Oracle Database Appliance Owner's Guide

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Oracle Database Appliance Owner's Guide

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Contents

Preface

This preface provides the following information:

Documentation and Feedback

Documentation	Link
All Oracle products	http://docs.oracle.com
Oracle Database Appliance	http://www.oracle.com/goto/oda/docs
Oracle Integrated Lights Out Manager (Oracle ILOM) 3.X	http://www.oracle.com/goto/ilom/docs

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Change History

The following lists the release history of this documentation set:

- May 2016. Initial publication.
- June 2016. Addition of Oracle Database Appliance X6-2 series.

1

Oracle Database Appliance Setup Tasks

This chapter describes the tasks you must complete when setting up Oracle Database Appliance.

Task Checklist

Step	Task	Refer to
1	Access the online product documentation for your release of Oracle Database Appliance.	http://www.oracle.com/goto/oda/docs
2	Review safety information before performing the installation.	*Oracle Database Appliance Series Safety and Compliance Guide*: Online at the product documentation site
		Important Safety Information for Oracle's Hardware Systems: Printed document included in the Accessory Kit
3	Review system features and components.	Chapter 2, "Overview of Oracle Database Appliance"
4	Complete the site preparation procedures.	Chapter 3, "Site Preparation"
5	Rackmount the system.	Chapter 4, "Installing the System Into a Rack"
6	Connect cables.	*Oracle Database Appliance Getting Started Guide*
7	Connect to Oracle Integrated Lights Out Manager (ILOM).	*Oracle Database Appliance Getting Started Guide*
8	Deploy Oracle Database Appliance software.	*Oracle Database Appliance Getting Started Guide*

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♦ ♦ ♦   **C H A P T E R   2**

2

Overview of Oracle Database Appliance

This chapter describes Oracle Database Appliance features. There are several versions of Oracle Database Appliance and this document covers all versions:

- Oracle Database Appliance X6-2S/X6-2M
- Oracle Database Appliance X5-2
- Oracle Database Appliance X4-2
- Oracle Database Appliance X3-2
- Oracle Database Appliance original version (also referred to as "version 1" or "V1")

For information about Oracle Database Appliance features:

Supported Components and Capabilities

The following sections describe the components and capabilities of the different versions of Oracle Database Appliance.

Oracle Database Appliance X6-2 Series Components and Capabilities

The following table lists supported components and capabilities for the Oracle Database Appliance X6-2 series systems.

Component	Oracle Database Appliance X6-2S	Oracle Database Appliance X6-2M
Server node	Single 1U server node.	Single 1U server node.
CPUs	One 10-core 2.2 GHz Intel Xeon E5-2630 V4 processor.	Two 10-core 2.2 GHz Intel Xeon E5-2630 V4 processors.
Memory	128 GB – four 32 GB low-voltage DDR4 RDIMM rated at 2400 MT/s (2133 MT/s actual maximum). **Note -** Optional memory expansion to 384 GB. See "Optional Component Installation" on page 46.	256 GB – eight 32 GB low-voltage DDR4 RDIMM rated at 2400 MT/s (2133 MT/s actual maximum). **Note -** Optional memory expansion to 768 GB. See "Optional Component Installation" on page 46.
Storage devices	The server includes: ■ Two 2.5-inch 480 GB SATA SSDs in slots HDD 0-1 ■ Two 2.5-inch 3.2 TB NVMe SSDs in slots NVMe 0-1 **Note -** Two optional NVMe SSDs can be added. See "Optional Component Installation" on page 46.	The server includes: ■ Two 2.5-inch 480 GB SATA SSDs in slots HDD 0-1 ■ Two 2.5-inch 3.2 TB NVMe SSDs in slots NVMe 0-1 **Note -** Two optional NVMe SSDs can be added. See "Optional Component Installation" on page 46.
USB 2.0 ports	Six total (two front, two rear and two internal) per server node.	Six total (two front, two rear and two internal) per server node.
PCI Express (PCIe) I/O slots	Three external and one internal low-profile PCIe Gen-3 slots. They contain: ■ PCIe slot 2: NVMe Switch PCIe Card ■ PCIe slot 3: Dual-port 10 GbE SFP+ PCIe 2.0 Low Profile Adapter ■ PCIe Slot 4: Dual-port Internal 12Gb/s SAS3 host bus adapter	Three external and one internal low-profile PCIe Gen-3 slots. They contain: ■ PCIe Slot 2: NVMe Switch PCIe Card ■ PCIe slot 3: Dual-port 10 GbE SFP+ PCIe 2.0 Low Profile Adapter ■ PCIe Slot 4: Dual-port Internal 12Gb/s SAS3 host bus adapter
SAS ports	Two internal SAS3 ports	Two internal SAS3 ports
Onboard Ethernet ports	Two functional 10 GbE network interface ports with RJ-45 connectors located on the back of the server. **Note -** Ethernet ports NET 2 and NET 3 are nonfunctional in single-processor systems.	Four 10 GbE network interface ports with RJ-45 connectors located on the back of the server.
Network management (NET MGT) port	One 10/100/1000Base-T network interface port with RJ-45 connector dedicated to the service processor (SP) on each server node rear panel.	One 10/100/1000Base-T network interface port with RJ-45 connector dedicated to the service processor (SP) on each server node rear panel.
Serial management (SER MGT) port	One RS-232 RJ-45 serial port on each server node rear panel.	One RS-232 RJ-45 serial port on each server node rear panel.
VGA port	One high-density HD-15 video port on each server node rear panel.	One high-density HD-15 video port on each server node rear panel.
Service Processor (SP)	Each server node has a service processor with the following features:	Each server node has a service processor with the following features:

Component	Oracle Database Appliance X6-2S	Oracle Database Appliance X6-2M
	■ Includes the Baseboard Management Controller (BMC), which supports the industry-standard Intelligent Platform Management Interface (IPMI) feature set. ■ Supports remote KVMS over IP. ■ Supports Ethernet access to SP through a dedicated 10/100/1000Base-T management port and optionally through one of the host GbE ports (sideband management).	■ Includes the Baseboard Management Controller (BMC), which supports the industry-standard Intelligent Platform Management Interface (IPMI) feature set. ■ Supports remote KVMS over IP. ■ Supports Ethernet access to SP through a dedicated 10/100/1000Base-T management port and optionally through one of the host GbE ports (sideband management).
Power supplies	Two hot-pluggable power supplies per server node and per storage shelf.	Two hot-pluggable power supplies per server node and per storage shelf.
Cooling fans	Four 40-mm, hot-pluggable fan modules per server node for chassis cooling. Each fan module contains two counter-rotating fan pairs (four rotors total). Each power supply has its own cooling fans.	Four 40-mm, hot-pluggable fan modules per server node for chassis cooling. Each fan module contains two counter-rotating fan pairs (four rotors total). Each power supply has its own cooling fans.
Operating system	Oracle Linux.	Oracle Linux.
Management software	Oracle Integrated Lights Out Manager (ILOM) 3.2.	Oracle Integrated Lights Out Manager (ILOM) 3.2.

Oracle Database Appliance Original Version and Models X3-2, X4-2 and X5-2 Components and Capabilities

The following table lists supported components and capabilities for the Oracle Database Appliance original version, Oracle Database Appliance X3-2, Oracle Database Appliance X4-2 and Oracle Database Appliance X5-2.

Component	Oracle Database Appliance (Original Version)	Oracle Database Appliance X3-2	Oracle Database Appliance X4-2	Oracle Database Appliance X5-2
Server node	Two server nodes per chassis. Each server node operates independently from the other server node. The lower server node is SN0; the upper server node is SN1.	Two server nodes per chassis. Each server node operates independently from the other server node. The lower server node is node 0 (SN0). The upper server node is node 1 (SN1).	Two server nodes per chassis. Each server node operates independently from the other server node. The lower server node is node 0 (SN0). The upper server node is node 1 (SN1).	Two server nodes per chassis. Each server node operates independently from the other server node. The lower server node is node 0 (SN0). The upper server node is node 1 (SN1).
CPUs	Two 6-core 3.06 GHz Intel Xeon X5675 processors per server node.	Two 8-core 2.9 GHz Intel Xeon E5-2690 processors per server node.	Two 12-core 2.7 GHz Intel Xeon E5-2697 v2 processors per server node.	Two 18-core 2.3 GHz Intel Xeon E5-2699 v3 processors per server node.
Memory	96 GB per server node. Six 8 GB low-voltage DDR3 RDIMM (single or dual rank) at 1333 MT/s per server node.	256 GB per server node. Sixteen 16 GB low-voltage DDR3 RDIMM at 1600 MT/s per server node.	256 GB per server node. Sixteen 16 GB low-voltage DDR3 RDIMM at 1600 MT/s per server node.	256 GB per server node. Eight 32 GB low-voltage DDR4 LRDIMM at 2133 MT/s per server node.

Component	Oracle Database Appliance (Original Version)	Oracle Database Appliance X3-2	Oracle Database Appliance X4-2	Oracle Database Appliance X5-2
	Note - Quad-rank DIMMs are not supported.			**Note -** Optional memory expansion to 512 GB or 768 GB. Both server nodes must have the same amount of memory. See "Optional Component Installation" on page 46.
Storage devices	Each server node includes: ■ Twenty 3.5-inch SAS 600-GB HDDs in slots 0-19 ■ Four 3.5-inch SAS 73-GB SSDs in slots 20-23 ■ Two rear accessed, 2.5 inch SATA 500-GB HDDs reserved for operating system storage and system booting ■ One internal 4 GB USB thumb drive	Each server node includes: ■ Two 2.5 inch 600 GB SAS2 HDDs reserved for operating system storage and system booting The storage shelf and the optional storage expansion shelf each include: ■ Twenty 2.5 inch 900 GB SAS2 HDDs in slots 0-19 ■ Four 2.5 inch 200 GB SAS SSDs in slots 20-23	Each server node includes: ■ Two 2.5 inch 600 GB SAS2 HDDs reserved for operating system storage and system booting ■ One internal 4 or 8 GB USB thumb drive (reserved for future use) The storage shelf and the optional storage expansion shelf each include: ■ Twenty 2.5-inch 900 GB SAS2 HDDs in slots 0-19 ■ Four 2.5 inch 200 GB SAS SSDs in slots 20-23	Each server node includes: ■ Two 2.5 inch 600 GB SAS2 HDDs reserved for operating system storage and system booting ■ One internal 8 GB USB thumb drive (reserved for future use) The storage shelf and the optional storage expansion shelf each include: ■ Sixteen 3.5 inch 4 TB or 8 TB SAS2 HDDs in slots 0-15 ■ Four 2.5 inch 400 GB medium endurance SAS SSDs in slots 16-19 ■ Four 2.5 inch 200 GB high endurance SAS SSDs in slots 20-23
USB 2.0 ports	Two rear and one internal for each server node.	Six total (two front, two rear and two internal) per server node.	Six total (two front, two rear and two internal) per server node.	Six total (two front, two rear and two internal) per server node.
PCI Express (PCIe) I/O slots	Three external low-profile PCIe Gen-2 slots (x8) for each server node: ■ PCIe slot 0: Dual-port 10 GbE SFP+ PCIe 2.0 Low Profile Adapter ■ PCIe slot 1: Quad-port 1 GbE (Gigabit Ethernet) Network Adapter with RJ-45 connectors ■ PCIe slot 2: Dual-port External 6Gb/s SAS2 host bus adapter One internal low-profile PCIe Gen-2 slot (x8) with a Dual-port Internal 6Gb/s SAS2 host bus adapter	Three external and one internal low-profile PCIe Gen-3 slots for each server node. They contain: ■ PCIe Slot 1: Dual-port 10 GbE Network Adapter with RJ-45 connectors ■ PCIe Slot 2: Dual-port External 6Gb/s SAS2 host bus adapter ■ PCIe Slot 3: Dual-port External 6Gb/s SAS2 host bus adapter ■ PCIe Slot 4: Dual-port Internal 6Gb/s SAS2 host bus adapter	Three external and one internal low-profile PCIe Gen-3 slots for each server node. They contain: ■ PCIe Slot 1: Dual-port 10 GbE SFP+ PCIe 2.0 Low Profile Adapter ■ PCIe Slot 2: Dual-port External 6Gb/s SAS2 host bus adapter ■ PCIe Slot 3: Dual-port External 6Gb/s SAS2 host bus adapter ■ PCIe Slot 4: Dual-port Internal 6Gb/s SAS2 host bus adapter	Three external and one internal low-profile PCIe Gen-3 slots for each server node. They contain: ■ PCIe Slot 1: Dual Port QDR InfiniBand M3 PCIe 3.0 Low Profile Adapter ■ PCIe Slot 2: Dual-port External 12Gb/s SAS3 host bus adapter ■ PCIe Slot 3: Dual-port External 12Gb/s SAS3 host bus adapter ■ PCIe Slot 4: Dual-port Internal 12Gb/s SAS3 host bus adapter

Component	Oracle Database Appliance (Original Version)	Oracle Database Appliance X3-2	Oracle Database Appliance X4-2	Oracle Database Appliance X5-2
Cluster device	One integrated cluster device with node-to-node connections is provided on each server node. Each integrated cluster device provides two internal 1 GbE network interface ports and two internal dual-port UART ports.	One integrated cluster device with node-to-node interconnection is provided on each server node through two 10 GbE network interface ports with RJ-45 connections.	One integrated cluster device with node-to-node interconnection is provided on each server node through two 10 GbE network interface ports with dual-rate SFP+ connections. Alternately, you have the option of creating the node-to-node interconnection using two of each server node's four 10 GbE network interface ports with RJ-45 connections. Refer to the *Oracle Database Appliance Getting Started Guide* for more information.	One integrated cluster device with node-to-node interconnection is provided on each server node through two InfiniBand ports with QSFP+ connections. Alternately, you have the option of creating the node-to-node interconnection using two of each server node's four 10 GbE network interface ports with RJ-45 connections. Refer to the *Oracle Database Appliance Getting Started Guide* for more information.
SAS ports	N/A	Two internal SAS2 and four external SAS2 ports on each server node. Six SAS2 ports on the storage shelf. Six SAS2 ports on the storage expansion shelf.	Two internal SAS2 and four external SAS2 ports on each server node. Six SAS2 ports on the storage shelf. Six SAS2 ports on the storage expansion shelf.	Two internal SAS3 and four external SAS3 ports on each server node. Six SAS2 ports on the storage shelf. Six SAS2 ports on the storage expansion shelf.
Onboard Ethernet ports	Two 1 GbE network interface ports with RJ-45 connectors located on the rear panel of each server node.	Four 10 GbE network interface ports with RJ-45 connectors located on the back of each server node.	Four 10 GbE network interface ports with RJ-45 connectors located on the back of each server node.	Four 10 GbE network interface ports with RJ-45 connectors located on the back of each server node. **Note -** Optionally, you can purchase the Sun Dual 10GbE SFP+ PCIe 2.0 Low Profile Adapter as a replacement for the standard InfiniBand adapter if an Ethernet fiber connection to the data center or public network is required. See "Optional Component Installation" on page 46.
Network management (NET MGT) port	One 10/100Base-T network interface port with RJ-45 connector dedicated to the service processor (SP) on each server node rear panel.	One 10/100Base-T network interface port with RJ-45 connector dedicated to the service processor (SP) on each server node rear panel.	One 10/100Base-T network interface port with RJ-45 connector dedicated to the service processor (SP) on each server node rear panel.	One 10/100/1000Base-T network interface port with RJ-45 connector dedicated to the service processor (SP) on each server node rear panel.
Serial management (SER MGT) port	One RS-232 RJ-45 serial port on each server node rear panel.	One RS-232 RJ-45 serial port on each server node rear panel.	One RS-232 RJ-45 serial port on each server node rear panel.	One RS-232 RJ-45 serial port on each server node rear panel.

Component	Oracle Database Appliance (Original Version)	Oracle Database Appliance X3-2	Oracle Database Appliance X4-2	Oracle Database Appliance X5-2
VGA port	One high-density HD-15 video port on each server node rear panel.	One high-density HD-15 video port on each server node rear panel.	One high-density HD-15 video port on each server node rear panel.	One high-density HD-15 video port on each server node rear panel.
Service Processor (SP)	Each server node has a service processor with the following features: ■ Includes the Baseboard Management Controller (BMC), which supports the industry-standard Intelligent Platform Management Interface (IPMI) feature set. ■ Supports remote KVMS over IP. ■ Supports Ethernet access to SP through a dedicated 10/100Base-T management port and optionally through one of the host GbE ports (sideband management)	Each server node has a service processor with the following features: ■ Includes the Baseboard Management Controller (BMC), which supports the industry-standard Intelligent Platform Management Interface (IPMI) feature set. ■ Supports remote KVMS over IP. ■ Supports Ethernet access to SP through a dedicated 10/100Base-T management port and optionally through one of the host GbE ports (sideband management).	Each server node has a service processor with the following features: ■ Includes the Baseboard Management Controller (BMC), which supports the industry-standard Intelligent Platform Management Interface (IPMI) feature set. ■ Supports remote KVMS over IP. ■ Supports Ethernet access to SP through a dedicated 10/100Base-T management port and optionally through one of the host GbE ports (sideband management).	Each server node has a service processor with the following features: ■ Includes the Baseboard Management Controller (BMC), which supports the industry-standard Intelligent Platform Management Interface (IPMI) feature set. ■ Supports remote KVMS over IP. ■ Supports Ethernet access to SP through a dedicated 10/100/1000Base-T management port and optionally through one of the host GbE ports (sideband management).
Power supplies	Two hot-pluggable power supplies per chassis.	Two hot-pluggable power supplies per server node and per storage shelf.	Two hot-pluggable power supplies per server node and per storage shelf.	Two hot-pluggable power supplies per server node and per storage shelf.
Cooling fans	Two redundant hot-pluggable fan modules per server node.	Four 40-mm, hot-pluggable fan modules per server node for chassis cooling. Each fan module contains two counter-rotating fan pairs (four rotors total).	Four 40-mm, hot-pluggable fan modules per server node for chassis cooling. Each fan module contains two counter-rotating fan pairs (four rotors total).	Four 40-mm, hot-pluggable fan modules per server node for chassis cooling. Each fan module contains two counter-rotating fan pairs (four rotors total).
		Each power supply (server node and storage shelf) has its own cooling fans.	Each power supply (server node and storage shelf) has its own cooling fans.	Each power supply (server node and storage shelf) has its own cooling fans.
Operating system	Oracle Linux.	Oracle Linux.	Oracle Linux.	Oracle Linux.
Management software	Oracle Integrated Lights Out Manager (ILOM) 3.0.	Oracle Integrated Lights Out Manager (ILOM) 3.1.	Oracle Integrated Lights Out Manager (ILOM) 3.1.	Oracle Integrated Lights Out Manager (ILOM) 3.2.

Oracle Database Appliance X6-2S/X6-2M Front and Back Panels

This section describes Oracle Database Appliance X6-2S/X6-2M front and back panels. If you have Oracle Database Appliance X5-2, see . If you have Oracle Database Appliance X3-2 or Oracle

Database Appliance X4-2, see "Oracle Database Appliance X3-2/X4-2 Front and Back Panels" on page 26. If you have Oracle Database Appliance (original version), see "Oracle Database Appliance (Original Version) Front and Back Panels" on page 33.

■ "Oracle Database Appliance X6-2S/X6-2M Front Panel" on page 17
■ "Oracle Database Appliance X6-2S/X6-2M Back Panel" on page 18

Oracle Database Appliance X6-2S/X6-2M Front Panel

Oracle Database Appliance X6-2S/X6-2M are single node servers. The Oracle Database Appliance X6-2S and Oracle Database Appliance X6-2M each occupy 1RU.

The following figure shows the components on the front panel of an **Oracle Database Appliance X6-2S/X6-2M**.

Callout	Description	Callout	Description
1	Product Serial Number (PSN) label and Radio Frequency Identification (RFID) tag	8	Fan Fault LED: amber
2	Locate LED/button: white	9	Power Supply (PS) Fault LED: amber
3	USB 2.0 connectors (2)	10	System Over Temperature Warning LED: amber
4	SP OK LED: green	11 - 12	HDD 0 - HDD 1
5	Service Required LED: amber	13 - 16	NVMe 0, NVMe 1, NVMe 2 (or HDD filler), NVMe 3 (or HDD filler)
6	Power/OK LED: green	17 - 18	HDD filler
7	Power button	19	DVD filler

> **Note -** When contacting Oracle Support Services, use the Top Level Identifier (TLI) instead of the serial number. You can find the TLI by looking at the top of either server node or on the top of the storage shelf. For details, see "Technical Support" on page 40.

Oracle Database Appliance X6-2S/X6-2M Back Panel

This section describes the back panel features for Oracle Database Appliance X6-2S/X6-2M.

The following figure shows the components on the **Oracle Database Appliance X6-2S/X6-2M back panel**.

Callout	Description	Callout	Description
1	Power Supply (PS) 0 with fan module	9	NET MGT port. Service processor 10/100/1000Base-T network interface port with RJ-45 connector used to connect to Oracle Integrated Lights Out Manager (ILOM) **Caution -** The management ports are intended for use by service engineers only.
2	Power Supply (PS) 0 status indicators: Service Required LED: amber, AC OK LED: green	10	SER MGT port. Service processor RJ-45 serial port used to connect to Oracle ILOM **Caution -** The management ports are intended for use by service engineers only.
3	Power Supply (PS) 1 with fan module	11	10 GbE network interface port with RJ-45 connector **Note -** Ethernet ports NET 2 and NET 3 are nonfunctional in Oracle Database Appliance X6-2S.
4	Power Supply (PS) 1 status indicators: Service Required LED: amber, AC OK LED: green	12	10 GbE network interface port with RJ-45 connector

Callout	Description	Callout	Description
			Note - Ethernet ports NET 2 and NET 3 are nonfunctional in Oracle Database Appliance X6-2S.
5	System status indicators: Locate LED: white, Service Required LED: amber, Power/OK LED: green	13	10 GbE network interface port with RJ-45 connector
6	PCIe card slot 1: empty	14	10 GbE network interface port with RJ-45 connector
7	PCIe card slot 2: NVMe Switch PCIe Card	15	USB 2.0 connectors (2)
8	PCIe card slot 3. Dual-port 10 GbE SFP+ PCIe 2.0 Low Profile Adapter	16	DB-15 video connector
	PCIe card slot 4 (internal). Dual-port Internal 12Gb/s SAS3 host bus adapter		

Oracle Database Appliance X5-2 Front and Back Panels

This section describes Oracle Database Appliance X5-2 front and back panels. If you have Oracle Database Appliance X6-2S/X6-2M, see "Oracle Database Appliance X6-2S/X6-2M Front and Back Panels" on page 16. If you have Oracle Database Appliance X3-2 or Oracle Database Appliance X4-2, see "Oracle Database Appliance X3-2/X4-2 Front and Back Panels" on page 26. If you have Oracle Database Appliance (original version), see "Oracle Database Appliance (Original Version) Front and Back Panels" on page 33.

- "Oracle Database Appliance X5-2 Front Panel" on page 19
- "Oracle Database Appliance X5-2 Back Panel" on page 22

Oracle Database Appliance X5-2 Front Panel

Oracle Database Appliance X5-2 includes two server nodes (two Oracle Server X5-2's) and an Oracle DE2-24C storage shelf. The entire unit occupies 6RU. The optional storage expansion shelf requires an additional 4RU, increasing the total to 10RU.

The following figure shows the front of Oracle Database Appliance X5-2 with an optional storage expansion shelf.
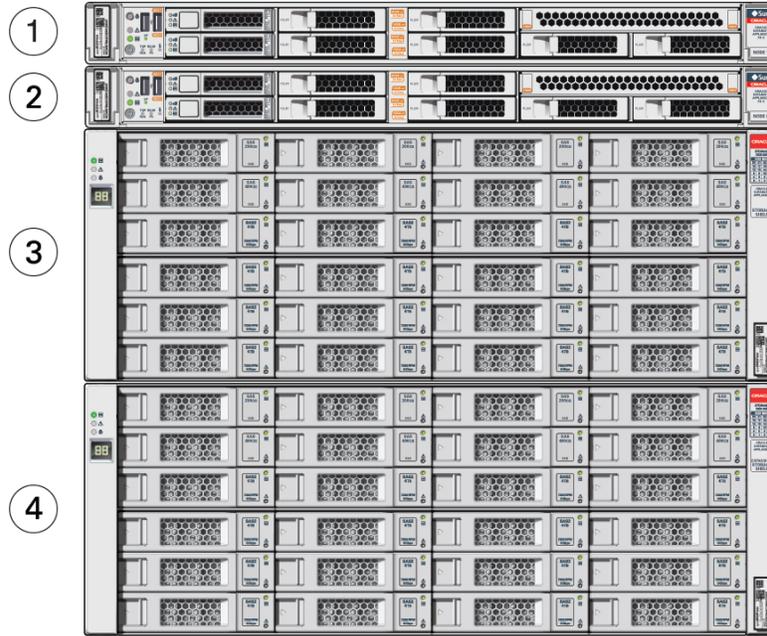
Callout	Description
1	Server node 1
2	Server node 0
3	Storage shelf (DE2-24C)
4	Optional storage expansion shelf (DE2-24C)

Server Node Front Panel Features

The following figure shows the components on the front panel of an Oracle Database Appliance X5-2 **server node**.

Callout	Description	Callout	Description
1	Product Serial Number (PSN) label and Radio Frequency Identification (RFID) tag	8	Fan Fault LED: amber
2	Locate LED/button: white	9	Power Supply (PS) Fault LED: amber
3	USB 2.0 connectors (2)	10	System Over Temperature Warning LED: amber
4	SP OK LED: green	11	HDD 0
5	Service Required LED: amber	12	HDD 1
6	Power/OK LED: green	13 - 18	HDD filler
7	Power button	19	DVD filler

Note - When contacting Oracle Support Services, use the Top Level Identifier (TLI) instead of the serial number. You can find the TLI by looking at the top of either server node or on the top of the storage shelf. For details, see "Technical Support" on page 40.

Storage Shelf Front Panel Features

The following figure shows the Oracle Database Appliance X5-2 **storage shelf** front panel features.
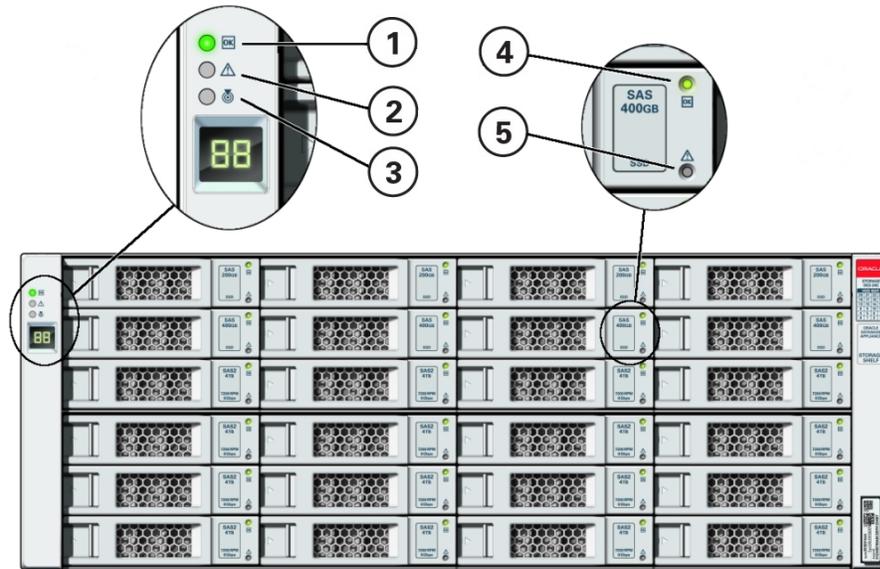
Callout	Description
1	Storage shelf OK/power indicator
2	Storage shelf fault indicator
3	Storage shelf Locate indicator
4	Drive power/activity indicator
5	Drive fault indicator

Oracle Database Appliance X5-2 Back Panel

This section describes the back panel features for Oracle Database Appliance X5-2. The following figure shows the Oracle Database Appliance X5-2.
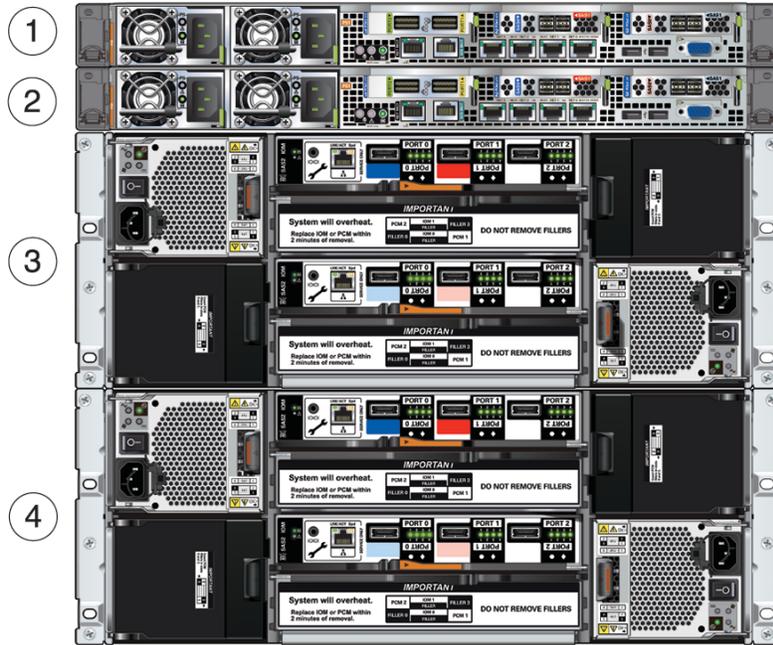
Callout	Description
1	Server node 1
2	Server node 0
3	Storage shelf (DE2-24C)
4	Optional storage expansion shelf (DE2-24C)

Server Node Back Panel Features

The following figure shows the components on the Oracle Database Appliance X5-2 **server node** back panel.

Callout	Description	Callout	Description
1	Power Supply (PS) 0 with fan module	9	NET MGT port. Service processor 10/100/1000Base-T network interface port with RJ-45 connector used to connect to Oracle Integrated Lights Out Manager (ILOM) **Caution -** The management ports are intended for use by service engineers only.
2	Power Supply (PS) 0 status indicators: Service Required LED: amber, AC OK LED: green	10	SER MGT port. Service processor RJ-45 serial port used to connect to Oracle ILOM **Caution -** The management ports are intended for use by service engineers only.
3	Power Supply (PS) 1 with fan module	11	10 GbE network interface port with RJ-45 connector
4	Power Supply (PS) 1 status indicators: Service Required LED: amber, AC OK LED: green	12	10 GbE network interface port with RJ-45 connector
5	System status indicators: Locate LED: white, Service Required LED: amber, Power/OK LED: green	13	10 GbE network interface port with RJ-45 connector
6	PCIe card slot 1. Provides two InfiniBand network interface ports with QSFP+ connections for a private cluster interconnect between server nodes. Alternately, you have the option of creating the node-to-node interconnection using two of each server node's four 10 GbE network interface ports with RJ-45 connections. Refer to the *Oracle Database Appliance Getting Started Guide* for more information.	14	10 GbE network interface port with RJ-45 connector
7	PCIe card slot 2. Provides two SAS3 connectors used to connect the servers to the storage shelf and the storage expansion shelf.	15	USB 2.0 connectors (2)
8	PCIe card slot 3. Provides two SAS3 connectors used to connect the servers to the storage shelf and the storage expansion shelf.	16	DB-15 video connector

Storage Shelf Back Panel Features

The following figure shows the Oracle Database Appliance X5-2 **storage shelf** back panel features.

⚠️ **Caution -** The network ports on the storage shelf are intended for use by service engineers only.

Callout	Description
1	AC power fail indicator
2	Power supply status indicator
3	Fan fail indicator
4	DC power fail indicator

Callout	Description
5	Service ports (reserved for Oracle Service only)
6	SAS I/O module 1
7	Power Supply with Fan Module 2
8	SAS I/O module 0
	Power Supply with Fan Module 1
9	Power Supply with Fan Module 1

Oracle Database Appliance X3-2/X4-2 Front and Back Panels

This section describes Oracle Database Appliance X3-2/X4-2 front and back panels. If you have Oracle Database Appliance X6-2S/X6-2M, see "Oracle Database Appliance X6-2S/X6-2M Front and Back Panels" on page 16. If you have Oracle Database Appliance X5-2, see "Oracle Database Appliance X5-2 Front and Back Panels" on page 19. If you have Oracle Database Appliance (original version), see "Oracle Database Appliance (Original Version) Front and Back Panels" on page 33.

Oracle Database Appliance X3-2/X4-2 Front Panel

Oracle Database Appliance X3-2/X4-2 includes two server nodes (either two Sun Server X3-2's, or two Sun Server X4-2's) and an Oracle DE2-24P storage shelf. The entire unit occupies 4RU. The optional DE2-24P storage expansion shelf requires an additional 2RU, increasing the total to 6RU.

The following figure shows the front of Oracle Database Appliance X3-2 with an optional storage expansion shelf. Except for product labeling, Oracle Database Appliance X4-2 is identical in appearance.
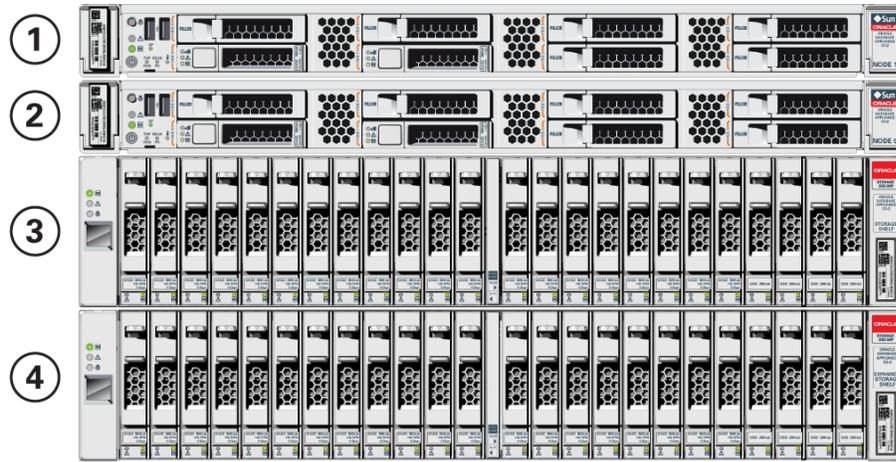
Callout	Description
1	Server node 1
2	Server node 0
3	Storage shelf (DE2-24P)
4	Optional storage expansion shelf (DE2-24P)

Server Node Front Panel Features

The following figure shows the components on the front panel of an Oracle Database Appliance X3-2/X4-2 **server node**.
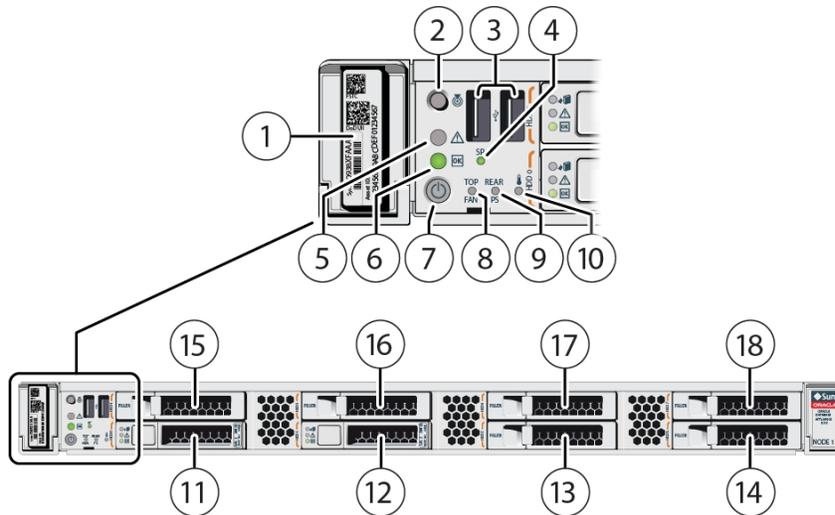
Callout	Description	Callout	Description
1	Product Serial Number (PSN) label and Radio Frequency Identification (RFID) tag	10	System Over Temperature Warning LED: amber
2	Locate LED/button: white	11	HDD 0
3	USB 2.0 connectors (2)	12	HDD 1
4	SP OK LED: green	13	HDD filler
5	Service Required LED: amber	14	HDD filler
6	Power/OK LED: green	15	HDD filler
7	Power button	16	HDD filler
8	Fan Fault LED: amber	17	HDD filler
9	Power Supply (PS) Fault LED: amber	18	HDD filler

Note - When contacting Oracle Support Services, use the Top Level Identifier (TLI) instead of the serial number. You can find the TLI by looking at the top of either server node or on the top of the storage shelf. For details, see .

Storage Shelf Front Panel Features

The following figure shows the Oracle Database Appliance X3-2/X4-2 **storage shelf** front panel features.

Callout	Description
1	Storage shelf OK/power indicator
2	Storage shelf fault indicator
3	Storage shelf Locate indicator
4	Drive fault indicator
5	Drive power/activity indicator

Oracle Database Appliance X3-2/X4-2 Back Panel

This section describes the back panel features for Oracle Database Appliance X3-2/X4-2. The following figure shows the Oracle Database Appliance X4-2. The Oracle Database Appliance X3-2 and Oracle Database Appliance X4-2 are identical except for the network card in PCIe slot 1 (see "Server Node Back Panel Features" on page 30).

Callout	Description
1	Server node 1
2	Server node 0
3	Storage shelf (DE2-24P)
4	Optional storage expansion shelf (DE2-24P)

Server Node Back Panel Features

The following figure shows the components on the **server node** back panel.

Callout	Description	Callout	Description
1	Power Supply (PS) 0 with fan module	9	NET MGT port. Service processor 10/100BASE-T network interface port with RJ-45 connector used to connect to Oracle Integrated Lights Out Manager (ILOM) **Caution -** The management ports are intended for use by service engineers only.
2	Power Supply (PS) 0 status indicators: Service Required LED: amber, AC OK LED: green	10	SER MGT port. Service processor RJ-45 serial port used to connect to Oracle ILOM **Caution -** The management ports are intended for use by service engineers only.
3	Power Supply (PS) 1 with fan module	11	10 GbE network interface port with RJ-45 connector
4	Power Supply (PS) 1 status indicators: Service Required LED: amber, AC OK LED: green	12	10 GbE network interface port with RJ-45 connector
5	System status indicators: Locate LED: white, Service Required LED: amber, Power/OK LED: green	13	10 GbE network interface port with RJ-45 connector
6	**Oracle Database Appliance X4-2:** PCIe card slot 1. Provides two 10 GbE dual-rate SFP+ ports for a private cluster interconnect between server nodes. Alternately, you have the option of creating the node-to-node interconnection using two of each server node's four 10 GbE network interface ports with RJ-45 connections. Refer to the *Oracle Database Appliance Getting Started Guide* for more information. **Oracle Database Appliance X3-2:** PCIe card slot 1. Provides two 10 GbE network interface ports with RJ-45 connectors for a	14	10 GbE network interface port with RJ-45 connector

Callout	Description	Callout	Description
	private cluster interconnect between server nodes.		
7	PCIe card slot 2. Provides two SAS2 connectors used to connect the servers to the storage shelf and the storage expansion shelf.	15	USB 2.0 connectors (2)
8	PCIe card slot 3. Provides two SAS2 connectors used to connect the servers to the storage shelf and the storage expansion shelf.	16	DB-15 video connector

Storage Shelf Back Panel Features

The following figure shows the Oracle Database Appliance X3-2/X4-2 **storage shelf** back panel features.

⚠️ **Caution -** The network ports on the storage shelf are intended for use by service engineers only.

Callout	Description
1	AC power fail indicator
2	Power supply status indicator

Callout	Description
3	Fan fail indicator
4	DC power fail indicator
5	Power Supply with Fan Module 0
6	Service ports (reserved for Oracle Service only)
7	SAS I/O module 1
8	SAS I/O module 0
9	Power Supply with Fan Module 1

Oracle Database Appliance (Original Version) Front and Back Panels

This section describes Oracle Database Appliance (original version) front and back panels. If you have Oracle Database Appliance X6-2S/X6-2M, see "Oracle Database Appliance X6-2S/X6-2M Front and Back Panels" on page 16. If you have Oracle Database Appliance X5-2, see "Oracle Database Appliance X5-2 Front and Back Panels" on page 19. If you have Oracle Database Appliance X3-2 or Oracle Database Appliance X4-2, see "Oracle Database Appliance X3-2/X4-2 Front and Back Panels" on page 26.

- "Oracle Database Appliance (Original Version) Front Panel" on page 33
- "Oracle Database Appliance (Original Version) Back Panel" on page 35

Oracle Database Appliance (Original Version) Front Panel

Oracle Database Appliance (original version) includes two server nodes, SN0 and SN1. SN0 is on the bottom and SN1 is on the top. Server nodes are also called system controllers.

The following figure shows Oracle Database Appliance front panel and describes its components.
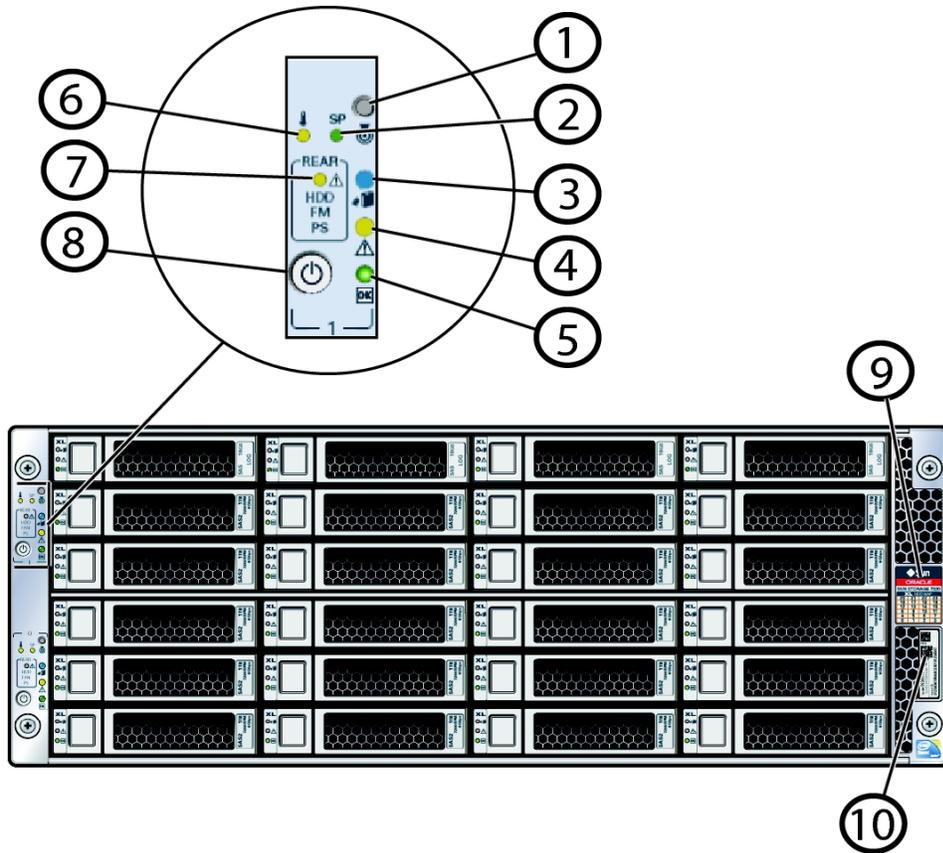
Note - The system has **two** each of items 1 through 8; one for each server node. It has only **one** RFID, product serial number tag, and, drive map.

Callout	Description
1	Locate button/LED (white)
2	SP (service processor) OK LED (green = OK, amber = fault)
3	Server Node Ready to Remove LED (blue)
4	Service Required LED (amber)
5	Power/OK LED (green)
6	System Over Temperature LED (amber)
7	Rear HDD (hard disk drive)/PS (power supply)/Fan Fault LED (amber)
8	Power button (recessed)
9	Drive map
10	RFID (radio frequency identification) and product serial number tag

Oracle Database Appliance (Original Version) Back Panel

The following figure shows Oracle Database Appliance (original version) back panel and identifies the components on SN0. The components on SN1 are identical.

Callout	Description	Callout	Description
1	Power Supply Unit (PSU)	8	Fans
2	Locate button/LED (white)	9	SER MGT port. Service processor RJ-45 serial port used to connect to Oracle ILOM **Caution -** The management ports are intended for use by service engineers only.
3	Host nonmaskable interrupt (NMI) and SP reset recessed switches	10	Dual onboard 1 GbE network interface ports with RJ-45 connectors
4	Status LEDs: ■ Server Node Ready to Remove LED (blue) ■ Service required LED (amber) ■ Power/OK LED (green)	11	USB ports
5	External MiniSAS ports (2 per server node) – Reserved. Do not use or connect cables to these ports	12	NET MGT port. Service processor 10/100BASE-T network interface port with RJ-45 connector used to connect to Oracle Integrated Lights Out Manager (ILOM) **Caution -** The management ports are intended for use by service engineers only.
6	PCI Express (PCIe) slot 0 – Dual 10 GbE network interface ports	13	Video connector to console
7	PCIe slot 1 – Quad 1 GbE network interface ports with RJ-45 connectors	14	Rear hard disk drives (RHDDs) (2 per server node) **Note -** The RHDDs are behind hinged access panels.

Oracle Database Appliance Specifications

This section describes the physical, electrical and Environmental specifications for the various versions of Oracle Database Appliance.

Physical Specifications

This section describes the physical specifications for the various versions of Oracle Database Appliance.

Physical Specifications for Oracle Database Appliance X6-2 Series

Item	Oracle Database Appliance X6-2S	Oracle Database Appliance X6-2M
Height	42.6 mm (1.7 in.)	42.6 mm (1.7 in.)
Width	436.5 mm (17.2 in.)	436.5 mm (17.2 in.)
Depth	737.0 mm (29.0 in.)	737.0 cm (29.0 in.)
Weight	16.1 kg (35.4 lbs)	16.1 kg (35.4 lbs)

Physical Specifications for Oracle Database Appliance Original Version and Models X3-2, X4-2 and X5-2

Item	Oracle Database Appliance (Original Version)	Oracle Database Appliance X3-2/X4-2	Oracle Database Appliance X5-2
Height	175.1 mm (6.9 in)	42.6 mm (1.7 in) per server node	42.6 mm (1.7 in) per server node
		87.9 mm (3.5 in) per storage shelf	175 mm (6.9 in) per storage shelf
Width	437 mm (17.2 in) (without mounting ears)	Server node: 436.5 mm (17.2 in)	Server node: 436.5 mm (17.2 in)
	482.6 mm (19 in) (with mounting ears)	Storage shelf: 483 mm (19 in)	Storage shelf: 483 mm (19 in)
Depth	762 mm (30 in)	Server node: 737 mm (29 in)	Server node: 737 mm (29 in)
	782 mm (30.8 in) (including fan module handles and latches)	Storage shelf: 630 mm (24.8 in)	Storage shelf: 630 mm (24.8 in)
Weight	72.6 kg (160 lbs)	16.3 kg (36 lbs) per server node	16.3 kg (36 lbs) per server node
		24 kg (52.9 lbs) per storage shelf	37.2 kg (82 lbs) per storage shelf

Electrical Specifications

This section describes the electrical specifications for the various versions of Oracle Database Appliance.

Electrical Specifications for Oracle Database Appliance X6-2 Series

Item	Oracle Database Appliance X6-2S	Oracle Database Appliance X6-2M
Server node power supply output rated maximum	600W at 100-127 VAC 600W at 200-240 VAC	600W at 100-127 VAC 600W at 200-240 VAC
Server node AC power	7.2A at 100-127 VAC 3.4A at 200-240 VAC	7.2A at 100-127 VAC 3.4A at 200-240 VAC
Power usage	For more information on power consumption, see Oracle Server X6-2 Power Calculator.	For more information on power consumption, see Oracle Server X6-2 Power Calculator.

Electrical Specifications for Oracle Database Appliance Original Version and Models X3-2, X4-2 and X5-2

Item	Oracle Database Appliance (Original Version)	Oracle Database Appliance X3-2/X4-2	Oracle Database Appliance X5-2
Server node power supply output rated maximum	1270W at 100-120 VAC 1370W at 200-240 VAC	600W at 100-127 VAC 600W at 200-240 VAC	600W at 100-127 VAC 600W at 200-240 VAC
Server node AC power	12A at 110-127 VAC 7A at 200-240 VAC 13A at 100 VAC (Japan only)	7.2A at 100-127 VAC 3.4A at 200-240 VAC	7.2A at 100-127 VAC 3.4A at 200-240 VAC
Storage shelf power supply output rated maximum	Not supported	580W at 100-127 VAC 580W at 200-240 VAC	580W at 100-127 VAC 580W at 200-240 VAC
Storage shelf AC Power	Not supported	8A at 100-127 VAC 3A at 220-240 VAC	8A at 100-127 VAC 3A at 220-240 VAC
Power usage	Not available	Not available	Server node ■ Maximum: 727W ■ Typical: 508W Storage shelf ■ Maximum: 699W ■ Typical: 469W

Environmental Specifications

This section describes the environmental specifications for a single, non-racked Oracle Database Appliance.

Environmental Specifications for Oracle Database Appliance X6-2 Series

Item	Oracle Database Appliance X6-2S	Oracle Database Appliance X6-2M
Operating temperature	5° C to 35° C (41° F to 95° F).	5° C to 35° C (41° F to 95° F)
Nonoperating temperature	-40° C to 70° C (-40° F to 158° F).	-40° C to 70° C (-40° F to 158° F)
Operating humidity	10% to 90% relative humidity, noncondensing	10% to 90% relative humidity, noncondensing
Nonoperating humidity	Up to 93% relative humidity, noncondensing.	Up to 93% relative humidity, non-condensing
Operating altitude	Up to 3,000 m* (9,840 ft); maximum ambient temperature is derated by 1° C per 300 m above 900 m * Except in China markets where regulations might limit installations to a maximum altitude of 2,000 m (6560 ft).	Up to 3,000 m* (9,840 ft); maximum ambient temperature is derated by 1° C per 300 m above 900 m * Except in China where regulations might limit installations to a maximum altitude of 2,000 m (6560 ft).
Nonoperating altitude	Up to 12,000 m (39,370 ft)	Up to 12,000 m (39,370 ft)
Cooling	■ At maximum usage: 2482 BTU/h ■ At typical usage: 1734 BTU/h	■ At maximum usage: 2482 BTU/h ■ At typical usage: 1734 BTU/h
Acoustic noise	7.0 Bels A-weighted operating, 7.0 Bels A-weighted idling	7.0 Bels A-weighted operating, 7.0 Bels A-weighted idling

Environmental Specifications for Oracle Database Appliance Original Version and Models X3-2, X4-2 and X5-2

Item	Oracle Database Appliance (Original Version)	Oracle Database Appliance X3-2/X4-2	Oracle Database Appliance X5-2
Operating temperature	5° C to 35° C (41° F to 95° F).	5° C to 35° C (41° F to 95° F)	5° C to 35° C (41° F to 95° F)
Nonoperating temperature	-40° C to 70° C (-40° F to 158° F).	-40° C to 70° C (-40° F to 158° F)	-40° C to 70° C (-40° F to 158° F)
Operating humidity	10% to 90% relative humidity, noncondensing	10% to 90% relative humidity, noncondensing	10% to 90% relative humidity, noncondensing

Item	Oracle Database Appliance (Original Version)	Oracle Database Appliance X3-2/X4-2	Oracle Database Appliance X5-2
Nonoperating humidity	Up to 93% relative humidity, noncondensing.	Up to 93% relative humidity, non-condensing	Up to 93% relative humidity, non-condensing
Operating altitude	Up to 3000 m* (9,840 ft). Maximum ambient temperature is derated by 1 ^{o}C per 300 m (984 ft) above 900 m (2,953 ft)	Up to 3,048 m* (10,000 ft); maximum ambient temperature is derated by 1° C per 300 m above 900 m	Up to 3,048 m* (10,000 ft); maximum ambient temperature is derated by 1° C per 300 m above 900 m
	* Except in China markets where regulations might limit installations to a maximum altitude of 2,000 m (6562 ft).	* Except in China where regulations might limit installations to a maximum altitude of 2,000 m (6562 ft).	* Except in China where regulations might limit installations to a maximum altitude of 2,000 m (6562 ft).
Nonoperating altitude	Up to 12,000 m (39,370 ft)	Up to 12,000 m (39,370 ft)	Up to 12,000 m (39,370 ft)
Cooling	Not available	Not available	Server node ■ At maximum usage: 2482 BTU/h ■ At typical usage: 1734 BTU/h Storage shelf ■ At maximum usage: 2385 BTU/h ■ At typical usage: 1600 BTU/h
Acoustic noise	7.8 B operating, 7.1 B idling (LwAd: 1 B=10 dB)	7.9 B operating, 5.58 B idling (LwAd: 1 B=10 dB)	7.0 Bels A-weighted operating, 7.0 Bels A-weighted idling

Technical Support

For technical support, go to:

https://support.oracle.com

When requesting technical support for Oracle Database Appliance, report the following to Oracle Support Services:

Oracle Database Appliance (Original Version) and Models X6-2S/X6-2M	Oracle Database Appliance X3-2/X4-2/X5-2
■ For the Oracle Database Appliance (original version), report the serial number located on the front panel of the system or on the Customer Information Sheet that is shipped with the system.	For Oracle Database Appliance X3-2, Oracle Database Appliance X4-2, Oracle Database Appliance X5-2, report the Top Level Identifier (TLI). To see the TLI, look on the Customer Information Sheet or look at the top of a server node or storage shelf on the left-hand side towards the front. The TLI part number and TLI serial number are the same for all factory-bundled components of an appliance. For example:

Oracle Database Appliance (Original Version) and Models X6-2S/X6-2M	Oracle Database Appliance X3-2/X4-2/X5-2
■ For the Oracle Database Appliance X6-2S/X6-2M, report the Top Level Identifier (TLI) and serial number located on the top of the server or on the Customer Information Sheet that is shipped with the system. If the appliance is in a rack where you cannot see the TLI, slide the server partway out on its rails, just far enough to see the TLI. See the *Oracle Database Appliance Service Manual* for details. **Note -** You only need to extend the server node a couple of inches on its slide rails to see the TLI. You do not need to release any cables, or slide it to the extended maintenance position.	Oracle Database Appliance X3-2 SysTLI PN: ████████████ SysTLI SN: ████████████ If the appliance is in a rack where you cannot see the TLI, do one of the following: ■ Look on another component (server node or storage shelf) of the appliance. All factory-bundled components of Oracle Database Appliance have the same TLI numbers. ■ Slide a server node partway out on its rails, just far enough to see the TLI. See the *Oracle Database Appliance Service Manual* for details. **Note -** You only need to extend the server node a couple of inches on its slide rails to see the TLI. You do not need to release any cables, or slide it to the extended maintenance position.

3

Site Preparation

This chapter describes the tasks you must complete *before* installing Oracle Database Appliance into a rack and cabling it.

Preparing Your Site

Use the following procedure to prepare your site for Oracle Database Appliance installation:

▼ Prepare Your Site

1. **Ensure that your site meets the environmental requirements in "Environmental Specifications" on page 39.**

2. **Ensure that your site meets the electrical specifications in "Electrical Specifications" on page 37.**

3. **Ensure that your site has adequate clearance for the shipping containers.**

4. **Allow the equipment to acclimatize to the computer center environment.**

   If significant temperature differences exist ($> 10^{\circ}$ C / 18° F) between the new system and the designated computer center, the equipment should be left in its boxes for a sufficient period of time to allow the temperature of the equipment to come to within a few degrees of the computer center.

   ⚠ **Caution - Equipment damage.** The system should never be powered on unless it is within the supported operating range (temperature and humidity).

5. **Open the shipping containers.**

   You should do this at the location where the system will be installed, but outside of the computer center itself.

⚠️ **Caution - Equipment damage.** Use a separate area in which to remove the packaging material to reduce particle contamination before entering the computer center.

6. Check the contents of the shipping container.

⚠️ **Caution - System failure.** All items in a shipment are designed to be used together as a single system. Do not mix components from different shipments; this could cause the system to fail.

It should contain:

Oracle Database Appliance (Original Version) and Models X6-2S/X6-2M	Oracle Database Appliance X3-2/X4-2/X5-2

▪ Preconfigured system
▪ Accessory kit, including:
   ▪ *Accessing Product Documentation* or Setup booklet
   ▪ Safety and legal documentation
   ▪ Rackmount Guide and Alignment Template
   ▪ Rackmount kit
▪ Power cords (shipped separately)
▪ Shipping kit (optional)
	▪ **The server nodes include:**
	   ▪ Preconfigured server nodes (0 and 1)
	   ▪ Accessory kit, including:
	      ▪ Oracle Database Appliance setup poster
	      ▪ Safety and legal documentation
	      ▪ Rackmount guide and alignment template
	      ▪ Rackmount kit
	      ▪ Power Cords
	      ▪ SAS cables, Ethernet cables, cluster cables, and labels are shipped with the storage shelf.
	▪ **The storage shelf includes:**
	   ▪ Preconfigured storage shelf
	   ▪ Rackmount kit
	   ▪ Power cords
	   ▪ Cables
	   ▪ Oracle Database Appliance setup poster
	▪ If you ordered a storage expansion shelf, it is shipped separately and includes the same list of components as the storage shelf.

♦♦♦ **C H A P T E R 4**

Installing the System Into a Rack

This chapter includes the following sections:

Task Overview

Follow the appropriate procedures to rack mount your system.

Note - These procedures describe how to insert the system into a rack. For cabling instructions, refer to the *Getting Started Guide* and setup poster or setup booklet.

Oracle Database Appliance (Original Version)	Oracle Database Appliance X3-2/X4-2	Oracle Database Appliance X5-2	Oracle Database Appliance X6-2S/X6-2M
• "Optional Component Installation" on page 46	• "Optional Component Installation" on page 46	• "Optional Component Installation" on page 46	• "Optional Component Installation" on page 46
• "Safety Precautions When Rackmounting" on page 47	• "Safety Precautions When Rackmounting" on page 47	• "Safety Precautions When Rackmounting" on page 47	• "Safety Precautions When Rackmounting" on page 47
• "ESD Precautions" on page 47	• "ESD Precautions" on page 47	• "ESD Precautions" on page 47	• "ESD Precautions" on page 47
• "Rack Compatibility Requirements" on page 48	• "Rack Compatibility Requirements" on page 48	• "Rack Compatibility Requirements" on page 48	• "Rack Compatibility Requirements" on page 48
• "Rackmount Kit Contents" on page 72	• "Contents of the Shipping Pallet" on page 53	• "Contents of the Shipping Pallet" on page 53	• "Contents of the Shipping Container" on page 50
• "Staff, Tools, and Equipment Required to Rackmount the System" on page 74	• "Installation Sequence" on page 53	• "Installation Sequence" on page 53	• "Tools and Equipment Needed" on page 51
• "Removing Components to Reduce System Weight" on page 74	• "Verify Component Compatibility" on page 54	• "Verify Component Compatibility" on page 54	• "Stabilize the Rack for Installation" on page 51
	• "Tools and Equipment Needed" on page 54	• "Tools and Equipment Needed" on page 54	• "Installing the Server Node Into a Rack" on page 52

Oracle Database Appliance (Original Version)	Oracle Database Appliance X3-2/X4-2	Oracle Database Appliance X5-2	Oracle Database Appliance X6-2S/X6-2M
■ "Install Rackmount Hardware Into a Rack" on page 75 ■ "Install the System Into a Rack" on page 82 ■ "Installing Shipping Brackets" on page 86	■ "Stabilize the Rack for Installation" on page 55 ■ "Applying Labels" on page 55 ■ "Installing the Storage Shelves Into a Rack" on page 57 ■ "Add a Storage Expansion Shelf Into an Existing System" on page 71 ■ "Installing the Server Nodes Into a Rack" on page 71	■ "Stabilize the Rack for Installation" on page 55 ■ "Applying Labels" on page 55 ■ "Installing the Storage Shelves Into a Rack" on page 57 ■ "Add a Storage Expansion Shelf Into an Existing System" on page 71 ■ "Installing the Server Nodes Into a Rack" on page 71	

Optional Component Installation

Standard system components are installed at the factory. Optional components that you purchased independent of the standard configuration are shipped separately, and in most cases should be installed before you install the server in a rack.

The following optional components can be ordered separately:

■ DIMM memory kits:

   ■ For Oracle Database Appliance X6-2S, you have the option of ordering memory expansion to 384 GB. Refer to the *Service Manual* for instructions on installing memory.

   ■ For Oracle Database Appliance X6-2M, you have the option of ordering memory expansion to 512 GB or 768 GB. Memory kits come in sets of 8 x 32 GB DIMMs. Refer to the *Service Manual* for instructions on installing memory.

   ■ For Oracle Database Appliance X5-2, you have the option of ordering memory expansion to 512 GB or 768 GB. Memory kits come in sets of 8 x 32 GB DIMMs, which means you need two kits (one for each server node) for 512 GB, and four kits (two for each server node) for 768 GB. Both server nodes must have the same amount of memory. Refer to the *Service Manual* for instructions on installing memory.

■ Storage drives:

   For the Oracle Database Appliance X6-2S/X6-2M with the default configuration of two NVMe drives, you have the option of ordering two additional 2.5-inch 3.2 TB NVMe SSDs for slots NVMe 2-3. Drives must be installed in pairs.

■ Other optional configurations:

   For the Oracle Database Appliance X5-2, you have the option of ordering two Sun Dual 10GbE SFP+ PCIe 2.0 Low Profile Adapters to replace the two standard InfiniBand adapters (one in each server node) to support an Ethernet fiber connection to the data center or public network (it cannot be used for the appliance private node-to-node connection).

To replace the standard InfiniBand adapter, refer to the *Service Manual* for instructions on replacing a PCIe card in Slot 1. After the card is replaced, refer to the *Getting Started Guide* for instructions on cabling and software configuration.

Safety Precautions When Rackmounting

This section describes safety precautions you must follow when installing the server into a rack.

Caution - Personal injury or equipment damage. Prevent the rack from tipping over. 1) Deploy the anti-tilt bar or legs on the equipment rack before beginning an installation. 2) Always load equipment into a rack from the bottom up so that the rack will not become top-heavy and tip over. 3) Mount equipment in the rack such that it does not create uneven or dangerous mechanical loading. 4) Do not use slide-rail mounted equipment as a shelf or workspace.

Caution - Equipment damage caused by elevated temperature. 1) If you install the equipment in a closed or multi-unit rack assembly, ensure that the operating ambient temperature inside the rack does not exceed the maximum ambient temperature specified for the server. For server environmental requirements, see "Environmental Specifications" on page 39. 2) Install the equipment in the rack such that airflow is not restricted or impeded.

Caution - Supply circuit damage and data loss. The AC circuits used to supply power to the system must be rated for the maximum amount of power that the system requires. See "Electrical Specifications" on page 37 for input power requirements.

Caution - Equipment damage. Maintain reliable earthing. Pay particular attention to supply connections other than direct connections to the branch circuit (for example, use of power strips).

ESD Precautions

Caution - Equipment damage. To prevent damage from electrostatic discharge, use the following precautions when installing or servicing components.

- Place components on an antistatic surface, such as an antistatic discharge mat, an antistatic bag, or a disposable antistatic mat.
- Wear an antistatic grounding strap connected to a metal surface on the chassis when you work on system components.

Rack Compatibility Requirements

The rack-mounting hardware can be used only in specialized racks that meet the requirements in the following tables.

For the Oracle Database Appliance X6-2 series:

Feature	Oracle Database Appliance X6-2S	Oracle Database Appliance X6-2M
Rack structure	Four-post rack (mounting at both front and rear). Two-post racks are not compatible.	Four-post rack (mounting at both front and rear). Two-post racks are not compatible.
Space available	Must have 1 rack units (1RU) of space available.	Must have 1 rack units (1RU) of space available.
Rack horizontal opening and unit vertical pitch	Conforms to ANSI/EIA 310-D-1992 or IEC 60927 standards.	Conforms to ANSI/EIA 310-D-1992 or IEC 60927 standards.
Distance between front and rear mounting planes	Minimum 610 mm and maximum 915 mm (24 in to 36 in).	Minimum 610 mm and maximum 915 mm (24 in to 36 in).
Clearance depth in front of front mounting plane	Distance to front cabinet door is at least 25.4 mm (1 in).	Distance to front cabinet door is at least 25.4 mm (1 in).
Clearance depth behind front mounting plane	Distance to rear cabinet door is at least 900 mm (35.43 in) with the cable management arm, or 800 mm (31.5 in) without the cable management arm.	Distance to rear cabinet door is at least 900 mm (35.43 in) with the cable management arm, or 800 mm (31.5 in) without the cable management arm.
Clearance width between front and rear mounting planes	Distance between structural supports and cable troughs is at least 456 mm (18 in).	Distance between structural supports and cable troughs is at least 456 mm (18 in).
Minimum clearance for service access	Front clearance: 123.2 cm (48.5 in) Rear clearance: 91 cm (36 in)	Front clearance: 123.2 cm (48.5 in) Rear clearance: 91 cm (36 in)
Server node dimensions	Height: 42.6 mm (1.7 in) Width: 436.5 mm (17.2 in) Depth: 737 mm (29 in)	Height: 42.6 mm (1.7 in) Width: 436.5 mm (17.2 in) Depth: 737 mm (29 in)

For the Oracle Database Appliance original version and Oracle Database Appliance X3-2/X4-2/X5-2:

Feature	Oracle Database Appliance (Original Version)	Oracle Database Appliance X3-2/X4-2	Oracle Database Appliance X5-2
Rack structure	Four-post rack (mounting at both front and rear). Two-post racks are not compatible.	Four-post rack (mounting at both front and rear). Two-post racks are not compatible.	Four-post rack (mounting at both front and rear). Two-post racks are not compatible.

Feature	Oracle Database Appliance (Original Version)	Oracle Database Appliance X3-2/X4-2	Oracle Database Appliance X5-2
Space available	Must have 4 rack units (4RUs) of space available.	4RU without optional storage expansion shelf. 6RU with optional storage expansion shelf.	6RU without optional storage expansion shelf. 10RU with optional storage expansion shelf.
Rack horizontal opening and unit vertical pitch	Conforms to ANSI/EIA 310-D-1992 or IEC 60927 standards.	Conforms to ANSI/EIA 310-D-1992 or IEC 60927 standards.	Conforms to ANSI/EIA 310-D-1992 or IEC 60927 standards.
Distance between front and rear mounting planes	Minimum 660.4 mm and maximum 876.3 mm (26 in to 34.5 in).	Minimum 610 mm and maximum 915 mm (24 in to 36 in).	Minimum 610 mm and maximum 915 mm (24 in to 36 in).
Clearance depth in front of front mounting plane	Distance to front cabinet door is at least 25.4 mm (1 in).	Distance to front cabinet door is at least 25.4 mm (1 in).	Distance to front cabinet door is at least 25.4 mm (1 in).
Clearance depth behind front mounting plane	Distance to rear cabinet door is at least 700 mm (27.5 in).	Distance to rear cabinet door is at least 900 mm (35.43 in) with the cable management arm, or 800 mm (31.5 in) without the cable management arm.	Distance to rear cabinet door is at least 900 mm (35.43 in) with the cable management arm, or 800 mm (31.5 in) without the cable management arm.
Clearance width between front and rear mounting planes	Distance between structural supports and cable troughs is at least 456 mm (18 in).	Distance between structural supports and cable troughs is at least 456 mm (18 in).	Distance between structural supports and cable troughs is at least 456 mm (18 in).
Minimum clearance for service access	Front clearance: 123.2 cm (48.5 in) Rear clearance: 91 cm (36 in)	Front clearance: 123.2 cm (48.5 in) Rear clearance: 91 cm (36 in)	Front clearance: 123.2 cm (48.5 in) Rear clearance: 91 cm (36 in)
Server node dimensions	Height: 175.1 mm (6.9 in). Width (without mounting ears): 437 mm (17.2 in). Width (with mounting ears): 482.6 mm (19 in). Depth: 762 mm (30 in).	Height: 42.6 mm (1.7 in). Width: 436.5 mm (17.2 in). Depth: 737 mm (29 in).	Height: 42.6 mm (1.7 in). Width: 436.5 mm (17.2 in). Depth: 737 mm (29 in).
Storage shelf dimensions	N/A	Height: 87.9 mm (3.5 in) Width: 483 mm (19 in) Depth: 630 mm (24.8 in)	Height: 175 mm (6.9 in) Width: 483 mm (19 in) Depth: 630 mm (24.8 in)

Caution - Personal injury or equipment damage. Always load equipment into a rack from the bottom up so that it will not become top-heavy and tip over. Deploy your rack's anti-tilt bar to prevent the rack from tilting during equipment installation. This caution is not applicable if an earthquake kit has been installed on the rack and it is bolted to the floor.

Inserting Oracle Database Appliance Into a Rack

This section describes how to install an Oracle Database Appliance into a rack as follows:

Inserting Oracle Database Appliance X6-2S/X6-2M Into a Rack

This section describes how to install the Oracle Database Appliance X6-2S/X6-2M server into a rack. If you are installing an Oracle Database Appliance X3-2, Oracle Database Appliance X4-2, or Oracle Database Appliance X5-2, see . If you are installing Oracle Database Appliance (original version), see .

This section includes the following subsections:

Caution - Personal injury or equipment damage. Always install equipment in a rack from the bottom up.

Caution - System Failure. Oracle Database Appliance is shipped with matched sets of components that must be installed together. Mixing components from different systems might cause the system to fail.

Contents of the Shipping Container

Inspect the shipping cartons of your Oracle Database Appliance X6-2S/X6-2M system for evidence of physical damage. If a shipping carton appears damaged, request that the carrier's agent be present when the carton is opened. Keep all contents and packing material for the agent's inspection.

The ship kit for the server includes the following items:

- Power cords, packaged separately with country kit
- Rail kit containing rack rails, hardware, template and installation instructions
- RJ-45 cross-over adapter
- Miscellaneous hardware, cables, and connectors
- Setup booklet
- Legal and safety documents

Tools and Equipment Needed

Obtain the following tools and equipment before beginning the installation of Oracle Database Appliance X6-2S/X6-2M.

- Phillips head No. 2 screwdriver that is a minimum of 4 inches long
- T20 Torx driver if using a threaded rack
- A mechanical lift is highly recommended

⚠ **Caution - Personal injury or equipment damage.** The storage shelf weighs approximately 51 lbs (23 kg). If no mechanical lift is available, use three people to place it in the rack.

▼ Stabilize the Rack for Installation

⚠ **Caution - Personal injury or equipment damage.** To reduce the risk of personal injury, stabilize the rack cabinet, and extend all anti-tilt devices before installing the server.

See your rack documentation for detailed instructions for the following steps.

1. **Open and remove the front and rear doors from the rack cabinet.**

   Note - The front and rear doors need to be removed only if they interfere with the installation.

2. **To prevent the rack cabinet from tipping during the installation, fully extend the rack cabinet's anti-tilt legs or anti-tilt bar, which are located at the bottom front of the rack cabinet.**

3. **If there are leveling feet beneath the rack cabinet to prevent it from rolling, extend these leveling feet fully downward to the floor.**

Installing the Server Node Into a Rack

Use the instructions in this section to install the Oracle Database Appliance X6-2 series server node in the rack.

Note - The links in the following table take you to instructions *outside* of the Oracle Database Appliance library to the Oracle Server X6-2 documentation libraries. Use your browser's Back button to return to the Oracle Database Appliance library.

Oracle Database Appliance X6-2S	Oracle Database Appliance X6-2M
Verify Rackmount Hardware	Verify Rackmount Hardware
Install Mounting Brackets	Install Mounting Brackets
Mark the Rackmount Location	Mark the Rackmount Location
Attach the Tool-less Slide-Rail Assemblies	Attach the Tool-less Slide-Rail Assemblies
Install the Server into the Slide-Rail Assemblies	Install the Server into the Slide-Rail Assemblies
Install the Cable Management Arm and Verify Operation	Install the Cable Management Arm and Verify Operation
Optional: Install the Shipping Bracket With Cable Trough	Optional: Install the Shipping Bracket With Cable Trough

Inserting Oracle Database Appliance X3-2/X4-2/X5-2 Into a Rack

This section describes how to install the server nodes and storage shelves of Oracle Database Appliance X3-2, Oracle Database Appliance X4-2, Oracle Database Appliance X5-2 into a rack. If you are installing an Oracle Database Appliance X6-2S/X6-2M, see "Inserting Oracle Database Appliance X6-2S/X6-2M Into a Rack" on page 50. If you are installing Oracle Database Appliance (original version), see "Inserting Oracle Database Appliance (Original Version) Into a Rack" on page 72.

This section includes the following subsections:

> **Caution - Personal injury or equipment damage.** Always install equipment in a rack from the bottom up. See "Installation Sequence" on page 53.

> **Caution - System Failure.** Oracle Database Appliance is shipped with matched sets of components that must be installed together. Mixing components from different systems might cause the system to fail.

Contents of the Shipping Pallet

Oracle Database Appliance X3-2, Oracle Database Appliance X4-2, Oracle Database Appliance X5-2 are shipped with the entire system on a single pallet. It includes all server nodes, storage shelves, mounting hardware, cables, and labels.

> **Caution - System failure.** All items in a shipment are designed to be used together as a single system. Do not mix components from different shipments; this could cause the system to fail. For details, see "Verify Component Compatibility" on page 54.

The items in this shipment include:

- Server node 0 and server node 1
- Rackmounting hardware, cables, and labels for server nodes 0 and 1
- One storage shelf
- Rackmounting hardware for the storage shelf

If you ordered a storage expansion shelf, it is shipped separately.

Installation Sequence

Always install equipment in a rack starting at the bottom and working upwards. For Oracle Database Appliance X3-2, Oracle Database Appliance X4-2, Oracle Database Appliance X5-2, install the equipment in the following order:

1. Storage expansion shelf, if equipped.
2. Storage shelf.
3. Server node 0.
4. Server node 1.

▼ Verify Component Compatibility

For Oracle Database Appliance X3-2, Oracle Database Appliance X4-2, Oracle Database Appliance X5-2 , all appliance components that are bundled at the factory have a Top Level Identifier (TLI) number that is matched for the system. Both server nodes, the storage shelf, and the (optional) storage expansion shelf (if included in the initial appliance configuration from the factory), must have the same TLI.

Note - If you add a storage expansion shelf to the system after the initial installation (that is, the storage expansion shelf was not part of the initial configuration order for the appliance), its TLI will be different from the rest of the system. In this scenario, an add-on component having a different TLI from the main appliance TLI is appropriate.

1. **Locate the TLI for both server nodes, the storage shelf, and (if present) the storage expansion shelf.**

   The TLI label is on top of the component, on the left-hand side, near the front.

2. **Check to ensure that all components have the same TLI numbers (a TLI part number and TLI serial number).**

Tools and Equipment Needed

Obtain the following tools and equipment before beginning the installation of Oracle Database Appliance X3-2, Oracle Database Appliance X4-2, or Oracle Database Appliance X5-2.

- Phillips head No. 2 screwdriver that is a minimum of 4 inches long
- T20 Torx driver if using a threaded rack
- A mechanical lift is highly recommended

⚠ **Caution - Personal injury or equipment damage.** The storage shelf weighs approximately 51 lbs (23 kg). If no mechanical lift is available, use three people to place it in the rack.

▼ Stabilize the Rack for Installation

⚠️ **Caution - Personal injury or equipment damage.** To reduce the risk of personal injury, stabilize the rack cabinet, and extend all anti-tilt devices before installing the server.

See your rack documentation for detailed instructions for the following steps.

1. **Open and remove the front and rear doors from the rack cabinet.**

   Note - The front and rear doors need to be removed only if they interfere with the installation.

2. **To prevent the rack cabinet from tipping during the installation, fully extend the rack cabinet's anti-tilt legs or anti-tilt bar, which are located at the bottom front of the rack cabinet.**

3. **If there are leveling feet beneath the rack cabinet to prevent it from rolling, extend these leveling feet fully downward to the floor.**

Applying Labels

Oracle Database Appliance X3-2, Oracle Database Appliance X4-2, Oracle Database Appliance X5-2 are shipped with a label kit that provides four labels, to be applied to the front of each server node and storage shelf.

▼ To Apply Labels to Server Nodes and Storage Shelves

1. **Find the labels.**

   Depending on your model, the shipping kit might include server node labels and a sheet with storage shelve labels.

   - Oracle Database Appliance X5-2 systems only include server node labels to attach. The storage shelf labels are attached at the factory.
   - Oracle Database Appliance X3-2 and Oracle Database Appliance X4-2 systems include both server node and storage shelf labels that you need to attach.

2. **Verify that the locations where the labels need to go are clean, and free of grease and dirt.**

3. **Apply the labels where needed:**

   For labels that you attach, peel off the backing sheet and apply the label to the corresponding spot on the right-hand side of the appliance front panel.

- Server Node 1: Apply this label to the top server node [1].
- Server Node 0: Apply this label to the lower server node [2].
- Storage shelf: Apply this label to the storage shelf directly beneath server node 0 [3].
- Storage expansion shelf (optional): Apply this label to the bottom storage shelf, if one is present [4].
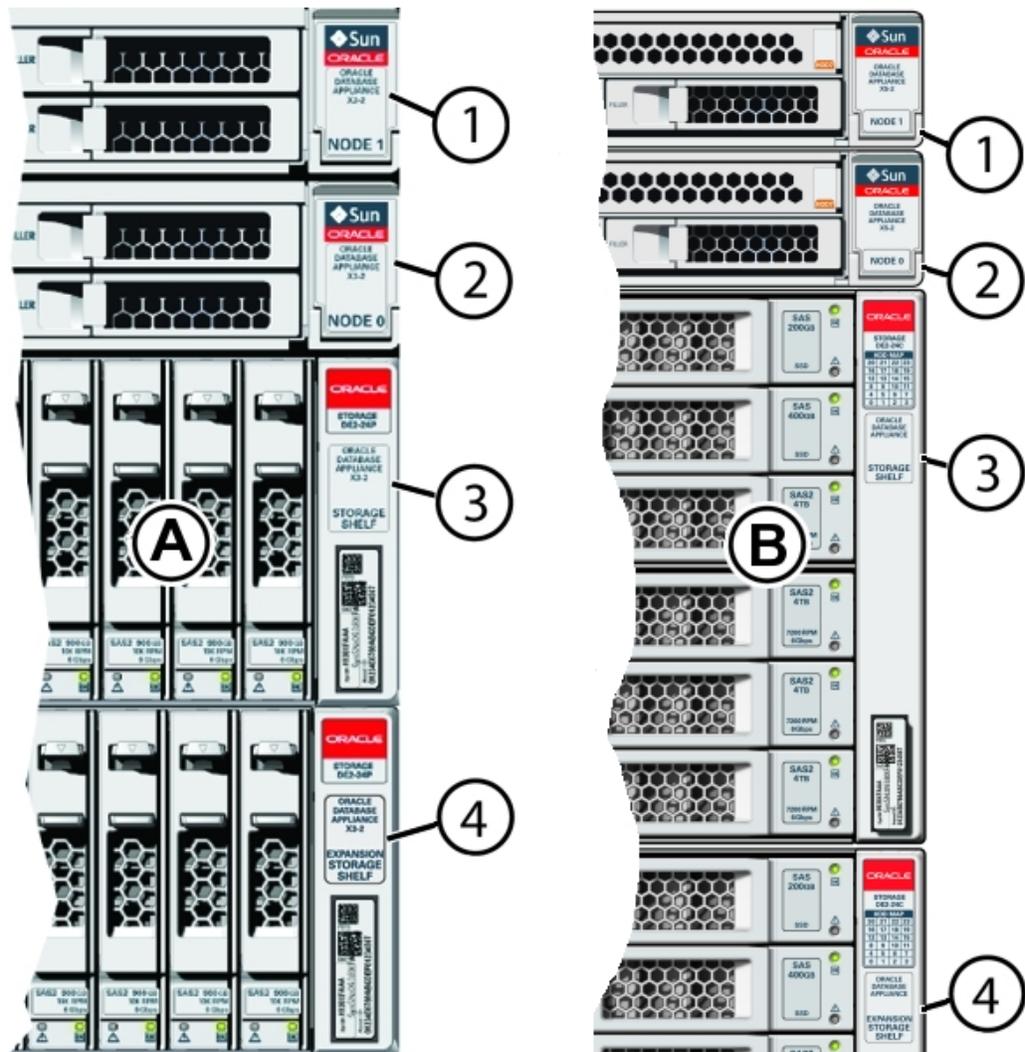
Callout	Description
A	Oracle Database Appliance X3-2 and Oracle Database Appliance X4-2
B	Oracle Database Appliance X5-2
1	Server node 1
2	Server node 0
3	Storage shelf
4	Optional storage expansion shelf

Installing the Storage Shelves Into a Rack

This section includes instructions for installing the storage shelf into a rack.

Oracle Database Appliance X3-2, Oracle Database Appliance X4-2, Oracle Database Appliance X5-2 require one storage shelf and might include a second storage shelf, called the storage expansion shelf. Both are installed in the same way, with the following caveats:

- If you have a storage expansion shelf, install it first. Follow the procedure for your system:
  - "Install the Oracle Database Appliance X5-2 DE2-24C Storage Shelf Into a Rack" on page 57
  - "Install the Oracle Database Appliance X3-2/X4-2 DE2-24P Storage Shelf Into a Rack" on page 62
- If you are adding a storage expansion shelf to an existing system, see "Add a Storage Expansion Shelf Into an Existing System" on page 71 for additional details.

▼ Install the Oracle Database Appliance X5-2 DE2-24C Storage Shelf Into a Rack

The Oracle Storage Drive Enclosure DE2-24C requires four standard mounting units (4RU) of vertical space in the cabinet. Starting at the bottom of the cabinet, locate the appropriate rack unit (RU) height. Install storage shelves below controllers to prevent the rack from tipping.

Before You Begin   This task provides instructions for both threaded and unthreaded racks.

- Ensure that your site meets the requirements in "Oracle Database Appliance Specifications" on page 36
- Ensure that the rack meets the requirements in "Rack Compatibility Requirements" on page 48
- Observe all precautions in "Safety Precautions When Rackmounting" on page 47

1. **If using an unthreaded universal 19-inch or Sun Rack II cabinet, snap one supplied cage nut into the 8th rack hole, counting upward, in each front rail of the 4RU space.**
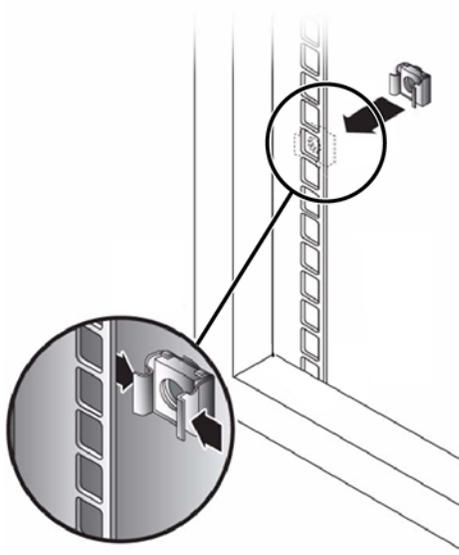
2. **Prepare the screws in each rail end:**

   ■ Square-hole unthreaded cabinet: No preparation.

   ■ Round-hole unthreaded cabinet: Remove the screws from each rail end and discard. Locate the screws for round-hole cabinets and place aside.

   ■ Threaded cabinet: Remove screws and replace them in the opposite direction (from the inside of the rail flange) so they act as location pins. Also remove the clip nut from each front rail end and discard.

3. **Position the front of the rails inside the cabinet, with the rail flange inside of the cabinet flange, and the rail label facing the inside of the cabinet.**

   ■ Square-hole unthreaded cabinet: The screw heads fit inside the rack holes.

   ■ Round-hole unthreaded cabinet: Install two screws through the rack and into the front of each rail. Do not install into the cage nut in the rack, or the clip nut on the rail.

   ■ Threaded cabinet: The location pins fit inside the rack holes.

4. **Adjust the rail lengths to fit.**
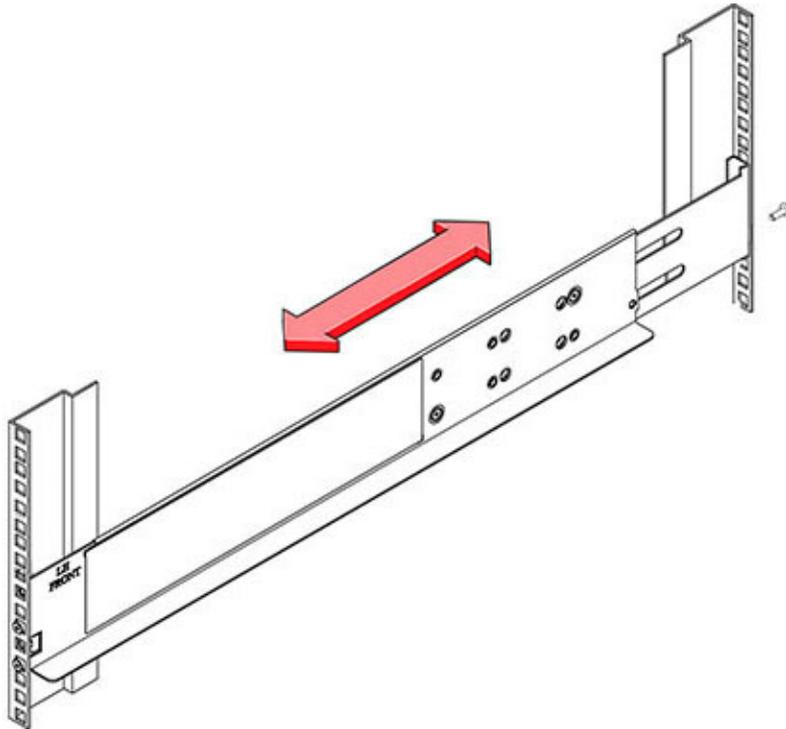
5. **Install one screw through the rack and into the rear of each rail.**

6. Tighten the two locking screws in the rails.
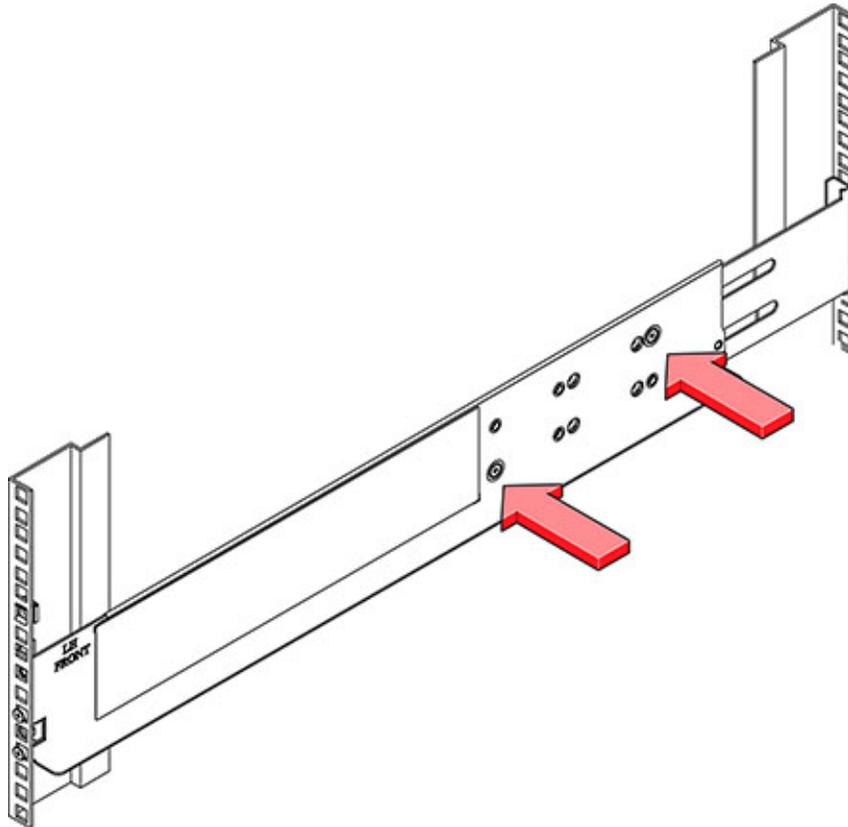
7. **Using a mechanical lift or two people, one at each side of the storage shelf, carefully lift and rest the shelf on the bottom ledge of the left and right rails. Do not lift using the power supply handles.**
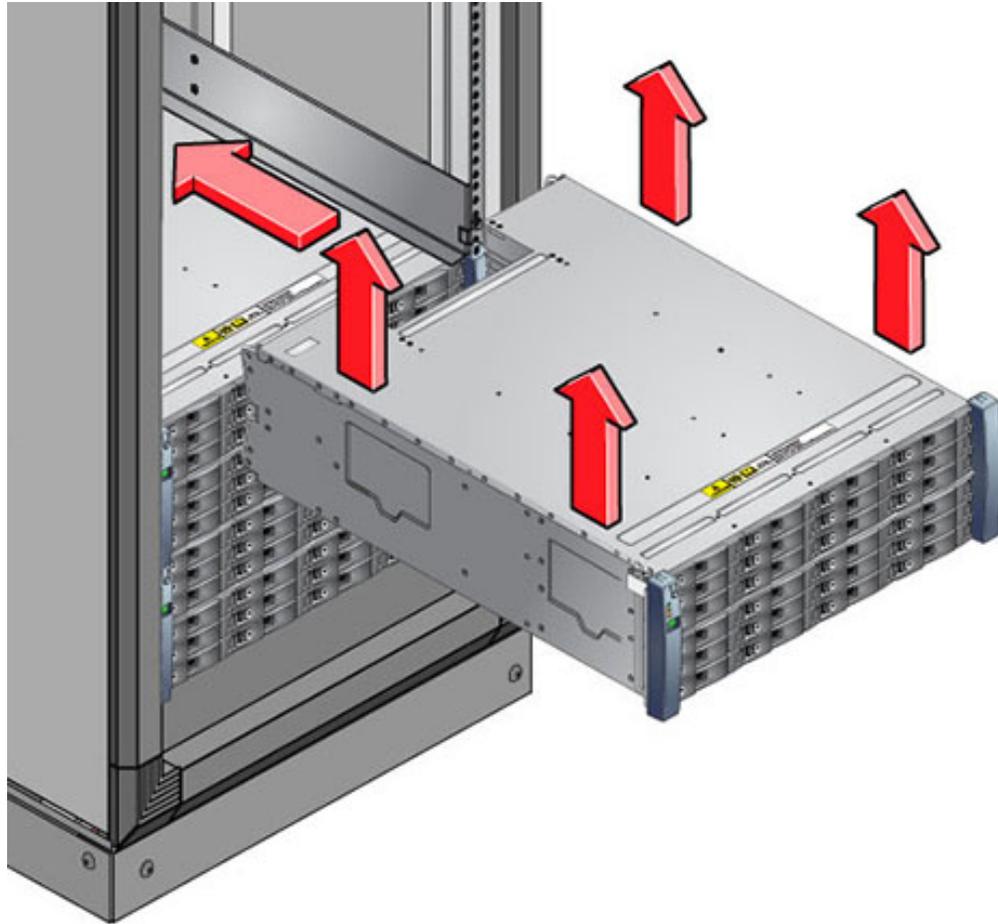
8. **Carefully slide the shelf into the cabinet. Ensure that the shelf is fully seated within the rails. If removing the shelf to reseat it, support it at all times.**

9. **Remove the front side caps, install two screws into each front side, and replace the caps.**

10. Install one long patchlock screw per rail to secure the rear of the shelf to the rear of the rack.
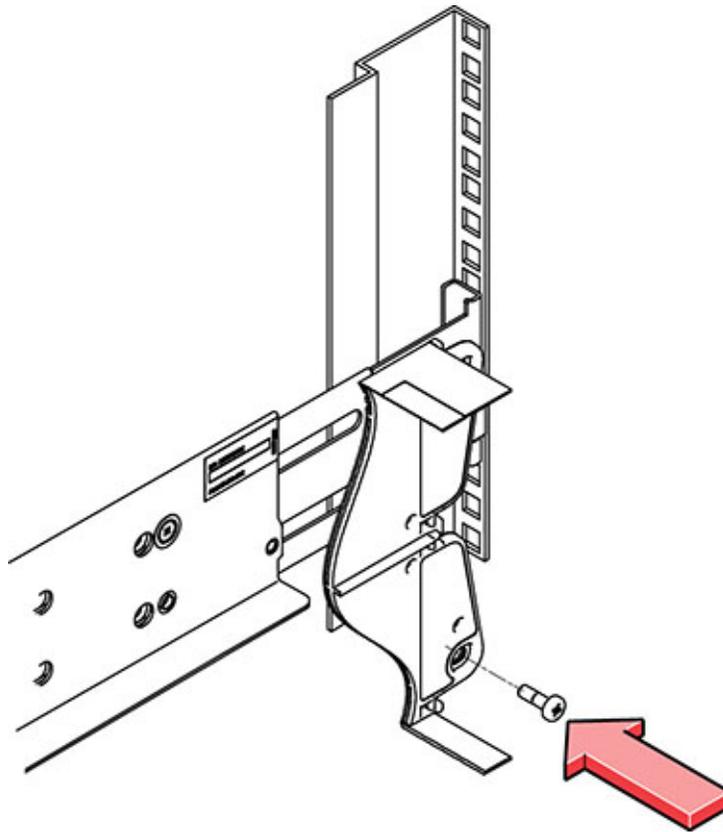
11. Repeat these steps if you have an additional storage shelf to install.

▼ Install the Oracle Database Appliance X3-2/X4-2 DE2-24P Storage Shelf Into a Rack

The Oracle Storage Drive Enclosure DE2-24P requires two standard mounting units (2RU) of vertical space in the cabinet. The storage shelf rack-mount kit contains two rack rails, long and short M6 screws, and a 10mm wrench.

Before You Begin This task provides instructions for both threaded and unthreaded racks.

■ Ensure that your site meets the requirements in "Oracle Database Appliance Specifications" on page 36

- Ensure that the rack meets the requirements in "Rack Compatibility Requirements" on page 48
- Observe all precautions in "Safety Precautions When Rackmounting" on page 47

1. **Install the rails in the rack.**

    - **If you have an unthreaded rack:**

        a. **Position the front rail location pegs [1] fully inside the appropriate holes in the front of the rack.**

            The rail flange [2] must be inside of the cabinet flange, and the rail label facing the inside of the cabinet.

        b. **Insert and loosely tighten one screw through the front of the rack and into the top hole in the rails [3].**

c. Insert and loosely tighten one screw through the back of the rack and into the back of the rails [4].
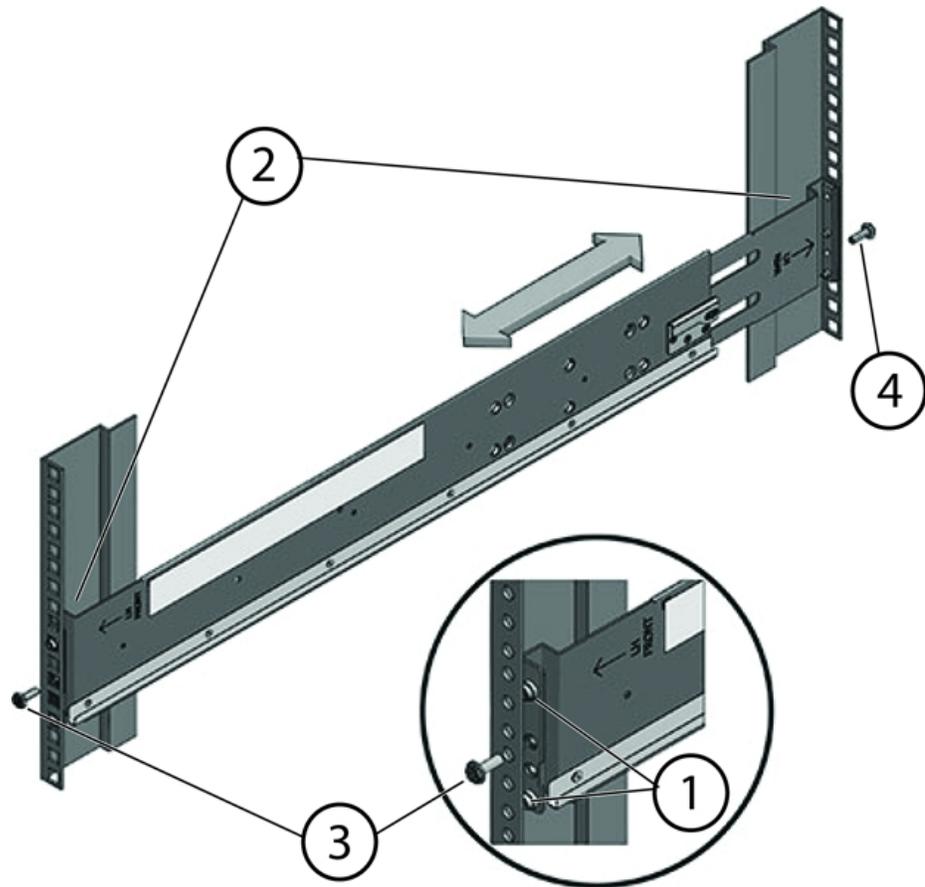
Callout	Description
1	Location pegs
2	Rail flange and label
3	Front mounting screw
4	Rear mounting screw

■ **If you have a threaded rack:**

a. **Use the T20 Torx driver to remove the rail location pegs from the front and rear of the rails [1].**

b. **Use a 10mm wrench (supplied) to insert the pins into the ends of the rails where you removed the location pegs [1].**

c. **Position the front of the rails inside the cabinet, with the rail flange inside of the cabinet flange, and the rail label facing the inside of the cabinet [2].**

    The pins should be fully located within the rack holes.

d. **Insert and loosely tighten one screw through the front of the rack and into the top hole in the rails [3].**

    The screws for threaded racks have an unthreaded area near the top of the shaft. Before threading these screws into the rails, thread them through the rack until the threads clear the rack and the screws turn freely.

> ⚠️ **Caution - Mechanical failure**. When installing a storage shelf in a threaded rack, be sure to use the screws with the partially unthreaded shaft. Before threading them into the rails, be sure to thread them through the rack until the threads clear the rack and the screws turn freely.
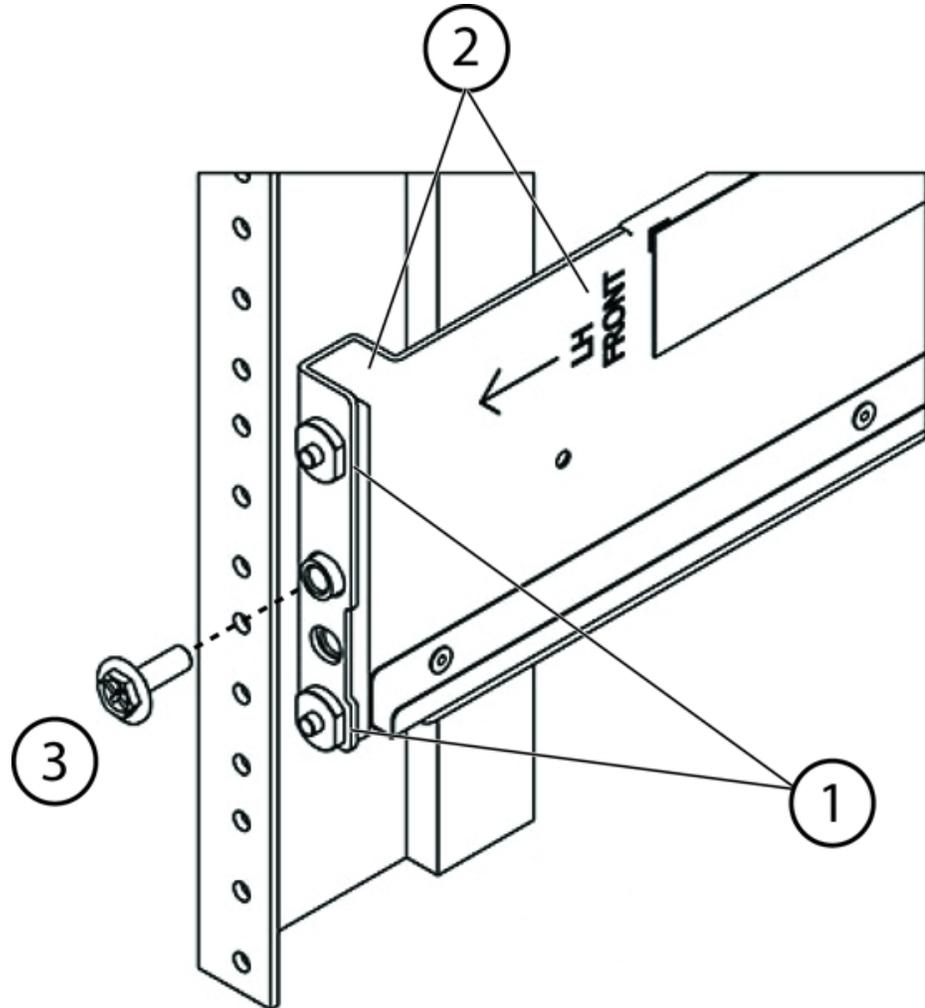
Callout	Description
1	Pins (these replaced the location pegs)
2	Rail flange and label

Callout	Description
3	Front mounting screw

e. **Adjust the rail lengths to fit, and locate the rear pins inside the corresponding rear rack holes [1].**

f. **Insert and loosely tighten one screw through the back of the rack and into the back of the rails [2].**
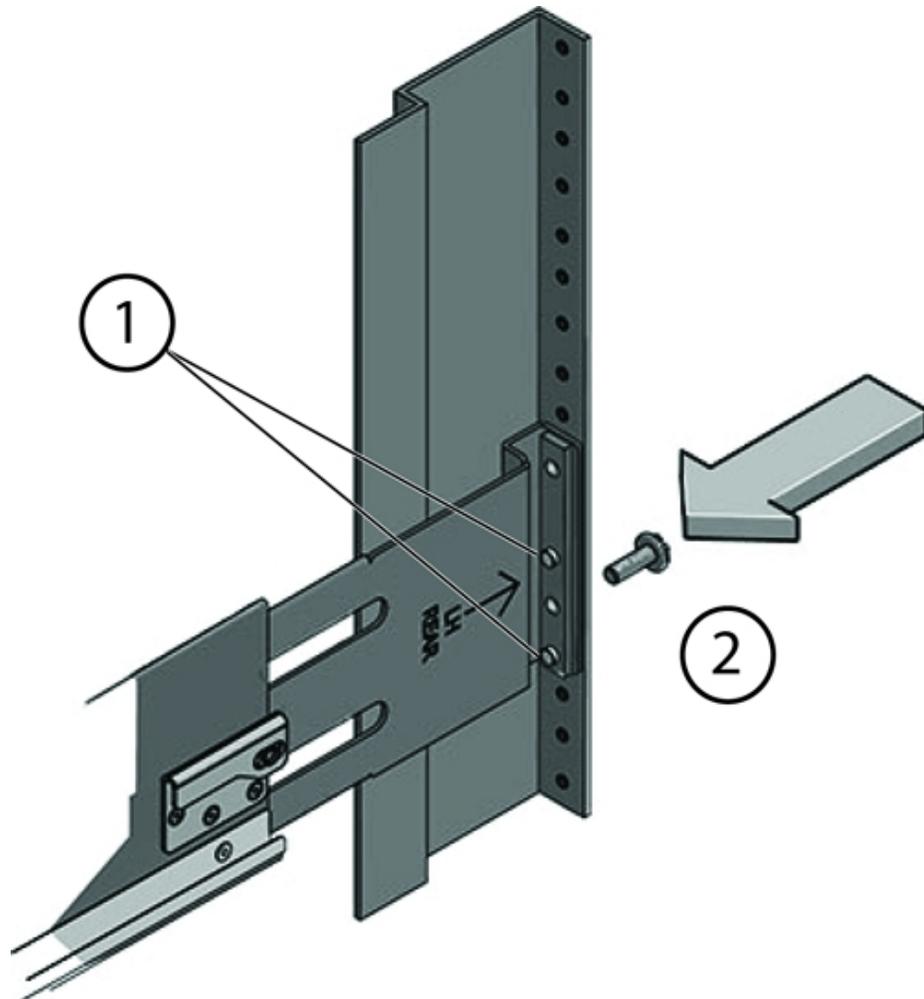
Number	Description
1	Pins (replace location pegs)
2	Rear mounting screw

2. **Carefully slide the storage shelf onto the shelf rails until it is fully seated in the rack.**

⚠ **Caution - Equipment damage.** Do not lift the storage shelf using the handles on the power supply/fan module.

⚠ **Caution - Personal injury or equipment damage.** Use a mechanical lift, or three persons. If you are using three persons, use two to lift the storage shelf into place, and a third to check that it is resting securely on the rails before releasing it.

3. **Pull the storage shelf partway out of the rack until it is approximately 7.8 inches (200 mm) out of the rack.**

4. **Tighten the four screws that fasten the rails to the rack (two in front, two in back).**

5. **Slide the storage shelf back into the rack and check to ensure that it is resting securely on the rails.**
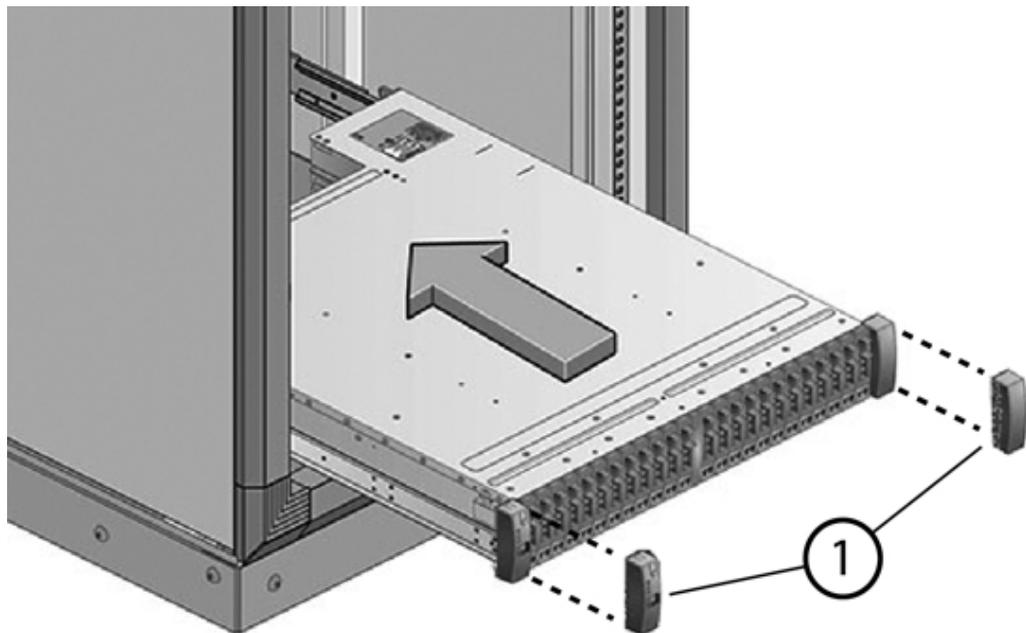
6. **Remove the front end caps that cover the ears on the front of the storage shelf [1]. They snap off.**

7. **Use one short screw on each side to fasten the front of the storage shelf to the rack.**

8. **Snap the end caps back onto the storage shelf.**

9.   **Use one short screw per rail to secure the rear of the storage shelf to threaded hole on the rail.**
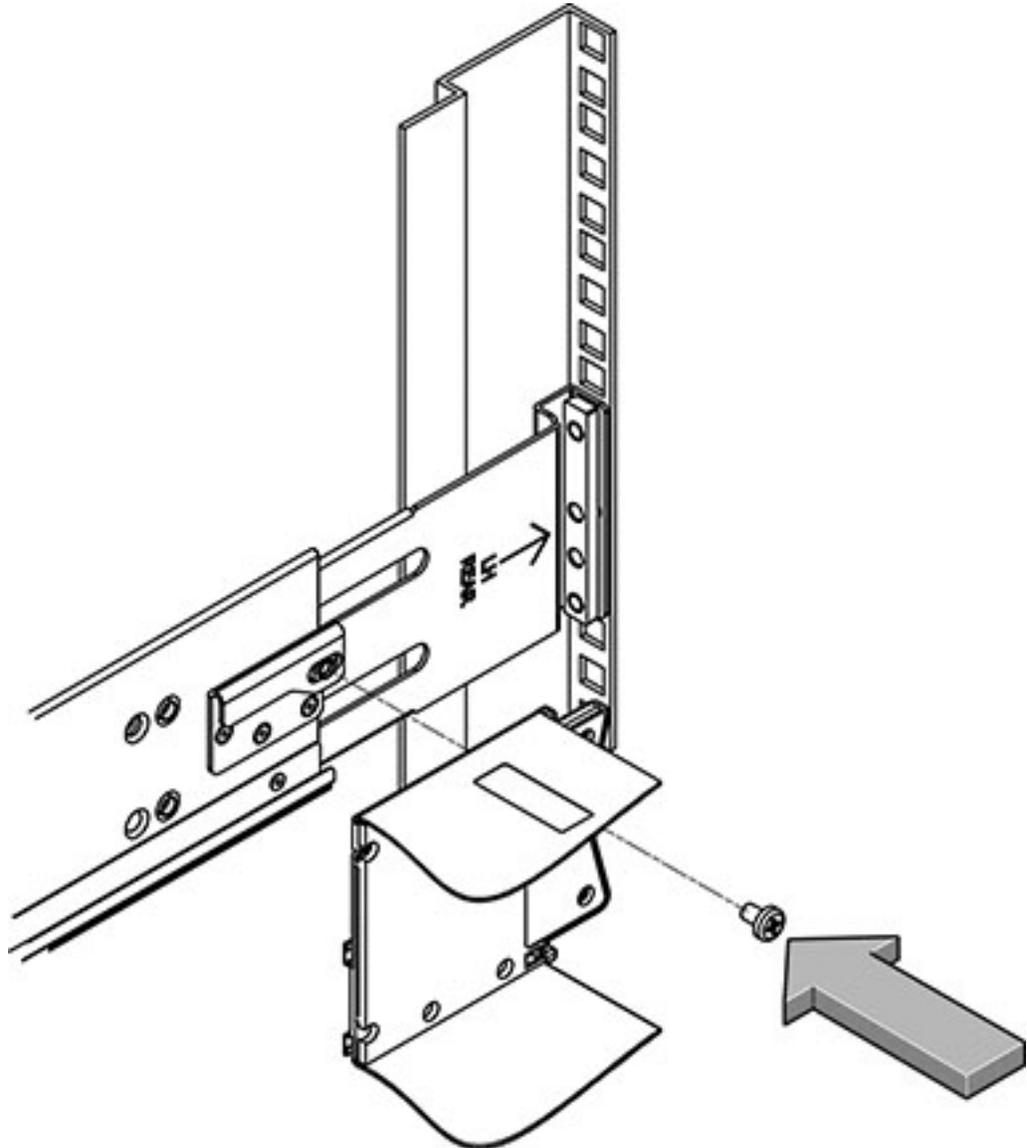
10.   **Repeat these steps if you have an additional storage shelf to install.**

▼ **Add a Storage Expansion Shelf Into an Existing System**

Before You Begin   This task assumes that you are adding a storage expansion shelf to an already running Oracle Database Appliance X3-2, Oracle Database Appliance X4-2, Oracle Database Appliance X5-2.

It is not necessary to shut down your system to complete this task.

Please note the following exceptional conditions:

■ The storage expansion shelf normally sits at the bottom of Oracle Database Appliance, beneath the storage shelf. However, since racks should always be provisioned from the bottom up, that space might be unavailable. In these cases, to avoid re-rackmounting the entire system, it can be placed above the server nodes, or even in a different rack.

■ The Top Level Identifier (TLI) on the storage expansion shelf will not match the rest of the system as described in "Verify Component Compatibility" on page 54. However, adding a storage expansion shelf after your initial purchase and setup of the appliance is a supported configuration.

1. **Apply the label, if needed.**

   The expansion storage shelf shipment includes a label that says "EXPANSION STORAGE SHELF". If the label is not already applied to the front of the shelf, apply it now as described in "Applying Labels" on page 55.

2. **Install the expansion storage shelf as described in "Installing the Storage Shelves Into a Rack" on page 57.**

3. **Cable, power-on, and verify that the new storage is added.**

   Refer to the *Getting Started Guide*.

Installing the Server Nodes Into a Rack

Use the instructions in this section to install server nodes in the rack.

Note - The links in the following table take you to instructions *outside* of the Oracle Database Appliance library to the Sun Server X3-2, Sun Server X4-2, Oracle Server X5-2 documentation libraries. Use your browser's Back button to return to the Oracle Database Appliance library.

Oracle Database Appliance X3-2	Oracle Database Appliance X4-2	Oracle Database Appliance X5-2
Verify Rackmount Hardware	Verify Rackmount Hardware	Verify Rackmount Hardware
Install Mounting Brackets	Install Mounting Brackets	Install Mounting Brackets
Mark the Rackmount Location	Mark the Rackmount Location	Mark the Rackmount Location

Oracle Database Appliance X3-2	Oracle Database Appliance X4-2	Oracle Database Appliance X5-2
Attach the Tool-less Slide-Rail Assemblies	Attach the Tool-less Slide-Rail Assemblies	Attach the Tool-less Slide-Rail Assemblies
Install the Server into the Slide-Rail Assemblies	Install the Server into the Slide-Rail Assemblies	Install the Server into the Slide-Rail Assemblies
Install the Cable Management Arm and Verify Operation	Install the Cable Management Arm	Install the Cable Management Arm and Verify Operation
	Verify Operation of Slide Rails and CMA	Optional: Install the Shipping Bracket With Cable Trough

Inserting Oracle Database Appliance (Original Version) Into a Rack

This section describes inserting Oracle Database Appliance (original version) into a rack. If you are installing an Oracle Database Appliance X6-2S/X6-2M, see "Inserting Oracle Database Appliance X6-2S/X6-2M Into a Rack" on page 50. If you are installing an Oracle Database Appliance X3-2, Oracle Database Appliance X4-2, or Oracle Database Appliance X5-2, see "Inserting Oracle Database Appliance X3-2/X4-2/X5-2 Into a Rack" on page 52.

This section includes the following subsections:

- "Rackmount Kit Contents" on page 72
- "Staff, Tools, and Equipment Required to Rackmount the System" on page 74
- "Removing Components to Reduce System Weight" on page 74
- "Install Rackmount Hardware Into a Rack" on page 75
- "Install the System Into a Rack" on page 82
- "Installing Shipping Brackets" on page 86

Note - If you are going to use a mechanical lift, you do not need to perform this procedure.

Note - The system chassis is fixed in the rack by the rack-mounting kit hardware. The rack-mounting kit does not include slide rails. After the system chassis is installed in the rack, it does not slide in or out of the rack. The server nodes (also called system controllers) can be removed from the chassis while the chassis is installed in the rack.

Rackmount Kit Contents

The Rackmount Kit contains the hardware required to install Oracle Database Appliance (original version) into a supported rack. The Rackmount Guide and Alignment Template is

shipped with the system in the shipping kit. Use this template when you are installing the system into the rack.

Note - The rackmount kit does *not* include slide rails. After the system is installed, it does not slide in or out of the rack. See the Rackmount Guide and Alignment Template for additional instructions on how to install your system into a four-post rack.

The following figure shows the hardware that comes with the rackmount kit.
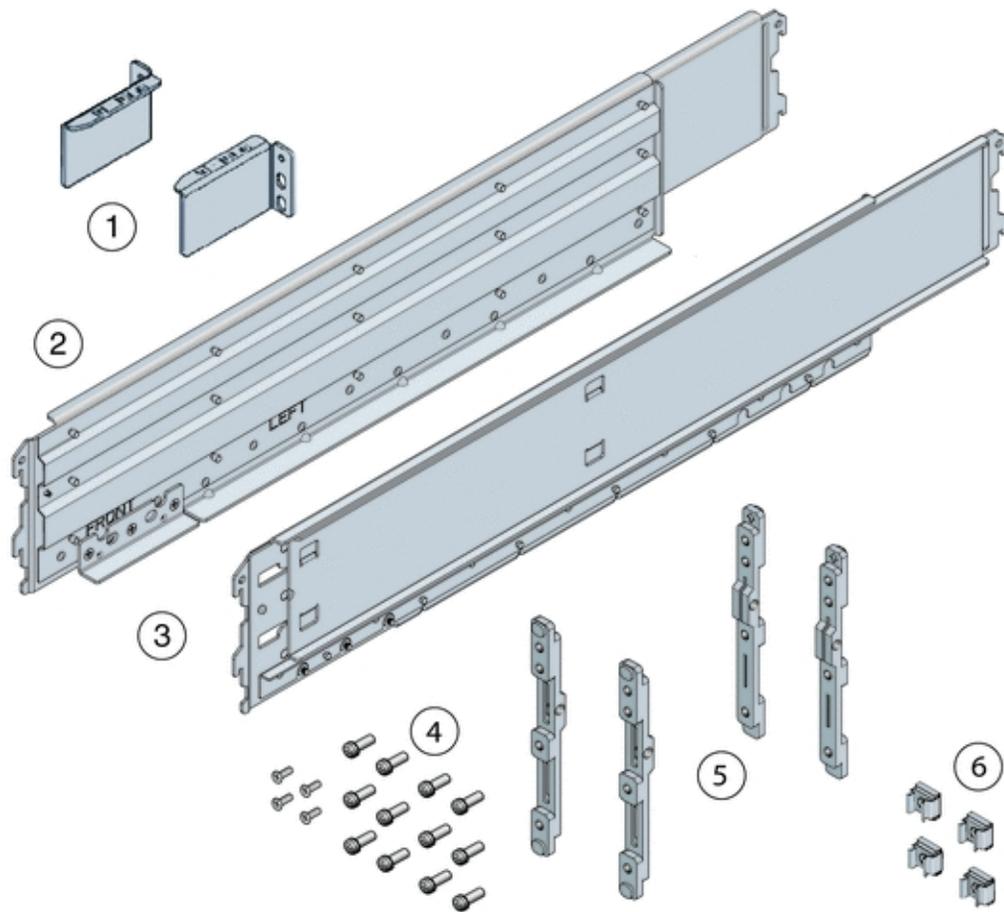
Callout	Description
1	Top rear braces that attach to the posts at the upper rear of the system.
2	Left shelf rail.

Callout	Description
3	Right shelf rail.
4	An assortment of M6 and 10-32 screws, including twelve M6 x 16 screws, twelve M6 x 12 screws, four M6 x 4 flathead screws, ten 10–32 screws, and twelve 10–32 shoulder screws.
5	Two sets of four adapter brackets, one set for round-hole racks, and one set for square-hole racks.
6	Four M6 cage nuts. **Note -** The cage nuts are not used. You can recycle them.

Staff, Tools, and Equipment Required to Rackmount the System

Caution - Personal injury or equipment damage. Use a mechanical lift to install the system or follow the precautions in "Removing Components to Reduce System Weight" on page 74.

Before starting the installation, gather the staff, tools, and equipment required to rackmount the system.

Staff, Tools, and Equipment	Notes
Four trained staff	Four people are needed to lift or transport the system. **Note -** If a mechanical lift is available or components have been removed from the system, it is safe for two people to lift or transport the system.
No. 2 10-inch Phillips screwdriver	A magnetic tip is recommended.
Mechanical lift	Strongly recommended. If not available, reduce the weight of the system. See "Removing Components to Reduce System Weight" on page 74.
Compatible four-post rack	See "Rack Compatibility Requirements" on page 48.
Rackmount kit	See "Rackmount Kit Contents" on page 72.
Transportation kit	See "Transportation Kit Contents" on page 87.
Antistatic wrist strap and antistatic mat	Required only if you remove system components.

Removing Components to Reduce System Weight

Before installing Oracle Database Appliance (original version) into a rack, you can remove components to reduce the weight of the system so that two persons can lift the system into the rack. Removing system components reduces the weight to approximately 96 pounds (43.5 kg).

Remove the following components to reduce the system weight:

- Server nodes

- Power supplies

Note - Because of their light weight, you do not need to remove filler panels from the system.

For instructions on removing components from the system and associated safety information, see the *Oracle Database Appliance Service Manual*.

▼ Install Rackmount Hardware Into a Rack

Oracle Database Appliance (original version) rack-mounting hardware consists of shelf rails, front and rear adapter brackets, rear braces, and screws.

Caution - Personal injury or equipment damage. Use a mechanical lift to install the system, or follow the precautions in "Removing Components to Reduce System Weight" on page 74. Removing components reduces the weight from 160 pounds (72.6 kg) when fully loaded with components to approximately 96 pounds (43.5 kg).

Caution - Tip hazard. Always load equipment into a rack from the bottom up so that it does not become top-heavy and tip over. Deploy your rack's anti-tilt bar to prevent the rack from tipping during installation.

Caution - Elevated operating ambient temperature. Install this equipment in an environment that does not exceed the maximum ambient temperature (Tma) specified in "Environmental Specifications" on page 39. If the system is installed in a closed or multi-unit rack assembly, then the operating ambient temperature of the rack environment might be greater than room ambient temperature.

Caution - Thermal damage. Install the equipment in a rack so that the air flow is not restricted.

Caution - Circuit overloading. Consider the connection of the equipment to the supply circuit and the effect that overloading of the circuits might have on overcurrent protection and supply wiring. Be aware of equipment nameplate power ratings when addressing this concern.

Caution - Equipment damage. Maintain reliable grounding of rack-mounted equipment. Pay attention to supply connections other than direct connections to the branch circuit (for example, use of power strips).

1. **Use the *Rackmount Guide and Alignment Template* to measure the 4 rack unit (4RU) space in the rack where you will install the system.**
   Also, use that template to align the adapter brackets with the rack posts.

2. Verify that you have a 4RU space in your rack.

Place the bottom edge of the *Rackmount Guide and Alignment Template* in the lowest available position in the rack. Align all arrows with holes on the rack post. Ensure that 4RU space is available in the rack.

3. Select the adapter brackets that match your rack.

The system ships with two sets of adapter brackets: one set [1] for racks with square holes and one set [2] for racks with round holes.

The adapter brackets are labeled to indicate whether they are for square-hole racks or round-hole racks. Additionally, arrows on the adapter brackets indicate how they should be oriented. Install all brackets with the arrow labeled "Top" pointing up.

4. Attach the adapter brackets to the front rack posts.

The following figure shows the front adapter brackets being attached to a square-hole rack [1] and a round-hole rack [2].
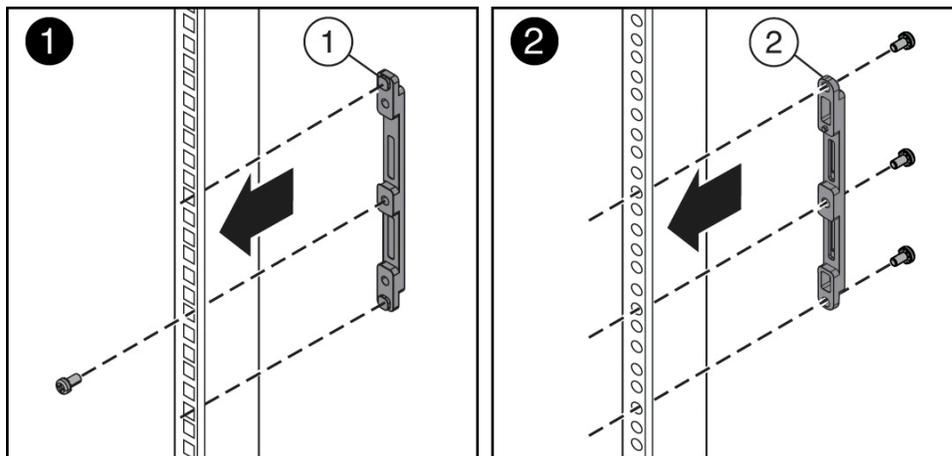
a. Place the brackets so that the bracket is aligned with the 4RU space where the server will be installed, and verify that the arrow labeled "Top" on the brackets points up.

b. Select the screws that match your rack.

- For a square-hole rack, use one M6 x 12 mm screw per adapter bracket.
- For a threaded round-hole rack, use three M6 x 12 mm screws, or three 10-32 shoulder screws per adapter bracket.

5. Attach the adapter brackets to the rear rack posts.

a. **Place the brackets so that the bracket is aligned with the space where the server will be installed and verify that the arrow labeled "Top" on the brackets points up.**

b. **Select the screws that match your rack.**

   - For a square-hole rack, use two M6 x 12 mm screws per adapter bracket.
   - For a threaded round-hole rack, use two M6 x 12 mm screws or two 10-32 shoulder screws per adapter bracket.

   The following figure shows the rear adapter brackets being attached to a round-hole rack.
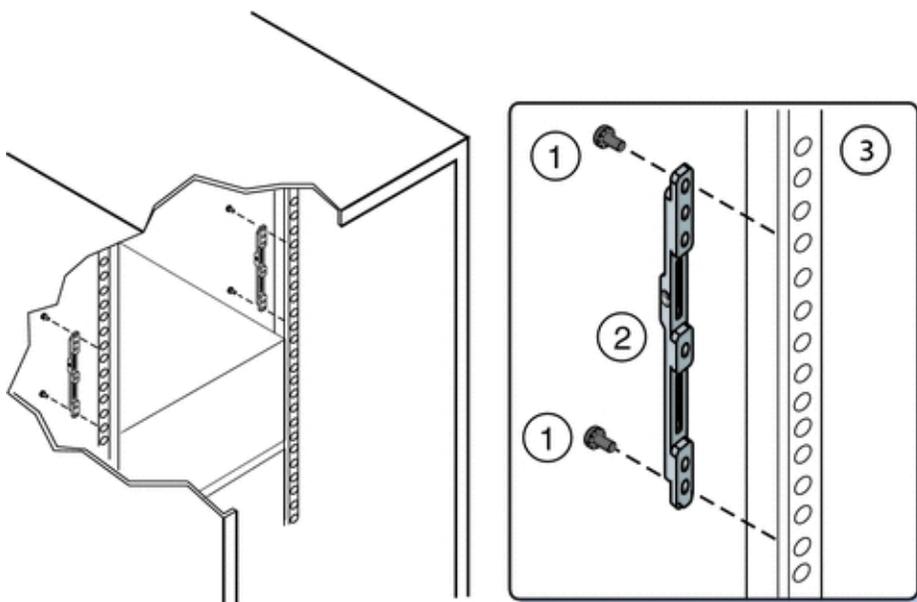
The following figure shows the rear adapter brackets being attached to a square-hole rack.
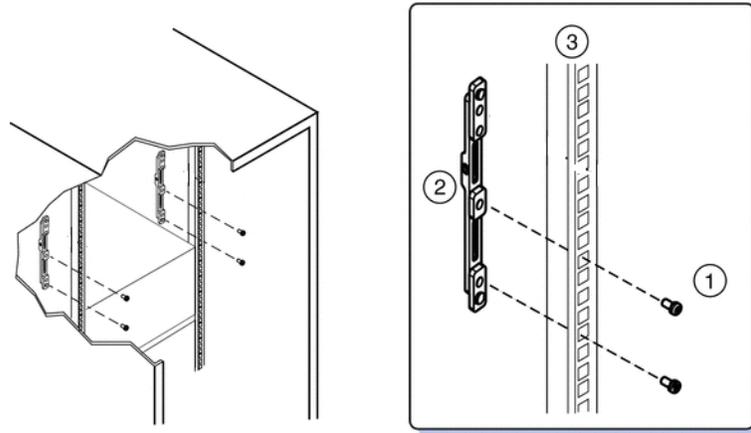
6. **Attach rear braces to the rear rack posts and to the adapter brackets.**

    a. **Position the rear braces so that the tops of the braces [1] align with the 4U mark on each rear rack post.**

b. Install two M6 x 12 mm screws [3] or two 10-32 x 10 screws to attach each rear brace to the rack post and the adapter bracket.
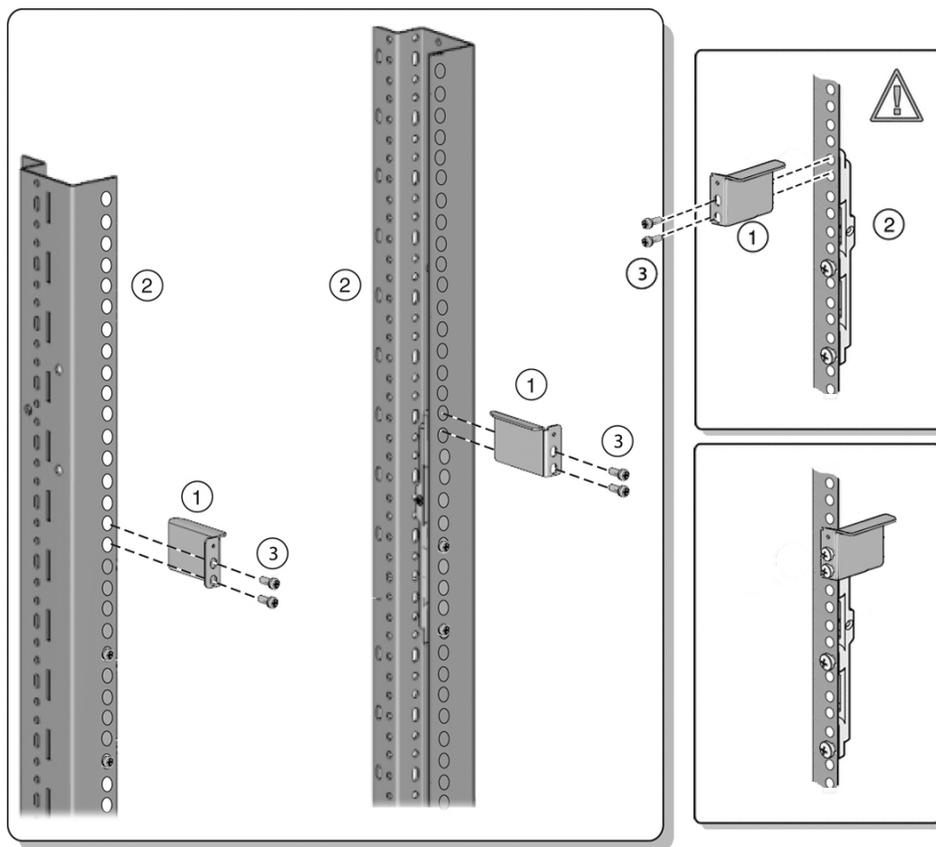
Note - Before tightening the screws, slide the brackets [1] up as far as they will go. The holes on the brackets are oval-shaped so they can move up and down when the screws are loose.

7. Install the shelf rails into the rack.

Caution - System failure. Orient the shelf rails properly, with the shelf facing inward and the gap toward the front of the rack; otherwise, the system might fall.

a. Expand the shelf rails [1] to fit between the front and rear rack posts.

b. **Insert the rear hooks of the shelf rails into the slots on the rear adapter brackets [2 and 3] first. Push down on the rail to engage the hooks.**

c. **Insert the front hooks of the shelf rails into the slots on the front adapter bracket. Push down on the rails to engage the hooks.**
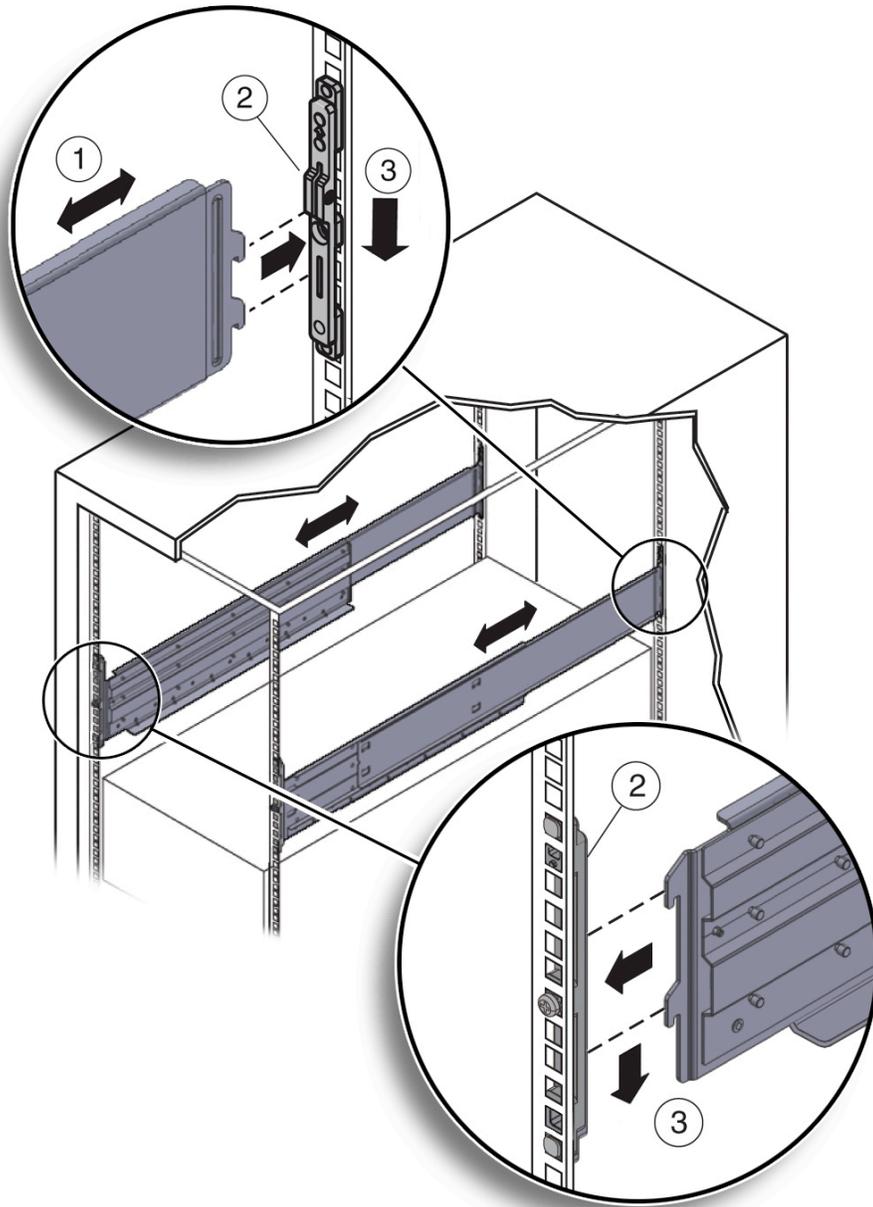
8. **Thread the four M4 x 10 flathead locking screws into the four adapter brackets [1]).**

    These screws prevent the shelf rails from accidentally lifting out of the adapter brackets.
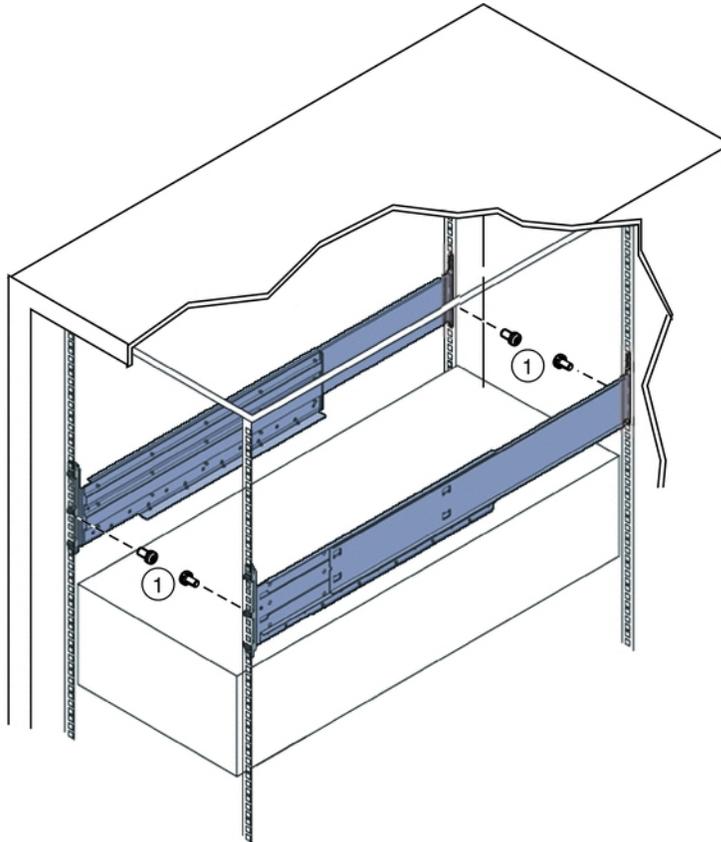
▼ Install the System Into a Rack

Before You Begin Before you begin installing your Oracle Database Appliance (original version) into a rack, perform the steps in "Install Rackmount Hardware Into a Rack" on page 75.

1. **Raise the system to slightly above the shelf surfaces.**

    Use a mechanical lift if possible.

⚠️ **Caution - Personal injury or equipment damage.** Use a mechanical lift to install the system, or follow the precautions in "Removing Components to Reduce System Weight" on page 74. Removing components reduces the weight from 160 pounds (72.6 kg) when fully loaded with components to approximately 96 pounds (43.5 kg).

⚠️ **Caution - Tip hazard.** Always load equipment into a rack from the bottom up so that it does not become top-heavy and tip over. Deploy your rack's anti-tilt bar to prevent the rack from tipping during installation.

2. **Slide the system onto the shelf rails until the rack-mounting ears contact the rack post. Adjust the top rear braces to fully insert the system.**

⚠️ **Caution - Drop Hazard.** Do not release the system until it is *more* than 12 inches (305 mm) into the rack, and is firmly supported by the shelf rails. The shelf rails do not safely support the system until it is *more* than 12 inches (305 mm) inside the rack.

3.   Use four screws to attach the front of the system to the front of the rack.

- On a threaded, round-hole rack, use four M6 x 12 mm screws or four 10-32 x 10 mm screws.
- On a square-hole rack, use four M6 x 16 mm screws.

Note - On square-hole racks, the screws pass through the rack and thread into the adapter bracket. On round-hole racks, the screws thread into the rack rails.
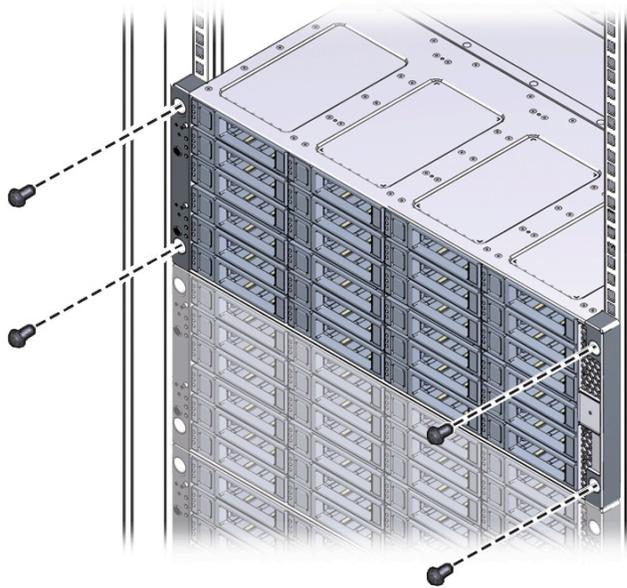
4.   To adjust the rear braces, do the following:

a.   Loosen the screws on the rear braces [1].

b.   Slide the rear braces down until they rest firmly on top of the system [2].

c. **Tighten the screws in the rear braces [1].**
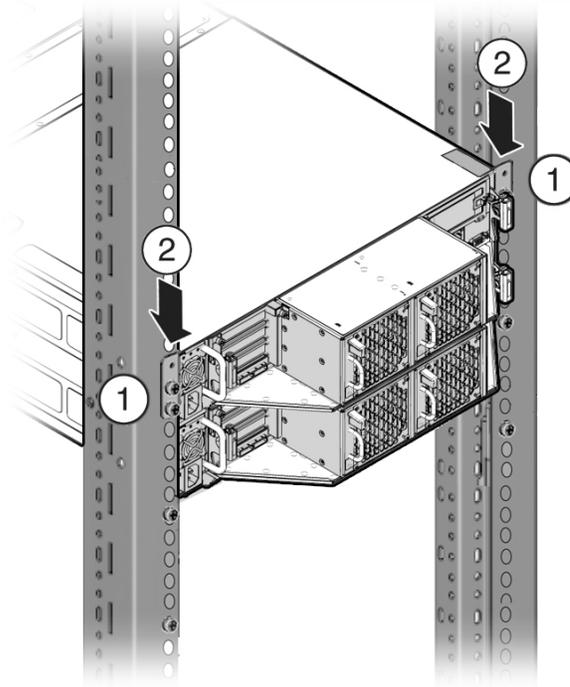
5. **If you removed components from the system, replace them.**

For instructions, see the *Service Manual*, which is part of the product documentation.

Installing Shipping Brackets

This section includes the following information about installing the shipping brackets for Oracle Database Appliance (original version):

- "Transportation Kit Contents" on page 87.
- If you plan to ship the system in a rack to another destination, see "Install Shipping Brackets" on page 88.

- If your system is shipped to you in a rack, you must remove the shipping brackets before placing the system into service. For instructions, see the *Oracle Database Appliance Service Manual*.

Transportation Kit Contents

The following figure shows the hardware that is included in the Oracle Database Appliance (original version) transportation kit.
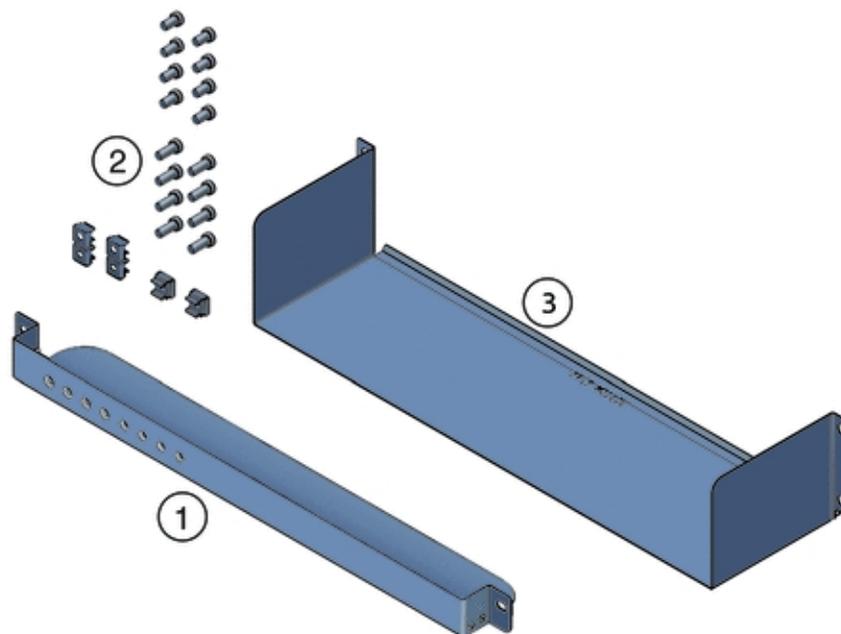
Callout	Description
1	Front shipping bracket.
2	Screws and cage nuts: For the rear shipping bracket: - Two sets of M6 x 30 and 10-32 x 1.25 inch screws, two screws per set. - Two sets of M6 x 16 mm and 10-32 x 10 mm screws, four screws per set.

Callout	Description
	■ Six M6 cage nuts. **NOTE** - The cage nuts are not used. Recycle unused hardware.
3	Rear shipping bracket.

▼ Install Shipping Brackets

If you plan to move or ship Oracle Database Appliance (original version) in a rack to another location, you need to install the shipping brackets.

1. Remove the two short screws that fasten the bottom of the system to the rack.
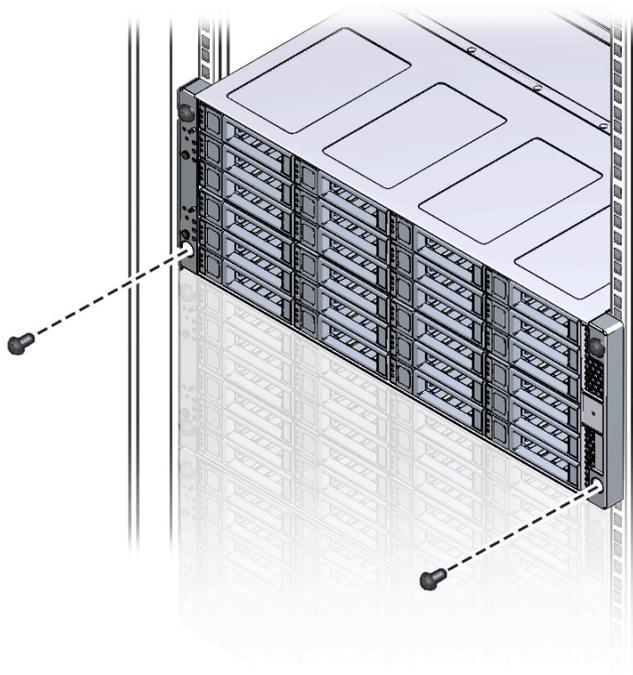
2. Insert the front shipping bracket [2] under the front of the system with the supporting flange underneath the system.
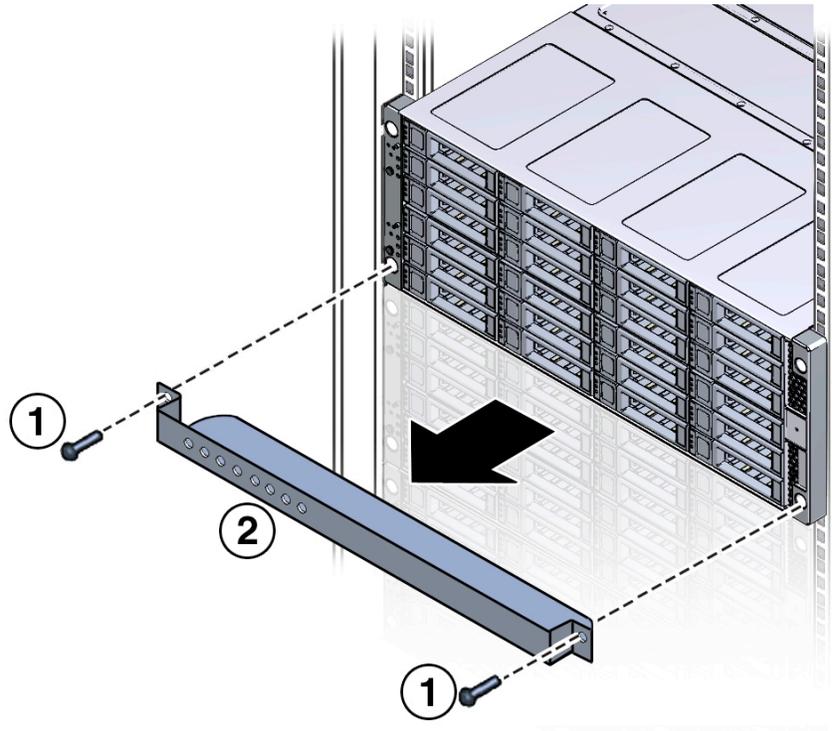
3. Use the two long screws (either the M6 x 30 mm screws or the 10-32 x 1.25 inch screws) [1] to fasten the shipping bracket [2] to the front of the system.

Tighten the two long screws to secure the shipping bracket and the system to the rack.

Note - The front shipping bracket includes eight threaded holes used for storing unused screws. When the shipping brackets are not installed, the front shipping bracket holds the long screws used to install them. When the shipping brackets are installed, it stores the short screws that were used to secure the system to the front of the rack before the front shipping bracket was installed.

4. Insert the short screws into the four empty storage holes on the front shipping bracket.

Store the screws so they can be used when the shipping bracket is removed.

5. Remove the bottom two screws that hold the rear adapter brackets in place.

> ⚠ **Caution - Equipment damage.** Do not remove the bottom screws unless you are certain that at least one upper screw is in place; otherwise, the system might fall.

6. **Insert the rear shipping bracket [2] under the back of the system with the side panels facing up.**

Use four screws [1] (either the M6 x 16 mm screws or the 10-32 x 10 mm screws) to fasten the rear shipping bracket to the rack. Do not finish tightening these screws. The screws should be tight enough to hold the bracket in place, but you should still be able to move the bracket slightly.

The bracket should be fastened to the posts, but loose enough to move slightly.
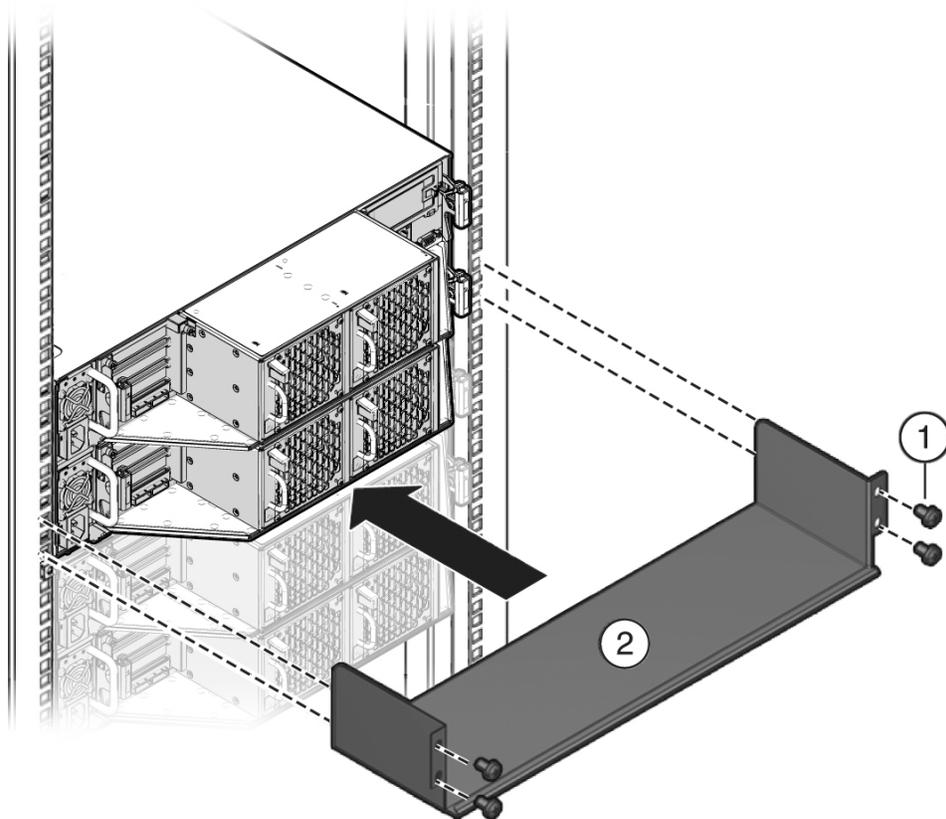
7. **Lift the rear shipping bracket up so that it rests firmly against the bottom of the system, then finish tightening the screws that hold the bracket in place.**

If necessary, loosen the screws enough so that you can move the bracket, then push the bracket against the bottom of the system and tighten the screws.

Caution - Equipment damage. To prevent damage to the system during shipping, the bottom shipping bracket must be positioned firmly against the bottom of the system.

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