Oracle® Database Appliance

Getting Started Guide

Release 12.1.2.6.0 for Linux x86-64

E68528-01

January 2016

ORACLE®

Oracle Database Appliance Getting Started Guide, Release 12.1.2.6.0 for Linux x86-64

E68528-01

Contents

4 Deploying Oracle Software on Oracle Database Appliance

5 Oracle Database Appliance Postinstallation Tasks

Index

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 book does not include information about Oracle Database architecture, tools, management, or application development that is covered in the main body of Oracle Documentation unless 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, along with this document, are published in the Oracle Database Appliance online documentation library, available at http://www.oracle.com/goto/oda/docs:

- *Oracle Database Appliance Setup Poster* (a full-size printed copy ships with Oracle Database Appliance)

- Oracle Database Appliance Administration and Reference Guide

- *Oracle Database Appliance Release Notes for Linux x86-64*

- *Oracle Database Appliance Owner's Guide*

- *Oracle Database Appliance Service Manual*

- *Oracle Database Appliance Series Safety and Compliance Guide*

- *Oracle Database Appliance Security Guide*

- *Oracle Database Appliance Licensing Information User Manual for Linux x86-64*

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

For more information about using Oracle Database, see the following documents:

- *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, Oracle Integrated Lights Out Manager, and so on, 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.
italic	Italic type indicates book titles, emphasis, or placeholder variables for which you supply particular values.
monospace	Monospace type indicates commands within a paragraph, URLs, code in examples, text that appears on the screen, or text that you enter.
# prompt	The pound (#) prompt precedes a Linux command.

1

About Oracle Database Appliance

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

Oracle Database Appliance Capacity-on-Demand Licensing

Capacity-on-Demand software licensing enables you to scale quickly to more processor cores without incurring the excessive costs and downtime usually associated with hardware upgrades. You can deploy as few or as many processors in Oracle Database Appliance as your workload requires.

Table 1–1 lists the scaling capacities for Oracle Database Appliance bare metal and virtualized platform deployments. The decision to use bare-metal or Oracle Database Appliance Virtualized Platform depends on your company policies and the benefits that each implementation offers your company.

Table 1–1 Oracle Database Appliance Scaling Capacities

Oracle Database Appliance Platform	Minimum Number Processor Cores	Maximum Number Processor Cores
X5-2	2	72
X4-2	2	48
X3-2[1]	4	32
Version 1	2	24

[1] For Oracle Database Appliance X3-2 Virtualized Platform, processor cores are licensed for your ODA_BASE only, from a minimum of 2 processor cores to a maximum of 32 processor cores.

Oracle Database Appliance Software

Table 1–2 lists the software that might be included with each Oracle Database Appliance component. Some releases may not contain all of the items for one or more components listed in the table.

Table 1–2 Software for Oracle Database Appliance

Component	Component Contents	Component Required On	Installed or Downloaded
Oracle Database Appliance Operating System Image	Oracle Appliance Manger command-line interface	All deployments	Installed
	Oracle Appliance Manager configurator (graphical user interface)		
	Oracle Linux		
	Hardware drivers		
Oracle Database Appliance Patch-Set Bundle	Basic input/output system (BIOS)	All deployments	Downloaded
	Hardware drivers and 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 Automated Service Request (ASR)		
	Oracle Grid Infrastructure		
	Oracle Intelligent Platform Management Interface (IPMI)		
	Java Development Kit (JDK)		
Oracle Database Appliance End-User Bundle	Oracle Database clone binaries	Bare metal deployments	Downloaded
	Oracle Database templates, customized for Oracle Database Appliance deployments		
	Oracle Grid Infrastructure clone binaries		
ODA_BASE template	Oracle Database clone binaries	Virtualized platform deployments	Downloaded
	Oracle Database templates, customized for Oracle Database Appliance deployments		
	Oracle Grid Infrastructure clone binaries		

Components listed as **Installed** are typically available on Oracle Database Appliance when you receive it, and components listed as **Downloaded** are components that you will typically download and deploy yourself.

Overview of Oracle Database Appliance Deployment

Deployment consists of three high-level steps:

1. Prepare for Oracle Database Appliance.

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

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

   - Set up the server site.

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

     Use the Oracle Appliance Manager configurator to generate the network names and addresses or to validate your existing network names and

addresses. The standalone configurator is available for download from Oracle Technology Network. You can create a configuration file on a local machine before delivery of your Oracle Database Appliance, as described in "Preparing for Oracle Database Appliance Installation and Deployment".

> **Note:** Download the standalone Oracle Appliance Manager configurator from
> http://www.oracle.com/technetwork/database/database-applianc e/overview

See Chapter 2, "Preparing for Oracle Database Appliance Installation and Deployment" and Oracle Database Appliance Owner's Guide for more information to complete this step.

2. Prepare Oracle Database Appliance for deployment.

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

   - Connect power and required cables to Oracle Database Appliance.

   - Create an initial network configuration to load external files.

   See Chapter 3, "Readying Oracle Database Appliance for Deployment" and Oracle Database Appliance Owner's Guide for more information to complete this step.

3. Install and deploy software on Oracle Database Appliance.

   - Download and copy the Oracle Database Appliance software package to Oracle Database Appliance.

   - Run the Oracle Appliance Manager configurator and select or enter the required information.

     During deployment, you configure a two-node Oracle Grid Infrastructure installation (Oracle Clusterware and Oracle Automatic Storage Management). You also have the option to configure Oracle Database Enterprise Edition, Oracle RAC, or Oracle RAC One Node. After the initial deployment, you might add databases, configure core count and instance caging, and add virtual domains if you have deployed Oracle Database Appliance.

   See Chapter 4, "Deploying Oracle Software on Oracle Database Appliance" for more information to complete this step.

4. Complete post-installation tasks.

   - Download patches to apply after deployment.

   - Reset default passwords.

   See Chapter 5, "Oracle Database Appliance Postinstallation Tasks" for more information to complete this step.

2

Preparing for Oracle Database Appliance Installation and Deployment

This chapter provides a checklist of tasks that you can complete before delivery of Oracle Database Appliance. These tasks are:

- Registering Your Support Identifier on My Oracle Support
- Planning Oracle Database Appliance Configuration Options
- Gathering System Requirement Information
- Creating an Oracle Appliance Manager Deployment Plan

Registering Your Support Identifier on My Oracle Support

Add your hardware Support Identifier (SI) to your My Oracle Support account profile. Your hardware SI is supplied when you purchase Oracle Database Appliance. If you have acquired new software licenses then you must also register your new software SIs. The SI registration process can take up to 24 hours to complete.

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

Planning Oracle Database Appliance Configuration Options

You can deploy Oracle Database Appliance either as a bare metal or a virtualized system. For bare metal installations, decide how many CPU cores to enable and what database configuration options you need, if any. For Oracle Database Appliance Virtualized Platform installations, there are a number of additional options to consider. See the following sections to plan your system appropriately:

- Selecting Oracle Database Appliance Virtualized Platform Options

  This section describes the use of options such as shared disks and virtual local area networks.

- Selecting Database Configuration Options

  This section describes the use of single instance, Oracle Real Application Clusters (Oracle RAC), and Oracle RAC One Node databases and sizing templates to configure your initial database. This information is relevant to you if you plan to configure an initial database during deployment on bare metal or virtualized platforms.

Selecting Oracle Database Appliance Virtualized Platform Options

Before you implement virtual machines you must decide how and where they will run. Based on your requirements, you might provide high-availability options, reduce interference between competing virtual machines for CPU and network access, provide more storage space, and enable automatic startup for virtual machines. Some of these options require additional network configuration outside of the Oracle Database Appliance servers.

By default you have one local repository on each node and the maximum size is dependent on the hardware:

- 350 GB on Oracle Database Appliance X5-2 Virtualized Platform

- 350 GB on Oracle Database Appliance X4-2 Virtualized Platform

- 350 GB on Oracle Database Appliance X3-2 Virtualized Platform

- 250 GB on Oracle Database Appliance Version 1

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

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

When you use a shared repository hosted on shared disks, the virtual machines consume space in Oracle Automatic Storage Management (Oracle ASM) disk groups, DATA and RECO. On shared disks, virtual machines can start automatically whenever the repository becomes available, can run on a preferred node, and can start or failover to the other node if the preferred node is unavailable.

Oracle Database Appliance Virtualized Platform supports multiple VLANs on the same network interface card (NIC) port. Each VLAN is essentially an independent logical network operating with other VLANs over the same physical connection. Use VLANs to minimize the number of required physical connections and NICs while concurrently separating traffic. Each VLAN is assigned a distinct VLAN identification (ID). The network switch uses VLAN IDs to segregate traffic among the different VLANs operating on the same link. When a VLAN is configured, the VLAN functions exactly like a separate physical connection.

> **Note:** Virtual LANs need to be configured in the physical switches before you use them.

Selecting Database Configuration Options

These tasks will guide you through selecting your database configuration items:

- Selecting Database Deployment Options

- Selecting Database Templates

- Calculating Required Cores

Before continuing, print the checklist tables found in "Information Checklist Tables". Use the checklists to record decisions and information that you collect for your planned Oracle Database Appliance configuration.

> **Caution:** Do not use Oracle Database Configuration Assistant (DBCA) to create databases on Oracle Database Appliance; use only Oracle Appliance Manager. Oracle Appliance Manager ensures databases are properly configured, optimized, and supported on Oracle Database Appliance.

Selecting Database Deployment Options

Oracle Appliance Manager installs the Oracle Database software on mirrored disks that are internal to Oracle Database Appliance. During the initial deployment with the Oracle Appliance Manager configurator, you can create a database or defer database creation to a later time. If you plan to create an initial database during deployment, prepare to select one of the following options:

- **Enterprise Edition**: Oracle Database 12*c* Release 1 Enterprise Edition (no automated failover), with the following characteristics:

  - Single-instance Oracle Database Enterprise Edition home

  - Oracle Database software installation on both nodes

- **Oracle Real Application Clusters (Oracle RAC) One Node**: Oracle RAC One Node 12*c* Release 1, with the following characteristics:

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

  - Oracle RAC One Node software installed on both servers

  - Automated failover

  - Enterprise Edition license required

  - Oracle RAC One Node license on each server required

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

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

- **Oracle RAC**: Oracle Real Application Clusters 12*c* Release 1, with the following characteristics:

  - Oracle RAC home

  - Oracle RAC software installed on both servers

  - Enterprise Edition license required

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

Selecting Database Templates

Oracle Database Appliance software includes preconfigured templates that incorporate Oracle best practices with optimization for different classes of databases. Due to differences in CPU counts, memory size, and other resources available with different Oracle Database Appliance models, some templates are not supported on all models.

Each database template has different workload profile and performance characteristics based on the following:

- Memory requirements, calculated from the System Global Area (SGA) plus Program Global Area (PGA) sizes

- Processing requirements, calculated from the number of processes

- Logging requirements, based on log buffer size and online redo log size

To determine which templates to use for the databases you deploy, use the guidelines from Appendix B (Database Sizing for Oracle Database Appliance) in the *Oracle Database Appliance Administration and Reference Guide*. Then refer to Table 2–1 to check if a particular template is available on your Oracle Database Appliance hardware model. Templates that do not have a corresponding "X" in a model column are not available on that model.

Table 2–1   Database Template Names and Characteristics

Template Name	V1	X3-2	X4-2	X5-2
Odb-01s	X	X	X	X
Odb-01	X	X	X	X
Odb-02	X	X	X	X
Odb-04	X	X	X	X
Odb-06	X	X	X	X
Odb-12	X	X	X	X
Odb-16		X	X	X
Odb-24			X	X
Odb-32				X
Odb-36				X

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

On Oracle Database Appliance Virtualized Platform, if you only plan to deploy one Oracle Database, then use a template for your ODA_BASE that has the same name as the template you choose for your Oracle Database. However, you do not have to select database templates with the same size category as the ODA_BASE template. For example, use a small ODA_BASE template to host two very small databases and a large ODA_BASE template to host either one large with one small database or one medium database with one small and two very small databases. When choosing your template sizes, note that the total requirements for your selected database templates must not exceed the capacity of your ODA_BASE template. The size of ODA_BASE can be adjusted after the initial deployment. Thus users can expand ODA_BASE to accommodate more databases in ODA_BASE.

Calculating Required Cores

Once you have selected the templates for your planned databases, use the tables in Appendix B (Database Sizing for Oracle Database Appliance) of the Oracle Database

Appliance Administration and Reference Guide to determine the total number of CPUs they require to support them.

Gathering System Requirement Information

You need to collect information before deploying Oracle Database Appliance. Print the tables and use them to enter values as you find and finalize them.

Information You Will Need

This section describes the type of information you will need to collect as you prepare to install and deploy Oracle Database Appliance. Once you understand what you need, you can print and collect the details for your specific system using that checklist tables provided in the next section, "Information Checklist Tables".

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

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

- On Oracle Database Appliance X5-2, Oracle Database Appliance X4-2, and Oracle Database Appliance X3-2, data files are stored in the storage shelf and the optional storage expansion shelf. Database redo log files are stored on solid-state drives (SSDs) in the storage shelf and the optional storage expansion shelf

- On Oracle Database Appliance Version 1, data files are stored in the shared storage bay and database redo log files are stored on solid-state drives (SSDs) in the shared storage bay. There is not an option to add a storage expansion shelf.

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

> **Note:** Oracle Database Appliance X4-2 ships with 900 GB shared disks and Oracle Database Appliance X5-2 ships with 4 TB shared disks. Disk hardware capacity is measured using 1 KB = 1,000 bytes whereas software storage requirements are based on 1 KB = 1,024 bytes. This means that a disk with a rated capacity of 900 GB has only about 838 GB of space for software storage, and a 4 TB disk is actually 3.725 TB.

Ensure that the names and addresses that you provide for network configuration are configured in your Domain Name System (DNS) servers. With Patch Set 1 and later, the addresses that you provide are configured in the `/etc/hosts` file to provide IP name and address resolution, even if a DNS server is not available.

If you are deploying Oracle Database Appliance X5-2 or Oracle Database Appliance X4-2, then you have the option to connect to either a copper or a fiber public network. To connect to a fiber network on Oracle Database Appliance X5-2, you must also replace the InfiniBand cards with 10 GbE SFP+ fiber cards. Ensure that your network planning is based on the correct type of public network.

Oracle recommends using a DNS server so that you can use the features of Single Client Access Name (SCAN). If you deploy without a DNS server but later create a DNS server and add SCAN, then you must specify additional VIP addresses as described in Oracle Database Appliance Release Notes for Linux x86-64.

A correctly configured Oracle Database Appliance requires at least six public addresses on the same subnet for the nodes: a public and a virtual IP name and address for each node, and two addresses that resolve to the SCAN for the cluster. All names must conform to the RFC 952 standard, which permits alphanumeric characters and hyphens ("-"), but does not allow underscores ("_").

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

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

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

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

Questions to Ask Your Oracle Database Appliance Administrator

1. Is a network time protocol (NTP) service configured for each server, so that the local system time for each server is synchronized?

   If you have NTP servers, and you want to synchronize time between Oracle Database Appliance nodes using NTP, then be prepared to provide the addresses for the servers. Otherwise, the Oracle Grid Infrastructure software provides time synchronization between nodes using Cluster Time Synchronization Service (CTSS).

2. Will the public IP address cables be plugged in to redundant switches to avoid a single point of failure for Oracle Database Appliance?

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

Questions to Ask Your Network Administrator

Confirm with your network administrator that the IP addresses to be configured for Oracle Database Appliance meet these three criteria:

1. They are static IP addresses.

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

3. They include the following:

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

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

- SCANs for Oracle Database Appliance with the following characteristics:

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

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

  - Have names that do not begin with a numeral

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

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

Additional Information

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

http://www.oracle.com/technetwork/database/clustering/overview/scan-129069.pdf

Information Checklist Tables

Print the checklist tables that match your system and use them to record your progress and save information that you gather for your system requirements.

Checklist for System Details

The following table is a checklist for gathering system information. Use the final column (the *Value* column) to record the selected values as you work through the checklist.

Table 2–2   Checklist for System Details Configuration

System Information	Description	Value
Oracle Database Appliance System Name	Provide the name for the cluster running on Oracle Database Appliance. This name is also used as the default root word for Oracle Database Appliance network addresses. The name should comply with the host name specifications described in the RFC 952 standard. For example, the name should be alphanumeric and not begin with a numeral. The name you choose will become the default first part of the names for the following items. The default (generated names) can be changed. ■ Oracle ILOM host names for Nodes 1 and 2 (*systemname*1-ilom and *systemname*2-ilom respectively) ■ SCAN host name (*systemname*-scan) ■ Node 0 and Node 1 Public IP addresses (*systemname*1 and *systemname*2 respectively) ■ Node 0 and Node 1 Virtual IP addresses (*systemname*1-vip and *systemname*2-vip respectively)	
Type of Configuration	Typical, which has the most default values Custom (recommended by Oracle), which allows you to override default values for any or all of the following: ■ Database block size, language, territory, backup file location, or disk redundancy level for the DATA and RECO disk groups ■ Oracle Integrated Lights Out Manager (Oracle ILOM) server ■ Oracle Auto Service Request (Oracle ASR) configuration ■ Oracle Cloud File System mount point and file system size ■ Network Time Protocol service server	
Mode	Bare metal or virtualized platform	
Region	Select the region where you plan to operate the Oracle Database Appliance system.	
Timezone	Select the time zone where you plan to operate the Oracle Database Appliance system.	
Initial Database Details (if you want to create one during deployment)	■ Database name ■ Normal or container database ■ Class (database template) ■ Database language ■ Database deployment (Oracle Enterprise Edition single instance, Oracle RAC One Node, or Oracle RAC) ■ Data file size in GB (for container database only)	

> **Note:** Do not use a host name with more than 13 characters. Additionally, Oracle recommends that you use all lower case characters for the host name. The names are generated as follows: If you provide *mysystem* as the name of your system then the derived host names are *mysystem0* and *mysystem1*; the derived host vip names are *mysystem0-vip* and *mysystem1-vip* and the ILOM names are *mysystem0-ilom* and *mysystem1-ilom*.

> **Note:** You will need to provide a new password for the root user during deployment. However, there is no entry for this password in the preceding table because this is not a value that you should write down.

Checklist for Custom Node Network Address Configuration

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

Use the following checklists to identify the IP addresses required for Oracle Database Appliance. Table 2–3 lists the IP address defaults and requirements for Oracle Database Appliance bare metal deployments. Table 2–4 lists the IP address defaults and requirements for Oracle Database Appliance Virtualized Platform. You can retain the default values or use addresses provided by your system administrator to perform a custom configuration. Ensure that all addresses with an "X" in the "Same Subnet" column are on the same subnet as each other.

Table 2–3   Minimum IP Address Requirements for Oracle Database Appliance Bare Metal Systems

Type of IP	Minimum IP Address Counts	IP Address Default Values	Your Values As Applicable	Same Subnet
Host Public Addresses	2			X
Host Private Addresses	4	192.168.16.24 192.168.16.25 192.168.17.24[1] 192.168.17.25[2]	Not applicable: the private addresses are defined during deployment and should not be changed	X
Oracle RAC VIP	2			X
Single Client Access Name (SCAN)	2			X
Oracle Integrated Lights Out Manager (ILOM)	2			
User Virtual Machine	Not Applicable			

[1] This IP address is not used on Oracle Database Appliance X5-2 when using InfiniBand
[2] This IP address is not used on Oracle Database Appliance X5-2 when using InfiniBand

Table 2–4   Minimum IP Address Requirements for Oracle Database Appliance Virtualized Platform

Type of IP	Minimum IP Address Counts	IP Address Default Values	Your Values As Applicable	Same Subnet
Host Public Addresses	2 (for ODA_BASE) 2 (for Dom0) (Total of 4)	192.168.16.24 192.168.16.25 192.168.17.24[1] 192.168.17.25[2]		X
Host Private Addresses	2	192.168.16.24 (for Dom0) 192.168.16.25 (for Dom0) 192.168.16.27 (for ODA_BASE) 192.168.16.28 (for ODA_BASE)	Not applicable: the private addresses are defined during deployment and should not be changed	X
Oracle RAC VIP	2			X
Single Client Access Name (SCAN)	2			X
Oracle Integrated Lights Out Manager (ILOM)	2			
User Virtual Machine	At least 1 for each Virtual Machine			

[1]   This IP address is not used on Oracle Database Appliance X5-2 when using InfiniBand
[2]   This IP address is not used on Oracle Database Appliance X5-2 when using InfiniBand

Creating an Oracle Appliance Manager Deployment Plan

Use the standalone Oracle Database Appliance configurator to create an offline deployment plan and validate your network settings before the actual deployment. However, if you prefer to configure your system at the time you deploy it, you can wait and use the online configurator that is part of the base Oracle Database Appliance software.

About the Standalone Oracle Database Appliance Configurator

The standalone Oracle Appliance Manager configurator is a Java-based tool that enables you to generate your deployment plan and validate your network settings before the actual deployment.

If you want to use this tool before deployment, then you must download and run the configurator on a local client system which can be a Linux, UNIX, MAC, or Windows system.

At the end of an offline configurator session, you can save your deployment plan in a configuration file. When you are ready to deploy, copy this configuration file to Oracle Database Appliance and run the online Oracle Appliance Manager configurator to

import and deploy your saved plan. You can also print the file's content and use the printout as a checklist for setting up your external network configuration.

Prior to saving your configuration file, Oracle recommends that you test your network settings. However, this will only work correctly if your client system is connected to same network that you will use for Oracle Database Appliance.

Running the Standalone Oracle Database Appliance Configurator

To run the standalone Oracle Database Appliance configurator:

1. Download the standalone Oracle Appliance Manager configurator that matches your version of Oracle Database Appliance software.

   All versions of the configurator are available from the Overview page by clicking the "Oracle Database Appliance Manager Configurator" link at

   http://www.oracle.com/technetwork/database/database-appliance/overview/index.html

2. Start the configurator using the command config.bat on a Windows client, or the command ./config.sh on a Linux or UNIX client.

   The Oracle Appliance Manager Welcome page appears.

3. Click **Next**.

4. On the Configuration Type page, select the options for configuration type, environment, and hardware model. You can optionally load an existing configuration file by clicking **Browse**.
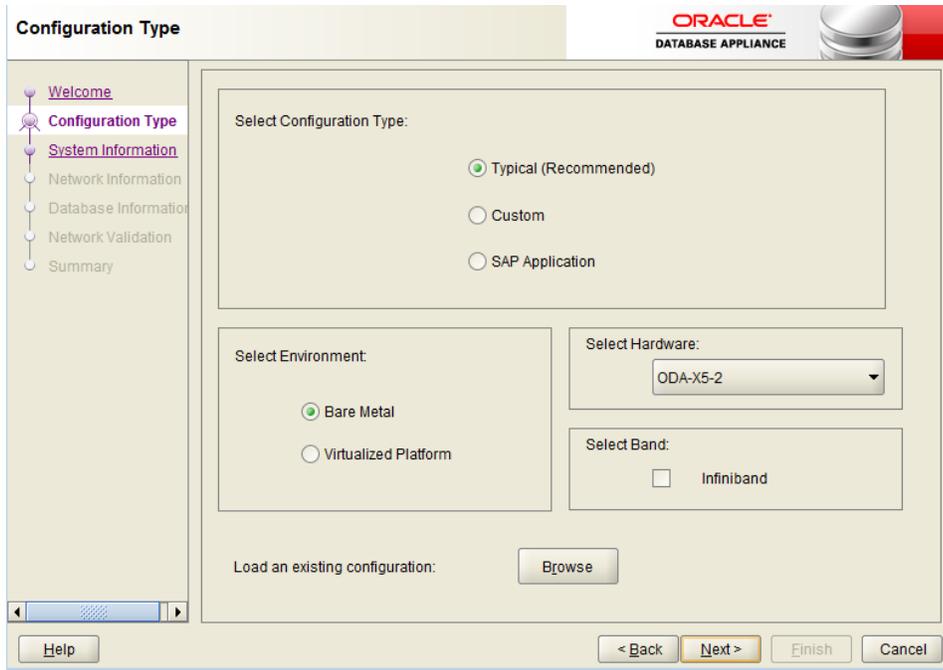
Oracle recommends the typical configuration except for SAP databases and applications, in which case select **SAP Application**. Choose the **Custom** option to configure additional or alternate network interfaces or to override the default values for one or more of the following:

- Database block size, language, territory, backup file location, or disk redundancy level for the DATA and RECO disk groups

- Oracle Integrated Lights Out Manager (Oracle ILOM) server

- Oracle Auto Service Request (Oracle ASR) configuration

- Oracle Cloud File System mount point and file system size

- Network Time Protocol service server

To see the default values for your version of Oracle Database Appliance software before choosing the **Typical** or **Custom** option, run the configurator using the **Custom** option.

If you are installing Oracle Database Appliance Virtualized Platform, then select **Virtualized Platform**. Otherwise, leave the default value, **Bare Metal**, as the environment option. If you are installing on X3-2, X4-2, or X5-2 hardware, then select **ODA-X3-2**, **ODA-X4-2** or **ODA-X5-2** respectively, or leave the default value, **ODA V1**, as the hardware option.

If you are using InfiniBand as the interconnect between the two Oracle Database Appliance servers, select the **Infiniband** checkbox. This option is only available for Oracle Database Appliance X5-2 systems.

The **Browse** option is not useful during the initial run because there are no configuration files to load.

In this example, **Typical**, **Virtualized Platform**, and **ODA-X5-2** are the selected options.

> **Note:** The **SAP Application** option is only valid with the Bare Metal option.

Click **Next**.

5. On the System Information page, provide the system name, and select the correct value from the lists for your region and time zone.

   In the New Root Password and New Root Password (confirm) fields, enter a new password for the `root` user. This password is encrypted in the configuration file and will be temporarily decrypted to reset the password during deployment.

6. Click **Next**.

7. On the Network Information page, provide your domain name, DNS server addresses, public and VIP addresses for your two nodes, SCAN name and addresses, and Netmask and Gateway addresses.

As you enter data on this page, some fields will automatically fill with values derived from earlier entries. For example, if the address that you provide for the Node 0 public IP address is 192.0.2.18, then the default node addresses are generated as follows. Note that the default generated network names and IP addresses can be changed as needed.

- Node 0 public IP address: 192.0.2.18

- Node 1 public IP address: 192.0.2.19

- Node 0 virtual IP (VIP) address: 192.0.2.20

- Node 1 virtual IP (VIP) address: 192.0.2.21

- SCAN addresses (two addresses resolving to the SCAN VIP name): 192.0.2.22, 192.0.2.23

Note: For information about requirements for nonstandard public IP addresses, see "Checklist for Custom Node Network Address Configuration".

8. Click **Next**.

9. On the Database Information page, select whether you want to create an initial database. If you check the box to create a database, then you can also provide your database details. These details include the database name, which you must enter, and the following options, selected from the available list values:

   - **Is Container Database**: leaving the default value, **false**, will build a non-container database

   - **Database Type:** the default type is OLTP, or you can select DSS or In-Memory

- **Database Class**: see "Selecting Database Templates" for guidelines to help you choose the appropriate template, noting that not all options are available for all models of Oracle Database Appliance; the default class is **odb-06**

- **Database Language**: the default language is **AMERICAN**

- **Database Deployment**: select one of the following, where **RAC** is the default:

  - Oracle RAC

  - Oracle RAC One Node

  - Oracle Database Enterprise Edition (no Oracle RAC)

- **Data File Size (GB)**: if you indicated that you want to build a container database, then you need to provide a database data file size in the final field on the page. (This field does not accept input unless the Is Container Database selection is **True**.) If you do not want to create an initial database, then do not check the Create Initial Database check box.

- **Data Files on Flash Storage**: select **true** if you plan to store your entire database in flash storage (400 GB SSDs); otherwise, leave the selection **false**. This option is only available on Oracle Database Appliance X5-2 systems.
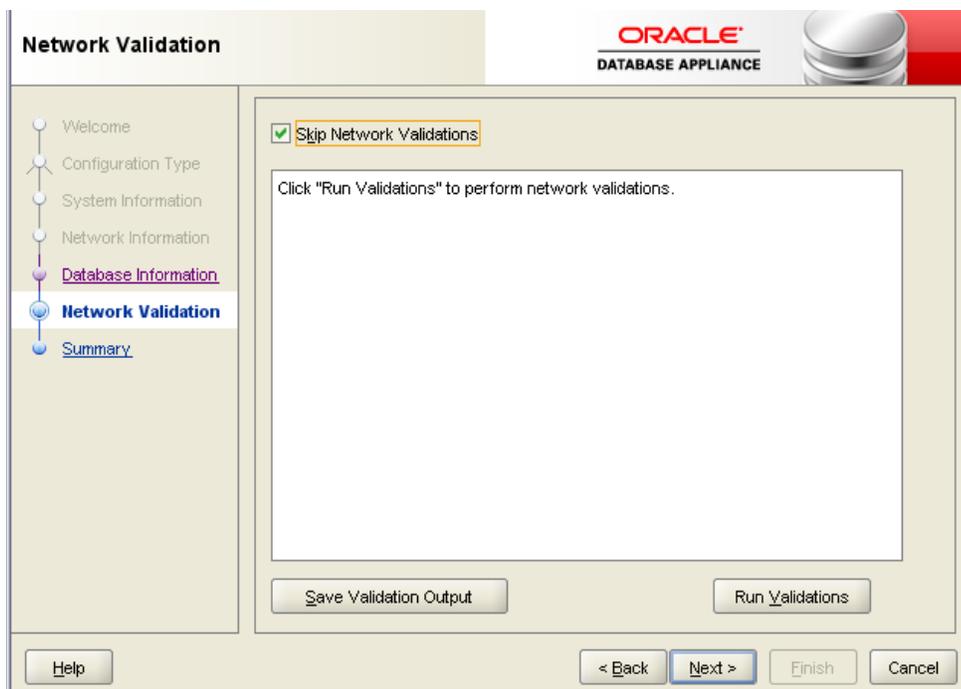

Click **Next**.

10. On the Network Validation page, either validate the network settings and save the validation output in a file or bypass the validation step by selecting the **Skip Network Validations** check box.

Oracle recommends that you validate your network before deploying your configuration. However, unless you are running Oracle Appliance Manager configurator on a server attached to the network subnet configured for your appliance, the validation will fail. Should this occur, enable the **Skip Network Validations** check box, and then click **Next** to proceed to the next page. If you run the validation, then review the results. After you review the results, if you are ready to proceed, then click **Next**. If the validation fails, then save the validation output to review these results with your network administrator. To save the configuration information that you have entered and correct the network addresses later, select **Skip Network Validations** and click **Next** to continue to the next page.

11. On the Summary page, review the configuration options that you have selected. Click **Save** to save the configuration file, or click **Back** to modify your selections.

You can print the contents of the configuration file and use the printout to review your configuration entries for deployment planning purposes. You might also use the configuration file during the actual deployment, as described in "Task 5: Deploy Your Configuration (All Platform Deployments)" on page 4-5.
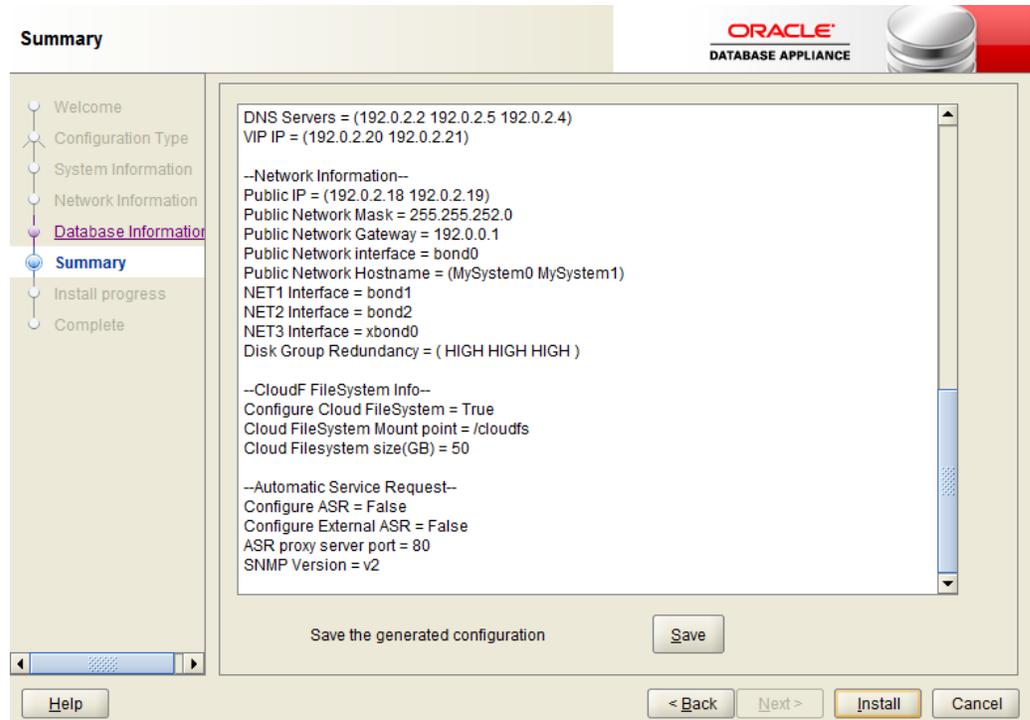
If you are running the configurator on Oracle Database Appliance and have completed the preliminary steps to configure your initial network and install the End-User Bundle or deploy ODA_BASE, then you can click **Install** to deploy the configuration that you just created. If you are not ready to complete the deployment, then first click **Save** and then click **Finish**. Note the name and location of the file you save as you might want to copy the file to your Oracle Database Appliance, as described in Chapter 4, "Deploying Oracle Software on Oracle Database Appliance." If you need to make corrections before deployment, then rerun the standalone Oracle Appliance Manager configurator, load your configuration file, make the changes, and save the file again.

3

Readying Oracle Database Appliance for Deployment

This chapter covers the following tasks that you must complete before deploying Oracle Database Appliance software:

- **Attaching Supplied Cables**

    This task is not required for Oracle Database Appliance Version 1 which has all interconnects and storage connections pre-configured when shipped.

- **Attaching a Storage Expansion Shelf**

    This task is not required for Oracle Database Appliance Version 1 which does not use external storage shelves.

- **Attaching Peripheral Devices**

    This task is only applicable if you have direct access to Oracle Database Appliance and intend to use a locally connected monitor, keyboard, and mouse.

- **Booting Up the First Time**

    The steps in this section apply to your newly-installed Oracle Database Appliance but are also applicable when you need to power it down or add new hardware, such as a storage expansion shelf.

- **Configuring Oracle Integrated Lights Out Manager**

    Although this is not a required step, or one that you can perform after deployment, Oracle Integrated Lights Out Manager (ILOM) provides alternate ways to restart and troubleshoot Oracle Database Appliance.

- **Configuring an Initial Network Connection**

    To build your network information during deployment, you need a temporary network configuration framework, which this section explains how to configure.

- **Validating Oracle Appliance Manager Software Version**

    Oracle recommends that you always use the current version of Oracle Database Appliance software if you are deploying or redeploying.

For more information on installing the hardware, see the Oracle Database Appliance Setup Poster and the Oracle Database Appliance Owner's Guide.

Attaching Supplied Cables

Use Figure 3–1 and Figure 3–2 to guide you as you insert the supplied cables into Oracle Database Appliance models with a single storage shelf. If you are able to

distinguish colors, then match cable colors (for the green and yellow cables), or the labels at the ends of each cable, with the colored line shown in the following illustration. Also match the cable colors to the background colors of the socket identification labels. If you are unable to use color coding, then use the callout numbers described in Table 3–1 to complete the cabling for Oracle Database Appliance with a single storage shelf. Because all cables with the same terminations are interchangeable, you can safely ignore the color coding.

The cables shown in Figure 3–1 and Figure 3–2 and described in Table 3–1 are included with each shipped Oracle Database Appliance. Other than the green and yellow Cat-6 cables, the cables are all black, but have colored labels at each end that match the references to cable colors in the text and the label colors on the back panels.

See the Oracle Database Appliance Owner's Guide for details about cabling with the supplied Cable Management Arm.

> **Note:** The back panel of each node contains three PCIe generation 3 terminal slots, with two sockets in each slot. The PCIe slots are labeled "*X* PCIe3," where "*X*" is the PCIe slot number. Table 3–1 identifies these slots as PCIe slot 1, PCIe slot 2, and PCIe slot 3, which matches the numbers on the labels reading from left to right. The storage shelf back panel has two IO modules, one located above the other. Each IO module has three ports, numbered 0, 1, and 2. Table 3–1 identifies these ports as either "top" or "bottom" ports, for ports in the upper and in the lower IO module respectively.

Attaching Cables for Oracle Database Appliance X5-2

Figure 3–1 illustrates the cable connections between ports on Oracle Database Appliance model X5-2 in a single storage shelf. The numbered callouts are defined in Table 3–1.

Figure 3–1   Interconnects and Cables for a Single Storage Shelf on Oracle Database Appliance X5-2
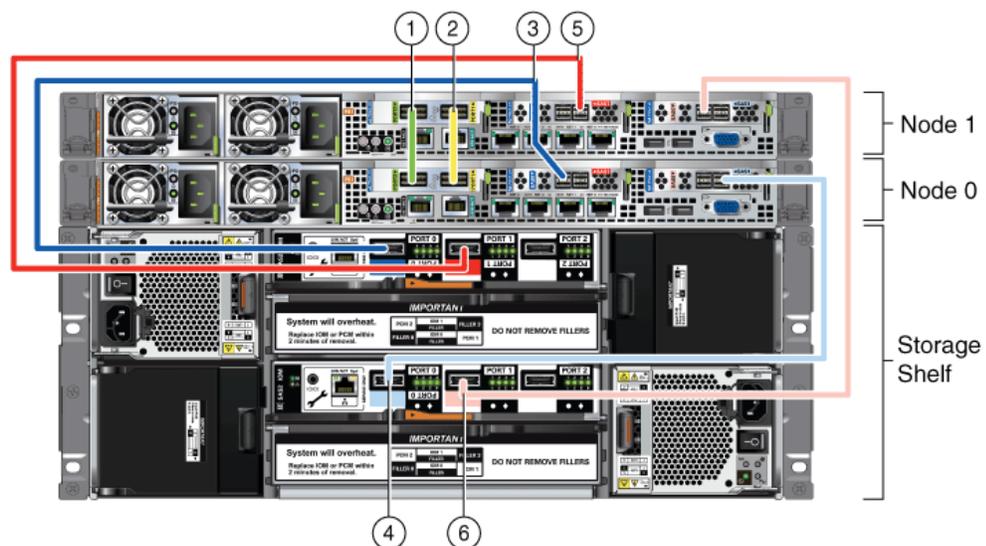
Attaching Cables for Oracle Database Appliance Models X4-2 and X3-2

Figure 3–2 illustrates the cable connections between ports on Oracle Database Appliance model X4-2 and model X3-2 in a single storage shelf. The numbered callouts are defined in Table 3–1.

Figure 3–2   Interconnects and Cables for Single Storage Shelf on Oracle Database Appliance X4-2 and X3-2
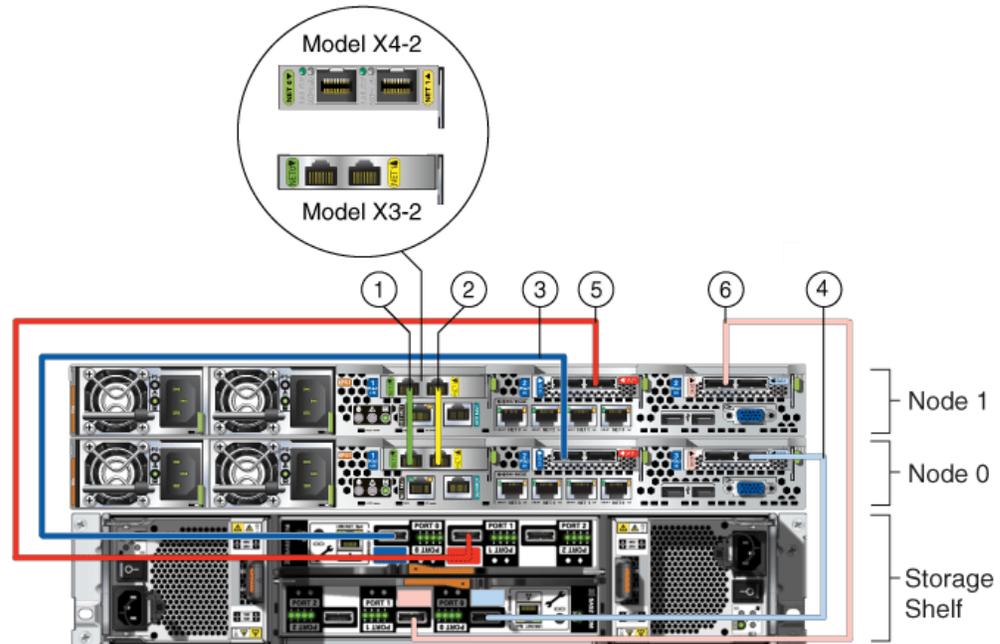

Table 3–1   Description of Callouts for Cabling Oracle Database Appliance With Single Storage Shelf

Callout Number	Description
1	Green InfiniBand Cable (Oracle Database Appliance X5-2) ■ From: Node 0, PCIe slot 1, PORT2 ■ To: Node 1, PCIe slot 1, PORT2 Green Cat 6 cable (Oracle Database Appliance X3-2) or green-labelled twinax cable (Oracle Database Appliance X4-2): ■ From: Node 0, PCIe slot 1, NET0 ■ To: Node 1, PCIe slot 1, NET0
2	Yellow InfiniBand Cable (Oracle Database Appliance X5-2) ■ From: Node 0, PCIe slot 1, PORT1 ■ To: Node 1, PCIe slot 1, PORT1 Yellow Cat 6 cable (Oracle Database Appliance X3-2) or yellow-labeled twinax cable (Oracle Database Appliance X4-2) ■ From: Node 0, PCIe slot 1, NET1 ■ To: Node 1, PCIe slot 1, NET1
3	Dark blue SAS cable: ■ From: Node 0, PCIe slot 2, SAS0 ■ To: Storage shelf, top I/O port 0

Table 3–1   (Cont.) Description of Callouts for Cabling Oracle Database Appliance With Single Storage Shelf

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

> **Caution:**   Do not attach cables to ethernet ports in the I/O modules labeled "SERVICE ONLY" when cabling the system. These ports are intended for use by service engineers only. You must use Oracle Appliance Manager to manage Oracle Database Appliance storage.

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

For Oracle Database Appliance X4-2 and X5-2 installations, if you wish to use fiber connections between Oracle Database Appliance and your public network, the interconnect must be cabled using the green and yellow copper ports (onboard ports net0 and net1). The green and yellow Cat 6 interconnect cables for these ports ship with the base system.

Oracle Database Appliance X4-2 includes fiber ports as part of the base configuration. However, for Oracle Database Appliance X5-2, you must replace the InfiniBand cards with 10 GbE SFP+ (fiber) cards, because fiber ports do not exist in the base configuration.

> **Caution:**   If you replace the Infiniband interconnect cards on Oracle Database Appliance X5-2, then you will not be able to use the Oracle Database Appliance in-memory fault tolerance feature. Also, interconnect bandwidth will be reduced from 40 GB to 10 GB. If you have RAC databases, then you may have slower intercommunication speeds (depending on the workload).

Refer to the Oracle Database Appliance Owner's Guide for instructions on how to replace PCIe cards for Oracle Database Appliance. Once you replace the cards, Oracle Database Appliance will auto-detect the network configuration changes.

> **Note:**   You must re-image Oracle Database Appliance X5-2 after you replace the PCIe cards.

Figure 3–3, callouts 1 and 2., illustrate proper cabling for the green and yellow copper ports (onboard ports net0 and net1) to interconnect Oracle Database Appliance to a fiber public network. Note that the illustration shows the rear panel of the Oracle

Database Appliance X4-2. The rear panel of the Oracle Database Appliance X5-2 is slightly different but the interconnect cabling is the same.

Figure 3–3   Interconnects When Using Fiber Connections to the Public Network on Oracle Database Appliance Models X5-2 and X4-2
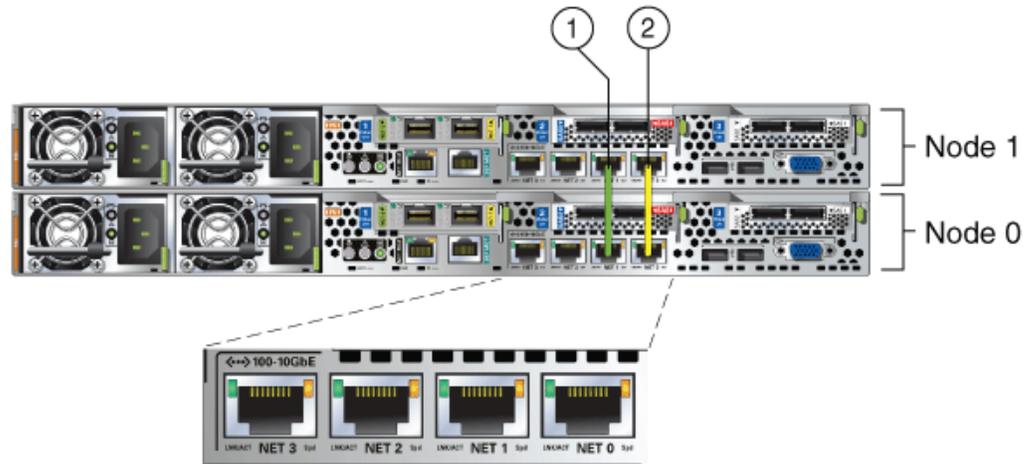
Here are the cabling options for 10 GbE SFP+ PCI cards:

Copper

For copper cables, you can purchase the following cables from Oracle Sun. These cables have built-in SFP+ connectors:

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

Fiber

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

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

Attaching a Storage Expansion Shelf

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

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

Oracle recommends that you add a storage expansion shelf when you have relatively little activity on your databases. As soon as Oracle Database Appliance recognizes the new storage, ASM automatically rebalances the disk groups, which might degrade database performance until the operation completes.

Complete the following two tasks to install and to cable the storage expansion shelf:

- Installing a Storage Expansion Shelf
- Cabling a Storage Expansion Shelf

Installing a Storage Expansion Shelf

To install a storage expansion shelf:

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

   > **Note:**   The storage expansion shelf normally sits at the bottom of Oracle Database Appliance, beneath the storage shelf. However, because racks should always be provisioned from the bottom up, that space might be unavailable. In these cases, to avoid re-rack mounting the entire system, position the storage expansion shelf above the server nodes or even in a different, but adjacent, rack.

2. The extension storage shelf is installed in exactly the same manner as the original storage shelf. For information about installing optional components in the Oracle Database Appliance, see the section "Optional Component Installation" in Chapter 4 of the Oracle Database Appliance Owner's Guide.

3. Install the supplied cables as described in "Cabling a Storage Expansion Shelf" or as shown on the Oracle Database Appliance Setup Poster.

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

4. Attach the supplied power cords as explained in "Attaching Power Cords and Initializing Components".

   > **Caution:**   Do not turn on power to the expansion shelf until you have added the cables as described in "Cabling a Storage Expansion Shelf".

   > **Note:**   Oracle recommends that you do not remove a storage expansion shelf from Oracle Database Appliance, whether the shelf was installed during the initial setup or added later.

Cabling a Storage Expansion Shelf

Figure 3–4 and Figure 3–5 show you how to insert the required cables into the storage expansion shelf of Oracle Database Appliance. The cables for the two nodes and the original storage shelf are included in the illustration for reference.

If you are able to distinguish colors, match the colors of the labels at the ends of each cable with the colored line shown in the following illustration. Also match the cable colors to the background colors of the socket identification labels.

If you are unable to use color coding, then use the callout numbers described in Table 3–2 to complete the cabling of the storage expansion shelf. Because all cables with the same terminations are interchangeable, you can ignore the color coding.

See the *Oracle Database Appliance Owner's Guide* for details about cabling with the supplied Cable Management Arm.

Figure 3–4   Cables for Storage Expansion Shelf on Oracle Database Appliance X5-2
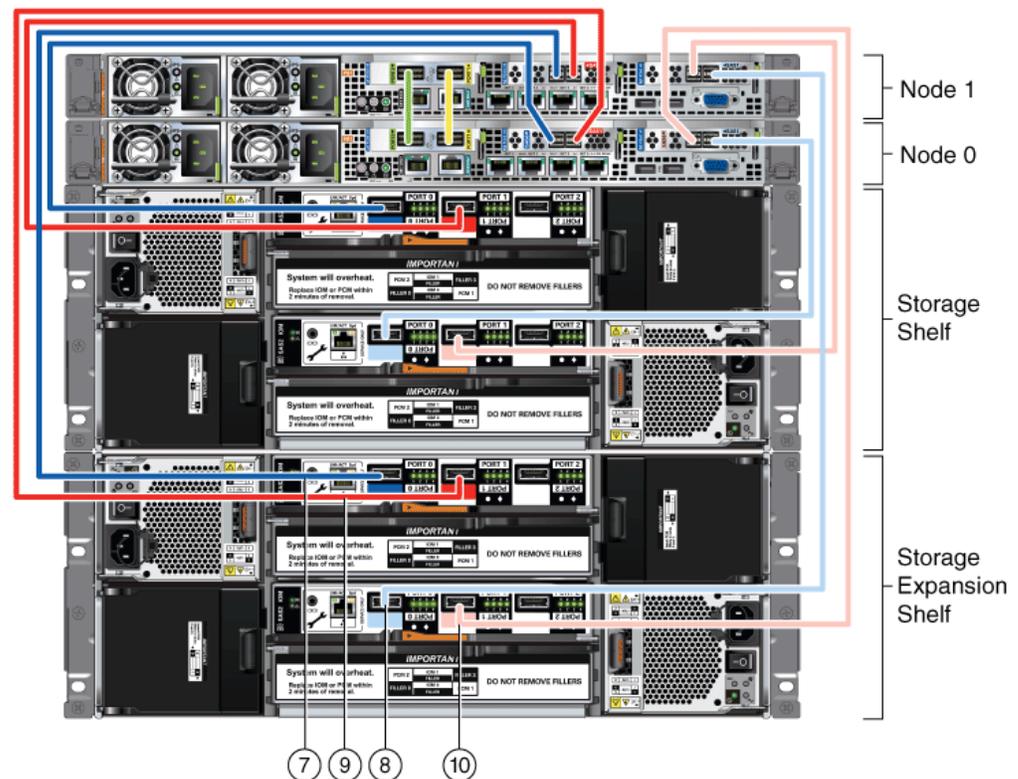
Figure 3–5   Cables for Storage Expansion Shelf on Oracle Database Appliance X3-2 and X4-2
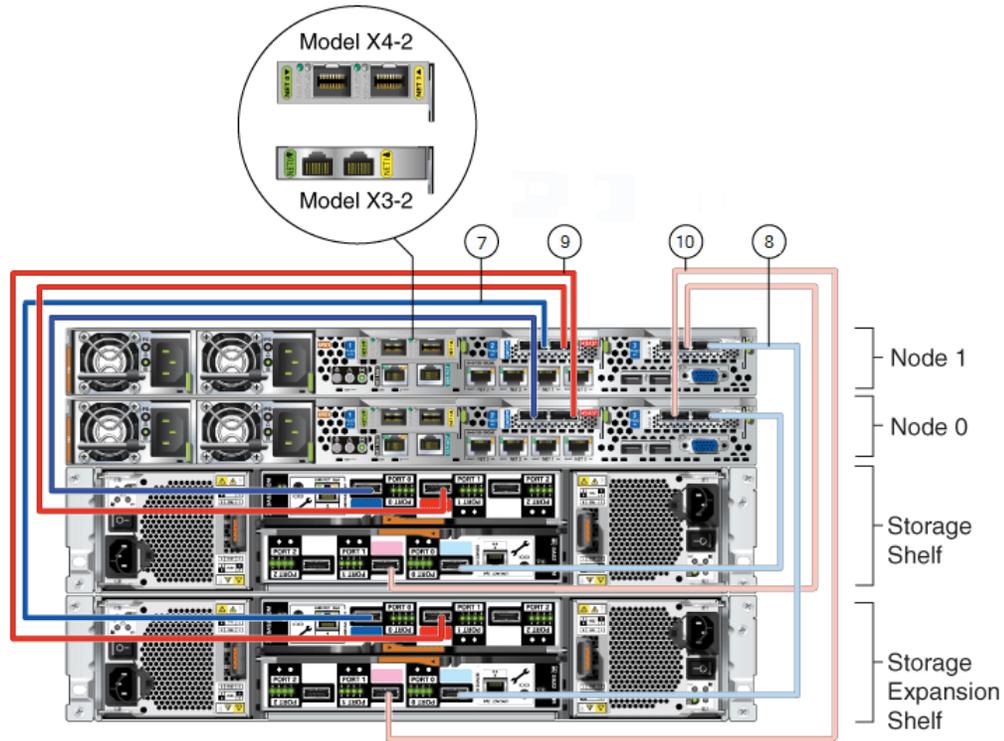
The cables identified with callout numbers in Figure 3–4 and Figure 3–5 and described in Table 3–2 are included with each shipped Oracle Database Appliance storage expansion shelf. These cables are all black, but have colored labels at each end that match the references to cable colors in the text and the label colors on the back panels.

Note: The back panel of each node contains three PCIe generation 3 terminal slots, with two sockets in each slot. The PCIe slots are labeled "*X* PCIe3," where "*X*" is the PCIe slot number. Table 3–2 identifies these slots as PCIe slot 1, PCIe slot 2, and PCIe slot 3, which matches the numbers on the labels reading from left to right. The storage expansion shelf back panel has two IO modules, one located above the other. Each IO module has three ports, numbered 0, 1, and 2. Table 3–2 identifies these ports as either "top" or "bottom" ports, for ports in the upper and in the lower IO module respectively.

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

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

Table 3–2   (Cont.) Description of Callouts for Cabling Oracle Database Appliance Storage Expansion Shelf

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

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

Attaching Peripheral Devices

Oracle Database Appliance is not equipped with devices for human interaction, such as a monitor or keyboard. To log in directly (not through a network), attach a monitor to the graphics card port and a keyboard and a mouse to the USB ports on Node 0 only. See callout 1 for the keyboard and mouse inputs and callout 2 for the monitor input in the following figures, where Figure 3–6 shows Oracle Database Appliance models X3-2 and X4-2. The Oracle Database Appliance X5-2 rear panel is slightly different however the peripheral device connections are the same as X3-2 and X4-2. Figure 3–7 shows Oracle Database Appliance Version 1.

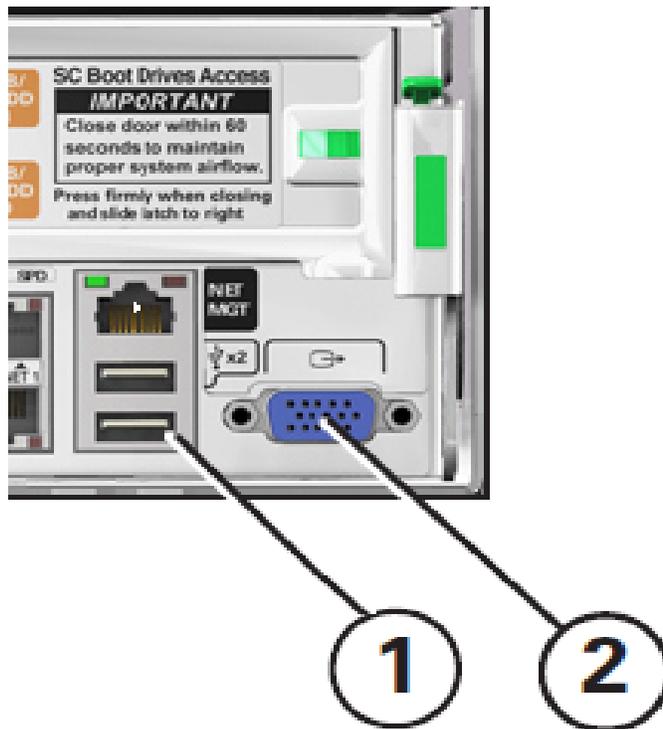*Figure 3–6   Peripheral Device Connections for Oracle Database Appliance (Node 0)*
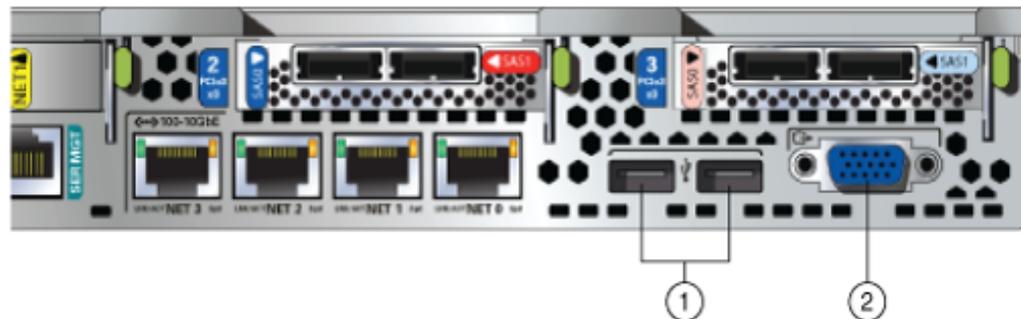
Figure 3–7   Peripheral Device Connections for Oracle Database Appliance Version 1 (Node 0)

Booting Up the First Time

To ready Oracle Database Appliance for the powering on the first time, you need to attach all of the required power cords, which differ between models and options, and confirm that initialization completes successfully. You can then start up the system by switching on the process server nodes.

These two tasks are described in the following sections:

- Attaching Power Cords and Initializing Components
- Powering On the First Time

Attaching Power Cords and Initializing Components

Use the callouts in Figure 3–8 and Figure 3–9 and Table 3–3 as guides to insert the supplied power cords into Oracle Database Appliance models with external storage. Ensure that the electrical outlets providing the power are grounded before plugging in the power cords.

Figure 3–8   Power Cord Connections on Oracle Database Appliance X5-2
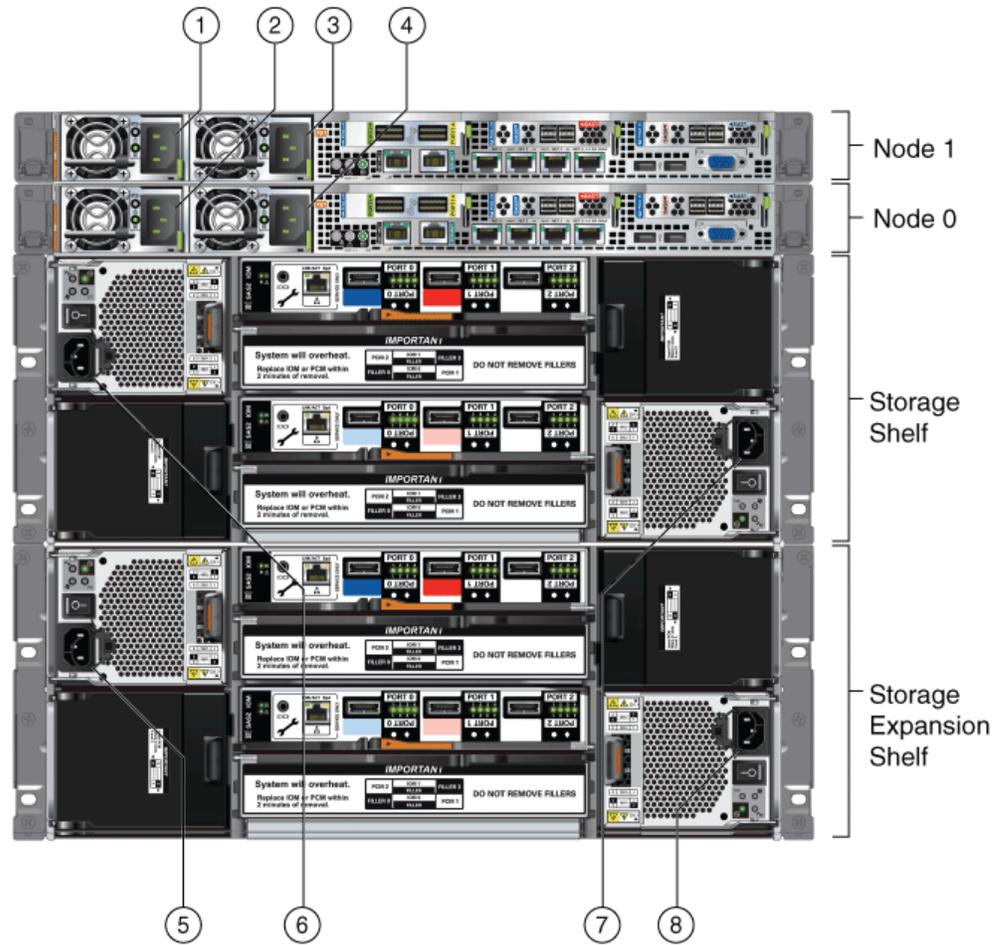
Figure 3–9   Power Cord Connections on Oracle Database Appliance X4-2 and X3-2
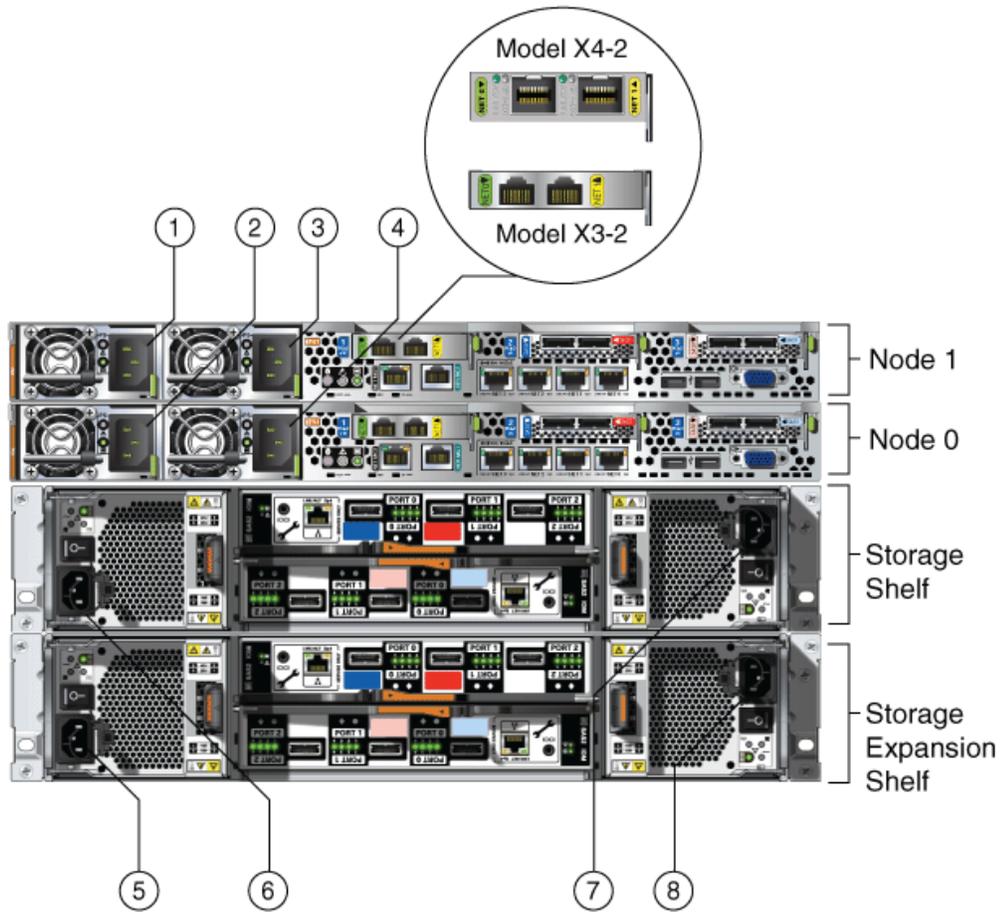
If you use only a single AC circuit, connect both power cords for each component to that circuit. However, to maintain N+1 power supply redundancy, use two separate AC circuits. Then, for both nodes and the storage shelf or shelves, connect one power cord from each AC circuit into each component. See the following table, where the two separate AC circuits are denoted by AC1 and AC2, for the recommended power connections as identified by the callouts in the preceding figure.

> **Caution:**   Before you insert any power cables, ensure that the power supply On/Off switch on the storage shelf is in the Off position. If a storage expansion shelf is installed, then ensure that the power supply switches on both storage shelves are in the Off position.

Table 3–3   Electrical Power Cord Connections for Oracle Database Appliance with Storage Shelves

Callout Number	Component	AC Circuit
1	Node 1	AC1
2	Node 0	AC1
3	Node 1	AC2
4	Node 0	AC2

Table 3–3   (Cont.) Electrical Power Cord Connections for Oracle Database Appliance with Storage Shelves

Callout Number	Component	AC Circuit
5	Storage expansion shelf (Not required for single storage shelf implementations)	AC1
6	Storage shelf	AC1
7	Storage shelf	AC2
8	Storage expansion shelf (Not required for single storage shelf implementations)	AC2

Oracle Database Appliance Version 1 hardware has only one power socket for each node. The power sockets are at the lower left corner of the rear panels. Ensure that the electrical outlets providing the power are grounded before plugging in the power cords.

See the *Oracle Database Appliance Owner's Guide* for details about cabling with the supplied Cable Management Arm.

Powering On the First Time

Before continuing with the following steps, ensure that all of the required power cables are attached to both Oracle Database Appliance nodes and to one or both storage shelves, if included in your system.

> **Note:**   You might notice that the two nodes appear to be running as soon as you attach the power cords because the fans are turned on and the front panel LEDs start to blink or eventually remain on. However, to properly start the system processors, you must complete the steps in this section.

1. If attached, switch the storage power supplies On/Off switch to the "On" position for each storage shelf.

    Each storage shelf has a two power switches, one located on the right side and one on the left side of the rear panel.

    The disks begin to initialize which can take several minutes.

    > **Note:**   Do not apply main power to the server nodes until the storage shelves are fully initialized, indicated by the green LEDs on the shelves and the system processer (SP) on the nodes staying steadily lit.

2. Wait for the server nodes, and storage shelves, if attached, to complete their initialization steps. To indicate that initialization is complete, the green system processer (SP) LEDs on the front of the nodes will stop blinking and remain steadily on. See callout 1 in the following figures, the first of which shows the front panel of Oracle Database Appliance Version 1 and second of which shows the front panel of all other models.

Figure 3–10   Front of Oracle Database Appliance Models X3-2, X4-2, and X5-2: Power Panel

Figure 3–11   Front of Oracle Database Appliance Version 1: Power Panel

3. When both nodes are initialized, on each node:

   ■ Push the recessed Power button on the node's front panel (see callout 2 in the preceding figures).

   ■ Wait for several minutes until for the green Power OK LED on the node's front panel (see callout 3 in the preceding figures) to stay on instead of blinking.

   Note: Do not repeatedly push the power button, callout 2 in the preceding figures.

   ■ Oracle Database Appliance is ready for use as soon as the green Power OK LEDs (see callout 3 in Figure 3–10) on the front of both system nodes remain steadily on.

Defining Your Public Network Option

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

> **Note:**   The above statement is valid for Oracle Database Appliance X4-2 only. When you power on Oracle Database Appliance X5-2 for the first time, the system automatically defines your public network interface based on the interconnect. On Oracle Database Appliance X5-2, the InfiniBand network is used for the interconnect if InfiniBand cards are used. If InfiniBand cards are replaced with 10 GbE SFP+ (fiber) cards, then the onboard 10GBase-T (Copper) ports are used for the interconnect. See Figure 3–3 for interconnect cabling instructions when InfiniBand cards are replaced with 10 GbE SFP+ (fiber) cards.

First, define your system's public connection type by responding to the following:

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

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

If you make a mistake or need to change your public network choice later, reconfigure your system by running the script `/opt/oracle/oak/lib/setupX4network.pl` as the `root` user on both nodes.

> **WARNING:**   If you have already deployed the End-User Bundle (for a Bare Metal installation) or the ODA_BASE template (for a Virtualized Platform installation), then you will need to redeploy that software after running the setupX4network.pl procedure.

Configuring Oracle Integrated Lights Out Manager

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

Although not required, Oracle ILOM provides alternate ways to restart and troubleshoot Oracle Database Appliance.

To configure Oracle ILOM, you will need:

- A name and IP address for each of the two nodes
- A password to replace the default Oracle ILOM password
- Access to a management network through an assigned netmask
- An Ethernet cable connected from each node of Oracle Database Appliance, using the nodes' NET MGT ports, into the management network

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

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

Refer to Chapter 2, "Overview of Oracle Database Appliance" in *Oracle Database Appliance Owner's Guide* for details about the port used for ILOM on your platform.

Additionally, the Oracle Integrated Lights Out Manager Documentation Library at http://docs.oracle.com/cd/E19860-01/index.html provides additional information about Oracle ILOM.

> **Note:** Until you complete Oracle Database Appliance configuration, as described in Chapter 4, you will not be able to access Oracle ILOM unless DCHP is enabled.

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

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

   a. Using a client system's browser, enter the IP address or host name assigned by DHCP into the browser address field and press **Enter**.

   b. At the login page, enter the default user name, `root` and the default password, `changeme`.

      The Oracle ILOM web interface appears.

2. Log in using a command line interface (CLI) by completing these steps:

   a. Using a client system, establish a secure shell (SSH) connection by entering the following on the command line:

      `ssh -l root sp_ip_address`

      where `sp_ip_address` is the IP address assigned by DHCP.

   b. Enter the default user name, `root`, and the default password, `changeme`.

      The Oracle ILOM CLI prompt appears.

Configuring an Initial Network Connection

To manage your Oracle Database Appliance deployment across a network, you need to configure an initial network connection. You use this network to transfer deployment software to Oracle Database Appliance.

If you have physical access to your Oracle Database Appliance, then you can download deployment software to USB storage that you plug into the system, in which case you do not need an initial network.

> **Note:** An initial network configuration will be replaced during the final image deployment.

1. Log in as `root`, password `welcome1`. If you are configuring the network on Oracle Database Appliance Virtualized Platform, then login to Dom0 to complete this step.

2. Oracle recommends that you perform a validity check of cabling before you perform any other actions on Oracle Database Appliance with one or more storage shelves, unless you are planning a virtualized platform deployment. (For Virtualized Platform installations, the check is performed after deploying the system as described in Chapter 4). Perform this check by running the `oakcli validate -c storageTopology` command.

3. Run the `oakcli configure firstnet` command to configure the initial network.

You might need to refer to data that you collected on the work sheets in the first section of this chapter for some of the required values. Use the global option by accepting the default value in the first prompt and then provide the required data for the remaining prompts. You do not need to enter anything to accept the default values that are shown in square brackets at the end of prompts.

The following is an example shows the key features of the dialog, some details may be different depending on the model of Oracle Database Appliance. In this example, default values are always selected and values that you need to provide when running the command are shown in *italic font*.

```
oakcli configure firstnet
Configure the network for the node(s)(local, global) [global]:
The network configuration for both nodes:
Domain Name:  your organization domain name
DNS Server(s):  Primary Dns Server:  your primary DNS server
                Secondary Dns Server:  your secondary DNS server
                Tertiary Dns Server:  your tertiary DNS server
Node Name       Host Name
0               your Node 0 host name
1               your Node 1 host name
Choose the network interface to configure (net1, net2, net3, net4) [net1]:
Configure DHCP on net1 (yes/no) [no]:
You have chosen static configuration on net1
Enter the IP address for net1 on Node 0: your Node 0 IP address
Enter the IP address for net1 on Node 1: your Node 1 IP address
Netmask for net1: your netmask
Gateway Address for net1 [<Gateway IP>]:
Plumbing the IPs now on Node 0 …
::::::::::::::::::::::::::::::::::::::::::::::::::::
Plumbing the IPs now on Node 1 …
::::::::::::::::::::::::::::::::::::::::::::::::::::
```

In the preceding example, the prompt for the net1 gateway address includes a default value, shown as <Gateway IP>. The program derives this gateway address using values from previous entries. You should accept this value unless your network administrator has provided a specific address that differs from the derived address.

> **Caution:**   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.

Validating Oracle Appliance Manager Software Version

Before deploying Oracle Database Appliance, as described in Chapter 4, you should have the current version of the Oracle Appliance Manager software installed. Run the following command to find the installed version:

```
oakcli show version
```

Confirm that you have the version 12.1.2.5.0. If you have an earlier version, then see the My Oracle Support Note 888888.1 (at https://support.oracle.com/CSP/main/article?cmd=show&type=NOT&id=888888.1) for information on how to re-image your system with the current version.

4

Deploying Oracle Software on Oracle Database Appliance

This chapter provides a checklist of tasks to deploy Oracle software after you have established connectivity to Oracle Database Appliance as described in Chapter 3, "Readying Oracle Database Appliance for Deployment." Deploying Oracle Database Appliance software requires approximately 1 hour to complete for bare metal installations and about 3 hours for virtualized platform deployments. The extra time for virtualized deployments is required to complete additional steps and because some operations take longer when configuring virtual domains.

Each task in this chapter identifies whether it applies to a bare metal platform, to a virtualized platform, or to all platforms. Take care to perform only the tasks designated for a deployment on your platform: tasks 1, 3, 4, and 5 are for Oracle Database Appliance Virtualized Platform deployments, tasks 2, 4, and 5 are for Oracle Database Appliance bare metal deployments.

You can repeat a failed deployment, or perform a new deployment to convert from a bare metal to a virtualized platform, or from a virtualized to a bare metal platform, after running a cleanup script as described at the end of this chapter.

> **Note:** If you are planning to convert from Oracle Database Appliance Virtualized Platform to a bare metal deployment, first check with My Oracle Support to confirm that you have a compatible image installed.

Refer to the Oracle Database Appliance Setup Poster for an overview of the deployment process.

Deployment Tasks: An Annotated Check List

You must complete the deployment tasks in the order that they are listed. However, some tasks are not needed for bare metal deployments and other steps are not needed for virtualized platform deployments. When you are not required to complete a task for your type of deployment, continue with the next required task.

Task 1: Check Oracle Database Appliance Virtualization Status (Virtualized Platform Deployments Only)

To check whether Oracle Database Appliance has a virtualized platform image installed, log in as `root` with the password `welcome1` and enter the command `oakcli show env_hw`. If the output contains the value `VM-Dom0` along with the model of your hardware, then you can proceed with deployment of Oracle Database Appliance

Virtualized Platform as described in the next section. If the command does not produce the required output or generates errors, then you must install the Oracle Database Appliance virtualized platform image.

> **Note:** Find instructions to install the Oracle Database Appliance virtualized image in the My Oracle Support Note 1520579.1 at https://support.oracle.com/CSP/main/article?cmd=show&type=NOT&id=1520579.1

After installing the virtualized image, you may need to reconfigure your initial network as described in "Configuring an Initial Network Connection".

Task 2: Install the End-User Bundle (Bare Metal Platform Deployments Only)

You must install the end-user bundle on Oracle Database Appliance before you deploy any other software. This requires downloading the appropriate patch file to your external client and then copying and installing the patch as described in the following steps.

1. From an external client machine, log on to My Oracle Support and access MOS note 888888.1 at

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

2. In the Latest Releases section, find the link to the patch described as "End User Bundle (GI+RDBMS)."

3. Click the link to download the current Oracle Database Appliance end-user bundle patch onto the client system (desktop or laptop).

4. Copy the end-user bundle patch to a location on Oracle Database Appliance (for example, the `/tmp` directory) using a secure copy (`scp`) command by navigating to the folder on your client where you downloaded the end-user bundle patch, then enter a command similar to the following (which shows an Oracle Database Appliance Release 2.10 file):

   ```
   scp p12978712_210000_Linux-x86-64.zip root@oda_host:/tmp
   ```

   This example assumes that you set up a static IP address with the host name `oda_host` and configured Oracle Database Appliance with that address using the `oakcli configure firstnet` command. Refer to the Oracle Database Appliance Administration and Reference Guide for details on the `oakcli configure firstnet` command syntax and usage.

   Alternatively, place the end-user bundle patch onto a USB storage device that you make accessible on Oracle Database Appliance. Go to go to the location of the end-user bundle image on the device.

   > **Note:** Format any USB drives as FAT32, ext3, or ext4. NTFS file formats are not supported.

5. Use the command syntax `oakcli unpack -package` `/directory_path/package_name` to unpack the Oracle Database Appliance software. `directory_path` is the path where the end-user bundle patch file is located.

For example, if the end-user bundle patch files for Oracle Database Appliance Release 12.1.2.5.0 are in `/tmp`, then the following commands will unpack p12978712_121250_Linux-x86-64.1of2.zip and p12978712_121250_ Linux-x86-64.2of2.zip

```
# oakcli unpack -package /tmp/p12978712_121250_Linux-x86-64.1of2.zip
# oakcli unpack -package /tmp/p12978712_121250_Linux-x86-64.2of2.zip
```

The `oakcli unpack` command unpacks the bundle patch, and places the extracted files in the directory locations required for deployment.

Task 3: Install the ODA_BASE Template (Virtualized Platform Deployments Only)

You must install the ODA_BASE template on Oracle Database Appliance before you deploy any other software. This requires downloading the appropriate ODA_BASE template to an external client and then copying the template to your Oracle Database Appliance as described in the following steps.

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. In the Latest Releases section, find the link to the patch described as "VM Template (ODA_BASE)."

3. Click the link to download the current Oracle Database Appliance ODA_BASE template onto your external client.

4. Use an `scp` command to copy the ODA_BASE template from the external client to Dom0 on Node 0. Use the `/scp` or `/OVS` directory as the target location.

    Alternatively, you could place the ODA_BASE template onto a USB storage device and copy the template once the USB device is visible on Oracle Database Appliance.

    > **Note:** Format any USB drives as FAT32, ext3, or ext4. NTFS file formats are not supported.

5. Log in to Dom0 as `root` on Node 0 of Oracle Database Appliance Virtualized Platform and copy the ODA_BASE template to the `/OVS` directory on Dom0 if it is not already there. Remain logged in to Dom0 while you complete the remaining steps in this task.

6. Use the command `oakcli deploy oda_base` and respond to the prompts to deploy ODA_BASE. This command automatically deploys ODA_BASE on both nodes. If your ODA_BASE template is in the `/OVS` directory, then your deployment dialog should look similar to the following example (values, such as the number of available CPU cores, differ between Oracle Database Appliance Virtualized Platform hardware platforms):

```
# oakcli deploy oda_base
Enter the template location: /OVS/templateBuild-2012-12-22-12-05.tar.gz
Core Licensing Options:
1.   2 CPU Cores
2.   4 CPU Cores
3.   6 CPU Cores
4.   8 CPU Cores
```

```
 5.  10 CPU Cores
 6.  12 CPU Cores
 7.  14 CPU Cores
 8.  16 CPU Cores
 9.  24 CPU Cores
10.  36 CPU Cores
Selection [1 : 6]: 3
ODA base domain memory in GB (min 16, max 244)(Current Memory 150G)[default
192]: 32
```

7. The `oakcli deploy oda_base` command also enables you to assign one or more virtual local area networks (VLANs) to your ODA_BASE. To deploy VLANs, respond with y when prompted for additional VLAN networks, and respond with n when you have no (or no more) VLANs to deploy, as shown in this partial example:

```
Additional vlan networks to be assigned to oda_base ? (y/n) : y
Select the network to assign [Test00,Test01,Test02,Test03]: Test00
Additional vlan networks to be assigned to oda_base ? (y/n) : y
Select the network to assign [Test00,Test01,Test02,Test03]: Test01
Additional vlan networks to be assigned to oda_base ? (y/n) : n
```

Refer to the Oracle Database Appliance Administration and Reference Guide for more information about VLANs on Oracle Database Appliance Virtualized Platform.

8. When the command completes, verify that your deployment of ODA_BASE is valid by running the `show oda_base` command. Examine the output to confirm that ODA_BASE is configured as shown in the following example.

```
# oakcli show oda_base
ODA base domain
ODA base CPU cores :2
ODA base domain memory :16
ODA base template :/tmp/oda_base_2.10.tar.gz
ODA base vlans :['priv1', 'net1', 'net2', 'net3', 'net4', 'db_mgmt']
ODA base current status :Running
```

Note: If you have problems and need to cleanup and start again with a new ODA_BASE deployment, then first run the following command from Dom0 on Node 0:

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

This command will remove ODA_BASE so that you can try a fresh deployment.

---

9. If you are deploying Oracle Database Appliance X3-2, Oracle Database Appliance X4-2, or Oracle Database Appliance X5-2, then Oracle recommends that you check the storage cabling before continuing with deployment. To perform this check, connect to ODA_BASE on Node 0 using `root` for the user name and `welcome1` for the password. After connecting, run the following command:

```
# oakcli validate -c storagetopology
```

The command will display errors if the cables between the two nodes and the storage shelf or shelves are not in the correct sockets.

Task 4: Prepare to Run Oracle Appliance Manager Configurator (All Platform Deployments)

Log in to Node 0 of Oracle Database Appliance as the `root` user with the default password. If you are deploying on Oracle Database Appliance Virtualized Platform, then you need to connect to ODA_BASE through VNC using `dom0` for the **Hostname** and `5900` for the **Port**.

If you want to deploy from a configuration file that you created offline, as described in "Creating an Oracle Appliance Manager Deployment Plan" then copy the configuration file to Oracle Database Appliance using a command similar to the `scp` command used to copy the patch in Step 4 of your previous task. If you are deploying on Oracle Database Appliance Virtualized Platform, then you need to copy the file from Dom0 to ODA_BASE using another `scp` command to send the file to the internal IP address 192.168.16.27. You can place the configuration file in the `/tmp` directory for convenience, or into a more permanent location for future use.

Run the command `startx` to ready the X Window System for Oracle Appliance Manager configurator.

> **Note:** Set the DISPLAY variable in your terminal window if the `oakcli deploy` command fails to open the Welcome window in Oracle Appliance Manager configurator.

Task 5: Deploy Your Configuration (All Platform Deployments)

You must have a configuration file to deploy Oracle Database Appliance. You can use a file that you created earlier with the standalone Oracle Appliance Manager configurator or build a new one at this time. You can also use a configuration file previously built and saved on Oracle Database Appliance.

To initiate the deployment using an existing configuration file, enter a command similar to the following, substituting your file's name and directory path as necessary:

```
# oakcli deploy -conf /tmp/onecommand.param
```

> **Note:** Do not use a configuration file created for an earlier version of Oracle Appliance Manager configurator. If you do not have a current configuration file, then complete a real-time configuration and deployment as described in the following step.

To initiate a real-time configuration and deployment, enter the following command:

```
# oakcli deploy
```

Follow the instructions to complete the Oracle Appliance Manager configurator screens given in "Creating an Oracle Appliance Manager Deployment Plan". Select the **Install** option on the configurator Summary page to complete the deployment.

When the deployment is complete on both nodes, you will see the message `Oracle Database Appliance Deployment successful`.

> **Note:**   If you encounter deployment problems and need to cleanup
> and to perform a fresh deployment, then run the following command
> on Node 0 (from ODA_BASE domain if you are configuring Oracle
> Database Appliance Virtualized Platform):
>
> ```
> /opt/oracle/oak/onecmd/cleanupDeploy.pl
> ```
>
> This command restores the servers to their predeployment state. You
> can then restart the deployment.

Viewing the Oakcli Deploy Log File

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

5

Oracle Database Appliance Postinstallation Tasks

This chapter describes the following administrative tasks that you must complete after you have deployed the software but before the system is operational:

- Changing the Oracle Installation Owner Passwords
- Changing the IPMI User Name and Password
- Configuring Oracle Auto Service Request

Changing the Oracle Installation Owner Passwords

You must change the default administrative account passwords after installation to secure your system. During deployment, you should have changed the password of the `root` user. After deployment, change the Oracle Grid Infrastructure installation owner (`grid`) and Oracle Database installation owner (`oracle`) default passwords (`welcome1`) to passwords that comply with your enterprise user security protocols. Also, if you created an initial database during deployment, change the default passwords for open database accounts such as the SYS, SYSTEM, DBSNMP users and other roles. The default password for the `SYS` and `SYSTEM` users is `welcome1`.

> **Note:** The account passwords should be changed on both nodes. The passwords on both nodes should be the same.

Refer to the Oracle Database Appliance Security Guide, *Oracle Database Concepts*, and *Oracle Database Security Guide* for information about the required configuration and best practices to secure database systems.

Changing the IPMI User Name and Password

Oracle Clusterware supports the Intelligent Platform Management Interface (IPMI), an industry-standard protocol that can isolate a failed node from the rest of the cluster. IPMI can restart a problematic node without cooperation from either Oracle Clusterware or from the operating system.

Configuring IPMI is an option when performing a custom deployment of Oracle Database Appliance. If you completed a custom deployment and configured IPMI, then change the default user name and password using the following procedure:

1. Log in as the user *grid*.

2. Enter the command `crsctl set css ipmiadmin` *username*. *username* is the new name for the IPMI administrator account. Provide a new password when prompted. You must enable IPMI v1.5 first. For example:

```
$ ipmitool -I open sunoem cli "set /SP/services/ipmi v1_5_sessions=enabled"
$ /u01/app/12.1.0.2/grid/bin/crsctl set css ipmiadmin racadm
$ IPMI BMC password:
CRS-4229: The IPMI information change was successful $ ipmitool -I open sunoem
cli "set /SP/services/ipmi v1_5_sessions=disabled"
$ IPMI BMC password:
CRS-4229: The IPMI information change was successful
```

> **Caution:** Do not change the default passwords until after you have completed software deployment on Oracle Database Appliance. If you change the passwords before deployment completes, then you might encounter configuration errors.

Configuring Oracle Auto Service Request

Oracle Auto Service Request (Oracle ASR) is a secure support feature that automatically generates a service request for specific hardware faults. Oracle ASR can improve system availability through expedited diagnostics and priority service request handling. You can configure Oracle ASR on Oracle Database Appliance to use its own ASR Manager or use Oracle ASR Manager configured on another server in the same network as your appliance.

To support Oracle ASR, your Oracle Database Appliance hardware must be associated with a Support Identifier (SI) in My Oracle Support. For details, see "Validate ASR Systems in My Oracle Support" in the Oracle Auto Service Request Installation and Operations Guide.

You can configure Oracle ASR during initial deployment by choosing the Custom configuration option. You can also configure Oracle ASR after deployment (either Typical or Custom) using the `oakcli configure asr` command. The command prompts for input and, after you provide all of the required information, completes the Oracle ASR configuration.

An Oracle ASR configuration requires you to enter your My Oracle Support account user name and password. If a proxy server is required for Internet access to Oracle, then you must also provide the name of the proxy server. You can optionally configure Oracle ASR to use Simple Network Management Protocol (SNMP) Version 2 or SNMP Version 3.

To confirm that you have a working Oracle ASR configured, run the `oakcli test asr` command. Review your Oracle ASR configuration with the `oakcli show asr` command.

Index