines and virtual disks.

oakcli configure commands

Commands for configuring Oracle Database Appliance components.

oakcli copy

Prepares a copy of the configuration file for use during deployment.

oakcli create commands

Commands for creating Oracle Database Appliance components.

oakcli delete commands

Commands for removing Oracle Database Appliance components.

oakcli deploy

Deploys Oracle Database Appliance.

oakcli diskwritecache

Manages disk write cache.

oakcli import vmtemplate

Imports a virtual machine template.

oakcli locate disk

Locates a shared disk on a storage shelf by turning on an indicator light.

oakcli manage diagcollect

Collects diagnostic statistics and information, primarily for use when working with Oracle Support.

oakcli migrate vm

Migrates a currently running virtual machine to another node.

oakcli modify

Attaches and detaches virtual disks to and from virtual machines, transmits first-boot installation messages to virtual machines, and assigns and deletes networks from virtual machines and virtual machine templates.

oakcli orachk

Audits configuration settings.

oakcli resize dbstorage

Resizes the space used for an ACFS storage structure.

oakcli restart oda_base

Restarts ODA_BASE on the local node.

oakcli show commands

Commands for displaying information about various Oracle Database Appliance components.

oakcli start commands

Commands for starting a Domain U or ODA_BASE virtual machine.

oakcli stop command

Commands to stop a virtual machine, stop a shared repository on a node, or to stop ODA_BASE on the local node.

oakcli stordiag

Runs tests on a storage shelf or storage expansion shelf device.

oakcli test asr

Checks if Oracle Auto Service Request (Oracle ASR) is functioning properly.

oakcli unpack

Unpacks the given package to the Oracle Appliance Manager command-line interface repository.

oakcli update

Updates software such as the infrastructure, grid infrastructure, and database, and verifies patching.

oakcli upgrade

Upgrades Oracle databases on Oracle Database Appliance.

oakcli validate

Validates the state of Oracle Database Appliance or the viability of an operating system patch.

oakcli add disk -local

Use the `oakcli add disk -local` command to add a local disk to the system after physically replacing a failed disk.

Note: This command is available only for Oracle Database Appliance X4-2, X3-2, and V1

Syntax

```
oakcli add disk -local
```

Usage Notes

- You cannot add more than two disks per node.
- You must remove the failed drive and replace it with a new drive before running the `oakcli add disk -local` command.
- The new disk must be inserted into the slot before you run this command.
- The `oakcli add disk -local` command is supported only on bare metal deployments. It is not supported on virtualized configurations.

oakcli apply

Use the `oakcli apply` command from Node 0 to reconfigure your Oracle Database Appliance core capacity.

Syntax

Use the following syntax where *core_config_key_file* is the full path name of a configuration key file generated on My Oracle Support and copied to Oracle Database Appliance:

```
oakcli apply core_configuration_key core_config_key_file [-h]
```

Parameters

Parameter	Description
<i>core_config_key_file</i>	Identifies the full path and name of the configuration key file
-h	(Optional) Display help for using the command.

Usage Notes

- Run the `oakcli apply` command from the first node in Oracle Database Appliance as the root user.
- After you run the `oakcli apply` command, Oracle Database Appliance applies the key to both nodes and reboots both nodes.
- Run the `oakcli show core_config_key` command to view the core configuration key. See [oakcli show core_config_key](#).
- The core key application is applicable only to bare metal implementations. It is not available on Oracle Database Appliance Virtualized Platform.

Example

Reconfigure Oracle Database Appliance with a new core count using the configuration key file `/tmp/set8cores.conf`:

```
oakcli apply core_configuration_key /tmp/set8cores.conf
.....done
INFO: Cluster will be rebooted after applying the core_configuration_key
successfully
INFO: .....

INFO: Applying core_configuration_key on '192.0.2.21'
INFO: .....
INFO: Running as root: /usr/bin/ssh -l root 192.0.2.21 /tmp/tmp_lic_exec.pl
INFO: Running as root: /usr/bin/ssh -l root 192.0.2.21 /opt/oracle/oak/bin/oakcli
enforce core_configuration_key /tmp/.lic_file
INFO: Applying core_configuration_key on '192.0.2.20'

INFO: .....
INFO: Running as root: /usr/bin/ssh -l root 192.0.2.20 /tmp/tmp_lic_exec.pl
INFO: Running as root: /usr/bin/ssh -l root 192.0.2.20 /opt/oracle/oak/bin/oakcli
enforce core_configuration_key /tmp/.lic_file
INFO: Applying core_configuration_key on '192.0.2.20'
```

oakcli clone commands

Use the `oakcli clone` commands to clone virtual machines or virtual disks.

oakcli clone vdisk

Use the `oakcli clone vdisk` command to create clones of virtual disks.

Syntax

```
oakcli clone vdisk new_vdisk_name -repo repo_name -src source_vdisk_name [-h]
```

Parameters

Parameter	Description
<i>new_vdisk_name</i>	Name given to the clone virtual disk
<i>repo_name</i>	Name of the repository source for the virtual disk being cloned
<i>source_vdisk_name</i>	Name of the virtual disk being cloned
<code>-h</code>	(Optional) Display help for using the command.

Example

Clone a virtual disk named `my_vdisk2` from an existing virtual disk named `vdisk1` that is stored in the repository named `vrepo1`:

```
oakcli clone vdisk my_vdisk2 -repo vrepo1 -src vdisk1
```

oakcli clone vm

Use the `oakcli clone vm` command to create clones and snap clones of virtual machines.

Syntax

To create a virtual machine from a template:

```
oakcli clone vm vm_name -vmtemplate template_name -repo repo_name [-node 0|1][h]
```

To create a snapshot clone of an existing virtual machine:

```
oakcli clone vm vm_name -vm src_name -snap
```

To create a virtual machine snapshot from a template:

```
oakcli clone vm vm_name -vmtemplate template_name -snap
```

Parameters

Parameter	Description
<code>vm_name</code>	Name given to the cloned virtual machine
<code>-vmtemplate template_name</code>	Name of the template containing the virtual machine that you want to clone
<code>-repo repo_name</code>	Name of the repository that contains the template being cloned
<code>-node 0 1</code>	Identifies the Oracle Database Appliance node that contains the shared repository from which the virtual machine is to be cloned The <code>-node</code> parameter must be used when you clone from a shared repository. The <code>-node</code> parameter is invalid for non-shared repositories.
<code>-vm src_name</code>	Name of the virtual machine that is to be cloned
<code>-snap</code>	Creates a snapshot of the source virtual machine or virtual machine template
<code>-h</code>	(Optional) Display help for using the command.

Example

Create a virtual machine image named `myol6u_test` from the virtual machine template named `myol6u_15gb1`, which is stored in the shared repository named `repo2` on Node 0:

```
oakcli clone vm myol6u_test -vmtemplate myol6u_15gb1 -repo repo2 -node 0
```

oakcli configure commands

Use the `oakcli configure` commands to configure components on Oracle Database Appliance.

oakcli configure additionalnet

Configures any unconfigured public networks in Bare Metal, Domain 0, and ODA_BASE

oakcli configure asr

Configures Oracle Auto Service Request (Oracle ASR) for Oracle Database Appliance

oakcli configure cpupool

Configures a CPU pool

oakcli configure firstnet

Configures initial network connection

oakcli configure ib2fiber

Configures 10GbE SFP+ (fiber) cards after they have been replaced by InfiniBand cards

oakcli configure network

Configures the network after either replacing a network card or swapping the public network from copper to fiber and vice versa

oakcli configure oda_base

Configures CPU core count, memory allocation, virtual local area networks for ODA_BASE

oakcli configure repo

Configures a shared repository by increasing its size

oakcli configure vm

Configures a virtual machine

oakcli configure vmtemplate

Configures a virtual machine template

oakcli configure additionalnet

Use the `oakcli configure additionalnet` command to configure any unconfigured public networks in bare metal, Domain 0, and ODA_BASE. This command automatically detects any unconfigured networks and runs a script which guides you through how to configure the network.

Syntax

```
oakcli configure additionalnet [-h]
```

Parameter

-h displays online help for using the command.

Usage Notes

The `oakcli configure additionalnet` command runs an interactive script that requires the following input:

- Interface name

- DHCP [Y/N]
- IP
- Netmask

Note: If you are running the command on a bare metal deployment, then the interface name expects a bond name. If you are running the command on Dom0, then the interface name expects a net name. If you are running the command on Dom1, then the interface name expects an eth name.

oakcli configure asr

Use the `oakcli configure asr` command to configure Oracle Auto Service Request (Oracle ASR) on Oracle Database Appliance.

Syntax

```
oakcli configure asr [-h]
```

Parameter

`-h` displays help for using the command.

Usage Notes

- The `oakcli configure asr` command initiates an interactive script that requests the following information to implement Oracle ASR on Oracle Database Appliance:
 - Action to be performed (internal or external install, deinstall, or reconfigure)
 - PROXY server name, port, user ID, and password
 - Oracle ASR user ID and password
 - Oracle ASR Manager IP and port

Example

```
# oakcli configure asr

INFO    : Logging all actions in
/opt/oracle/oak/onecmd/tmp/scaoda1011-20150805153300.log and traces in
/opt/oracle/oak/onecmd/tmp/scaoda1011-20150805153300.trc

Please enter
1 to setup Internal ASR
2 to setup External ASR
3 to Deinstall ASR
0 to Exit

[1]:INFO    : Logging all actions in
/opt/oracle/oak/onecmd/tmp/scaoda1011-20150805153300.log and traces in
/opt/oracle/oak/onecmd/tmp/scaoda1011-20150805153300.trc
```

oakcli configure cpupool

Use the `oakcli configure cpupool` command to configure a CPU pool on one Oracle Database Appliance Virtualized Platform node.

Syntax

```
oakcli configure cpupool poolname -numcpu cpu_count -node nodenum [-h]
```

Parameters

Parameter	Description
<i>poolname</i>	Unique name for the CPU pool
-numcpu <i>cpu_count</i>	Number of CPUs for the CPU pool
-node <i>nodenum</i>	Node where the CPU pool will be created (0 or 1)
-h	(Optional) Display help for using the command.

Example

Configure a CPU pool named `twonode` with two cores on Node 1 of Oracle Database Appliance Virtualized Platform:

```
oakcli configure cpupool twonode -numcpu 2 -node 1
```

oakcli configure firstnet

Use the `oakcli configure firstnet` command to configure an initial network on Oracle Database Appliance that enables you to download deployment software.

Syntax

```
oakcli configure firstnet
```

Example

The `oakcli configure firstnet` command creates an initial network on a new Oracle Database Appliance using an interactive script. The following example shows how to configure the initial network on a bare metal Oracle Database Appliance:

```
oakcli configure firstnet
Select the interface to configure network on [bond0 bond1 bond2 xbond0]:bond0
Configure DHCP on bond0?(yes/no):no
INFO: Static configuration selected
Enter the IP address to configure:192.0.2.18
Enter the netmask address to configure:255.255.252.0
Enter the gateway address to configure:192.0.2.1
Plumbing the IPs now
Restarting the network
::::::::::::::::::::
```

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

oakcli configure ib2fiber

Run the `oakcli configure ib2fiber` command after replacing InfiniBand 10GbE SFP+ cards (fiber) cards and before deployment to unconfigure IB setup and configure fiber cards.

Note: The command is supported only on X5-2. If you are using Oracle Database Appliance Virtualized Platform, then you must execute the command from Dom0.

Usage Notes

This command must be run before deployment to configure 10GbE SFP+ (fiber) cards.

Syntax

```
oakcli configure ib2fiber [-h]
```

Parameter

-h displays help for using the command.

oakcli configure network

Use the `oakcli configure network` command to configure the network after either replacing a network card or swapping the public network from copper to fiber and vice versa. The meaning of the command changes depending on which parameter you use.

Syntax

```
oakcli configure network [-changeNetCard|-publicNet][-h]
```

Parameters

Parameter	Description
-changeNetCard	Configures the network card after it has been replaced. You must run the <code>oakcli configure network -changeNetCard</code> command on each node if the network card was replaced. This parameter is supported on all Oracle Database Appliance hardware models. This command must be executed from Dom0 on virtualized platforms.
-publicNet	Configures the network after you have swapped the public network from copper to fiber and vice versa. You must run the <code>oakcli configure network -publicNet</code> command on each node, and this requires the stack to be down. The stack includes GI and RDBMS. If you are using Oracle Database Appliance Virtualized Platform, the virtual machines must be down. The virtual machines may need some configuration changes, especially if they are using VLANs. This parameter is supported only on Oracle Database Appliance X4-2 hardware models.
-h	(Optional) Display help for using the command.

oakcli configure oda_base

Use the `oakcli configure oda_base` command to:

- Change the CPU core count assigned to ODA_BASE.
- Add or remove virtual local area networks assigned to ODA_BASE.
- Adjust resource allocation among user domains and between ODA_BASE and other user domains.
- Increase or decrease resource allocation to the ODA_BASE domain.

You must restart the domain for the resource allocation change to take effect.

Syntax

```
oakcli configure oda_base
```

Examples

Changing the CPU Core Count in ODA_BASE

Change the CPU core count from six to eight in ODA_BASE:

```
# oakcli configure oda_base
Core Licensing Options:
  1. 2 CPU Cores
  2. 4 CPU Cores
  3. 6 CPU Cores
  4. 8 CPU Cores
  5. 10 CPU Cores
  6. 12 CPU Cores
Current CPU Cores      :6
Selection[1 : 6](default 12 CPU Cores) : 4
ODA base domain memory in GB(min 8, max 88)(Current Memory 64G)[default
32]      :
INFO: Using default memory size i.e. 32 GB
Additional vlan networks to be assigned to oda_base? (y/n) [n]:
Vlan network to be removed from oda_base (y/n) [n]
INFO: Node 0:Configured oda base pool
INFO: Node 1:Configured oda base pool
INFO: Node 0:ODA Base configured with new memory
INFO: Node 0:ODA Base configured with new vcpus
INFO: Changes will be incorporated after the domain is restarted on Node 0
INFO: Node 1:ODA Base configured with new memory
INFO: Node 1:ODA Base configured with new vcpus
INFO: Changes will be incorporated after the domain is restarted on Node 1
```

Changing the Amount of Memory Allocated to ODA_BASE

1. Log in to Dom0.
2. Execute the `oakcli configure oda_base` command and change the configuration.
3. Restart ODA_BASE.

Assigning VLANs to ODA_BASE

1. Log in to Dom0.
2. Execute the `oakcli configure oda_base` command.
3. Change the setting for Additional vlan networks to be assigned to oda_base? (y/n) to **y**.
4. Follow the prompts to assign additional VLANs to ODA_BASE.
5. Restart ODA_BASE.

oakcli configure repo

Use the `oakcli configure repo` command to increase the size of a shared repository.

Syntax

```
oakcli configure repo reponame -incsize size [M|G] [-h]
```

Parameter	Description
reponame	Name of the shared repository
size	Number that can be followed by M to define the size as megabytes or by G to define as size as gigabytes
-h	(Optional) Display help for using the command.

Example

Increase the size of the repo1 shared repository by 2 gigabytes:

```
# oakcli configure repo repo1 -incsize 2G
```

Configured Shared Repo : repo1 with new size 3712.0.

oakcli configure vm

Use the `oakcli configure vm` command to configure a virtual machine on Oracle Database Appliance Virtualized Platform and to increase or decrease resource allocation to user domains. You must restart the domain for the resource allocation change to take effect.

Syntax

```
oakcli configure vm name [-vcpu cpucount -maxvcpu maxcpu -cpuprio priority
-cpucap cap -memory memsize -maxmemory max_memsize -os sys -keyboard lang -mouse
mouse_type -domain dom -network netlist -autostart astart -disk disks -bootoption
bootstrap -cpupool pool -prefnode 0|1 -failover true|false] [-h]
```

Parameters

Parameter	Description
name	The name assigned to the virtual machine.
-vcpu <i>cpucount</i>	Number of nodes assigned to the virtual machine. The range is 1 to 72. This number depends on your Oracle Database Appliance configuration: <ul style="list-style-type: none"> On Oracle Database Appliance X5-2, the range is from 1 to 72. On Oracle Database Appliance X4-2, the range is from 1 to 48. On Oracle Database Appliance X3-2, the range is from 1 to 32. On Oracle Database Appliance, the range is 1 to 24.
-maxvcpu <i>maxcpu</i>	Maximum number of CPUs that the virtual machine can consume. The range is 1 to 72. This number depends on your Oracle Database Appliance configuration: <ul style="list-style-type: none"> On Oracle Database Appliance X5-2, the range is from 1 to 72. On Oracle Database Appliance X4-2, the range is from 1 to 48. On Oracle Database Appliance X3-2, the range is from 1 to 32. On Oracle Database Appliance version 1, the range is 1 to 24.

Parameter	Description
<code>-cpuprio priority</code>	Priority for CPU usage, where larger values have higher priority. The range is 1 to 65535,
<code>-cpucap cap</code>	Percentage of a CPU the virtual machine can receive. The range is 10 to 100.
<code>-memory memsize</code>	Amount of memory given to the virtual machine: (1 to 248)G to (1 to 760G) or (1 to 253952)M to (1 to 778240)M, based on RAM. The default is M.
<code>-maxmemory max_memsize</code>	Maximum amount of memory allowed for the virtual machine: (1 to 248)G to (1 to 760)G or (1-253952)M to (1-778240)M, based on RAM. The default is M.
<code>-os sys</code>	Operating system used by the virtual machine (WIN_2003, WIN_2008, WIN_7, WIN_VISTA, OTHER_WIN, OL_4, OL_5, OL_6, RHL_4, RHL_5, RHL_6, LINUX_RECOVERY, OTHER_LINUX, SOLARIS_10, SOLARIS_11, OTHER_SOLARIS, or NONE)
<code>-keyboard lang</code>	Keyboard used by virtual machine (en-us, ar, da, de, de-ch, en-gb, es, et, fi, fo, fr, fr-be, fr-ca, hr, hu, is, it, ja, lt, lv, mk, nl, n-be, no, pl, pt, pt-br, ru, sl, sv, th, or tr)
<code>-mouse mouse_type</code>	Mouse type used by the virtual machine (OS_DEFAULT, PS2_MOUSE, USB_MOUSE, or USB_TABLET)
<code>-domain dom</code>	Domain type from the following options: <ul style="list-style-type: none"> ■ Hardware virtualized guest (XEN_HVM) <ul style="list-style-type: none"> - The kernel or operating system is not virtualization-aware and can run unmodified. - Device drivers are emulated. ■ Para virtualized guest (XEN_PVM) <ul style="list-style-type: none"> - The guest is virtualization-aware and is optimized for a virtualized environment. - PV guests use generic, idealized device drivers. ■ Hardware virtualized guest (XEN_HVM_PV_DRIVERS) <ul style="list-style-type: none"> The PV drivers are hypervisor-aware and significantly reduce the overhead of emulated device input/output. ■ Hardware virtualized guest (UNKNOWN)
<code>-network netlist</code>	MAC address and list of networks used by the virtual machine
<code>-autostart astart</code>	Startup option for virtual machine (always, restore, or never)
<code>-disk disks</code>	List of disks (slot, disktype, and content) used by virtual machine
<code>-bootoption bootstrap</code>	Boot option used to bootstrap the virtual machine (PXE, DISK, or CDROM)
<code>-cpupool pool</code>	Named CPU pool assigned to the virtual machine
<code>-prefnode 0 1</code>	Preferred node on which the virtual machine will attempt to start (Node 0 or Node 1). This parameter is only valid for virtual machines created in shared repositories.
<code>-failover true false</code>	Allow (use the keyword "true") or disallow (use the keyword "false") the virtual machine to start or restart on a node other than the node defined by the <code>-prefnode</code> parameter. This parameter is only valid for virtual machines created in shared repositories.
<code>-h</code>	(Optional) Display help for using the command.

Usage Notes

- All of the parameters, except for *name*, are optional.
- You must include at least one optional parameter for the command to work.
- When you create a virtual machine, select the Processor Cap as a percentage, between 10 and 100%. The default is 100%. This value is then converted to a CPU utilization limit in the *vm.cfg* file for the virtual machine. The value set in the *vm.cfg* file limits the amount of CPU a guest is allowed to consume. If the Processor Cap is set at 100% in Oracle VM, then the value set in *vm.cfg* is 0, which means there is no limit to CPU utilization.

See Also: Oracle VM Release 3.1 documentation at http://docs.oracle.com/cd/E27300_01 for more information about the options in the preceding table. For example, see http://docs.oracle.com/cd/E27300_01/E27309/html/vmusg-ovm-vms.html for details about the *-domain dom* options

Example

Change the number of virtual CPUs to 3 and the virtual memory size to 4GB in a virtual machine named *sample_odarep01*:

```
oakcli configure vm sample_odarep01 -vcpu 3 -memory 4196
```

oakcli configure vmtemplate

Use the `oakcli configure vmtemplate` command to configure a virtual machine template on Oracle Database Appliance Virtualized Platform.

Syntax

```
oakcli configure vmtemplate name [-vcpu cpucount -maxvcpu maxcpu -cpuprio  
priority -cpucap cap -memory memsize -maxmemory max_memsize -os sys -keyboard  
lang -mouse mouse_type -domain dom -network netlist -disk disks] [h]
```

Parameters

Parameter	Description
<i>name</i>	Name assigned to the virtual machine template
<i>-vcpu cpucount</i>	Number of nodes assigned to virtual machines cloned from the template: <ul style="list-style-type: none">■ On Oracle Database Appliance X5-2, the range is from 1 to 72.■ On Oracle Database Appliance X4-2, the range is from 1 to 48.■ On Oracle Database Appliance X3-2, the range is from 1 to 32.■ On Oracle Database Appliance, the range is 1 to 24.

Parameter	Description
<code>-maxvcpu <i>maxcpu</i></code>	Maximum number of CPUs that virtual machines cloned from the template can consume: <ul style="list-style-type: none"> ■ On Oracle Database Appliance X5-2, the range is from 1 to 72. ■ On Oracle Database Appliance X4-2, the range is from 1 to 48. ■ On Oracle Database Appliance X3-2, the range is from 1 to 32. ■ On Oracle Database Appliance, the range is 1 to 24.
<code>-cpuprio <i>priority</i></code>	Priority for CPU usage, where larger values have higher priority (1 to 256).
<code>-cpucap <i>cap</i></code>	Percentage of a CPU that virtual machines cloned from the template can receive (1 to 100).
<code>-memory <i>memsize</i></code>	Amount of memory given to virtual machines cloned from the template (1G to 88 G or 1M to 90112M)
<code>-maxmemory <i>max_memsize</i></code>	Maximum amount of memory allowed for virtual machines cloned from the template
<code>-os <i>sys</i></code>	Operating system used by virtual machines cloned from the template (WIN_2003, WIN_2008, WIN_7, WIN_VISTA, OTHER_WIN, OL_4, OL_5, OL_6, RHL_4, RHL_5, RHL_6, LINUX_RECOVERY, OTHER_LINUX, SOLARIS_10, SOLARIS_11, OTHER_SOLARIS, or NONE)
<code>-keyboard <i>lang</i></code>	Keyboard used by virtual machines cloned from the template (en-us, ar, da, de, de-ch, en-gb, es, et, fi, fo, fr, fr-be, fr-ca, hr, hu, is, it, ja, lt, lv, mk, nl, n-be, no, pl, pt, pt-br, ru, sl, sv, th, or tr)
<code>-mouse <i>mouse_type</i></code>	Mouse type used by virtual machines cloned from the template (OS_DEFAULT, PS2_MOUSE, USB_MOUSE, or USB_TABLET)
<code>-domain <i>dom</i></code>	Domain type from the following options: <ul style="list-style-type: none"> ■ Hardware virtualized guest (XEN_HVM) <ul style="list-style-type: none"> - The kernel or operating system is not virtualization-aware and can run unmodified. - Device drivers are emulated. ■ Para virtualized guest (XEN_PVM) <ul style="list-style-type: none"> - The guest is virtualization-aware and is optimized for a virtualized environment. - PV guests use generic, idealized device drivers. ■ Hardware virtualized guest (XEN_HVM_PV_DRIVERS) <ul style="list-style-type: none"> The PV drivers are hypervisor-aware and significantly reduce the overhead of emulated device input/output.
<code>-network <i>netlist</i></code>	MAC address and list of networks used by virtual machines cloned from the template
<code>-disk <i>disks</i></code>	List of disks (slot, disktype, and content) used by virtual machines cloned from the template
<code>-h</code>	(Optional) Display help for using the command.

Usage Notes

- All of the parameters, except for *name*, are optional.
- You must include at least one optional parameter for the command to work.

See Also: Oracle VM Release 3.1 documentation at http://docs.oracle.com/cd/E27300_01 for more information about the options in the preceding table. For example, see http://docs.oracle.com/cd/E27300_01/E27309/html/vmusg-ovm-vms.html for details about the `-domain` options

Example

Set values for the following configuration values in the virtual machine template named `myol5u7_10gb`:

```
oakcli configure vmtemplate myol5u7_10gb
-vcpu 2 -maxvcpu 4 -cpucap 40 -memory 1536M -maxmemory 2G
-network "['type=netfront,bridge=net1']" -os OTHER_LINUX
```

- `-vcpu 2` = Two CPUs will assigned when the virtual machine starts up
- `-maxvcpu 4` = The maximum number of CPUs that can be assigned to the virtual machine is 4.
- `-cpucap 40` = The maximum percentage of a CPU's capacity that will be assigned to the virtual machine is 40%.
- `-memory 1536M` = The amount of memory assigned when the virtual machine starts up is 1536 MB.
- `-maxmemory 2G` = The maximum amount of memory that can be assigned to the virtual machine is 2 GB.
- `-network type=netfront,bridge=net1` = This is the list of networks used by virtual machines cloned from the template.
- `-os` = The operating system used by the virtual machine is OTHER_LINUX.

oakcli copy

Use the `oakcli copy` command to prepare a copy of the configuration file for use during the configuration of Oracle Database Appliance.

Syntax

```
oakcli copy -conf absolute_conf_file [-h]
```

Parameters

Parameter	Description
<code>-conf <i>absolute_conf_file</i></code>	Specifies the full path name of the configuration file
<code>-h</code>	(Optional) Display help for using the command.

Example

If you created a configuration file previously and copied this file to Oracle Database Appliance, then prepare the configuration file to be used during the configuration process. For example, if you copied the file `myserver1.conf` to `/tmp`, then enter the following command:

```
oakcli copy -conf /tmp/myserver1.conf
```

oakcli create commands

Use the `oakcli create` commands to create components on Oracle Database Appliance.

oakcli create cpupool

Creates a new CPU pool

oakcli create database

Creates a new database

oakcli create db_config_params

Creates a database configuration file

oakcli create dbhome

Creates a new database home

oakcli create dbstorage

Creates a new Oracle ACFS storage structure

oakcli create repo

Creates a new shared repository on an Oracle Database Appliance Virtualized Platform node

oakcli create snapshotdb

Creates a snapshot database from an existing database

oakcli create vdisk

Creates a virtual disk in a shared repository on Oracle Database Appliance Virtualized Platform

oakcli create vlan

Creates a virtual local area network on an Oracle Database Appliance Virtualized Platform node

oakcli create cpupool

Use the `oakcli create cpupool` command to create a CPU pool on one Oracle Database Appliance Virtualized Platform node.

Syntax

```
oakcli create cpupool poolname -numcpu cpu_count -node nodenum [-h]
```

Parameters

Parameter	Description
<i>poolname</i>	Uniquely names the CPU pool
<code>-numcpu</code> <i>cpu_count</i>	Defines the number of CPUs for the CPU pool
<code>-node</code> <i>nodenum</i>	Defines the node where the CPU pool will be created (0 or 1)
<code>-h</code>	(Optional) Display help for using the command.

Example

Create a CPU pool with two CPUs on Node 1 of Oracle Database Appliance Virtualized Platform:

```
oakcli create cpupool twonode -numcpu 2 -node 1
```

oakcli create database

Use the `oakcli create database` command to create additional databases on Oracle Database Appliance.

When you run `oakcli create database`, the command prompts you for further inputs.

Syntax

```
oakcli create database -db db_name [[-oh home] | [-version version]] [-params  
params_file] [-cdb]] [h]
```

Parameters

Parameter	Description
-db <i>db_name</i>	Name of the database that you want to create
-oh <i>home</i>	(Optional) Name of an existing Oracle home to use when creating the database. By default, the command creates a new database home.
-version <i>version</i>	(Optional) Version of the database that you want to create. By default, Oracle Database Appliance uses the highest version that you have downloaded.
-params <i>params_file</i>	(Optional) Name of the configuration file. By default, Oracle Database Appliance uses the default configuration file.
-cdb	(Optional) Creates the database as a container database
-h	(Optional) Display help for using the command.

Usage Notes

- The `-oh` and the `-version` parameters are mutually exclusive. Attempting to use both in the same command will generate an error.
- When a database is created without identifying an Oracle home, a new Oracle home is created using a standard naming convention (for example, OraDb11203_home3). The number at the end of the name is incremented by one for each new home created with the same version number.
- When you upgrade the database, infrastructure, and Oracle Grid Infrastructure, you must specify an existing home to create a new database.
- If you try to create a database using the option `-version version` before downloading and unpacking the specific version database clone files, then the command will fail.
- You can create configuration files with the `oakcli create db_config_params` command.
- The prompt "Do you want to keep the data files on FLASH storage: [Y | N] " is only shown if you choose the OLTP database type and if there is some free space available on flash storage. See ["Improving I/O Performance for Database Files"](#) for

more information about this option.

Examples

Creating a New Database Showing Prompts

When you run `oakcli create database` you are prompted for several inputs. The options listed for each input requested depend on the platform you run the command on. For example, Database Class options 9 and 10 are available only on Oracle Database Appliance X5-2.

The following command creates a database named `mydb` using an existing Oracle home named `OraDb12102_home1`.

```
oakcli create database -db mydb -oh OraDb12102_home1
```

```
Please enter the 'root' password :
Please re-enter the 'root' password:
```

```
Please enter the 'oracle' password :
Please re-enter the 'oracle' password:
```

```
Please enter the 'SYSASM' password : (During deployment we set the
SYSASM password to 'welcome1'):
Please re-enter the 'SYSASM' password:
Please select one of the following for Database Deployment [1 .. 3]:
```

```
1  => OLTP
2  => DSS
3  => In-Memory
```

```
1
Selected value is : OLTP
```

```
Please select one of the following for Database Deployment [1 .. 3]:
```

```
1  => EE : Enterprise Edition
2  => RACONE
3  => RAC
```

```
3
Selected value is : RAC
```

```
Do you want to keep the data files on FLASH storage: [ Y | N ]?N
```

```
Specify the Database Class (1. odb-01 '1 core, 8 GB memory' 2.
Others) [1]:2
```

```
Please select one of the following for Database Class [1 .. 10]:
```

```
1  => odb-01s ( 1 cores , 4 GB memory)
2  => odb-01 ( 1 cores , 8 GB memory)
3  => odb-02 ( 2 cores , 16 GB memory)
4  => odb-04 ( 4 cores , 32 GB memory)
5  => odb-06 ( 6 cores , 48 GB memory)
6  => odb-12 ( 12 cores , 96 GB memory)
7  => odb-16 ( 16 cores , 128 GB memory)
8  => odb-24 ( 24 cores , 192 GB memory)
9  => odb-32 ( 32 cores , 256 GB memory)
10 => odb-36 ( 36 cores , 256 GB memory)
```

Creating a New Database in an Existing Oracle Home

Create a database called `sales1` in `OraDb11203_home2`:

```
oakcli create database -db sales1 -oh OraDb11203_home2
```

Creating a New Database from a Template

Create a database called sales2 from the salesdbtemplate.bconf file (by appending the default file extension to the file name provided). This example also creates a new Oracle home:

```
oakcli create database -db sales2 -params salesdbtemplate
```

Creating a New Database as a Container Database

Create a version 12.1.0.2 container database called sales3:

```
oakcli create database -db sales3 -version 12.1.0.2 -cdb
```

Creating an Enterprise Edition Database

Create a version 12.1.0.2 database named DBPROD from the database configuration file named dbprodconf:

```
oakcli create database -db DBPROD -version 12.1.0.2 -params dbprodconf
```

The oakcli create database command starts a wizard that requires some basic inputs such as the root, oracle and SYSASM password. See ["Creating a New Database Showing Prompts"](#) for an example. After you enter the password information, specify the type of database and running node:

```
Please select one of the following for Database Deployment [1 .. 3]:
```

```
Selected value is: ODADBI2-base
```

```
1 => EE : Enterprise Edition
```

```
2 => RACONE
```

```
3 => RAC
```

```
1
```

```
Selected value is: EE
```

```
Please select one of the following for Node Number [1 .. 2]:
```

```
1 => ODADBI1-base
```

```
2 => ODADBI2-base
```

```
2
```

```
Selected value is: ODADBI2-base
```

```
Specify the Database Class (1. Medium 2. Others) [1]:2
```

```
Please select one of the following for Database Class [1 .. 8] :
```

```
1  => odb-01s ( 1 cores , 4 GB memory)
```

```
2  => odb-01 ( 1 cores , 8 GB memory)
```

```
3  => odb-02 ( 2 cores , 16 GB memory)
```

```
4  => odb-04 ( 4 cores , 32 GB memory)
```

```
5  => odb-06 ( 6 cores , 48 GB memory)
```

```
6  => odb-12 ( 12 cores , 96 GB memory)
```

```
7  => odb-16 ( 16 cores , 128 GB memory)
```

```
8  => odb-24 ( 24 cores , 192 GB memory)
```

```
9  => odb-32 ( 32 cores , 256 GB memory)
```

```
10 => odb-36 ( 36 cores , 256 GB memory)
```

```
3
```

```
Selected value is: 2 cores
```

The database class only defines the Oracle Database Configuration Assistant (DBCA) template to be used for the database creation. Oracle Database Appliance comes with eight templates and none can be added. See [Appendix B, "Database Templates for Oracle Database Appliance"](#) for template specifications.

oakcli create dbhome

Use the `oakcli create dbhome` command to create a new database home on Oracle Database Appliance.

Syntax

```
oakcli create dbhome [-version version] [-h]
```

Parameters

Parameter	Description
<code>-version version</code>	(Optional) Version that you want to install. If this is not provided, then Oracle Database Appliance uses the latest available version.
<code>-h</code>	(Optional) Display help for using the command.

Example

Create a database home called `sales1` using Oracle Database version 12.1.0.2.4.

```
oakcli create dbhome -version 12.1.0.2.4
```

oakcli create dbstorage

Use the `oakcli create dbstorage` command to create a storage structure for migrating databases from Oracle ASM to Oracle ACFS.

Syntax

```
oakcli create dbstorage -db db_name [-cdb] [-h]
```

Parameters

Parameter	Description
<code>-db db_name</code>	Sets up the required Oracle ACFS storage structure for the database to be created called <code>db_name</code>
<code>-cdb</code>	Must be passed if you are creating a multitenant container database
<code>-h</code>	(Optional) Display help for using the command.

Example

The `oakcli create dbstorage` command requests user input to determine the size of the storage structure to create, as shown in this example:

```
oakcli create dbstorage -db sales
```

```
Please enter the 'root' password :
Please re-enter the 'root' password:
```

```
Please enter the 'oracle' password :
Please re-enter the 'oracle' password:
```

```
Please enter the 'SYSASM' password : (During deployment we set the SYSASM password
to 'welcome1'):
Please re-enter the 'SYSASM' password:
```

```
Specify the Database Class (1. odb-01 '1 core, 8 GB memory' 2. Others) [1]:2
```

```
Please select one of the following for Database Class [1 .. 8] :
```

```
1 => odb-01s ( 1 cores , 4 GB memory)
2 => odb-01 ( 1 cores , 8 GB memory)
3 => odb-02 ( 2 cores , 16 GB memory)
4 => odb-04 ( 4 cores , 32 GB memory)
5 => odb-06 ( 6 cores , 48 GB memory)
6 => odb-12 ( 12 cores , 96 GB memory)
7 => odb-16 ( 16 cores , 128 GB memory)
8 => odb-24 ( 24 cores , 192 GB memory)
```

```
Selected value is: odb-01s ( 1 cores , 4 GB memory)
```

```
...
```

oakcli create db_config_params

Use the `oakcli create db_config_params` command to generate a database configuration file. The configuration file is created in `/opt/oracle/oak/install/dbconf` and is given the default extension `.dbconf`.

Syntax

```
oakcli create db_config_params -conf filename [-h]
```

Parameters

Parameter	Description
<code>-conf <i>filename</i></code>	Name you want to give to the configuration file, without its path name.
<code>-h</code>	(Optional) Display help for using the command

Example

Create the database parameter file:

```
/opt/oracle/oak/install/dbconf/newconf.dbconf:
```

```
# oakcli create db_config_params -conf newconf
```

```
Please select one of the following for Database Block Size [1 .. 4]:
```

```
1 ==> 4096
2 ==> 8192
3 ==> 16384
4 ==> 32768
```

```
2
```

```
Selected value is: 8192
```

```
Specify the Database Language (1. AMERICAN 2. Others) [1]:
```

```
Selected value is: AMERICAN
```

```
Specify the Database Characterset (1. AL32UTF8 2. Others) [1]:2
```

```
Please select one of the following for Database Characterset [0 .. 10] :
```

```
0 => Others
1 => AL32UTF8
2 => AR8ADOS710
```



```

3 => AR8ADOS710T
4 => AR8ADOS720
5 => AR8ADOS720T
6 => AR8APTEC715
7 => AR8APTEC715T
8 => AR8ARABICMACS
9 => AR8ASMO708PLUS
10 => AR8ASMO8X
1
Selected value is: AL32UTF8

```

Specify the Database Territory (1. AMERICA 2. Others) [1]:2

```

Please select one of the following for Database Territory [0 .. 10] :
0 => Others
1 => ALBANIA
2 => ALGERIA
3 => AMERICA
4 => ARGENTINA
5 => AUSTRALIA
6 => AUSTRIA
7 => AZERBAIJAN
8 => BAHRAIN
9 => BANGLADESH
10 => BELARUS
3
Selected value is: AMERICA

```

Specify the Component Language (1. en 2. Others) [1]:2

```

Please select one of the following for Component Language [0 .. 10] :
0 => Others
1 => en : English
2 => fr : French
3 => ar : Arabic
4 => bn : Bengali
5 => pt_BR : Brazilian Portuguese
6 => bg : Bulgarian
7 => fr_CA : Canadian French
8 => ca : Catalan
9 => hr : Croatian
10 => cs : Czech
1
Selected value is: en
Successfully generated the Database parameter file 'newconf'

```

oakcli create repo

Use the `oakcli create repo` command to create a new shared repository on Oracle Database Appliance Virtualized Platform.

Syntax

```
oakcli create repo repo_name -size size [M|G] -dg DATA|RECO [-h]
```

Parameters

Parameter	Description
<i>repo_name</i>	Name assigned to the shared repository
<code>-size size [M G]</code>	Amount of storage to be assigned to the shared repository. It can be defined in megabytes with the M option or in gigabytes with the G option.
<code>-dg DATA RECO</code>	Oracle ASM disk group in which the shared repository is to be stored, either the DATA+ disk group or the RECO+ disk group, selected by using the DATA or RECO option respectively
<code>-h</code>	(Optional) Display help for using the command.

Usage Notes

- The `-size` parameter requires a whole number for size.
- The minimum value for *size* is 500 when M is used or 1 when G is used for the sizing unit.
- The default unit for *size* is G (gigabytes).
- A shared repository should only be used for the virtual machine and not as a file staging area. Avoid copying or moving files into a shared repository.

Example

Create a 25-gigabyte shared repository named `repoprod1` in the DATA+ disk group:

```
oakcli create repo repoprod1 -dg DATA -size 25
```

oakcli create snapshotdb

Use the `oakcli create snapshotdb` command to create a snapshot database from an existing database.

Syntax

```
oakcli create snapshotdb [-db snap_dbname -from dbname] | [-h]
```

Parameters

Parameter	Description
<code>-db snap_dbname</code>	Name of the snapshot database to be created
<code>-from source_dbname</code>	Name of the source database
<code>-h</code>	(Optional) Display help for using the command

Example

Create a new snapshot database, name `snapprod`, from the database named `prod`:

```
oakcli create snapshotdb -db snapprod -from prod
```

oakcli create vdisk

Use the `oakcli create vdisk` command to create a new virtual disk in a shared repository on Oracle Database Appliance Virtualized Platform.

Syntax

```
oakcli create vdisk vdisk_name -repo repository_name -size size -type shared|local
-sparse [-h]
```

Parameters

Parameter	Description
<i>vdisk_name</i>	Name assigned to the virtual disk that is unique within the name repository
-repo <i>repository_name</i>	Name of the shared repository where the virtual disk will be created and from which it will acquire its storage
-size <i>size</i>	Amount of storage to be assigned from the shared repository to the shared disk. The default unit is G (for gigabytes) and the minimum size is 500 M (for megabytes)
-type <i>shared local</i>	Sets the option of allowing the virtual disk to be shared by more than one virtual machine (<i>shared</i>) or used by only one virtual machine (<i>local</i>)
-sparse	Creates a sparse vdisk
-h	(Optional) Display help for using the command.

Example

Create a virtual disk named *t2g* in the shared repository named *repoprod1* for use by only one virtual machine at a time in that repository. Assign the *t2g* virtual disk 2 GB in the *repoprod1* shared repository.

```
oakcli create vdisk t2g -repo repoprod1 -type local -size 2G
```

oakcli create vlan

Use the `oakcli create vlan` command to create a new virtual local area network (VLAN) on an Oracle Database Appliance Virtualized Platform node.

Syntax

```
oakcli create vlan vlan_name -vlanid tag_id -if interface_name -node 0|1 [-h]
```

Parameters

Parameter	Description
<i>vlan_name</i>	Name assigned to the VLAN
-vlanid <i>tag_id</i>	Tag number, used for packet routing, from 2 to 4096 inclusive. It uniquely identifies the VLAN on a node. The same tag number can be used on both nodes.
-if <i>interface_name</i>	Name of the interface on which the VLAN network is created
-node <i>0 1</i>	Node on which the VLAN is created, either 1 or 2
-h	(Optional) Display help for using the command.

Examples

Creating a New VLAN

Create a VLAN named `sample10` on Node 1 using the `bond1` interface and a tag with the number 10:

```
oakcli create vlan sample10 -vlanid 10 -if bond1 -node 1
```

Duplicating a VLAN on the Second Node

Create a VLAN named `sample10` on Node 0:

```
oakcli create vlan sample10 -vlanid 10 -if bond1 -node 0
```

oakcli delete commands

Use the `oakcli delete` commands to delete components from Oracle Database Appliance.

oakcli delete cpupool

Deletes a CPU pool

oakcli delete database

Removes a database

oakcli delete db_config_params

Deletes a database configuration file

oakcli delete dbhome

Deletes a database home

oakcli delete dbstorage

Deletes an ACFS storage structure

oakcli delete repo

Deletes a shared repository

oakcli delete vdisk

Deletes a virtual disk from a shared repository

oakcli delete vlan

Deletes an a VLAN

oakcli delete vm

Deletes a virtual machine

oakcli delete vmtemplate

Deletes a virtual machine template

oakcli delete cpupool

Use the `oakcli delete cpupool` command to delete a CPU pool from one Oracle Database Appliance Virtualized Platform node.

Syntax

```
oakcli delete cpupool poolname -node nodenum [-h]
```

Parameters

Parameter	Description
<i>poolname</i>	Name of the CPU pool to be deleted
-node <i>nodenum</i>	Node from which the CPU pool will be deleted (0 or 1)
-h	(Optional) Display help for using the command.

Example

Delete the CPU pool named *twonode* from Node 1 of Oracle Database Appliance Virtualized Platform:

```
oakcli delete cpupool twonode -node 1
```

oakcli delete database

Use the `oakcli delete database` command to delete a database from Oracle Database Appliance.

Syntax

```
oakcli delete database -db db_name [-h]
```

Parameters

Parameter	Description
<i>db_name</i>	Name of the database to be deleted.
-h	(Optional) Display help for using the command

Example

Delete the database named *sales1*:

```
oakcli delete database -db sales1
```

oakcli delete db_config_params

Use the `oakcli delete db_config_params` command to delete a database configuration file.

Syntax

```
oakcli delete db_config_params -conf filename [-h]
```

Parameters

Parameter	Description
-conf <i>filename</i>	Name of the configuration file that you want to remove, without its path name
-h	(Optional) Display help for using the command

oakcli delete dbhome

Use the `oakcli delete dbhome` command to delete a database home from Oracle Database Appliance.

Syntax

```
oakcli delete dbhome -oh oracle_home [-h]
```

Parameters

Parameter	Description
-oh <i>oracle_home</i>	The database home to be uninstalled
-h	(Optional) Display help for using the command.

Example

Delete a database home called `ora11_1`:

```
oakcli delete dbhome -oh ora11_1
```

oakcli delete dbstorage

Use the `oakcli delete dbstorage` command to delete a storage structure that was created for the purpose of migrating databases from Oracle ASM to Oracle ACFS. For example, run this command if you created a storage structure using `create dbstorage` that is no longer required.

Syntax

```
oakcli delete dbstorage -db db_name [-cdb] [-h]
```

Parameters

Parameter	Description
-db <i>db_name</i>	Name of the database structure to be deleted
-cdb	Must be passed if you are deleting a multitenant container database
-h	(Optional) Display help for using the command

Example

Delete the sales storage structure:

```
oakcli delete dbstorage -db sales
```

oakcli delete repo

Use the `oakcli delete repo` command to delete a shared repository.

Syntax

```
oakcli delete repo repository_name [-h]
```

Parameter

Parameter	Description
<i>repository_name</i>	The name of the shared repository to be deleted
-h	(Optional) Display help for using the command.

Example

Delete the testrepo01 shared repository:

```
oakcli delete repo testrepo01
```

The command will not succeed if testrepo01 is active on one or both nodes.

oakcli delete vdisk

Use the `oakcli delete vdisk` command to delete a virtual disk from a shared repository on Oracle Database Appliance Virtualized Platform.

Syntax

```
oakcli delete vdisk vdisk_name -repo repository_name [-h]
```

Parameters

Parameter	Description
<i>vdisk_name</i>	Name assigned to the virtual disk
-repo <i>repository_name</i>	Name of the shared repository where the virtual disk was created
-h	(Optional) Display help for using the command.

Example

Remove a virtual disk named t2g from the shared repository named repoprodl:

```
oakcli delete vdisk t2g -repo repoprodl
```

oakcli delete vlan

Use the `oakcli delete vlan` command to delete a virtual local area network.

Syntax

```
oakcli delete vlan vlan_name -node node_number [-h]
```

Parameters

Parameter	Description
<i>vlan vlan_name</i>	Name of the virtual local area network to be deleted
-node <i>node_number</i>	Oracle Database Appliance node from which you want to remove the virtual local area network
-h	(Optional) Display help for using the command.

Example

Delete the sample1 virtual local area network from Node 1:

```
oakcli delete vlan sample1 -node 1
```

oakcli delete vm

Use the `oakcli delete vm` command to delete a virtual machine.

Syntax

```
oakcli delete vm vm_name [-server node_number] [-h]
```

Parameters

Parameter	Description
<code>vm <i>vm_name</i></code>	(Optional) Name of the virtual machine to be deleted
<code>-server <i>node_number</i></code>	(Optional) Oracle Database Appliance node from which you want to remove the virtual machine. If this optional parameter is not included, then the virtual machine is removed from both nodes.
<code>-h</code>	(Optional) Display help for using the command.

Example

Delete the ovu22 virtual machine from Node 1:

```
oakcli delete vm ovu22 -server 1
```

oakcli delete vmtemplate

Use the `oakcli delete vmtemplate` command to delete a virtual machine template.

Syntax

```
oakcli delete vmtemplate template_name [-server=node_number] [-h]
```

Parameters

Parameter	Description
<code><i>template_name</i></code>	Name of the virtual machine template to be removed
<code>-server <i>node_number</i></code>	(Optional) Oracle Database Appliance node from which you want to remove the virtual machine template. If this optional parameter is not included, then the virtual machine template is removed from both nodes.
<code>-h</code>	(Optional) Display help for using the command.

Example

Delete the ovu22 virtual machine template from both nodes:

```
oakcli delete vmtemplate ovu22
```


oakcli deploy

Use the `oakcli deploy` command to deploy Oracle Grid Infrastructure for a cluster on Oracle Database Appliance.

Syntax

```
oakcli deploy [-config] [-conf config_file] [-advance] [-h]
```

Parameters

Parameter	Description
<code>-config</code>	(Optional) Run the Oracle Appliance Manager configurator.
<code>-conf <i>config_file</i></code>	(Optional) Preload the configuration stored in the named configuration file, <i>config_file</i> .
<code>-advance</code>	(Optional) Perform the deployment, or run the Oracle Appliance Manager configurator, in advance mode.
<code>-h</code>	(Optional) Display help for using the command.

Examples

Deploying the Complete Oracle Database Appliance

```
oakcli deploy
```

Running the Configurator

```
oakcli deploy -config
```

Preloading an Existing Configuration File

Preload the configuration stored in the MYCONFIG-VM configuration file:

```
oakcli deploy -conf myconfig -vm_file
```

Viewing the Log File

The `oakcli deploy` command creates a log file with the file name `STEP*` at `/opt/oracle/oak/onecmd/tmp/`.

oakcli diskwritetecache

Use the `oakcli diskwritetecache` command to locate disks with write cache enabled and to disable disk write cache for those disks. Enabled write caches should be disabled as soon as downtime for Oracle Database Appliance can be scheduled. During the downtime, use this command with the `disable` option for each disk, in turn, that has an enabled write cache.

Syntax

```
oakcli diskwritetecache [disable disk_name | enable disk_name | status ] [-h]
```

Parameters

Parameter	Description
<code>disable <i>disk_name</i></code>	(Optional) Disable disk write cache for named disk.

Parameter	Description
<i>enable disk_name</i>	(Optional) Enable disk write cache for named disk.
<i>status</i>	(Optional) Show the write cache status of all disks.
<i>-h</i>	(Optional) Display help for using the command.

Example

Show the write cache status of all disks:

```
oakcli diskwritecache status
```

oakcli import vmtemplate

Use the `oakcli import vmtemplate` command to import virtual machine templates.

Syntax

```
oakcli import vmtemplate vmtemplatename -files image_files | -assembly assembly_file -repo repo_name [- node 0 | 1 ][-h]
```

Parameters

Parameter	Description
<i>vmtemplatename</i>	Name that you want to assign to the template
<i>-files</i>	Use the <code>-files</code> option when importing one or more files that comprise a template.
<i>image_files</i>	<i>image_files</i> is one of the following: <ul style="list-style-type: none">■ A single template file name■ A comma-separated list of files that comprise a single template■ A URL enclosed in single quotation marks that links to a template file
<i>-assembly</i>	Use the <code>-assembly</code> option when importing an assembly file.
<i>assembly_file</i>	An assembly file, or a URL enclosed in single quotation marks, that links to an assembly file
<i>repo_name</i>	Name of the repository to store the template or templates that you are importing
<i>-node</i>	When you are importing to a shared repository, use the <code>-node</code> option with a value of 0 or 1 to identify the node.
<i>-h</i>	(Optional) Display help for using the command.

Usage Notes

- Include only one of the options, `-files` or `-assembly`, each time you run this command. You cannot include both of these options in the same statement.
- If the command imports more than one template from an assembly, then each template will automatically be given a unique name. These template names will include the name given in the `vmtemplate vmtemplatename` clause followed by a sequence number, such as `vmtemplatename1`, `vmtemplatename2`, and `vmtemplatename3`.

- When importing into a shared repository, you must include the `-node` option with a valid node number, 0 or 1. Using the `-node` option for imports into nonshared repositories will cause the command to fail.

Examples

Importing a Virtual Machine Template from Dom0

Import the required template (OVM_OL5U7_X86_64_PVM_10GB.tgz) from the /OVS directory in Dom0 into the odarepo1 repository and name the template file OL5U7:

```
oakcli import vmtemplate OL5U7 -files /OVS/OVM_OL5U7_X86_64_PVM_10GB.tgz -repo odarepo1
```

Importing a Virtual Machine Template from a Remote Server

Import a template from a remote server using a URL to identify the server and the template file:

```
oakcli import vmtemplate OL5U6 -files 'http://example.com/vm-template/OEL-5/OVM_OL5U6_X86_64_PVM_10GB.tgz' -repo odarepo2
```

Importing Virtual Machine Templates from an Assembly on a Remote Server

Import the templates contained in the assembly file stored on a remote server at the URL provided into the odarepo1 repository:

```
oakcli import vmtemplate OL6U1 -assembly 'http://example.com/assemblies/OEL6/OVM_OL6U1_x86_PVHVM.ova' -repo odarepo1
```

Importing Virtual Machine Templates Into a Shared Repository From an Assembly on a Remote Server

Import the templates contained in the assembly file stored on a remote server at the URL provided into a shared repository named repo4 on Node 1:

```
oakcli import vmtemplate OL6U1 -assembly 'http://example.com/assemblies/OEL6/OVM_OL6U1_x86_PVHVM.ova' -repo repo4 -node 1
```

oakcli locate disk

The `oakcli locate` command helps you locate the physical disk that is associated with a named Oracle ASM disk by turning the disk's LED light on or off.

Syntax

```
oakcli locate disk diskname [on|off] [-h]
```

Parameters

Parameter	Description
<i>diskname</i>	Name of the Oracle ASM disk to locate
on	(Optional) Turns on the LED of the named disk
off	(Optional) Turns off the LED of the named disk
-h	(Optional) Display help for using the command.

Example

Turn on the LED of the Oracle ASM disk named `disk pd_23`:

```
oakcli locate disk pd_23 on
```

oakcli manage diagcollect

Use the `oakcli manage diagcollect` command to collect diagnostic information about Oracle Database Appliance for troubleshooting purposes, and for working with Oracle Support Services.

Syntax

```
oakcli manage diagcollect [--all | --crs [--crshome crs_home_dir] [--core] |
--install | --chmos [--incidenttime time [--incidentduration time] | --adr adr_
location [--afterdate date] [--aftertime time] [--beforetime time] ]
[excl comp1,comp2,...] [--clean] [--storage] [-h]
```

Parameters

Parameter	Description
<code>--all</code>	Collect all of the diagnostic information excluding Automatic Diagnostic Repository (ADR) and Cluster Health Monitor. This is the default option.
<code>--crs</code>	Collect Oracle Clusterware diagnostic information.
<code>--crshome <i>crs_home_dir</i></code>	Specifies the location of the Oracle Clusterware home directory
<code>--core</code>	Package core files with the Oracle Clusterware diagnostic data.
<code>--install</code>	Collect the installation logs when the installation failed before running the script <code>root.sh</code> .
<code>--adr <i>adr_location</i></code>	Collect diagnostic information for ADR, where <i>adr_location</i> specifies the location of the ADR information.
<code>--afterdate <i>date</i></code>	Collect archives from the specified date. Specify the date in the <code>mm/dd/yyyy</code> format.
<code>--aftertime <i>time</i></code>	Collect the archives after the specified time. Enter the time using the format <code>YYYYMMDDHHMMSS24</code> . Supported only with the <code>-adr</code> parameter.
<code>--beforetime <i>time</i></code>	Collect the archives before the specified time. Enter the time using the format: <code>YYYYMMDDHHMMSS24</code> . Supported only the with the <code>-adr</code> parameter.
<code>--chmos</code>	Collect Cluster Health Monitor data.
<code>--incidenttime <i>time</i></code>	Collect Cluster Health Monitor data from the specified time. Enter the time using the format: <code>YYYYMMDDHHMMSS24</code> . If you do not use the <code>--incidenttime</code> parameter, then the command collects data for the past 24 hours.
<code>--incidentduration <i>time</i></code>	Collect Cluster Health Monitor data for the duration after the specified time. Enter the time using the format: <code>HH:MM</code> . If you do not specify a duration, then the command collects all Cluster Health Monitor data after the specified incident time.
<code>--excl [<i>comp1,comp2...</i>]</code>	Exclude the specified component logs. Valid components are: <code>acfs</code> , <code>invt</code> , <code>sys</code> , <code>ocr</code> , <code>crs</code> , <code>home</code> , and <code>base</code> .
<code>--clean</code>	Remove the diagnosability information gathered by this command.
<code>--storage</code>	Collect all of the logs for any storage issues. The logs can be used when you are experiencing any problems with storage and need support to diagnose the logs.

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

oakcli migrate vm

Use the `oakcli migrate vm` command to migrate a currently running virtual machine to another node.

Syntax

```
oakcli migrate vm vmname [-h]
```

Parameters

Parameter	Description
<i>vmname</i>	Name of the virtual machine to be migrated
-h	(Optional) Display help for using the command.

oakcli modify

Use the `oakcli modify` command to:

- Attach virtual disks to or detach virtual disks from virtual machines
- Transmit first-boot installation configuration messages to virtual machines
- Assign networks to or delete networks from virtual machines and virtual machine templates

Syntax

Use the following `oakcli modify` command syntax to modify a virtual machine or virtual machine template:

```
oakcli modify [vm vmname [-attachvdisk vdisk_name | -detachvdisk vdisk_name | -s
key1:value1;key2:value2;...] | [[vm vmname | vmtemplate vmtemplatename]
[-addnetwork network | -deletenetwork network]] [-h]
```

Parameters

Parameter	Description
<i>vmname</i>	Name of the virtual machine
<i>vmtemplatename</i>	Virtual machine template being modified
-attachvdisk <i>vdisk_name</i>	Attach the named virtual disk to the named virtual machine.
-detachvdisk <i>vdisk_name</i>	Detach the named virtual disk from the named virtual machine.
-s <i>key1:value1;key2:value2;...</i>	Identifies a message consisting of one or more key/value pairs to send to the <code>ovmd</code> utility, where each key and value is separated by a colon (:) and each key/value pair is separated from the next key/value pair by quotation marks
-addnetwork <i>network</i>	Identifies a new network to be assigned to the named virtual machine or template
-deletenetwork <i>network</i>	Identifies the network to be deleted from the named virtual machine or template

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

Usage Notes

- The `vmtemplate` object is valid with only the `-addnetwork` or `-deletenetwork` parameters.
- Do not use the `-attachvdisk` or the `-detachvdisk` option with the `-addnetwork`, `-deletenetwork`, or `-s` parameters.
- Include only one of the `-addnetwork`, `-deletenetwork`, or `-s` parameters when you use this command.

Examples

Modifying the Network Defined in a Virtual Machine Template

Replace the network assigned to the `gc_11g` virtual machine template with the `net1` network:

```
oakcli modify vmtemplate gc_11g -addnetwork net1
```

Sending a Message to a Running Virtual Machine

Update the `root` user password for the `gc_11g` virtual machine:

```
oakcli modify vm gc_11g -s "com.oracle.linux.root-password:root123"
```

oakcli orachk

Use the `oakcli orachk` command to audit configuration settings with the ORAchk utility.

Syntax

```
oakcli orachk [-a|-b|-v|-h|-p|-f|-m[-u -o][o]-c -t][-clusternodes  
|-localonly][-debug][-dbnames | -dbnone|-dball][upgrade]listlist
```

Parameters

Parameter	Description
-a	Perform a best practice check and recommended patch check.
-b	Perform a best practice check only without the recommended patch check.
-v	Display version.
-h	Display command usage (help).
-p	Perform patch check only.
-f	Run the command offline.
-m	Exclude checks for Maximum Availability scorecards.
-u -o	Perform check on pre-upgrade best practices (-u -o pre) or on post-upgrade best practices (-u -o post).

Parameter	Description
-o	As an argument to an option, if -o is followed by v, V, Verbose, or VERBOSE, output will display checks that pass on the display. Without the -o option, only failures will display on the screen.
-c	Determines granularity of information displayed on the screen. For use only when working with Oracle Support Services.
-clusternodes <i>list</i>	<i>list</i> is a comma-delimited list containing the names of the nodes where the command should run.
-localonly	Run the command only on the local node.
-debug	Creates a debug log.
-dbnames <i>list</i>	<i>list</i> is a comma-delimited list containing the names of the subset of databases on which the command should run.
-dbnone	Skip all database-related checks on all databases without prompting to select which database to skip.
-dball	Run all database-related checks on all databases without prompting to select which databases to check.
-upgrade	Force upgrade of the version of the ORAchk utility being run.

Usage Notes

- The command offers multiple options that are generic to the ORAchk command when run on servers other than the Oracle Database Appliance server. You can find details about these options by running the `oakcli orachk -h` command. The options are grouped into the following categories, but this document does not list the options for each category:
 - Report Options
 - Auto Restart Options
 - Daemon Options
 - Profile Run Options
- For more information about ORAchk, see the 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>.

oakcli resize dbstorage

Use the `oakcli resize dbstorage` command to resize the space used for a storage structure that was created for the purpose of migrating databases from Oracle ASM to Oracle ACFS. You can check the current space usage using `oakcli show fs` and then add or remove space using `oakcli resize dbstorage`.

Syntax

```
oakcli resize dbstorage -data size -reco size -redo size -db db_name [-h]
```

Parameters

Parameter	Description
-data <i>size</i>	Extendable size in GB for the DATA volume

Parameter	Description
<code>-reco size</code>	Extendable size in GB for the REDO volume
<code>-redo size</code>	Extendable size in GB for the RECO volume
<code>-db db_name</code>	Database for which these volumes must be resized
<code>-h</code>	(Optional) Display help for using the command.

Example

Increase the size of the volume by 10 GB on the DATA volume:

```
oakcli resize dbstorage -data 10G
```

oakcli restart oda_base

Use the `oakcli restart oda_base` command to stop and restart ODA_BASE on the local node. Use this command only when you are not concerned about the current status of ODA_BASE, because it performs a forced shutdown. You must run this command from Dom0 and, typically, if ODA_BASE needs to be restarted, you must restart it on both nodes.

Syntax

```
oakcli restart oda_base [-h]
```

The ODA_BASE to be restarted is on the same node as the Dom0 from which you run this command.

Parameter

(Optional) `-h` displays help for using the command.

oakcli show commands

Use the `oakcli show` commands to display the status of Oracle Database Appliance components.

The `oakcli show` commands display status information for the node where you run the command. Use the help option, `oakcli show -h`, to see the list of components available on the current node.

oakcli show asr

Displays the Oracle Auto Service Request configuration

oakcli show cooling

Displays the status of the cooling units

oakcli show controller

Displays information about the disk controllers

oakcli show core_config_key

Displays information about the core deployment

oakcli show cpupool

Displays information about mappings between cores and virtual machines

oakcli show databases

Displays information about the databases

oakcli show db_config_params

Displays configuration file names and parameters

oakcli show dbhomes

Displays information about the database homes

oakcli show dbstorage

Displays database storage information for databases created on Oracle Automatic Storage Management Cluster File System (ACFS)

oakcli show disk

Displays information about shared or local disks

oakcli show diskgroup

Displays information about Oracle ASM disk groups

oakcli show env_hw

Displays the current node's environment type and hardware version

oakcli show expander

Displays information about the SAS expanders

oakcli show enclosure

Displays information about the storage enclosure

oakcli show fs

Displays information about all database and cloudfs file systems created on ASM Cluster File System (ACFS) in addition to the local file systems on the Oracle Database Appliance node

oakcli show ib

Displays information about the InfiniBand card and port

oakcli show iraid

Displays information about the internal RAID

oakcli show memory

Displays information about the memory subsystem

oakcli show network

Displays information about the network subsystem

oakcli show power

Displays the status of the power supply subsystem

oakcli show processor

Displays processor (CPU) information

oakcli show raidsyncstatus

Displays the status of the RAID rebuild after a failed local disk is replaced

oakcli show repo

Displays information about virtual machine repositories

oakcli show server

Displays information about the server subsystem

oakcli show storage

Displays information about the storage for controllers, expanders, and disks

oakcli show validation storage

Displays status (enabled or disabled) of validation storage

oakcli show validation storage errors

Displays hard storage errors

oakcli show validation storage failures

Displays soft storage errors

oakcli show vdisk

Displays information about virtual disks

oakcli show version

Displays version information for the software and firmware

oakcli show vlan

Displays version information about virtual local area networks

oakcli show vm

Displays virtual machine names, memory and vCPU allocations, status, virtual disks, and the repository name for a virtual machine

oakcli show vmconsole

Opens a GUI VM console for a virtual machine

oakcli show vmtemplate

Displays information about virtual machine templates

Note: Depending on your model and version of Oracle Database Appliance software, the `oakcli show` command options may differ from the ones shown in this section and explained in the following sections. Run the command `oakcli show -h` for an annotated list of components covered on your system.

oakcli show asr

Use the `oakcli show asr` command to display your Oracle Auto Service Request configuration details.

Syntax

```
oakcli show asr [-h]
```

Parameters

(Optional) -h displays the help for using this command.

oakcli show cooling

Use the `oakcli show cooling` command to display the status of the cooling units.

Syntax

```
oakcli show cooling [-h]
```

Parameters

(Optional) -h displays the help for using this command.

Example

Display the cooling unit information for the node where the command is executed:

```
oakcli show cooling
NAME      HEALTH HEALTH_DETAILS LOCATION FAN % FAN SPEED
Fan_0     OK      -              FM0      30 % 6300 RPM
Fan_1     OK      -              FM0      19 % 3800 RPM
Fan_10    OK      -              FM2      34 % 6600 RPM
Fan_11    OK      -              FM2      23 % 4100 RPM
Fan_12    OK      -              FM3      32 % 6300 RPM
Fan_13    OK      -              FM3      22 % 3900 RPM
Fan_14    OK      -              FM3      24 % 4700 RPM
Fan_15    OK      -              FM3      14 % 2500 RPM
Fan_2     OK      -              FM0      29 % 6400 RPM
Fan_3     OK      -              FM0      18 % 3700 RPM
Fan_4     OK      -              FM1      32 % 6400 RPM
Fan_5     OK      -              FM1      20 % 3700 RPM
Fan_6     OK      -              FM1      33 % 6400 RPM
Fan_7     OK      -              FM1      22 % 3800 RPM
Fan_8     OK      -              FM2      33 % 6400 RPM
Fan_9     OK      -              FM2      22 % 3900 RPM
```

oakcli show controller

Use the `oakcli show controller` command to display information about the disk controllers.

Syntax

```
oakcli show controller controller_id [-h]
```

Parameters

Parameter	Description
<i>controller_id</i>	Specifies the controller for which the information should be displayed
-h	(Optional) Display help for using the command.

Example

Display details of controller 0:

```
oakcli show controller 0
```

oakcli show core_config_key

Use the `oakcli show core_config_key` command to display information about how to deploy your Oracle Database Appliance cores.

Syntax

```
oakcli show core_config_key
```

Examples**Determining Whether the Oracle Database Appliance Core Configuration Key Has Been Applied**

Show the core count status on a new Oracle Database Appliance that has not been configured:

```
oakcli show core_config_key
Optional core_config_key is not applied on this machine yet!
```

Displaying the Oracle Database Appliance Core Count Status on a Configured Oracle Database Appliance

Show the core count status on a previously configured Oracle Database Appliance:

```
oakcli show core_config_key
Host's serialnumber = 1132FMW003
Configured Cores = 20
```

oakcli show cpupool

Use the `oakcli show cpupool` command to display core allocations to virtual machine mappings.

Syntax

```
oakcli show cpupool -node nodenum
```

nodenum is the number of the Oracle Database Appliance node that you want to examine, either 0 or 1.

Example

Display the core mapping information for Node 0:

```
oakcli show cpupool -node 0
```

Pool	Cpu List	VM List
default-unpinned-pool	[14, 15, 16, 17, 18, 19, 20, 21, 22, 23]	['test1_odarepo1', 'sample5_odarepo1', 'vm_very_long_name_sample1_odarepo1', 'win_vm1']
twocpu	[12, 13]	['vm1_odarepo1']
odaBaseCpuPool	[0, 1, 2, 3, 10, 11]	['oakDom1']

oakcli show databases

Use the `oakcli show databases` command to display information about each existing database, including database name, database type, database home name and location, and database version.

Syntax

```
oakcli show databases [-h]
```

Parameters

(Optional) `-h` displays help for using the command.

Example

```
#oakcli show databases
```

Name	Type	Storage	HomeName	HomeLocation	Version
----	----	-----	-----	-----	-----
db1	RAC	ACFS	OraDb12102_home1	/u01/app/oracle/product/12.1.0.2/dbhome_1	12.1.0.2.5 (21359755,21359758)
db2	SINGLE	ACFS	OraDb12102_home2	/u01/app/oracle/product/12.1.0.2/dbhome_2	12.1.0.2.5 (21359755,21359758)
db3	RACOneNode	ACFS	OraDb12102_home3	/u01/app/oracle/product/12.1.0.2/dbhome_3	12.1.0.2.5 (21359755,21359758)
db4	RAC	ACFS	OraDb12102_home4	/u01/app/oracle/product/12.1.0.2/dbhome_4	12.1.0.2.5 (21359755,21359758)

oakcli show db_config_params

Use the `oakcli show db_config_params` command to display configuration file names and parameters. By default, the command will search for files with the extension `.dbconf` located in the `/opt/oracle/oak/install/dbconf` directory.

Syntax

```
oakcli show db_config_params [-conf filename] [-detail] [-h]
```

Parameters

Parameter	Description
<code>-conf filename</code>	(Optional) Name of configuration file to be displayed. If not included, then the command displays all configuration files.
<code>-detail</code>	(Optional) Display the parameter values stored in the configuration file or files.
<code>-h</code>	(Optional) Display help for using the command.

Example

Display the default database configuration parameter values stored in the configuration file or files:

```
oakcli show db_config_params -detail
Available DB configuration files are:
Default
DATABASE_BLOCK_SIZE      =>      8192
DATABASE_LANGUAGE        =>      AMERICAN
DATABASE_CHARACTERSET     =>      AL32UTF8
DATABASE_TERRITORY       =>      AMERICA
COMPONENT_LANGUAGES      =>      en
```

oakcli show dbhomes

Use the `oakcli show dbhomes` command to display information about each existing Oracle database home, including home name, home location, and database version.

Syntax

```
oakcli show dbhomes [-detail] [-h]
```

Parameters

Parameter	Description
-detail	(Optional) Include a list of databases associated with each home.
-h	(Optional) Display help for using the command.

Example

```
oakcli show dbhomes -detail
```

Oracle HomeName	Oracle Home Version	Oracle HomeLocation	Database Name	Database Type
OraDb11203_home1	11.2.0.3.15 (20760997,17592127)	/u01/app/oracle/product/11.2.0.3/dbhome_1	no DB available	
OraDb11204_home1	11.2.0.4.8 (21352635,21352649)	/u01/app/oracle/product/11.2.0.4/dbhome_1	no DB available	
OraDb12102_home1	12.1.0.2.5 (21359755,21359758)	/u01/app/oracle/product/12.1.0.2/dbhome_1	one43	RACOneNode
OraDb12102_home1	12.1.0.2.5 (21359755,21359758)	/u01/app/oracle/product/12.1.0.2/dbhome_1	ee120	SINGLE
OraDb12102_home1	12.1.0.2.5 (21359755,21359758)	/u01/app/oracle/product/12.1.0.2/dbhome_1	one311	RACOneNode
OraDb12102_home1	12.1.0.2.5 (21359755,21359758)	/u01/app/oracle/product/12.1.0.2/dbhome_1	ee311	SINGLE
OraDb12102_home1	12.1.0.2.5 (21359755,21359758)	/u01/app/oracle/product/12.1.0.2/dbhome_1	rac311	RAC
OraDb12102_home1	12.1.0.2.5 (21359755,21359758)	/u01/app/oracle/product/12.1.0.2/dbhome_1	ee43	SINGLE
OraDb12102_home1	12.1.0.2.5 (21359755,21359758)	/u01/app/oracle/product/12.1.0.2/dbhome_1	one120	RACOneNode
OraDb12102_home1	12.1.0.2.5 (21359755,21359758)	/u01/app/oracle/product/12.1.0.2/dbhome_1	odacn	RAC
OraDb12102_home1	12.1.0.2.5 (21359755,21359758)	/u01/app/oracle/product/12.1.0.2/dbhome_1	rac43	RAC
OraDb12102_home1	12.1.0.2.5 (21359755,21359758)	/u01/app/oracle/product/12.1.0.2/dbhome_1	rac120	RAC

oakcli show dbstorage

Use the `oakcli show dbstorage` command to display database storage information for databases created on Oracle Automatic Storage Management Cluster File System (Oracle ACFS). By default, all non-cdb databases will be listed together, because they share a common set of volumes. Each CDB database will be listed separately.

Syntax

```
oakcli show dbstorage [-db ] [-h] db_name
```

Parameters

Parameter	Description
-db dbname	(Optional) Display the name of the database for the storage information.
-h	(Optional) Display help for using the command.

Example 1: Oracle Database Appliance X3-2 or X4-2 with a Storage Expansion Shelf

Here is an example of the `oakcli show dbstorage` command output for an Oracle Database Appliance plus the storage expansion shelf. The output includes both CDB and non-CDB databases. The **Available** heading shows the available AFCS storage, which can be auto-extended. Half of the available disk group storage is allocated to

Oracle ACFS, except for the FLASH disk group. In the FLASH disk group, all storage is allocated to Oracle ACFS.

```
# oakcli show dbstorage
```

All the DBs with DB TYPE as non-CDB share the same volumes

DB_NAMES	DB_TYPE	Filesystem	Size	Used	Available	AutoExtend	Size	DiskGroup
-----	-----	-----	----	----	-----	-----	-----	-----
odacn	CDB	/u01/app/oracle/oradata/rdoacn	5G	3.15G	1.85G	1G		REDO
		/u02/app/oracle/oradata/datodacn	100G	3.86G	96.14G	10G		DATA
		/u01/app/oracle/fast_recovery_area/rcodacn	132G	0.92G	131.08G	13G		RECO
rac120, rac401, ra c408	non-CDB	/u01/app/oracle/oradata/datastore	60G	11.30G	48.70G	5G		REDO
		/u02/app/oracle/oradata/datastore	1027G	5.77G	1021.23G	102G		DATA
		/u01/app/oracle/fast_recovery_area/datastore	1336G	7.27G	1328.73G	133G		RECO
cdbracon	CDB	/u01/app/oracle/oradata/rdocdbracon	6G	4.15G	1.85G	1G		REDO
		/u02/app/oracle/oradata/datcdbracon	100G	4.05G	95.95G	10G		DATA
		/u01/app/oracle/fast_recovery_area/rcocdbracon	132G	0.79G	131.21G	13G		RECO

Example 2: Oracle Database Appliance X5-2 with a Storage Expansion Shelf and Non-CDB Databases

Here is an example of the `oakcli show dbstorage` command output for an Oracle Database Appliance plus the storage expansion shelf. The output includes only non-CDB databases. Half of the available disk group storage is allocated to Oracle ACFS, except for the FLASH disk group. In the FLASH disk group, all storage is allocated to Oracle ACFS.

```
# oakcli show dbstorage
```

All the DBs with DB TYPE as non-CDB share the same volumes

DB_NAMES	DB_TYPE	Filesystem	Size	Used	Available	AutoExtend	Size	DiskGroup
-----	-----	-----	----	----	-----	-----	-----	-----
db1, db2, db3, db4	non-CDB	/u01/app/oracle/oradata/datastore	62G	27.26G	34.74G	6G		REDO
		/u02/app/oracle/oradata/datastore	3730G	7.86G	3722.14G	373G		DATA
		/u02/app/oracle/oradata/flashdata	558G	205.25G	352.75G	55G		FLASH
		/u01/app/oracle/fast_recovery_area/datastore	4958G	21.05G	4936.95G	495G		RECO

oakcli show disk

Use the `oakcli show disk` command to display disk information.

Syntax

```
oakcli show disk [-shared | -local | -shared_disk_name] [-asm [-all]] [-h]
```

Parameters

Parameter	Description
-local	(Optional) Display information for all of the local disks.
-shared	(Optional) Display information for all of the shared disks.
-shared_disk_name	(Optional) Display information for only the specified shared disk.
-asm	(Optional) Displays information for an assembly.
-all	(Optional) Display complete details of the selected disk or disks.

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

Usage Notes

- Running the command with no parameters is identical to running the `oakcli show disk -shared` command.
- The `-all` parameter produces valid output only when used with the `shared_disk_name` parameter. All other parameters are optional and cannot be combined with other parameters.

Examples

Displaying Information About the Local Disks

```
oakcli show disk -local
```

Displaying Information About the Shared Disks

```
oakcli show disk -shared
```

Displaying Information About a Specific Shared Disk

Display information about the shared disk named `pd_01`:

```
oakcli show disk -shared pd_01
```

oakcli show diskgroup

Use the `oakcli show diskgroup` command to display Oracle Automatic Storage Management (Oracle ASM) disk group information.

Syntax

```
oakcli show diskgroup [disk_group_name] [-h]
```

Parameters

Parameter	Description
<i>disk_group_name</i>	(Optional) The name of an Oracle ASM disk group for which complete details should be displayed. If you do not specify this parameter, then information for all of the Oracle ASM disk groups is displayed.
-h	(Optional) Display help for using the command.

oakcli show enclosure

Use the `oakcli show enclosure` command to display information about the storage enclosure subsystem on the node where the command is executed.

Syntax

```
oakcli show enclosure [-h]
```

Parameter

`-h` displays help for using the command.

oakcli show env_hw

Use the `oakcli show env_hw` command to display the environment type and hardware version of the current node.

Syntax

```
oakcli show env_hw [-h]
```

Parameter

(Optional) `-h` displays help for using the command.

Example

Show the environment type and hardware model when logged in to ODA_BASE on Oracle Database Appliance X3-2 Virtualized Platform:

```
oakcli show env_hw
VM-ODA_BASE ODA X3-2
```

oakcli show expander

Use the `oakcli show expander` command to display information about a SAS expander.

Syntax

```
oakcli show expander [expander_id] [-h]
```

Parameter

Parameter	Description
<i>expander_id</i>	(Optional) Identifies the specific SAS expander
<code>-h</code>	(Optional) Display help for using the command.

oakcli show fs

Use the `oakcli show fs` command to display all database and cloudfs file systems created on ASM Cluster File System (ACFS) in addition to the local file systems on the Oracle Database Appliance node.

Syntax

```
oakcli show fs [-h]
```

Parameter

(Optional) `-h` displays help for using the command.

oakcli show ib

Use the `oakcli show ib` command to display InfiniBand card and port information if InfiniBand exists in the system.

Syntax

```
oakcli show ib [-h]
```

Parameter

(Optional) -h displays help for using the command.

oakcli show iraid

Use the `oakcli show iraid` command to display internal RAID and local disk information. This command is only available on X5-2 systems and later.

Syntax

```
oakcli show iraid [-h]
```

Parameter

(Optional) -h displays help for using the command.

oakcli show memory

Use the `oakcli show memory` command to display information about memory modules.

Syntax

```
oakcli show memory [-h]
```

Parameter

(Optional) -h displays help for using the command.

oakcli show network

Use the `oakcli show network` command to display information about the network subsystem.

Syntax

```
oakcli show network
```

Parameter

(Optional) -h displays help for using the command.

oakcli show power

Use the `oakcli show power` command to display information about the power supply subsystem.

Syntax

```
oakcli show power [-h]
```

Parameter

(Optional) -h displays help for using the command.

Example

Display the power supply information of the node where the command is executed:

```
oakcli show power
      NAME                HEALTH HEALTH_DETAILS PART_NO.  SERIAL_NO.      LOCATION
INPUT_POWER OUTPUT_POWER INLET_TEMP      EXHAUST_TEMP
```

```

Power_Supply_0 OK - 7047410 476856F+1242CE0020 PS0
Present 113 watts 33.250 degree C 36.688 degree C
Power_Supply_1 OK - 7047410 476856F+1242CE004J PS1
Present 89 watts 37.000 degree C 39.438 degree C

```

oakcli show processor

Use the `oakcli show processor` command to display information about CPU processors.

Syntax

```
oakcli show processor [-h]
```

Parameter

(Optional) `-h` displays help for using the command.

Example

Display the CPU processor information of the node where the command is executed:

```

oakcli show processor
NAME HEALTH HEALTH_DETAILS PART_NO. LOCATION
MODEL MAX_CLK_SPEED TOTAL_CORES ENABLED_CORES

CPU_0 OK - 060D P0 (CPU 0)
Intel(R) Xeon(R) CPU E5-2690 2.900 GHZ 8 8
CPU_1 OK - 060D P1 (CPU 1)
Intel(R) Xeon(R) CPU E5-2690 2.900 GHZ 8 8

```

oakcli show raidsyncstatus

Use the `oakcli show raidsyncstatus` command to display the status of the RAID rebuild after a failed local disk is replaced.

Note: The `show raidsyncstatus` command is only supported on a bare metal platform; it is not supported on the virtualized platform. For general RAID information, use the `oakcli show iraid` command.

Syntax

```
oakcli show raidsyncstatus [-h]
```

Parameter

(Optional) `-h` displays help for using the command.

oakcli show repo

Use the `oakcli show repo` command to display information about virtual machine repositories. To see all repositories, omit the repository name and node number. To see a specific shared repository, include the repository name and node.

Syntax

```
oakcli show repo [reponame -node 0|1] [-h]
```

Parameters

Parameter	Description
<i>reponame</i>	[Optional] Identifies a specific repository name
<i>-node</i>	[Optional] Identifies the node number 0 or 1
<i>-h</i>	[Optional] Display help for using the command.

Examples

Displaying the Available Virtual Machine Repositories

Display the virtual machine repositories on Oracle Database Appliance Virtualized Platform nodes:

```
oakcli show repo
      NAME      REPOTYPE  NODENUM
odarepo1  local      0
odarepo2  local      1
repo1     shared     0
repo1     shared     1
```

Displaying Details About a Specific Shared Repository

Display information about the repository named `repo1` on Node 1:

```
oakcli show repo repo1 -node 1
```

```
Resource: repo1_1
AutoStart      :      restore
DG             :      DATA
Device         :      /dev/asm/repo1-286
ExpectedState  :      Online
MountPoint     :      /u01/app/repo1
Name           :      repo1_0
Node           :      all
RepoType       :      shared
Size           :      102400
State          :      Online
```

oakcli show server

Use the `oakcli show server` command to display information about the server subsystem.

Syntax

```
oakcli show server [-h]
```

Parameter

(Optional) `-h` displays help for using the command.

oakcli show storage

Use the `oakcli show storage` command to display information about the storage for controllers, expanders, and disks.

Syntax

```
oakcli show storage -errors [-h]
```

Parameters

Parameter	Description
-errors	Display detailed information about reported errors.
-h	(Optional) Display help for using the command.

oakcli show validation storage

Use the `oakcli show validation storage` command to show whether validation storage is enabled or disabled.

Syntax

```
oakcli show validation storage [-h]
```

Parameter

(Optional) -h displays help for using the command.

Example

```
oakcli show validation storage
Enabled
```

oakcli show validation storage errors

Use the `oakcli show validation storage errors` command to show hard storage errors. Hard errors include having the wrong type of disk inserted into a particular slot, an invalid disk model, or an incorrect disk size.

Syntax

```
oakcli show validation storage errors [-h]
```

Parameter

(Optional) -h displays help for using the command.

oakcli show validation storage failures

Use the `oakcli show validation storage failures` command to show soft validation errors. A typical soft disk error would be an invalid version of the disk firmware.

Syntax

```
oakcli show validation storage failures [-h]
```

Parameter

(Optional) -h displays help for using the command.

oakcli show vdisk

Use the `oakcli show vdisk` command to display information about virtual disks on Oracle Database Appliance Virtualized Platform.

Syntax

```
oakcli show vdisk [vdisk_name -repo repository_name] [-h]
```

Parameters

Parameter	Description
<i>vdisk_name</i>	(Optional) Display information for just one virtual disk.
<i>-repo repository_name</i>	Required parameter if a virtual disk is specified in the command
<i>-h</i>	(Optional) Display help for using the command.

Examples

Display the Information for All Virtual Disks

Display information about all virtual disks on Oracle Database Appliance Virtualized Platform:

```
# oakcli show vdisk
```

NAME	SIZE	TYPE	REPOSITORY
myvdisk	10G	local	vdiskrepo
newv	1G	local	vdiskrepo

Display Information for a Single Virtual Disk

Display information for the virtual disk named *myvdisk1*:

```
# oakcli show vdisk myvdisk1
```

Resource: myvdisk_vdiskrepo

Name	:	myvdisk_vdiskrepo
RepoName	:	vdiskrepo
Size	:	10G
Type	:	local
VmAttached	:	0

oakcli show version

Use the `oakcli show version` command to display patch versions for Oracle Database Appliance software and firmware.

Syntax

```
oakcli show version [-detail] [-h]
```

Parameter	Description
<i>-detail</i>	(Optional) Display detailed version information.
<i>-h</i>	(Optional) Display help for using the command.

Example

Display the version information for the software and firmware on Oracle Database Appliance:

```
oakcli show version
Version
-----
12.1.2.5.0
```

oakcli show vlan

Use the `oakcli show vlan` command to display information about virtual local area networks configured on Oracle Database Appliance.

Syntax

```
oakcli show vlan [-h]
```

Parameter

(Optional) `-h` displays help for using the command.

Example

Display the names, tag ID numbers, networks, and node assignments for the available local virtual area networks:

```
oakcli show vlan
NAME                                ID  INTERFACE  NODENUM
net1                                1   bond1      0
net1                                1   bond1      1
net2                                1   bond2      0
net2                                1   bond2      1
net3                                1   bond3      0
net3                                1   bond3      1
net4                                1   xbond0     0
net4                                1   xbond0     1
priv1                               1   bond0      0
priv1                               1   bond0      1
```

oakcli show vm

Use the `oakcli show vm` command to display information about virtual machines.

Syntax

```
oakcli show vm [vm_name | -h]
```

Parameters

Parameter	Description
<code>vm_name</code>	(Optional) The name of the virtual machine for which details should be displayed. If you do not specify this parameter, then information for all the virtual machines is displayed.
<code>-h</code>	(Optional) Display help for using the command.

Examples

Displaying Details for All Virtual Machines

Display the virtual machine names, memory and vCPU allocations, status, virtual disks, and repository name for all virtual machines:

```
oakcli show vm
NAME                                MEMORY  VCPU  STATE  REPOSITORY
sample5_odarepo1                   2048   2     OFFLINE  odarepo1
```

sample6_odarepo1	2048	2	OFFLINE	odarepo2
test1_odarepo1	2048	2	OFFLINE	odarepo1
test2_odarepo2	2048	2	OFFLINE	odarepo2
vm1_odarepo1	4096	4	ONLINE	odarepo1
vm2_odarepo2	2048	2	OFFLINE	odarepo2
win_vm1	1500	1	ONLINE	odarepo1

Displaying Information for a Single Virtual Machine

Display information about the *vm1_odarepo1* virtual machine:

```
oakcli show vm vm1_odarepo1
Resource: vm1_odarepo1
  AutoStart      : restore
  CPUPriority    : 100
  Disks          : |file:/OVS/Repositories/odarepo1/Vi
                  rtualMachines/vm1_odarepo1/System.i
                  mg,xvda,w||file:/OVS/Repositories/o
                  darepo1/VirtualMachines/vm1_odarepo
                  1/u01.img,xvdb,w|
  Domain         : XEN_PVM
  ExpectedState  : online
  FailOver       : false
  IsSharedRepo   : false
  Keyboard       : en-us
  MaxMemory      : 3000
  MaxVcpu        : 4
  Memory         : 4096
  Mouse          : OS_DEFAULT
  Name           : vm1_odarepo1
  Networks       : |mac=00:21:F6:00:00:E4|
  NodeNum        : 0
  NodeNumStart   :
  OS             : OL_5
  PrivateIP      : None
  ProcessorCap   : 100
  RepoName       : odarepo1
  State          : Online
  TemplateName   : otml_sample1_odarepo1
  Vcpu           : 4
  cpupool        : twocpu
  vncport        : 5901
```

oakcli show vmconsole

Use the `oakcli show vmconsole` command to open a GUI virtual machine console to manage a specific virtual machine.

Syntax

```
oakcli show vmconsole vm_name [-h]
```

Parameters

Parameter	Description
<i>vm_name</i>	Name of the virtual machine for which you want to open a console
-h	(Optional) Display help for using the command.

Example

Open a console for the virtual machine named `vm1_odarepo1`:

```
oakcli show vmconsole vm1_odarepo1
```

oakcli show vmtemplate

Use the `oakcli show vmtemplate` command to display information about virtual machine templates.

Syntax

```
oakcli show vmtemplate [vmtemplate_name | -h]
```

Parameters

Parameter	Description
<i>vmtemplate_name</i>	(Optional) The name of the virtual template for which details should be displayed. If you do not specify this parameter, then information for all of the virtual templates is displayed.
<code>-h</code>	(Optional) Display help for using the command.

Example

Display information about the `sample1_odarepo1` virtual template:

```
oakcli show vmtemplate sample_odarepo1
```

Resource: `sample1_odarepo1`

```

CPUPriority      : 100
Disks           : |file:/OVS/Repositories/odarepo1/Templates/otml_sample1_odarepo1/System.img,xvda,w|file:/OVS/Repositories/odarepo1/Templates/otml_sample1_odarepo1/u01.img,xvdb,w|
Domain          : XEN_PVM
Keyboard        : en-us
MaxMemory       : 2048
MaxVcpu         : 2
Memory          : 2048
Mouse           : OS_DEFAULT
Name            : sample1_odarepo1
Networks        : |bridge=priv1||bridge=net1||bridge=net2|
NodeNum         : 0
OS              : OL_5
ProcessorCap     : 100
RepoName        : odarepo1
Vcpu            : 2

```

oakcli start commands

Use the `oakcli start` commands to start a virtual machine, to start a shared repository on a node, or to start ODA_BASE on the local node.

oakcli start oda_base

Starts ODA_BASE on the local node

oakcli start repo

Starts a shared repository on the specified node, or if none is specified, both nodes

oakcli start vm

Starts a virtual machine on the specified node, or if none is specified, both nodes

oakcli start oda_base

Use the `oakcli start oda_base` command to start ODA_BASE on the local node.

Syntax

```
oakcli start oda_base [-h]
```

Parameter

(Optional) `-h` displays help for using the command.

Example

Connect to Dom0 on the desired node and enter the following command to start ODA_BASE on that node:

```
oakcli start oda_base
```

oakcli start repo

Use the `oakcli start repo` command to start a shared repository on a node.

Syntax

```
oakcli start repo repo_name [-node node_number] [-h]
```

Parameters

Parameter	Description
<i>repo_name</i>	<i>repo_name</i> is the name of the shared repository to be started.
<code>-node <i>node_number</i></code>	Specifies the node on which to start the shared repository. <i>node_number</i> is the number of the node where it is to be started, either 0 or 1. If <code>-node</code> is not specified, the shared repository is started on both nodes.
<code>-h</code>	(Optional) Displays help for using the command.

Example

Start the shared repository named `repo1` on Node 0:

```
oakcli start repo repo1 -node 0
```

oakcli start vm

Use the `oakcli start vm` command to start a virtual machine on a node.

Syntax

```
oakcli start vm vm_name [-node node_number] [-d] [-h]
```

Parameters

Parameter	Description
<i>vm_name</i>	<i>vm_name</i> is the name of the virtual machine to be started.
<i>-node node_number</i>	Specifies the node on which to start the virtual machine. <i>node_number</i> is the number of the node where it is to be started, either 0 or 1. If <i>-node</i> is not specified, a virtual machine is started on both nodes.
<i>-d</i>	Provides details about the virtual machine starting procedure
<i>-h</i>	(Optional) Display help for using the command.

Example

Start the virtual machine named `vm1_odarepo1` on Node 0.

```
oakcli start vm vm_odarepo1 -node 0
```

oakcli stop command

Use the `oakcli stop` command to stop a virtual machine, to stop a shared repository on a node, or to stop ODA_BASE on the local node.

Syntax

```
oakcli stop [vm vm_name [-force] | repo repo_name [-node node_number] | oda_base ] [-h]
```

Parameters

Parameter	Description
<i>vm vm_name</i>	<i>vm_name</i> is the name of the virtual machine to be stopped.
<i>-force</i>	(Optional) forces the virtual machine to stop.
<i>repo repo_name</i>	<i>repo_name</i> is the name of the shared repository to be stopped.
<i>-node node_number</i>	<i>node_number</i> is the number of the node where the shared repository is to be stopped, either 0 or 1. The <i>-node</i> parameter is only valid when stopping a virtual machine on a shared repository. If <i>-node</i> is not specified, the shared repository is stopped on both nodes.
<i>oda_base</i>	Stops ODA_BASE on the local node
<i>-h</i>	(Optional) Displays help for using the command.

Examples

Forcing a Virtual Machine to Stop

Force the virtual machine named `vm1_odarepo1` to stop:

```
oakcli stop vm vm_odarepo1 -force
```

Stopping a Shared Repository

Stop the shared repository named `repo1` on Node 0:

```
oakcli stop repo repo1 -node 0
```

Stopping the Local ODA_Base

Connect to Dom0 on the desired node and enter the following command to stop ODA_BASE on that node:

```
oakcli stop oda_base
```

oakcli stordiag

Use the `oakcli stordiag` command to run diagnostic tests on a disk in the storage shelf or storage expansion shelf. The tool produces a list of 14 disk checks for each node.

Syntax

```
oakcli stordiag resource_type [n| -h]
```

Parameters

Parameter	Description
<i>resource_type</i>	Prefix that depends on the configuration. See "Usage Notes."
<i>n</i>	(Optional) Disk number (starting with 0 and increasing to one less than the number of disks)
<i>-h</i>	(Optional) Display help for using the command.

Usage Notes

Select the value for *resource_type* based from one of the following options:

- On Oracle Database Appliance Version 1, use `d`.
- On Oracle Database Appliance with a single storage shelf, use `pd_`.
- On Oracle Database Appliance with an expansion storage shelf, use `e0_pd_` for a disk in the storage shelf and use `e1_pd_` for a disk in the expansion storage shelf.

For Oracle Database Appliance systems that have internal storage, use the format `d_` [...] to identify the disk to be diagnosed. For Oracle Database Appliance systems that have connected a storage shelf (and optional storage expansion shelf), use the format `e[0..1] pd_[0..23]` to identify the disk to be diagnosed.

Example

Runs the diagnostic tests on disk 3 in the expansion storage shelf:

```
# oakcli stordiag e1_pd_3
Node Name : hr0
Test : Diagnostic Test Description

  1  : OAK Check
      NAME      PATH      TYPE      STATE      STATE_DETAILS
      pd_03     /dev/sdw   HDD       ONLINE     Good

  2  : ASM Check
  ...
<output truncated>
```

oakcli test asr

Use the `oakcli test asr` command to send a test trap to determine if Oracle Auto Service Request (Oracle ASR) is configured and working correctly. The command returns a success message if Oracle ASR is functioning properly.

Syntax

```
oakcli test asr [-h]
```

Parameter

(Optional) `-h` displays help for using the command.

oakcli unpack

Use the `oakcli unpack` command to unpack packages into the Oracle Appliance Manager repository.

Syntax

```
oakcli unpack -package absolute_package_name
```

Parameters

Parameters	Description
<i>absolute_package_name</i>	Identifies the package to be unpacked using the package's full absolute path and file name
<code>-h</code>	(Optional) Display help for using the command.

Example

Unpack the `p13982331_23000_Linux-86-62.zip` package, which was previously copied to `/tmp` on the current node, into the node's Oracle Appliance Manager command-line interface repository:

```
oakcli unpack -package /tmp/p13982331_23000_Linux-86-62.zip
```

oakcli update

Use the `oakcli update` command to apply Oracle Database Appliance patches. For upgrading only the Oracle Database software, see the [oakcli upgrade](#) command.

Syntax

```
oakcli update -patch version [--infra] | [--gi][--database]] [--noreboot] |  
[--clean] | [--verify][-h]
```

Parameters

Parameter	Description
<code>-patch <i>version</i></code>	Patch update that you want to install
<code>--infra</code>	(Optional) Infrastructure is to be patched, including firmware, OS, ASR, HMP, OAK, and so on. This is the default option.
<code>--gi</code>	(Optional) Grid Infrastructure is to be patched.

Parameter	Description
--database	(Optional) Database homes to be patched
--noreboot	(Optional) Node will not be rebooted after patching.
--clean	(Optional) Clean up all temporary files on the local node.
--verify	(Optional) Show the patchable components on the node.
-h	(Optional) Display help for using the command.

Example

Update the current node with the 12.1.2.5.0 patch:

```
oakcli update -patch 12.1.2.5.0
```

oakcli upgrade

Use the `oakcli upgrade` command to upgrade the Oracle Database software on Oracle Database Appliance. For patching Oracle Database Appliance itself, see the [oakcli update](#) command.

Syntax

```
oakcli upgrade database [-db db_names | -from source_home] -to destination_home
```

Parameters

Parameter	Description
-db db_names	Specifies the name or names (in a comma-delimited list) of the database or databases you want to upgrade
-from source_home	Specifies the current Oracle Database home of the databases you are upgrading
-to destination_home	Specifies the Oracle Database home containing the version to which you want to upgrade the databases
-h	(Optional) Display help for using the command.

Usage Notes

- You must include either a `-db` parameter or a `-from` parameter.
- Running the command with a `-db` parameter upgrades only the named databases, regardless of their current Oracle Database homes. If you include a `-from` parameter in addition to a `-db` parameter, then the command ignores the `-from` parameter. That is, the command upgrades named databases from other homes and ignores the databases in the named home if they are not listed in the `-db` parameter.
- Running the command without a `-db` parameter will upgrade all of the databases in the named Oracle Database home.
- You must always provide a `-to` parameter that names an existing Oracle Database home.

Example

Upgrade an Oracle 11.2.0.2.5 database named `tpcc` from Oracle Database 11.2.0.2.5 to Oracle Database 11.2.0.3.1 using the Oracle Database home directory `OraDb11203_home1`:

```
oakcli upgrade database -db tpcc -to OraDb11203_home1
```

oakcli validate

Use the `oakcli validate` command to validate the state of an Oracle Database Appliance or the viability of an operating system patch.

Syntax

Use the following `oakcli validate` syntax to validate an Oracle Database Appliance:

```
oakcli validate [[-V | -l | -h]] | [[-v][-f output_file] [-a | -d | -c  
checklist][-ver patch_version]]
```

Parameters

Parameter	Description
<code>-V</code>	Display the version of <code>oakValidation</code> .
<code>-l</code>	List the items that can be checked (and their descriptions).
<code>-h</code>	(Optional) Display help for using the command.
<code>-v</code>	Show verbose output (must be used with a parameter that generates a validation report).
<code>-f <i>output_file</i></code>	Send output to a file with a fully qualified file name, <i>output_file</i> , instead of to the screen (<code>stdout</code>).
<code>-a</code>	Run all system checks, including <code>DiskCalibration</code> . Oracle recommends that you use this command to validate system readiness before deployment. Do not run <code>oakcli validate</code> with this option on a busy production system, because the <code>DiskCalibration</code> system check can cause performance issues. See Table 5-2, "Oracle Database Appliance Validation Checks" for details about each check.
<code>-d</code>	Run only the default checks. The default checks are <code>NetworkComponents</code> , <code>OSDiskStorage</code> , <code>SharedStorage</code> , and <code>SystemComponents</code> . See Table 5-2, "Oracle Database Appliance Validation Checks" for details about each check.
<code>-c <i>checklist</i></code>	Run the validation checks for the items identified in <i>checklist</i> , a comma-delimited list. Use this parameter to check either a single item or subset of items.
<code>-c ospatch</code>	Run the validation checks for the patch version identified in <code>-ver <i>patch_version</i></code> .
<code>-ver <i>patch_version</i></code>	Report any reasons for not being able to patch Oracle Database Appliance with the patch named in <i>patch_version</i> .

Examples

See ["Examples of OAKCLI Validate Command Checks"](#) on page 5-2, for examples of how to use the `oakcli validate` command to perform validation checks.

Validating and Troubleshooting Oracle Database Appliance

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

- [Oracle Database Appliance Diagnostics and Validation](#)
- [Oracle Database Appliance Configuration Error Messages](#)
- [Preparing Log Files for Oracle Support Services](#)
- [Additional Troubleshooting Tools and Commands](#)
- [Oracle Database Appliance Hardware Monitoring Tool](#)

Oracle Database Appliance Diagnostics and Validation

The Oracle Appliance Manager diagnostics are managed with the `oakcli validate` command and options. The `oakcli validate` command provides diagnostic and validation functions to resolve support issues. If you experience problems with Oracle Database Appliance, then use the `oakcli validate` command options to verify that your environment is properly configured and that best practices are in effect. When placing a service request, also use Oracle Appliance Manager as described in this chapter to prepare the log files to send to Oracle Support Services.

Oracle Database Appliance Validation Command Overview

Use the `oakcli validate` command and options to validate the status of Oracle Database Appliance. You must run the `oakcli validate` command as the `root` user.

The command uses the following syntax, where *checklist* is a single check or a comma-delimited list of checks, and *output_file* is the name that you designate for a validation output file:

```
oakcli validate -h
oakcli validate [-V | -l | -h]
oakcli validate [-v] [-f output_file] [-a | -d | -c checklist] [-v patch_version]
```

See [Table 5–1](#) and [Table 5–2](#) for a summary of the `oakcli validate` command options and system checks.

Table 5–1 Oracle Database Appliance Validation Command Options

Option	Purpose
-a	Run all system checks, including <code>DiskCalibration</code> . Oracle recommends that you use this command to validate system readiness before deployment. Do not run <code>oakcli validate</code> with this option on a busy production system, because the <code>DiskCalibration</code> system check can cause performance degradation. See Table 5–2 for details about each check.
-c <i>checklist</i>	Run the validation checks for the items identified in <i>checklist</i> , a comma-delimited list. Use this parameter to check either a single item or subset of items.
-d	Run only the default checks. The default checks are <code>NetworkComponents</code> , <code>OSDiskStorage</code> , <code>SharedStorage</code> , and <code>SystemComponents</code> . See Table 5–2 for details about each check.
-f <i>output_file</i>	Send output to a file with a fully qualified file name, <i>output_file</i> , instead of to the screen (stdout).
-h	Display the online help.
-l	List the items that can be checked (and their descriptions).
-v	Show verbose output (must be used with a parameter that generates a validation report).
-V	Display the version of <code>oakValidation</code> .
-ver <i>patch_version</i>	Report any reasons for not being able to patch Oracle Database Appliance with the patch named in <i>patch_version</i> .

Table 5–2 Oracle Database Appliance Validation Checks

Command	Purpose
-c asr	Validate Oracle Auto Service Request (Oracle ASR) components based on the Oracle ASR configuration file and Oracle Integrated Lights Out Manager (Oracle ILOM) sensor data.
-c DiskCalibration	Preinstallation check for the storage disk performance using <code>/opt/oracle/oak/bin/orion</code> Do not run this check after you have deployed Oracle software on Oracle Database Appliance, because running the <code>DiskCalibration</code> command on a deployed system creates performance issues. Use the default check option (<code>oakcli validate -d</code>) if you do not want to perform a system check for disk calibration.
-c NetworkComponents	Validate public and private network hardware connections.
-c OSDiskStorage	Validate the operating system disks, and file system information.
-c ospatch	Validate that the system will be able to complete an upgrade successfully using the named patch.
-c SharedStorage	Validate shared storage and multipathing information.
-c StorageTopology	Validate the storage shelf connectivity.
-c SystemComponents	Validate system components, based on Oracle ILOM sensor data readings.

Examples of OAKCLI Validate Command Checks

Here are some of the validation checks you can perform using the `oakcli validate` command and options.

Listing All Checks and Their Descriptions

```
oakcli validate -l
```

```

Checkname -- Description
=====
*SystemComponents -- Validate system components based on ilom sensor data
readings
*OSDiskStorage -- Validate OS disks and filesystem information
*SharedStorage -- Validate Shared storage and multipathing information
DiskCalibration -- Check disk performance with orion
*NetworkComponents -- Validate public and private network components
*StorageTopology -- Validate external JBOD connectivity
asr -- Validate asr components based on asr config file and ilom sensor
data readings

```

* -- These checks are also performed as part of default checks

Note: The NetworkComponents validation check is not available on hardware prior to Oracle Database Appliance X3-2.

Running All Checks

Enter the following command to run all checks:

```
oakcli validate -a
```

Validating Storage Cable Connections

Check the cable connections between the system controllers and the storage shelf, as well as the cable connection to the storage expansion shelf (if one is installed):

```
oakcli validate -c storagetopology
```

Oracle recommends that you run the `oakcli validate -c StorageTopology` command *before* deploying the system. This will avoid and prevent problems during deployment due to wrong or missing cable connections. The output shown in the following example reports a successful configuration. If the cabling is not correct, you will see errors in your output.

```

# oakcli validate -c storagetopology
It may take a while. Please wait...
INFO : ODA Topology Verification
INFO : Running on Node0
INFO : Check hardware type
SUCCESS : Type of hardware found : X4-2
INFO : Check for Environment(Bare Metal or Virtual Machine)
SUCCESS : Type of environment found : Virtual Machine(ODA BASE)
SUCCESS : Number of External LSI SAS controller found : 2
INFO : Check for Controllers correct PCIe slot address
SUCCESS : External LSI SAS controller 0 : 00:15.0
SUCCESS : External LSI SAS controller 1 : 00:16.0
INFO : Check if powered on
SUCCESS : 1 : Powered-on
INFO : Check for correct number of EBODS(2 or 4)
SUCCESS : EBOD found : 2
INFO : Check for External Controller 0
SUCCESS : Controller connected to correct ebod number
SUCCESS : Controller port connected to correct ebod port
SUCCESS : Overall Cable check for controller 0
INFO : Check for External Controller 1

```

```
SUCCESS : Controller connected to correct ebod number
SUCCESS : Controller port connected to correct ebod port
SUCCESS : Overall Cable check for controller 1
INFO : Check for overall status of cable validation on Node0
SUCCESS : Overall Cable Validation on Node0
INFO : Check Node Identification status
SUCCESS : Node Identification
SUCCESS : Node name based on cable configuration found : NODE0
INFO : Check Nickname
SUCCESS : Nickname set correctly : Oracle Database Appliance - E0
INFO : The details for Storage Topology Validation can also be found in log
file=/opt/oracle/oak/log/<hostname>/storagetopology/StorageTopology-2014-07-03-08:
57:31_7661_15914.log
```

Validating Oracle ASR

Enter the following syntax to validate your Oracle ASR configuration:

```
# oakcli validate -c asr
INFO: oak Asr information and Validations
RESULT: /opt/oracle/oak/conf/asr.conf exist
RESULT: ASR Manager ip:10.139.154.17
RESULT: ASR Manager port:1162
SUCCESS: ASR configuration file validation successfully completed
RESULT: /etc/hosts has entry 141.146.156.46 transport.oracle.com
RESULT: ilom alertmgmt level is set to minor
RESULT: ilom alertmgmt type is set to snmptrap
RESULT: alertmgmt snmp_version is set to 2c
RESULT: alertmgmt community_or_username is set to public
RESULT: alertmgmt destination is set to 10.139.154.17
RESULT: alertmgmt destination_port is set to 1162
SUCCESS: Ilom snmp configuration for asr set correctly
RESULT: notification trap configured to ip:10.139.154.17
RESULT: notification trap configured to port:1162
SUCCESS: Asr notification trap set correctly
INFO: IP_ADDRESS HOST_NAME SERIAL_NUMBER ASR PROTOCOL SOURCE PRODUCT_NAME
INFO: -----
-----
10.170.79.98 oda-02-c 1130FMW00D Enabled SNMP ILOM SUN FIRE X4370 M2 SERVER
10.170.79.97 oda-01-c 1130FMW00D Enabled SNMP ILOM SUN FIRE X4370 M2 SERVER
INFO: Please use My Oracle Support 'http://support.oracle.com' to view the
activation status.
SUCCESS: asr log level is already set to Fine.
RESULT: Registered with ASR backend.
RESULT: test connection successfully completed.
RESULT: submitted test event for asset:10.139.154.17
RESULT: bundle com.sun.svc.asr.sw is in active state
RESULT: bundle com.sun.svc.asr.sw-frag is in resolved state
RESULT: bundle com.sun.svc.asr.sw-rulesdefinitions is in resolved state
RESULT: bundle com.sun.svc.ServiceActivation is in active state
SUCCESS: ASR diag successfully completed
```

Checking the Viability of a Patch

Use the `oakcli validate ospatch -ver patch_version` command to report any reasons for not being able to patch Oracle Database Appliance with the patch named in *patch_version*. Run this command before you attempt to patch Oracle Database Appliance to determine if it will succeed or if you need to make changes before applying the patch.

```
# oakcli validate -c ospatch -ver 12.1.2.5.0
```

```
INFO: Validating the OS patch for the version 12.1.2.5.0
WARNING: 2015-10-10 06:30:32: Patching sub directory
/opt/oracle/oak/pkgrepos/orapkg/OEL/5.10/Patches/5.10.1 is not existing
INFO: 2015-10-10 06:30:32: May need to unpack the Infra patch bundle for the
version: 12.1.2.5.0
ERROR: 2015-10-10 06:30:32: No OS patch directory found in the repository
```

Validating Hardware System and Network Components

The following command runs system checks to validate hardware system components and Oracle Database Appliance network components:

```
# oakcli validate -c SystemComponents,NetworkComponents
```

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>

Preparing Log Files for Oracle Support Services

If you have a system fault that requires help from Oracle Support Services, you might need to provide log records. Collect log file information by running the `oakcli manage diagcollect` command. 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.

Additional Troubleshooting Tools and Commands

This section describes additional tools and commands to diagnose and troubleshoot problems with Oracle Database Appliance. Although some of these tools are specific to Oracle Database Appliance, others are tools for all clustered systems. The section provides information about the following resources:

- [Oracle Appliance Manager Tools for Configuration Auditing and Disk Diagnosis](#)
- [Trace File Analyzer Collector](#)

Oracle Appliance Manager Tools for Configuration Auditing and Disk Diagnosis

Oracle Appliance Manager provides access to a number of sophisticated monitoring and reporting tools, some of them derived from standalone tools that require their own syntax and command sets. The following list briefly describes the ORAchk command and the disk diagnostic tool:

- ORAchk

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

- Operating system kernel parameters and packages
- RDBMDS
- Database parameters and other database configuration settings
- Oracle Cluster Ready Services (CRS)
- Oracle Grid Infrastructure
- Oracle ASM

ORAchk is system-aware and checks best practices, (for example, best practices that are specific to Oracle Database Appliance when ORAchk is run by Oracle Appliance Manager). To explore ORAchk on Oracle Database Appliance, use the `oakcli orachk -h` command. Find more details about ORAchk at <https://support.oracle.com/epmos/faces/DocContentDisplay?id=1268927.2>.

- Disk Diagnostic Tool

Use the Disk Diagnostic Tool to help identify the cause of disk problems. The tool produces a list of 14 disk checks for each node. To run the tool, enter the following command:

```
# oakcli storddiag resource_type
```

Trace File Analyzer Collector

Trace File Analyzer (TFA) Collector simplifies diagnostic data collection on Oracle Cluster Ready Services (CRS), Oracle Grid Infrastructure (Oracle GI), and Oracle RAC 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 CRS, Oracle GI, and Oracle RAC components on all cluster nodes into a single command executed 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: My Oracle Support note 1513912.1 "TFA Collector - Tool for Enhanced Diagnostic Gathering" at <https://support.oracle.com/CSP/main/article?cmd=show&type=NOT&id=1513912.1>

Oracle Database Appliance Hardware Monitoring Tool

The Oracle Database Appliance Hardware Monitoring Tool, implemented with the [oakcli show commands](#), displays the status of different hardware components in Oracle Database Appliance server nodes. Use the tool on bare metal and on virtualized systems.

See the list of monitored components in the output of the `oakcli show -h` command.

```
oakcli show power
```

NAME	HEALTH	HEALTH DETAILS	PART_NO.	SERIAL_NO.	LOCATION
INPUT	POWER	OUTPUT	POWER	INLET TEMP	EXHAUST TEMP
Power Supply_0	OK	-	7047410	476856F+1242CE0020	PS0
Present	88 watts	31.250 degree C	34.188 degree C		
Power Supply_1	OK	-	7047410	476856F+1242CE004J	PS1
Present	66 watts	31.250 degree C	34.188 degree C		

Note: Upon initial startup of ODA_BASE on Oracle Database Appliance Virtualized Platform, the Oracle Database Appliance Server Hardware Monitoring Tool is enabled and collects base statistics for about 5 minutes. During this time, the tool displays a "Gathering Statistics..." message.

The information reported by the Oracle Database Appliance Hardware Monitoring Tool is only for the node on which you run the command. Details in the output depend on the component that you select to review.

Oracle Database Appliance Software Configuration Defaults

The Oracle Database Appliance software configuration defaults are detailed in the following sections:

- [Directory Paths for Oracle Database Appliance](#)
- [Oracle Groups and Users Configuration for Oracle Database Appliance](#)
- [Database Disk Group Sizes for Oracle Database Appliance](#)
- [Storage on Oracle Database Appliance](#)
- [System Configuration for Oracle Database Appliance](#)

Directory Paths for Oracle Database Appliance

Table A–1 *Directory Paths for Oracle Database Appliance*

Item	Directory Path
Grid home	/u01/app/ <i>release-specific_name</i> /grid
Grid base	/u01/app/grid
Oracle home	/u01/app/oracle/product// <i>dbhome_release-specific_name</i> <i>sequence_number</i>
Oracle base	/u01/app/oracle
Oracle Inventory	/u01/app/oraInventory

Oracle Groups and Users Configuration for Oracle Database Appliance

Table A–2 *Oracle Groups and Users Configuration for Oracle Database Appliance*

Groups and Users	Default Value
Oracle Grid Infrastructure installation owner	grid, password welcome1 (change after installation), UID 1000
Oracle Database installation owner	oracle, password welcome1 (change after installation), UID 1001
Oracle Database system administrator	sys, password welcome1 (change after installation)
Oracle Database generic administrator	system, password welcome1 (change after installation)
Oracle Inventory system privileges group	oinstall, GID 1001
Oracle ASM Administrators system privileges	asmadmin, GID 1006
Oracle ASM Users system privileges	asmdba, GID 1004

Table A–2 (Cont.) Oracle Groups and Users Configuration for Oracle Database Appliance

Groups and Users	Default Value
Oracle ASM Operator system privileges	asmoper, GID 1005
Oracle Database Administrators system privileges	dba, GID 1002
Oracle Database Operator system privileges	racoper, GID 1003

Database Disk Group Sizes for Oracle Database Appliance

Table A–3 and Table A–4, and show the sizes for DATA, RECO, REDO, and FLASH disk groups on various configurations of Oracle Database Appliance. Each row has values for either normal or for high redundancy levels. The disk capacities shown in the table vary because they are derived by converting disk hardware terabytes (based on 1 kilobyte=1,000 bytes) into data storage terabytes (based on 1 kilobyte=1,024 bytes).

The space calculated with a storage expansion shelf approximately doubles the space mentioned in Table A–3, and Table A–4. Note that the storage expansion shelf can only be used in Oracle Database Appliance X3-2, X4-2, and X5-2.

Table A–3 Approximate Database Disk Group Sizes for Oracle Database Appliance Version 1, X3-2, and X4-2

Sizing	Version 1 (GB)	X3-2 (GB)	X4-2 (GB)
HDD Size	559	838	838
Total HDD	11,180	16,760	16,760
Total SSD (REDO Disk Group)	272	744	744
Total SSD (FLASH Disk Group)	N/A	N/A	N/A
Total HDD with High Redundancy	3,727	5,587	5,587
Total HDD with Normal Redundancy	5,590	8,380	8,380
DATA Disk Group with High Redundancy - External Backup	3,205	4,805	4,805
RECO Disk Group with High Redundancy - External Backup	522	782	782
DATA Disk Group with High Redundancy - Local Backup	1,603	2,402	2,402
RECO Disk Group with High Redundancy - Local Backup	2,124	3,185	3,185
DATA Disk Group with Normal Redundancy - External Backup	4,807	7,207	7,207
RECO Disk Group with Normal Redundancy - External Backup	783	1,173	1,173
DATA Disk Group with Normal Redundancy - Local Backup	2,404	3,603	3,603
RECO Disk Group with Normal Redundancy - Local Backup	3,186	4,777	4,777
REDO Disk Group	91	248	248
FLASH Disk Group	N/A	N/A	N/A

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

See Also: "Managing Capacity in Disk Groups" in *Oracle Automatic Storage Management Administrator's Guide* for more information about determining the amount of free space in your Oracle Database Appliance disk groups for Oracle ASM. [Table A-3](#) only provides the raw disk information.

Table A-4 Approximate Database Disk Group Sizes for Oracle Database Appliance X5-2

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

Notes:

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.

Usable Storage on Oracle Database Appliance X5-2

[Table A-5](#) shows the usage storage 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 a customer uses the reserve storage capacity, the system will continue to run and be protected through ASM mirroring. However, in the event of a second disk failure, the system will be running in a non-protected and degraded mode, and the disk needs to be replaced immediately.

For more ASM Disk Groups Capacity information, see:

http://docs.oracle.com/cd/B28359_01/server.111/b31107/asmdiskgrps.htm#CHDGGA

Table A–5 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 on page A-3.	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
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

Table A–5 (Cont.) Usable Storage on Oracle Database Appliance X5-2

Sizing	Raw Value (GB)	Reserve (GB)	Usable (GB)
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

Storage on Oracle Database Appliance

Oracle Database Appliance uses the Oracle Automatic Storage Management Cluster File System (Oracle ACFS) for storage of database and virtual machine files. Oracle ACFS provides both servers with concurrent access to some or all of the shared storage on Oracle Database Appliance. Oracle ACFS supports space-efficient storage snapshots, which provides fast provisioning databases and virtual machines within Oracle Database Appliance.

Three types of Oracle ACFS file systems are used in Oracle Database Appliance:

- Database
- Shared repositories
- General-purpose storage

Database file systems are used exclusively for storing database files, and they include a FLASH file system for storing database data files and flash cache files, a DATA file system for database data files, a RECO file system for storing archive files and backups, and a REDO file system for storing redo log files.

Shared repositories are file systems created on Oracle Database Appliance Virtualized Platform, and they are used to store virtual machine templates, runtime images, and virtual disks.

A general-purpose cluster file system, cloudfs, is also created by default on every Oracle Database Appliance. Cloudfs can be used for general purpose storage that must be shared between the servers (for example, staging for data loads).

All Oracle ACFS file systems are created on Oracle ASM Dynamic Volumes provisioned from disk groups created in the shared disk storage pool. In a bare metal deployment, these file systems are mounted directly in the operating system hosting the databases. In a virtualized deployment, these file systems are managed and mounted directly in ODA_BASE.

ACFS Mount Points

The various Oracle ACFS file systems are mounted in the operating system, or in ODA_BASE (Virtualized Platform) in different locations. [Table A–6](#) describes the various mount points and related Oracle ASM disk groups and volume information.

Table A–6 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 (Non-CDB)	+DATA	/dev/asm/datastore- <i>nnn</i>	/u02/app/oracle/oradata/datastore
RECO (Non-CDB)	+RECO	/dev/asm/datastore- <i>nnn</i>	/u01/app/oracle/fast_recovery_area/datastore
REDO (Non-CDB)	+REDO	/dev/asm/datastore- <i>nnn</i>	/u01/app/oracle/oradata/datastore
DATA (per CDB)	+DATA	/dev/asm/dat- <i>adbnamennn</i>	/u02/app/oracle/oradata/datad <i>dbname</i>
RECO (per CDB)	+RECO	/dev/asm/rco- <i>dbnamennn</i>	/u01/app/oracle/fast_recovery_area/rco <i>dbname</i>
REDO (per CDB)	+REDO	/dev/asm/rdo- <i>dbnamennn</i>	/u01/app/oracle/oradata/rdo <i>dbname</i>
FLASH	+FLASH	/dev/asm/flashdata- <i>nnn</i>	/u02/app/oracle/oradata/flashdata
Shared Repository <name>	+DATA or +RECO	/dev/asm/- <i>reponamennn</i>	/u01/app/sharedrepo/ <i>reponame</i>
General ACFS Storage	+RECO	/dev/asm/acfsvol- <i>nnn</i>	/cloudfs (default)

Space Management

The Oracle ACFS file systems are automatically created when you create a shared repository, or when you create a database. However, the file systems do not initially consume all of the storage in the appliance which preserves space for additional repositories, or in some cases, database files stored directly in Oracle ASM. In Oracle Database Appliance software releases 12.1.2.2 and earlier, the Oracle ACFS file systems do not automatically extend if they run low on space, even if storage space is still available in the shared storage pool. You can check for available storage space in your file systems by running the operating system command `df -h` as shown in the following example.

```
df -h
Filesystem      Size  Used Avail Use% Mounted on
/dev/mapper/VolGroupSys-LogVolRoot
                30G  8.6G   20G   31% /
/dev/mapper/VolGroupSys-LogVolU01
                97G   23G   70G   25% /u01
/dev/mapper/VolGroupSys-LogVolOpt
                59G   6.8G   49G   13% /opt
/dev/sda1        99M    26M   68M   28% /boot
tmpfs           127G   1.2G  125G    1% /dev/shm
/dev/asm/datafsvol-352
                5.0G    87M   5.0G    2% /odadatafs
/dev/asm/rdocdb1-66
                5.0G   4.2G   874M   83% /u01/app/oracle/oradata/rdocdb1
/dev/asm/datcdbl-303
               100G   4.2G   96G    4% /u02/app/oracle/oradata/datcdbl
/dev/asm/flashdata-138
               558G   1.4G  557G    1% /u02/app/oracle/oradata/flashdata
/dev/asm/rcocdbl-352
               132G   788M  132G    1% /u01/app/oracle/fast_recovery_area/rcocdbl
/dev/asm/acfsvol-352
               50G   178M   50G    1% /cloudfs
/dev/asm/datastore-66
                59G   4.3G   55G    8% /u01/app/oracle/oradata/datastore
/dev/asm/datastore-303
               3.6T   2.1G   3.6T    1% /u02/app/oracle/oradata/datastore
```

```
/dev/asm/datastore-352
          4.8T   10G   4.8T   1% /u01/app/oracle/fast_recovery_
area/datastore
```

To extend the size of one of your file systems to accommodate growth in your data, you must manually expand the pool.

See Also:

- [oakcli resize dbstorage](#) to expand space for database files
- [oakcli configure repo](#) to expand shared repositories
- My Oracle Support note 1437717.1 "Expanding /cloudfs File System" at <https://support.oracle.com/CSP/main/article?cmd=show&type=NOT&id=1437717.1>

System Configuration for Oracle Database Appliance

Table A–7 System Configuration for Oracle Database Appliance

Item	Value
Oracle Linux with the Red Hat compatible kernel	Oracle Linux 5.11 UEK2
Oracle Grid Infrastructure and Oracle Database Version (initial release)	<p>Release 12.1.2.5.0: Oracle Database 12c Release 1 (12.1.0.2) with PSU5, optionally Oracle Database 11g Release 2 (11.2.0.4) with PSU8, and Oracle Database 11g Release 2 (11.2.0.3) with PSU16</p> <p>Release 12.1.2.4.0: Oracle Database 12c Release 1 (12.1.0.2) with PSU4, optionally Oracle Database 11g Release 2 (11.2.0.4) with PSU7, and Oracle Database 11g Release 2 (11.2.0.3) with PSU15</p> <p>Release 12.1.2.3.0: Oracle Database 12c Release 1 (12.1.0.2) with PSU3, optionally Oracle Database 11g Release 2 (11.2.0.4) with PSU6, and Oracle Database 11g Release 2 (11.2.0.3) with PSU14</p> <p>Release 12.1.2.2.0: Oracle Database 12c Release 1 (12.1.0.2) with PSU2, optionally Oracle Database 11g Release 2 (11.2.0.4) with PSU5, and Oracle Database 11g Release 2 (11.2.0.3) with PSU13</p> <p>Release 12.1.2.1.0: Oracle Database 12c Release 1 (12.1.0.2) with PSU1, optionally Oracle Database 11g Release 2 (11.2.0.4) with PSU4, and Oracle Database 11g Release 2 (11.2.0.3) with PSU12</p> <p>Release 12.1.2: Oracle Database 12c Release 1 (12.1.0.2.0) and optionally 11.2.0.2.12, 11.2.0.3.11, and 11.2.0.4.3</p> <p>Release 2.10: Oracle Database 11g Release 2 (11.2.0.4.2 with PSU2), optionally Oracle Database 11g Release 11.2.0.2 with PSU9, and 11.2.0.2.12 and 11.2.0.3.10</p> <p>Release 2.9: Oracle Database 11g Release 2 (11.2.0.2.12, 11.2.0.3.9 and 11.2.0.4.1), with DB PSU1</p> <p>Release 2.8: Oracle Database 11g Release 2 (11.2.0.2.12 and 11.2.0.3.8 with PSU8, and 11.2.0.4)</p> <p>Release 2.7: Oracle Database 11g Release 2 (11.2.0.2.11 and 11.2.0.3.7), with PSU7</p> <p>Release 2.6: Oracle Database 11g Release 2 (11.2.0.3), with PSU6</p> <p>Release 2.5.5: Oracle Database 11g Release 2 (11.2.0.3), with PSU5</p> <p>Release 2.5: Oracle Database 11g Release 2 (11.2.0.3), with PSU5</p> <p>Release 2.4: Oracle Database 11g Release 2 (11.2.0.3), with PSU4</p> <p>Release 2.3: Oracle Database 11g Release 2 (11.2.0.3), with PSU3</p> <p>Release 2.2: Oracle Database 11g Release 2 (11.2.0.3), with PSU2</p> <p>Release 2.1.0.3: Oracle Database 11g Release 2 (11.2.0.2), with PSU7</p> <p>Release 2.1.0.3: Oracle Database 11g Release 2 (11.2.0.2), with PSU5</p> <p>Release 2.1: Oracle Database 11g Release 2 (11.2.0.2), with PSU3 and patches 12639177 (ASM), 12914151 (MLR on Grid Infrastructure PSU3), and 12419331 (Database PSU3)</p>
SCAN port number	1521
Oracle Enterprise Edition DB control port	<p>1158</p> <p>Use: <code>https://hostname:1158/em</code>, where <i>hostname</i> is the name of one of the Oracle Database Appliance server nodes.</p>

Database Templates for Oracle Database Appliance

Use the information in this appendix to select database templates for your planned databases. 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 templates define databases with parameters that have been selected specifically to optimize performance on Oracle Database Appliance. In addition, they help you to set up appropriate instance caging, to create ODA_BASE with a matching template on Oracle Database Appliance Virtualized Platform, and to acquire an appropriate license on bare metal installations.

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

Choosing a Database Template

With its multiple CPUs, 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 the 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.

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. [Table B-5](#), [Table B-6](#), [Table B-7](#), and [Table B-8](#) show the amount of space taken in the Oracle ACFS file system. You can extend an Oracle ACFS file system to avoid running out of space.
- I/O per second (IOPS) values are derived from an 8 K 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.

Find the information that is appropriate to your database workload and hardware:

- Use [Table B-2](#) if your database workload is of type OLTP.
- Use [Table B-3](#) if your database workload is of type DSS (Data Warehouse).
- Use [Table B-4](#) if your database workload is of type In-Memory.
- Use [Table B-5](#) if your database is on Oracle Database Appliance X5-2.
- Use [Table B-6](#) if your database is on Oracle Database Appliance X4-2.
- Use [Table B-7](#) if your database is on Oracle Database Appliance X3-2.
- Use [Table B-8](#) if your database is on original model of Oracle Database Appliance.

Note: Oracle Appliance Manager release 12.1.2.2.0 and later provide improved database templates that are specific to the type of database workload (OLTP, DSS, In-Memory). The improved 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. [Table B-1](#) provides a reference between the generic database template names and the database template names based on CPU cores.

Table B-1 Oracle Database Appliance Database 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 ¹	Extra Extra Extra Large ¹

¹ 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 Size

Template	CPU Cores	SGA	PGA	Flash	Processors	LOG buffer, Redo Log
odb-01s (All Hardware Versions)	1	2 GB	1 GB	6 GB	200	16 MB, 1 GB
odb-01 (All Hardware Versions)	1	4 GB	2 GB	12 GB	200	16 MB, 1 GB
odb-02 (All Hardware Versions)	2	8 GB	4 GB	24 GB	400	16 MB, 1 GB
odb-04 (All Hardware Versions)	4	16 GB	8 GB	48 GB	800	32 MB, 1 GB
odb-06 (All Hardware Versions)	6	24 GB	12 GB	72 GB	1200	64 MB, 2 GB
odb-12 (All Hardware Versions)	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 Size

Template	CPU Cores	SGA (GB)	PGA (GB)	Processors	Redo log file size (GB)	Log buffer (MB)
odb-01s (All Hardware Versions)	1	1	2	200	1	16
odb-01 (All Hardware Versions)	1	2	4	200	1	16
odb-02 (All Hardware Versions)	2	4	8	400	1	16
odb-04 (All Hardware Versions)	4	8	16	800	1	32
odb-06 (All Hardware Versions)	6	12	24	1200	2	64
odb-12 (All Hardware Versions)	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)	Processors	Redo log file size (GB)	Log buffer (MB)
odb-01s (All Hardware Versions)	1	2	1	1	200	1	16
odb-01 (All Hardware Versions)	1	4	2	2	200	1	16
odb-02 (All Hardware Versions)	2	8	4	4	400	1	16
odb-04 (All Hardware Versions)	4	16	8	8	800	1	32
odb-06 (All Hardware Versions)	6	24	12	12	1200	2	64
odb-12 (All Hardware Versions)	12	48	24	24	2400	4	64
odb-16 (X5-2, X4-2, X3-2 Only)	16	64	32	32	3200	4	64

Table B–4 (Cont.) Oracle Database Appliance In-Memory Database Template Size

Template	CPU Cores	SGA (GB)	PGA (GB)	In-Memory (GB)	Processors	Redo log file size (GB)	Log buffer (MB)
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: Actual I/O per second (I/Ops) and throughput for a given database will depend on the percentage of I/O operations that are serviced through the FLASH versus the HDDs. An OLTP workload whose working set fits in FLASH will be 80% reads (serviced through the flash cache) and 20% writes (serviced through the HDDs). Thus, the actual I/O performance will be weighted appropriately.

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

For a single database, select a template that best fits your expected workload (in terms of required CPU and I/Ops) on the hardware that you are using. When creating multiple databases, the overall workload will be affected by the CPU and I/Ops consumed by the existing databases that are already on the system.

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