

Oracle® Exadata Storage Server X5-2 High Capacity Installation Guide



Part No: E55081-03
July 2018

Part No: E55081-03

Copyright © 2015, 2018, Oracle and/or its affiliates. All rights reserved.

This software and related documentation are provided under a license agreement containing restrictions on use and disclosure and are protected by intellectual property laws. Except as expressly permitted in your license agreement or allowed by law, you may not use, copy, reproduce, translate, broadcast, modify, license, transmit, distribute, exhibit, perform, publish, or display any part, in any form, or by any means. Reverse engineering, disassembly, or decompilation of this software, unless required by law for interoperability, is prohibited.

The information contained herein is subject to change without notice and is not warranted to be error-free. If you find any errors, please report them to us in writing.

If this is software or related documentation that is delivered to the U.S. Government or anyone licensing it on behalf of the U.S. Government, then the following notice is applicable:

U.S. GOVERNMENT END USERS: Oracle programs, including any operating system, integrated software, any programs installed on the hardware, and/or documentation, delivered to U.S. Government end users are "commercial computer software" pursuant to the applicable Federal Acquisition Regulation and agency-specific supplemental regulations. As such, use, duplication, disclosure, modification, and adaptation of the programs, including any operating system, integrated software, any programs installed on the hardware, and/or documentation, shall be subject to license terms and license restrictions applicable to the programs. No other rights are granted to the U.S. Government.

This software or hardware is developed for general use in a variety of information management applications. It is not developed or intended for use in any inherently dangerous applications, including applications that may create a risk of personal injury. If you use this software or hardware in dangerous applications, then you shall be responsible to take all appropriate fail-safe, backup, redundancy, and other measures to ensure its safe use. Oracle Corporation and its affiliates disclaim any liability for any damages caused by use of this software or hardware in dangerous applications.

Oracle and Java are registered trademarks of Oracle and/or its affiliates. Other names may be trademarks of their respective owners.

Intel and Intel Xeon are trademarks or registered trademarks of Intel Corporation. All SPARC trademarks are used under license and are trademarks or registered trademarks of SPARC International, Inc. AMD, Opteron, the AMD logo, and the AMD Opteron logo are trademarks or registered trademarks of Advanced Micro Devices. UNIX is a registered trademark of The Open Group.

This software or hardware and documentation may provide access to or information about content, products, and services from third parties. Oracle Corporation and its affiliates are not responsible for and expressly disclaim all warranties of any kind with respect to third-party content, products, and services unless otherwise set forth in an applicable agreement between you and Oracle. Oracle Corporation and its affiliates will not be responsible for any loss, costs, or damages incurred due to your access to or use of third-party content, products, or services, except as set forth in an applicable agreement between you and Oracle.

Access to Oracle Support

Oracle customers that have purchased support have access to electronic support through My Oracle Support. For information, visit <http://www.oracle.com/pls/topic/lookup?ctx=acc&id=info> or visit <http://www.oracle.com/pls/topic/lookup?ctx=acc&id=trs> if you are hearing impaired.

Référence: E55081-03

Copyright © 2015, 2018, Oracle et/ou ses affiliés. Tous droits réservés.

Ce logiciel et la documentation qui l'accompagne sont protégés par les lois sur la propriété intellectuelle. Ils sont concédés sous licence et soumis à des restrictions d'utilisation et de divulgation. Sauf stipulation expresse de votre contrat de licence ou de la loi, vous ne pouvez pas copier, reproduire, traduire, modifier, accorder de licence, transmettre, distribuer, exposer, exécuter, publier ou afficher le logiciel, même partiellement, sous quelque forme et par quelque procédé que ce soit. Par ailleurs, il est interdit de procéder à toute ingénierie inverse du logiciel, de le désassembler ou de le décompiler, excepté à des fins d'interopérabilité avec des logiciels tiers ou tel que prescrit par la loi.

Les informations fournies dans ce document sont susceptibles de modification sans préavis. Par ailleurs, Oracle Corporation ne garantit pas qu'elles soient exemptes d'erreurs et vous invite, le cas échéant, à lui en faire part par écrit.

Si ce logiciel, ou la documentation qui l'accompagne, est livré sous licence au Gouvernement des Etats-Unis, ou à quiconque qui aurait souscrit la licence de ce logiciel pour le compte du Gouvernement des Etats-Unis, la notice suivante s'applique :

U.S. GOVERNMENT END USERS: Oracle programs, including any operating system, integrated software, any programs installed on the hardware, and/or documentation, delivered to U.S. Government end users are "commercial computer software" pursuant to the applicable Federal Acquisition Regulation and agency-specific supplemental regulations. As such, use, duplication, disclosure, modification, and adaptation of the programs, including any operating system, integrated software, any programs installed on the hardware, and/or documentation, shall be subject to license terms and license restrictions applicable to the programs. No other rights are granted to the U.S. Government.

Ce logiciel ou matériel a été développé pour un usage général dans le cadre d'applications de gestion des informations. Ce logiciel ou matériel n'est pas conçu ni n'est destiné à être utilisé dans des applications à risque, notamment dans des applications pouvant causer un risque de dommages corporels. Si vous utilisez ce logiciel ou ce matériel dans le cadre d'applications dangereuses, il est de votre responsabilité de prendre toutes les mesures de secours, de sauvegarde, de redondance et autres mesures nécessaires à son utilisation dans des conditions optimales de sécurité. Oracle Corporation et ses affiliés déclinent toute responsabilité quant aux dommages causés par l'utilisation de ce logiciel ou matériel pour des applications dangereuses.

Oracle et Java sont des marques déposées d'Oracle Corporation et/ou de ses affiliés. Tout autre nom mentionné peut correspondre à des marques appartenant à d'autres propriétaires qu'Oracle.

Intel et Intel Xeon sont des marques ou des marques déposées d'Intel Corporation. Toutes les marques SPARC sont utilisées sous licence et sont des marques ou des marques déposées de SPARC International, Inc. AMD, Opteron, le logo AMD et le logo AMD Opteron sont des marques ou des marques déposées d'Advanced Micro Devices. UNIX est une marque déposée de The Open Group.

Ce logiciel ou matériel et la documentation qui l'accompagne peuvent fournir des informations ou des liens donnant accès à des contenus, des produits et des services émanant de tiers. Oracle Corporation et ses affiliés déclinent toute responsabilité ou garantie expresse quant aux contenus, produits ou services émanant de tiers, sauf mention contraire stipulée dans un contrat entre vous et Oracle. En aucun cas, Oracle Corporation et ses affiliés ne sauraient être tenus pour responsables des pertes subies, des coûts occasionnés ou des dommages causés par l'accès à des contenus, produits ou services tiers, ou à leur utilisation, sauf mention contraire stipulée dans un contrat entre vous et Oracle.

Accès aux services de support Oracle

Les clients Oracle qui ont souscrit un contrat de support ont accès au support électronique via My Oracle Support. Pour plus d'informations, visitez le site <http://www.oracle.com/pls/topic/lookup?ctx=acc&id=info> ou le site <http://www.oracle.com/pls/topic/lookup?ctx=acc&id=trs> si vous êtes malentendant.

Contents

- Using This Documentation** 7
 - Product Documentation Library 7
 - Feedback 7

- Storage Server Features and Components** 9
 - Storage Server Integration Into Exadata 9
 - Storage Server Features 10
 - Storage Server Components 10
 - Front Panel Status Indicators, Connectors, and Drives 11
 - Front Panel With Twelve 3.5-inch Drives 11
 - Back Panel Status Indicators, Connectors, Drives, and PCIe Slots 12
 - Shipping Inventory 13
 - Spares Kit Components 14

- System Specifications** 15
 - Physical Specifications 15
 - Environmental Specifications 16
 - Power Specifications 17
 - Shipping Carton Space Requirements 17
 - Agency Compliance 18

- About Rack Installation** 19
 - Rack Installation Procedure Overview 19
 - Rack Requirements 20
 - Maintenance Space Requirements 21
 - Configuration Restrictions 21
 - Exadata Database Machine X5-2 Configuration Restrictions 21
 - Exadata Storage Expansion Rack X5-2 Configuration Restrictions 22

Installing the Storage Server Into a Rack	25
Installation Prerequisites	25
Safety Precautions When Rackmounting the Storage Server	26
ESD Precautions	27
Tools and Equipment Needed for Installation	27
Rackmount Kit Contents	28
Install the Storage Server Into the Rack	29
▼ Stabilize the Rack for Installation	29
▼ Install Mounting Brackets	30
▼ Mark the Rackmount Location	31
Connect AC Power Cables Before Installing Tool-less Slide-Rails in Sun Rack II 1042	33
▼ Install AC Power Cables and Slide-Rails	34
▼ Attach Tool-less Slide-Rail Assemblies	35
▼ Install the Storage Server Into the Slide-Rail Assemblies	38
▼ Install the Cable Management Arm	40
▼ Verify Operation of Slide-Rails and CMA	51
▼ Remove the Cable Management Arm	53
Cabling the Storage Server	59
Rear Cable Connections and Ports	59
Ethernet Ports	61
▼ Connect the Power Cords	62
Troubleshooting Installation Issues	65
References for Troubleshooting and Diagnostics	65
Technical Support Information Worksheet	66
Locating the Storage Server Serial Number	66
Locating the Exadata Database Machine Rack Serial Numbers and JobID Label	67
Index	69

Using This Documentation

- **Overview** – Contains hardware installation procedures for the Oracle Exadata Storage Server X5-2 High Capacity.
- **Audience** – Trained technicians and authorized service personnel who have been instructed on how to install the storage server into a rack.
- **Required knowledge** – Advanced experience with site preparations installing hardware.

Product Documentation Library

Documentation and resources for this product and related products are available at <https://www.oracle.com/goto/x5-2l/docs>.

Feedback

Provide feedback about this documentation at <https://www.oracle.com/goto/docfeedback>.

Storage Server Features and Components

This section describes the components, status indicators (LEDs), connectors, and disk management options for the storage server.

Description	Links
Review how the storage server fits into the Exadata Database Machine configuration.	“Storage Server Integration Into Exadata” on page 9
Review storage server features.	“Storage Server Features” on page 10
Review storage server components.	“Storage Server Components” on page 10
Locate status indicators, connectors, and storage drives on the storage server front and back panels.	“Front Panel Status Indicators, Connectors, and Drives” on page 11 “Back Panel Status Indicators, Connectors, Drives, and PCIe Slots” on page 12
Inspect the shipping cartons and contents of the ship kit.	“Shipping Inventory” on page 13
Review the contents of the Oracle Exadata Database Machine X5-2 spares kit.	“Spares Kit Components” on page 14

Storage Server Integration Into Exadata

The Oracle Exadata Storage Server X5-2 High Capacity is factory installed as part of your integrated Exadata Database Machine configuration. Use the information in this document only if you are adding additional storage servers to the Exadata rack configuration, or if you need to service components within the storage server. Service procedures for the storage server are documented in the *Oracle Exadata X5-2 Exadata Storage Server High Capacity Storage Server Service Manual*.

Storage Server Features

The Oracle Exadata Storage Server X5-2 High Capacity is an 12-slot 3.5-inch hard disk configuration designed in the Oracle Server X5-2L form factor with no changes to the chassis, motherboard, fans, PCIe slots, or rear IO. This configuration uses 12 slots in the disk cage. The chassis supports six Gen3 PCIe slots, two of which are x16 while the remaining four are x8.

Storage Server Components

TABLE 1 Oracle Exadata Storage Server X5-2 High Capacity Components

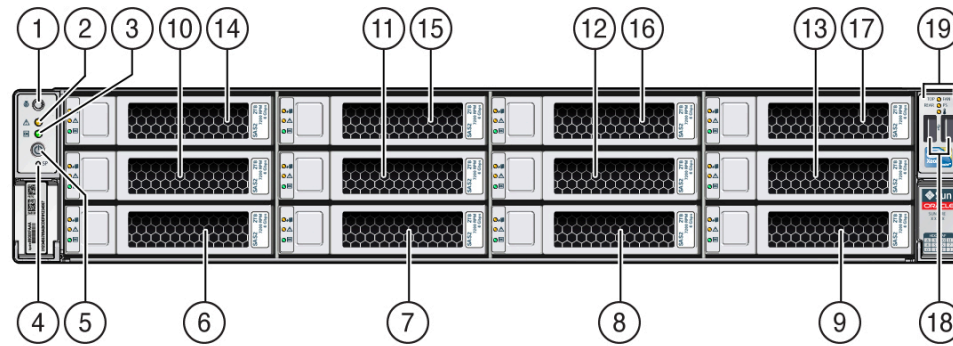
Feature	Description
Processor	8-core, 2.6 GHz, 85W Intel E5-2630 V3 processors
Memory	Two processors with four integrated DDR4 memory controllers per processor. Processors with the following capabilities are supported: Four 16-GB DIMMs and four 8-GB DIMMs for a total of 96 GB of memory. Only RDIMMs are supported.
Storage	Twelve 3.5-inch hot-pluggable SAS HDDs on the front panel.
PCI Express (PCIe) I/O slots	Six PCIe Gen3 slots that accommodate low-profile PCIe cards: - Slots 1, 2, 4, and 5: x8 electrical interface, contain NVMe PCIe Flash F160 cards. - Slot 3 contains a dedicated InfiniBand (IB) adapter. - Slot 6 contains a dedicated 12-GB SAS PCIe RAID HBA.
Ethernet ports	Four 10GBASE-T Gigabit Ethernet (10GbE) RJ-45 ports on the rear panel.
USB 2.0 ports	Two front, two rear, and two internal. Note - One internal USB port is preinstalled with a USB. The USB drive contains the GRUB boot loader for the operating system.
Video (VGA) ports	One rear high-density DB-15 video port.
Service processor (SP)	The storage server has an integrated service processor (SP). The SP provides IPMI 2.0-compliant remote management capabilities. The SP features: - Oracle Integrated Lights Out Manager (ILOM) 3.2.4 - Local Oracle ILOM command-line access using a serial connection - Support for Ethernet access to the SP through a dedicated, 10/100/1000BASE-T management port (NET MGT) and optionally through one of the host Ethernet ports (sideband management) - Support for remote KVMs (keyboard, video, mouse, and storage) over IP
Power supplies	Two hot-swappable and redundant 1000W power supplies.
Cooling Fans	Four 80-mm, hot-swappable fan modules. Each fan module contains two counter-rotating fan pairs. Each power supply has its own cooling fans.
Operating system	Exadata preinstalled operating system (OS) image located on hard disk drives 0, 1.

Front Panel Status Indicators, Connectors, and Drives

This section describes the status indicators (LEDs), connectors, and drives on the front panel of the Oracle Exadata Storage Server X5-2 High Capacity.

Front Panel With Twelve 3.5-inch Drives

The following figure shows the status indicators (LEDs), connectors, and drives on the front panel of a Oracle Exadata Storage Server X5-2 High Capacity configured with twelve 3.5-inch storage drives.



Call Out	Description
1	Locator LED/Locator button: white
2	Service Required LED: amber
3	Power/OK LED: green
4	Power button
5	SP OK LED: green
6	Storage drive 0
7	Storage drive 1
8	Storage drive 2
9	Storage drive 3
10	Storage drive 4
11	Storage drive 5
12	Storage drive 6

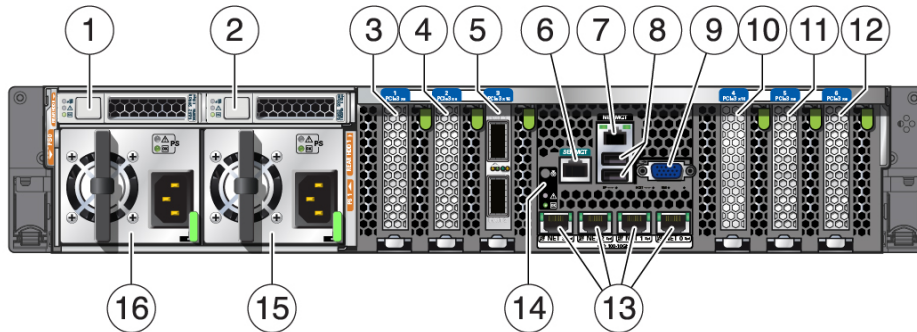
Call Out	Description
13	Storage drive 7
14	Storage drive 8
15	Storage drive 9
16	Storage drive 10
17	Storage drive 11
18	Service Required LEDs (3): Top: Fan Module (amber); Rear: Power Supply (amber); Overtemp Icon: System Over Temperature Warning (amber)
19	USB 2.0 connectors (2)

Related Information

- [“Back Panel Status Indicators, Connectors, Drives, and PCIe Slots” on page 12](#)
- [“Storage Server Components” on page 10](#)

Back Panel Status Indicators, Connectors, Drives, and PCIe Slots

This section shows the Oracle Exadata Storage Server X5-2 High Capacity back panel and describes its controls, connectors, and status indicators (LEDs).



Call Out	Description
1	Rear storage drive 0

Call Out	Description
2	Rear storage drive 1
3	PCIe slot 1 (Flash F160)
4	PCIe slot 2 (Flash F160)
5	Infiniband CX-3 Adapter card
6	Serial management (SER MGT)/RJ-45 serial port
7	Oracle Integrated Lights Out Manager (ILOM) service processor (SP) network management (NET MGT) 10/100/1000BASE-T port
8	USB 2.0 ports (2)
9	DB-15 video connector
10	PCIe slot 4 (Flash F160)
11	PCIe slot 5 (Flash F160)
12	PCIe slot 6 (SAS3 12Gb HBA)
13	Network (NET) 100/1000/10000 ports (NET3–NET0)
14	System status LEDs: Locator/Button: white; Service Required: amber; Power/OK: green
15	Power supply unit 1 (PSU1)
16	Power supply unit 0 (PSU0)

Related Information

- [“Front Panel Status Indicators, Connectors, and Drives” on page 11](#)
- [“Storage Server Components” on page 10](#)

Shipping Inventory

Inspect the shipping cartons 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 Oracle Exadata Storage Server X5-2 High Capacity includes the following items:

- Power cords, C13 outlet connector for rack PDU
- Rackmount kit containing rack rails and installation instructions
- Miscellaneous hardware, cables, and connectors
- Legal and safety documents

Related Information

- [“Shipping Inventory” on page 13](#)

Spares Kit Components

Oracle Exadata Database Machine X5-2 includes a spares kit. The contents of the spares kit include:

- One 1.2-TB 10,000-rpm high-performance SAS disk or one 4-TB 7,200-rpm high-capacity SAS disk
- One 800-GB Exadata Smart Flash card

Related Information

- [“Shipping Inventory” on page 13](#)
- [“Storage Server Components” on page 10](#)

System Specifications

This section provides the specifications for the Oracle Exadata Storage Server X5-2 system.

Description	Links
Review the storage server's physical specifications.	“Physical Specifications” on page 15
Review temperature, humidity, and other environmental requirements for the storage server.	“Environmental Specifications” on page 16
Review power requirements for the storage server.	“Power Specifications” on page 17
Review space requirements to transport the shipping cartons.	“Shipping Carton Space Requirements” on page 17
Review the storage server agency compliance	“Agency Compliance” on page 18

Related Information

- [“Storage Server Features and Components” on page 9](#)

Physical Specifications

The following table lists the physical specifications for the Oracle Exadata Storage Server X5-2 High Capacity.

TABLE 2 Oracle Exadata Storage Server X5-2 High Capacity Physical Specifications

Dimension	Storage Server Specification	Specification
Width	Storage cell chassis	44.5 cm (17.5 inches)
Depth	Maximum overall	73.7 cm (29 inches)
Height	2-rack unit (2U) nominal	8.76 cm (3.45 inches)
Weight	Fully populated storage server	29.03 kg (64 lb)

Related Information

- [“Rack Requirements” on page 20](#)

Environmental Specifications

The following table lists the temperature, humidity, and altitude specifications, as well as acoustic noise, vibration, and shock specifications.

TABLE 3 Environmental Specifications

Specification	Operating	Nonoperating	Optimum
Ambient temperature (Does not apply to removable media)	The ambient temperature for systems operating in an Exadata cabinet is 41°F to 90°F (5°C to 32°C) up to 2,953 feet (900 meters). Note - Maximum ambient operating temperature is derated by 1 degree C for every 300 meters elevation beyond 900 meters, up to a maximum altitude of 3,000 meters elevation.	–40°F to 158°F (–40°C to 70°C)	70°F to 74°F (21°C to 23°C)
Relative humidity	■ 10% to 90% noncondensing, short term 25°F to 113°F (–5°C to 55°C) ■ 5% to 90% noncondensing, but not to exceed 0.024 kg of water per kg of dry air (0.053 lbs water/2.205 lbs dry air)	Up to 93% noncondensing 100.4°F (38°C) maximum wet bulb	45% to 50% relative humidity
Altitude	Maximum 9,840 feet (3,000 meters) at 95°F (35°C) Note - In China markets, regulations may limit installations to a maximum altitude of 6,562 feet (2,000 meters).	Maximum 39,370 feet (12,000 meters)	
Acoustic Noise	■ Maximum condition: 8.1 Bels ■ Idle condition: 5.8 Bels	Not applicable	
Vibration	0.15 G (z-axis), 0.10 G (x-, y-axes), 5-500Hz swept sine IEC 60068-2-6 Test FC	0.5 G (z-axis), 0.25 G (x-, y-axes), 5-500Hz swept sine IEC 60068-2-6 Test FC	
Shock	3 Gs, 11 ms half-sine IEC 60068-2-27 Test Ea	Roll-off: 1.25-inch roll-off free fall, front to back rolling directions Threshold: 13 mm threshold height at 0.65 m/s impact velocity ETE-1010-02 Rev A	

Set conditions to the optimal temperature and humidity ranges to minimize the chance of downtime due to component failure. Operating the storage server for extended periods at or near the operating range limits, or installing it in an environment where it remains at or near nonoperating range limits could significantly increase hardware component failure.

Power Specifications

The storage server uses AC power. The values in the following table are the power supply specifications.

Note - The power dissipation numbers listed in the following table are the maximum rated power numbers for the power supply used in the system. The numbers are not a rating of the actual power consumption of the system.

TABLE 4 Power Supply Specifications

Parameter	AC Requirement
Voltage (nominal)	100 to 127/200 to 240 VAC
Input current (maximum)	12 A–8.5 A @ 100–127 VAC 5.7 A @ 200–240 VAC
Frequency	50/60 Hz (47 to 63 Hz range)

Shipping Carton Space Requirements

The following table lists the dimensions and weights for the shipping cartons that contain the Oracle Exadata Storage Server X5-2 High Capacity.

TABLE 5 Shipping Carton Specifications

Requirement	Specification
Shipping carton height	30.5 cm (12 inches)
Shipping carton width	59.9 cm (23.6 inches)
Shipping carton length	98.4 cm (38.7 inches)
Shipping carton weight	5.8 kg (12.8 lbs)

When the Oracle Exadata Storage Server X5-2 High Capacity is unloaded at your site, leave the storage server in its shipping carton until it arrives in its installation location. Use a separate

area in which to remove the packaging material to reduce particle contamination before entering the data center. Ensure that there is enough clearance and clear pathways for moving the storage cell from the unpacking area to the installation location.

Agency Compliance

The storage server complies with the following specifications.

Category	Relevant Standards
Regulations ^{†,‡}	■ Product Safety: UL/CSA 60950-1, EN 60950-1, IEC 60950-1 CB Scheme with all country differences ■ EMC ■ Emissions: FCC CFR 47 Part 15, ICES-003, EN55022, EN61000-3-2, EN61000-3-3 ■ Immunity: EN55024
Certifications [‡]	■ North America (NRTL) ■ European Union (EU) ■ International CB Scheme ■ BIS (India) ■ BSMI (Taiwan) ■ RCM (Australia) ■ CCC (PRC) ■ MSIP (Korea) ■ VCCI (Japan) ■ Customs Union EAC
European Union Directives	■ 2006/95/EC Low Voltage Directive ■ 2004/108/EC EMC Directive ■ 2011/65/EU RoHS Directive ■ 2012/19/EU WEEE Directive

[†]All standards and certifications referenced are to the latest official version. For additional detail, please contact your sales representative.

[‡]Other country regulations/certifications may apply.

About Rack Installation

This section provides an overview of the rack installation procedure.

Note - The Oracle Exadata Storage Server X5-2 High Capacity is factory installed as part of your integrated Exadata Database Machine configuration. If you are inserting additional storage servers into your Exadata configuration, use the rackmounting procedures in this document.

Description	Links
Review the entire installation procedure and find links to more information about each step.	“Rack Installation Procedure Overview” on page 19
Review rack requirements.	“Rack Requirements” on page 20
Review space requirements for maintenance of the storage server.	“Maintenance Space Requirements” on page 21
Review configuration restrictions for the Exadata Database Machine.	“Exadata Database Machine X5-2 Configuration Restrictions” on page 21
Review configuration restrictions for the Exadata Storage Expansion Rack.	“Exadata Storage Expansion Rack X5-2 Configuration Restrictions” on page 22

Rack Installation Procedure Overview

The following table lists the tasks you need to install the Oracle Exadata Storage Server X5-2 High Capacity into a rack.

Step	Description	Links
1	Review important safety documentation.	<i>Oracle Exadata Storage Server X5-2 High Capacity Safety and Compliance Guide</i>
2	Review the storage server rack specifications.	“Rack Requirements” on page 20
3	Review maintenance space requirements.	“Maintenance Space Requirements” on page 21
4	Review configuration restrictions.	“Configuration Restrictions” on page 21

Step	Description	Links
5	Review safety precautions for rackmounting a storage server.	“Safety Precautions When Rackmounting the Storage Server” on page 26
6	Gather the tools and equipment necessary for installation.	“Tools and Equipment Needed for Installation” on page 27
7	Ensure that all prerequisite tasks are complete before installation.	“Installation Prerequisites” on page 25
8	Install the storage server into a rack.	“Installing the Storage Server Into a Rack” on page 25
9	Attach data and storage server management cables to the storage server.	“Cabling the Storage Server” on page 59

Rack Requirements

The Oracle Exadata Storage Server X5-2 High Capacity is a 2 rack unit (2U) storage server that fits inside Oracle's Exadata rack. The rack specifications are listed in the following table.

TABLE 6 Exadata Rack Specifications

Requirement	Specification
Usable rack units	42
Height	199.8 cm (78.6 inches)
Width (with side panels)	60 cm (23.6 inches)
Depth	120 cm (47.24 inches)
(front door handle to rear door handle)	
Weight	150.6 kg (332 lbs)
Maximum dynamic load	1005 kg (2215 lbs)
Structure	Four-post rack (mounting at both front and rear). Supported rack types: square hole (9.5 mm) and round hole (M6 or 1/4-20 threaded only). Two-post racks are not compatible.
Rack horizontal opening and unit vertical pitch	Conforms to ANSI/EIA 310-D-1992 or IEC 60927 standards.
Distance between front and rear mounting planes	Minimum 61 cm and maximum 91.5 cm (24 inches to 36 inches).
Clearance depth in front of front mounting plane	Distance to front cabinet door is at least 2.54 cm (1 inch).
Clearance depth behind front mounting plane	Distance to rear cabinet door is at least 90 cm (35.43 inches) with the cable management arm, or 80 cm (31.49 inches) without the cable management arm.
Clearance width between front and rear mounting planes	Distance between structural supports and cable troughs is at least 45.6 cm (18 inches).

Requirement	Specification
Minimum clearance for service access	Clearance, front of storage server: 123.2 cm (48.5 inches)
	Clearance, rear of storage server: 91.4 cm (36 inches)

The minimum ceiling height for the cabinet is 230 cm (90 inches), measured from the true floor or raised floor, whichever is higher. An additional 91.4 cm (36 inches) is for top clearance. The space above the cabinet and its surroundings must not restrict the movement of cool air between the air conditioner and the cabinet, or the movement of hot air coming out of the top of the cabinet.

Maintenance Space Requirements

The maintenance area for the rackmounted Oracle Exadata Storage Server X5-2 High Capacity must have the required access space. The following table lists the maintenance access requirements for the storage server when it is installed in a rack.

TABLE 7 Maintenance Access Requirements

Location	Maintenance Access Requirement
Rear of the storage server	91.4 cm (36 inches)
Area above the rack	91.4 cm (36 inches)
Front of the storage server	123.2 cm (48.5 inches)

Configuration Restrictions

There are restrictions for adding servers to the Oracle Exadata Database Machine. The following sections describe the restrictions for flexible configurations:

- [“Exadata Database Machine X5-2 Configuration Restrictions” on page 21](#)
- [“Exadata Storage Expansion Rack X5-2 Configuration Restrictions” on page 22](#)

Exadata Database Machine X5-2 Configuration Restrictions

The following restrictions apply to Exadata Database Machine X5-2 flexible configurations:

- Up to 22 servers can be installed in the rack, within a total of 38 rack units.

- At least three storage servers must be installed in the rack.
- Up to 18 Exadata Storage Servers are supported in the rack. In this configuration, there are two database servers installed in the rack.
- Rack units U01, U20, U21, and U22 are reserved for the Cisco and Sun Datacenter InfiniBand Switch 36 switches.
- Database servers are installed in the rack in the following order:
 1. Up to 4 servers in U16 to U19, starting with U16.
 2. Up to 4 servers in U23 to U26, starting with U23.
 3. Up to 7 servers in U39 to U27, starting with U39. The servers in these rack units are separated by 1 rack unit, with solid fillers between the servers.
 4. Up to 7 servers in U14 to U02, starting with U14. The servers in these rack units are separated by 1 rack unit, with solid fillers between the servers. No Exadata storage servers are installed in the rack.
- Exadata storage servers are installed in the rack in the following order:
 1. Up to 3 storage servers in U02 to U07, starting with U02.
 2. Up to 4 storage servers in U08 to U15, starting with U08.
 3. Up to 7 storage servers in U27 to U40, starting with U27.
 4. Up to 2 storage servers in U26 to U30, starting with U26 (if no Database servers installed in these rack units).
 5. Up to 2 storage servers in U19 to U16, starting with U19 (if no Database servers installed in these rack units).
 6. 1 storage server in U41 to U42.

Exadata Storage Expansion Rack X5-2 Configuration Restrictions

The following restrictions apply to Oracle Exadata Storage Expansion Rack X5-2 flexible configurations:

- Up to 19 Exadata storage servers are supported in the rack.
- Oracle Exadata Storage Expansion Rack X5-2 cannot be converted to Oracle Exadata Database Machine X5-2 rack.
- Rack units U01, U20, U21, and U22 are reserved for the Cisco and Sun Datacenter InfiniBand Switch 36 switches.
- Exadata storage servers are installed in the rack in the following order:
 1. Up to 3 storage servers in U02 to U07, starting with U02.

2. Up to 4 storage servers in U08 to U15, starting with U08.
3. Up to 7 storage servers in U27 to U40, starting with U27.
4. Up to 2 storage servers in U26 to U23, starting with U26.
5. Up to 2 storage servers in U19 to U16, starting with U19.
6. 1 storage server in U41 to U42.

Installing the Storage Server Into a Rack

This section describes how to install the storage server into a rack using the rail assembly in the rackmount kit. Perform these procedures if you are inserting additional storage servers into your Exadata Database Machine configuration.

Description	Links
Complete all installation prerequisite tasks.	“Installation Prerequisites” on page 25
Review safety precautions.	“Safety Precautions When Rackmounting the Storage Server” on page 26
Review ESD precautions.	“ESD Precautions” on page 27
Gather the tools and equipment needed to install the storage server into a rack.	“Tools and Equipment Needed for Installation” on page 27
Verify that you have received all components in the rackmount kit.	“Rackmount Kit Contents” on page 28
Install the storage server into the rack.	“Install the Storage Server Into the Rack” on page 29

Related Information

- [“About Rack Installation” on page 19](#)
- [“System Specifications” on page 15](#)

Installation Prerequisites

Ensure that the following tasks are complete before you start the rackmount procedures:

- Read the *Oracle Exadata Storage Server X5-2 High Capacity Safety and Compliance Guide* and the *Important Safety Information for Oracle Hardware Systems*.
- Ensure that your site meets the required electrical and environmental requirements. See [“System Specifications” on page 15](#).

Safety Precautions When Rackmounting the Storage Server

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



Caution - Leveling feet position: When unpacking at the installation site, or when repackaging and moving the rack to a new location, verify that the leveling feet are up before moving the rack.



Caution - Stabilize Rack: Deploy the anti-tilt bar or legs on the equipment rack before beginning an installation.



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



Caution - Elevated operating ambient temperature: If the storage server is installed in a closed or multi-unit rack assembly, the operating ambient temperature of the rack environment might be greater than room ambient temperature. Therefore, consideration should be given to installing the equipment in an environment compatible with the maximum ambient temperature (T_{ma}) specified for the storage server. For storage server environmental requirements, see [“Environmental Specifications” on page 16](#).



Caution - Reduced airflow: Installation of the equipment in a rack should be such that the amount of airflow required for safe operation of the equipment is not compromised.



Caution - Mechanical loading: Mounting of the equipment in the rack should be such that a hazardous condition is not created due to uneven mechanical loading.



Caution - Circuit overloading: Consideration should be given to the connection of the equipment to the supply circuit and the effect that overloading of the circuits might have on over-current protection and supply wiring. Appropriate consideration of equipment nameplate power ratings should be used when addressing this concern.



Caution - Reliable earthing: Reliable earthing of rackmounted equipment should be maintained. Particular attention should be given to supply connections other than direct connections to the branch circuit (for example, use of power strips).



Caution - Mounted Equipment: Slide-rail-mounted equipment is not to be used as a shelf or a work space.

Related Information

- [“ESD Precautions” on page 27](#)

ESD Precautions

Electronic equipment is susceptible to damage by static electricity. Use a grounded antistatic wrist strap, foot strap, or equivalent safety equipment to prevent electrostatic discharge (ESD) when you install or service the storage server.



Caution - To protect electronic components from electrostatic damage, which can permanently disable the system or require repair by service technicians, 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.

Read the safety information in the *Oracle Exadata Storage Server X5-2 High Capacity Safety and Compliance Guide* and in the *Important Safety Information for Oracle® Hardware Systems* before installing the storage server.

Tools and Equipment Needed for Installation

To install the storage server, you must have the following tools:

- No. 2 Phillips screwdriver
- ESD mat and grounding strap

In addition, you must provide a system console device, such as one of the following:

- ASCII terminal
- Workstation
- Terminal server
- Patch panel connected to a terminal server

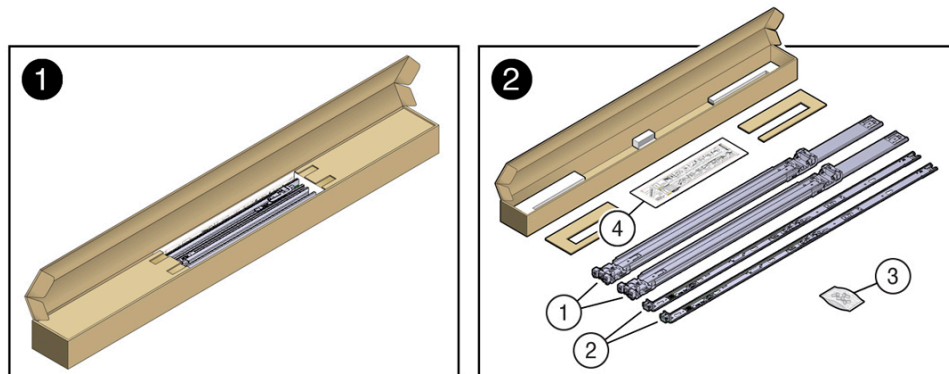
Related Information

- [“Installing the Storage Server Into a Rack” on page 25](#)

Rackmount Kit Contents

The rackmount kit contains two slide-rails, two mounting brackets, and optional securing screws.

Note - Refer to the rackmount kit installation card for simplified instructions about installing your storage server into a four-post rack, using the slide-rail and cable management arm options.



Call Out	Description
1	Slide-rails
2	Mounting brackets
3	Four M4 x 5 fine-pitch mounting bracket securing screws (not used)
4	Installation card

Related Information

- [“Rack Requirements” on page 20](#)

Install the Storage Server Into the Rack

Use the following procedures to add the storage server to the rack:

- “Stabilize the Rack for Installation” on page 29
- “Install Mounting Brackets” on page 30
- “Mark the Rackmount Location” on page 31
- “Connect AC Power Cables Before Installing Tool-less Slide-Rails in Sun Rack II 1042” on page 33
- “Attach Tool-less Slide-Rail Assemblies” on page 35
- “Install the Storage Server Into the Slide-Rail Assemblies” on page 38
- “Verify Operation of Slide-Rails and CMA” on page 51
- “Install the Cable Management Arm” on page 40

▼ Stabilize the Rack for Installation



Caution - To reduce the risk of personal injury, stabilize the rack cabinet, and extend all anti-tilt devices before installing the storage server.

Refer to 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 impinge on the mounting bay.

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.**



Caution - When moving the rack to a new location, including repacking, verify that the leveling feet are up before moving the rack.

4. After the cabinet is installed in its location, you can use the shipping brackets to secure the cabinet to the floor.



Caution - Shipping brackets are not for use for bracing or anchoring the rack during seismic events.

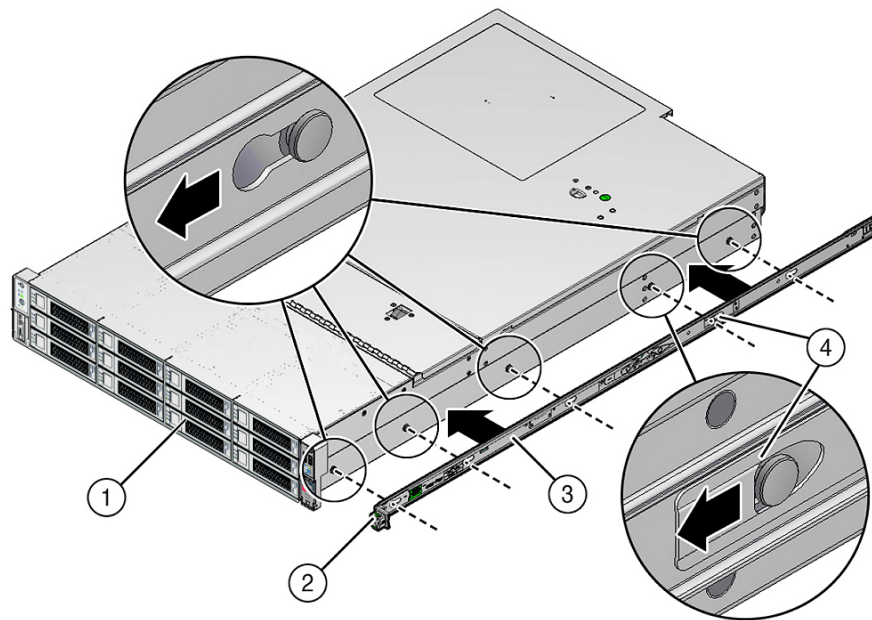
Related Information

- [“Safety Precautions When Rackmounting the Storage Server” on page 26](#)
- [“System Specifications” on page 15](#)
- Your rack cabinet documentation
- *Oracle Exadata Storage Server X5-2 High Capacity Safety and Compliance Guide*

▼ Install Mounting Brackets

To install the mounting brackets onto the sides of the storage server:

1. **Position a mounting bracket against the chassis so that the slide-rail lock is at the storage server front, and the five keyhole openings on the mounting bracket are aligned with the five locating pins on the side of the chassis.**



Call Out	Description
1	Chassis front
2	Slide-rail lock
3	Mounting bracket
4	Mounting bracket clip

2. With the heads of the five chassis locating pins protruding through the five keyhole openings in the mounting bracket, pull the mounting bracket toward the front of the chassis until the mounting bracket clip locks into place with an audible click.
3. Verify that the rear locating pin has engaged the mounting bracket clip.
4. Repeat [Step 1](#) through [Step 3](#) to install the remaining mounting bracket on the other side of the storage server.

Related Information

- [“Mark the Rackmount Location” on page 31](#)
- [“Attach Tool-less Slide-Rail Assemblies” on page 35](#)

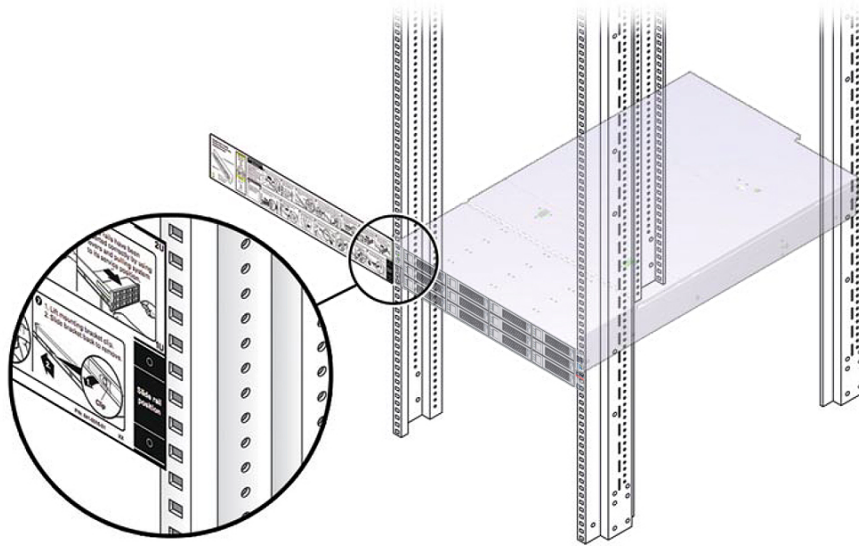
▼ Mark the Rackmount Location

Use the rackmount installation card to identify the correct mounting holes for the slide-rails.

Note - Load the rack from bottom to top.

1. Ensure that there is enough vertical space in the cabinet to install the storage server.
See [“Rack Requirements” on page 20](#).
2. Place the rackmount installation card against the front rails.

The bottom edge of the card corresponds to the bottom edge of the storage server. Measure up from the bottom of the installation card.



3. **Mark the mounting holes for the front slide-rails.**
4. **Mark the mounting holes for the rear slide-rails.**

Related Information

- [“Rack Requirements” on page 20](#)
- [“Install Mounting Brackets” on page 30](#)
- [“Attach Tool-less Slide-Rail Assemblies” on page 35](#)

Connect AC Power Cables Before Installing Tool-less Slide-Rails in Sun Rack II 1042

Note - You must perform the procedure in this section if you are installing the storage server in the Sun Rack II 1042 (1000-mm) system rack. This procedure does not need to be performed if you are installing the storage server in the Sun Rack II 1242 system rack.

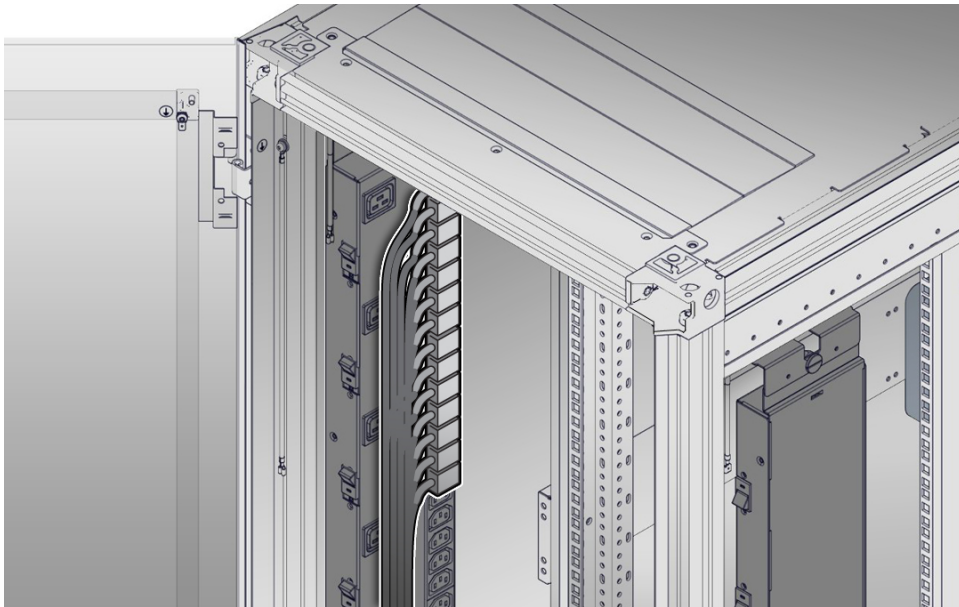
Right-angle AC power cables must be installed before slide-rails when installing the storage server into a Sun Rack II 1042 (1000-mm) system rack. The standard rail kit tool-less slide-rails impede access to the 15kVA and 22kVA Power Distribution Unit (PDU) electrical sockets in the 1000-mm rack. If you use the standard AC power cables and then install the slide-rails into the rack, you will be unable to disconnect or remove the AC power cables.

You must use the following 2-meter right-angle AC power cable for this procedure:

- 7079727 - Pwrcord, Jmpr, Bulk, SR2, 2m, C14RA, 10A, C13

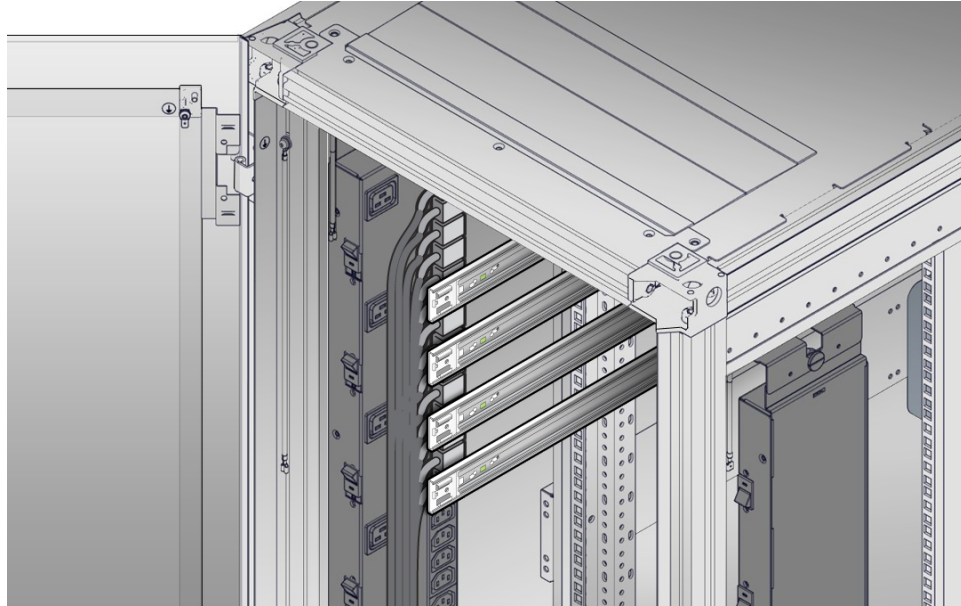
▼ Install AC Power Cables and Slide-Rails

1. Prior to installing the slide-rails into the rack, install right-angle AC power cables into the left-side and right-side PDU electrical sockets for the servers you are going to rack mount.



2. Install the slide-rails into the rack.

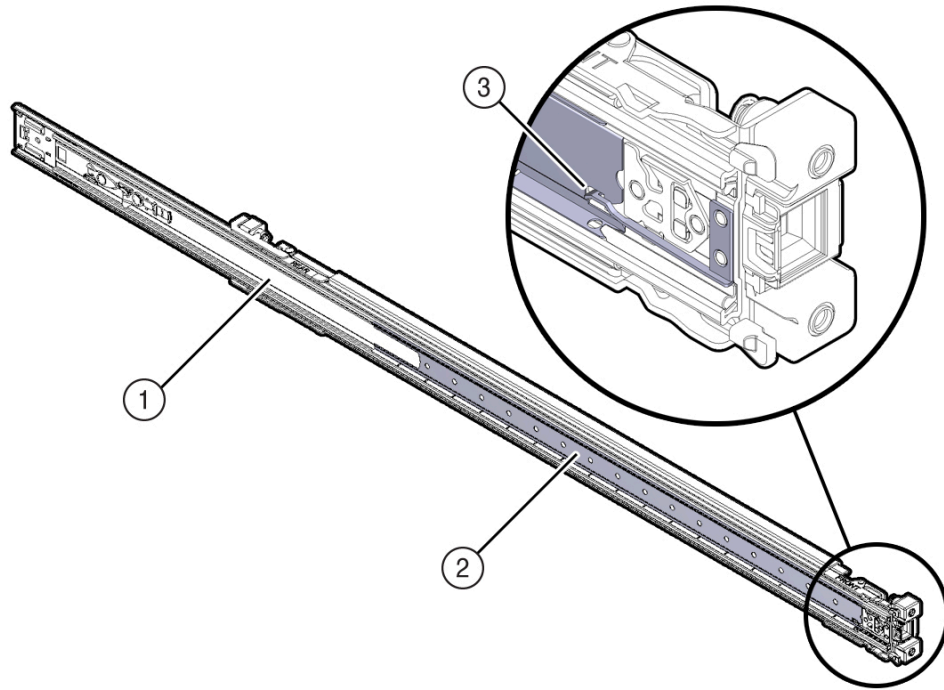
See [“Attach Tool-less Slide-Rail Assemblies”](#) on page 35.



▼ Attach Tool-less Slide-Rail Assemblies

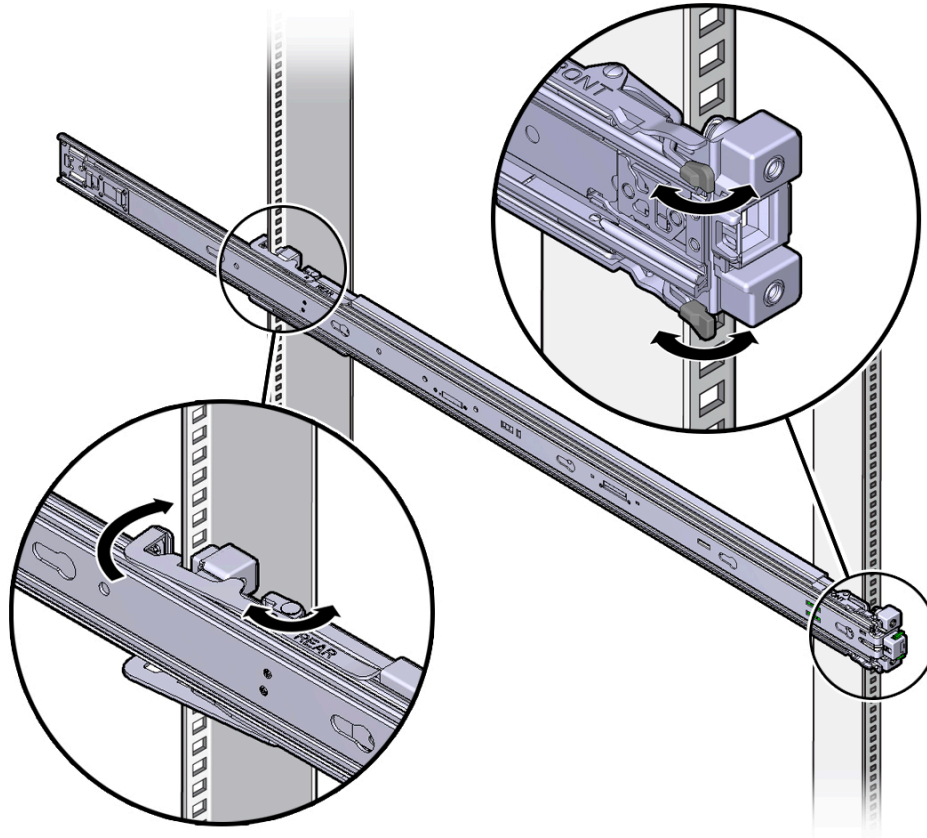
Use this procedure to attach tool-less slide-rail assemblies to the rack.

1. **Orient the slide-rail assembly so that the ball-bearing track is forward and locked in place.**



Callout	Description
1	Slide-rail
2	Ball-bearing track
3	Locking mechanism

2. Starting with either the left or right side of the rack, align the rear of the slide-rail assembly against the inside of the rear rack rail, and push until the assembly locks into place with an audible click.



3. Align the front of the slide-rail assembly against the outside of the front rack rail, and push until the assembly locks into place with an audible click.
4. Repeat [Step 1](#) through [Step 3](#) to attach the slide-rail assembly to the other side of the rack.

Related Information

- [“Install Mounting Brackets” on page 30](#)

- [“Mark the Rackmount Location” on page 31](#)
- [“Install the Storage Server Into the Slide-Rail Assemblies” on page 38](#)

▼ Install the Storage Server Into the Slide-Rail Assemblies

Use this procedure to install the storage server chassis, with mounting brackets, into the slide-rail assemblies that are mounted to the rack.



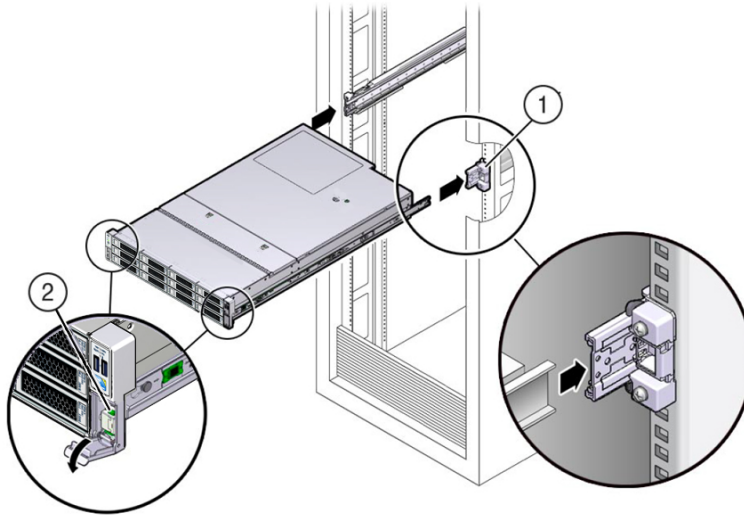
Caution - This procedure requires a minimum of two people because of the weight of the storage server. Attempting this procedure alone could result in equipment damage or personal injury.



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

1. **Push the slide-rails into the slide-rail assemblies in the rack as far as possible.**
2. **Position the storage server so that the rear ends of the mounting brackets are aligned with the slide-rail assemblies that are mounted in the rack.**

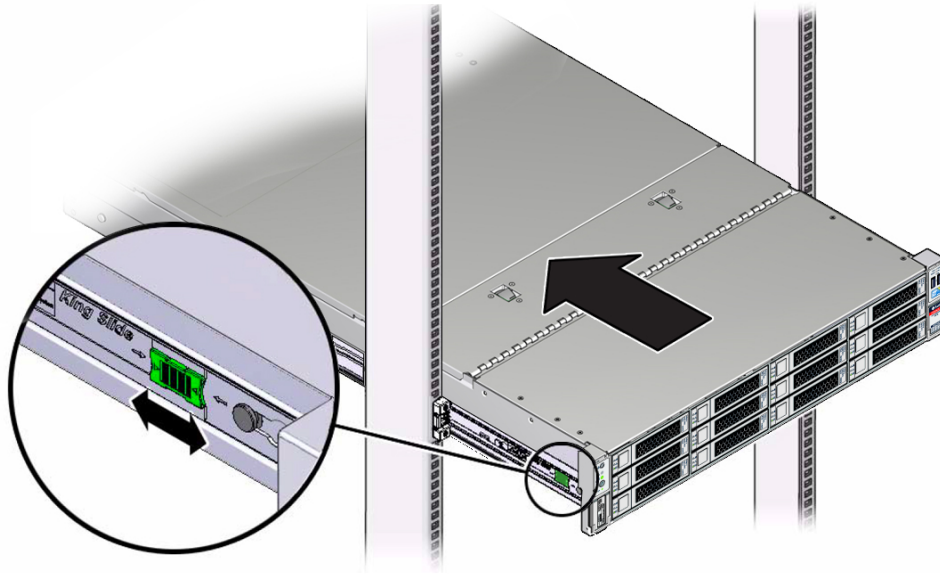
3. Insert the mounting brackets into the slide-rails, and then push the storage server into the rack until the mounting brackets encounter the slide-rail stops (approximately 12 inches, or 30 cm).



Call Out	Description
1	Inserting mounting bracket into slide-rail
2	Slide-rail release lever

4. Simultaneously pull down and hold the slide-rail release levers on each mounting bracket while you push the storage server into the rack. Continue pushing the storage server into the rack until the slide-rail locks (on the front of the mounting brackets) engage the slide-rail assemblies.

You will hear an audible click.



Caution - Verify that the storage server is securely mounted in the rack and that the slide-rail locks are engaged with the mounting brackets before you install the optional cable management arm.

Related Information

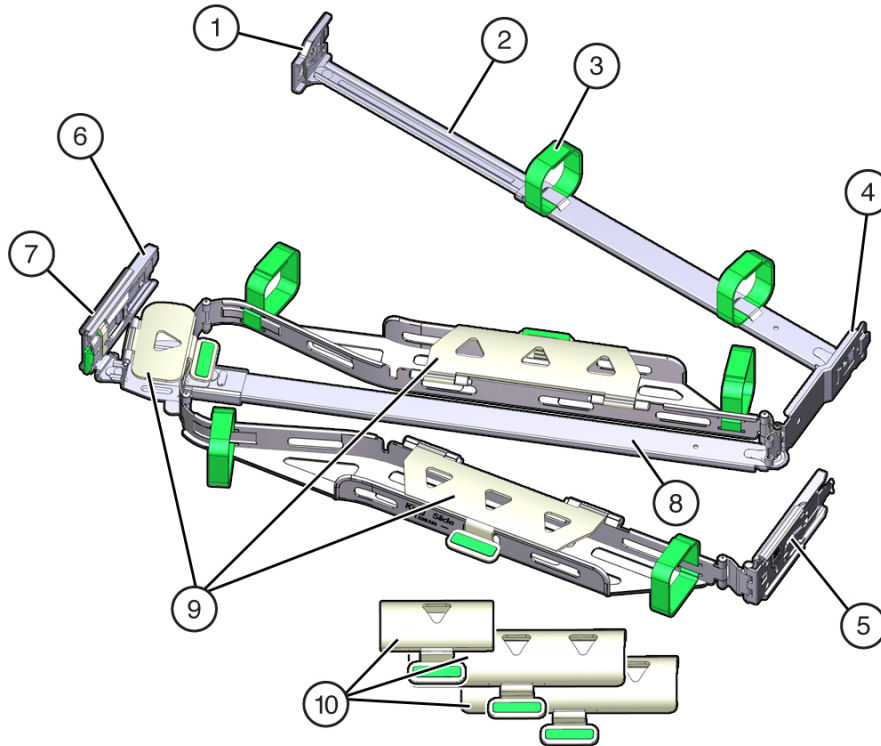
- [“Install the Cable Management Arm” on page 40](#)
- [“Verify Operation of Slide-Rails and CMA” on page 51](#)

▼ Install the Cable Management Arm

Follow this procedure to install the cable management arm (CMA), which you can use to manage cables connected to the rear of the storage server.

1. **Unpack the CMA.**

The following figure shows the CMA components.



Call Out	Description
1	Connector A
2	Front slide bar
3	Velcro straps (6)
4	Connector B
5	Connector C
6	Connector D
7	Slide-rail latching bracket (used with connector D)
8	Rear slide bar
9	Oracle Storage Server X5-2 cable covers
10	Oracle Storage Server X5-2L cable covers

2. **Ensure that the flat cable covers are installed on the CMA.**
3. **Ensure that the six Velcro straps are threaded into the CMA as shown in the figure in [Step 1](#).**

Note - Ensure that the two Velcro straps located on the front slide bar are threaded through the opening in the top of the slide bar as shown in the figure in [Step 1](#). This prevents the Velcro straps from interfering with the expansion and contraction of the slide bar when the storage server is extended out of the rack and returned into the rack.

4. **To make it easier to install the CMA, extend the storage server approximately 13 cm (5 inches) out of the front of the rack.**
5. **Take the CMA to the back of the equipment rack, and ensure that you have adequate room to work at the back of the storage server.**

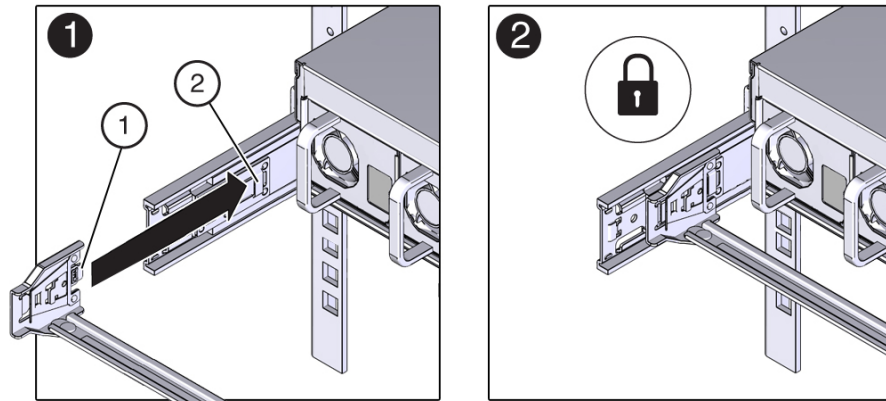
Note - References to “left” or “right” in this procedure assume that you are facing the back of the equipment rack.

Note - Throughout this installation procedure, support the CMA and do not allow it to hang under its own weight until it is secured at all four attachment points.

6. **To install the CMA's connector A into the right slide-rail:**
 - a. **Insert the CMA's connector A into the front slot on the left slide-rail until it locks into place with an audible click [frames 1 and 2].**

The connector A tab (see callout 1) goes into the slide-rail's front slot (callout 2).

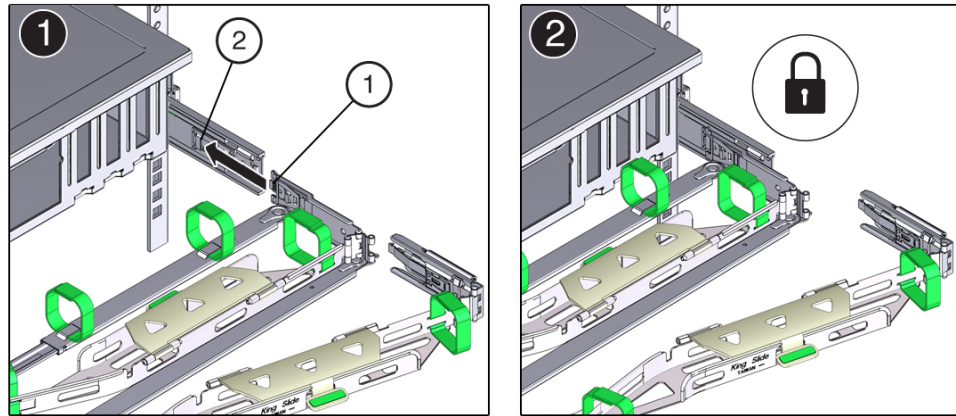
- b. Gently tug on the right side of the front slide bar to verify that connector A is properly seated.



Call Out	Description
1	Connector A tab
2	Left slide-rail front slot

7. To install the CMA's connector B into the right slide-rail:
- a. Insert the CMA's connector B into the front slot on the right slide-rail until it locks into place with an audible click [frames 1 and 2].
- The connector B tab (see callout 1) goes into the slide-rail's front slot (callout 2).

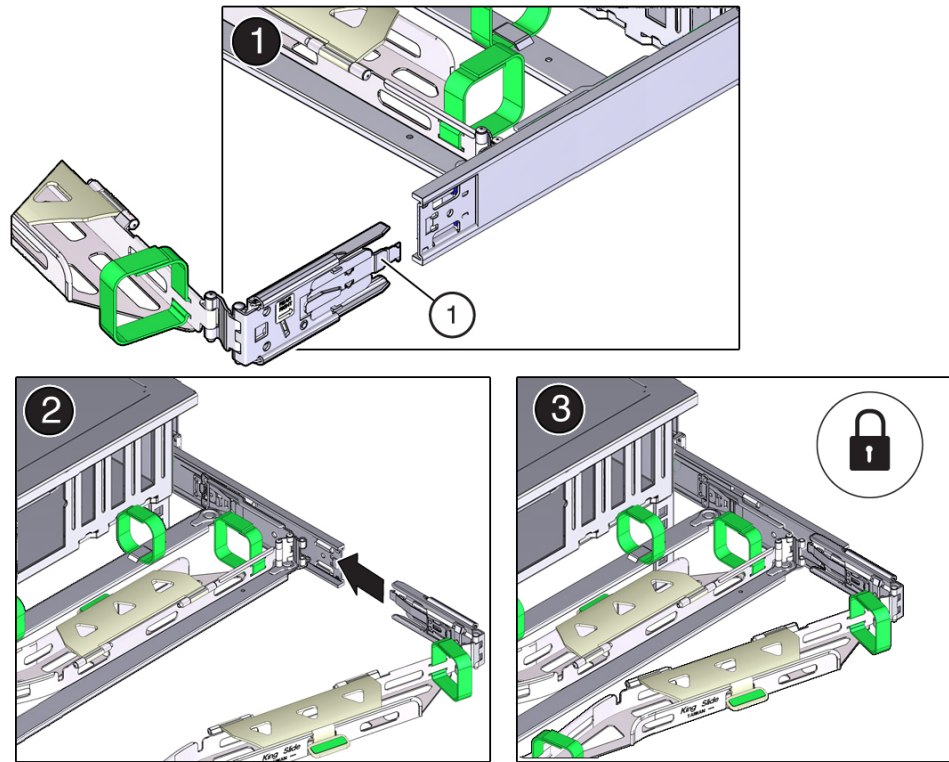
- b. Gently tug on the right side of the front slide bar to verify that connector B is properly seated.



Call Out	Description
1	Connector B tab
2	Right slide-rail front slot

8. To install the CMA's connector C into the right slide-rail:

- a. Align connector C with the slide-rail so that the locking spring (callout 1) is positioned inside (storage server side) of the right slide-rail [frame 1].

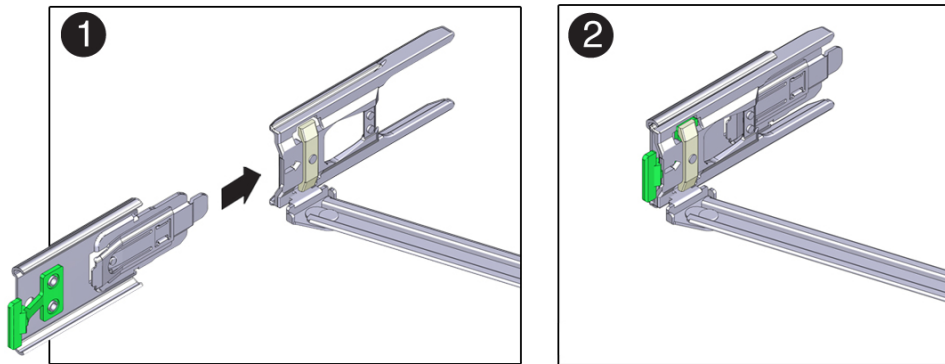


Call Out	Description
1	Connector C locking spring

- b. Insert connector C into the right slide-rail until it locks into place with an audible click [frames 2 and 3].
- c. Gently tug on the right side of the CMA's rear slide bar to verify that connector C is properly seated.

9. To prepare the CMA's connector D for installation, remove the tape that secures the slide-rail latching bracket to connector D and ensure that the latching bracket is properly aligned with connector D [frames 1 and 2].

Note - The CMA is shipped with the slide-rail latching bracket taped to connector D. You must remove the tape before you install this connector.

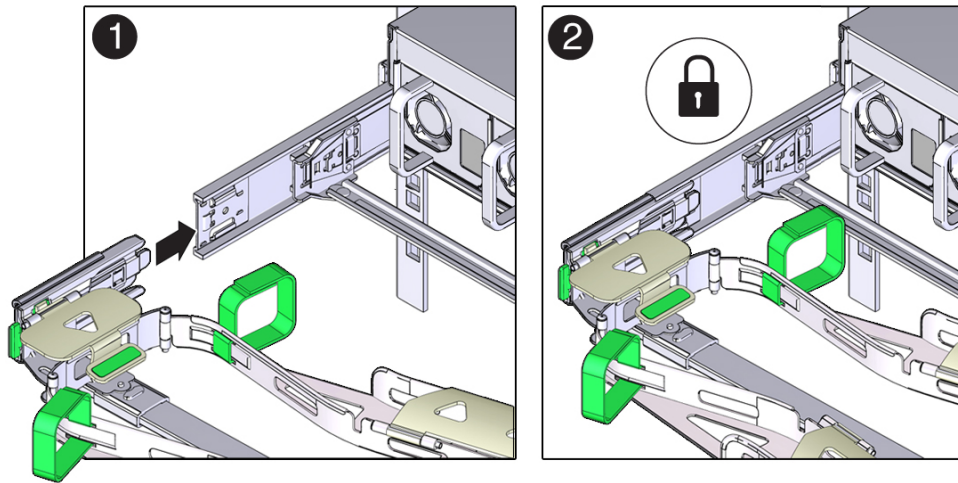


10. To install the CMA's connector D into the left slide-rail:
 - a. While holding the slide-rail latching bracket in place, insert connector D and its associated slide-rail latching bracket into the left slide-rail until connector D locks into place with an audible click [frames 1 and 2].

Note - When inserting connector D into the slide-rail, the preferred and easier method is to install connector D and the latching bracket as one assembly into the slide-rail.

- b. Gently tug on the left side of the CMA's slide bar to verify that connector D is properly seated.

Note - The slide-rail latching bracket has a green release tab. This tab is used to release and remove the latching bracket so that you can remove connector D.



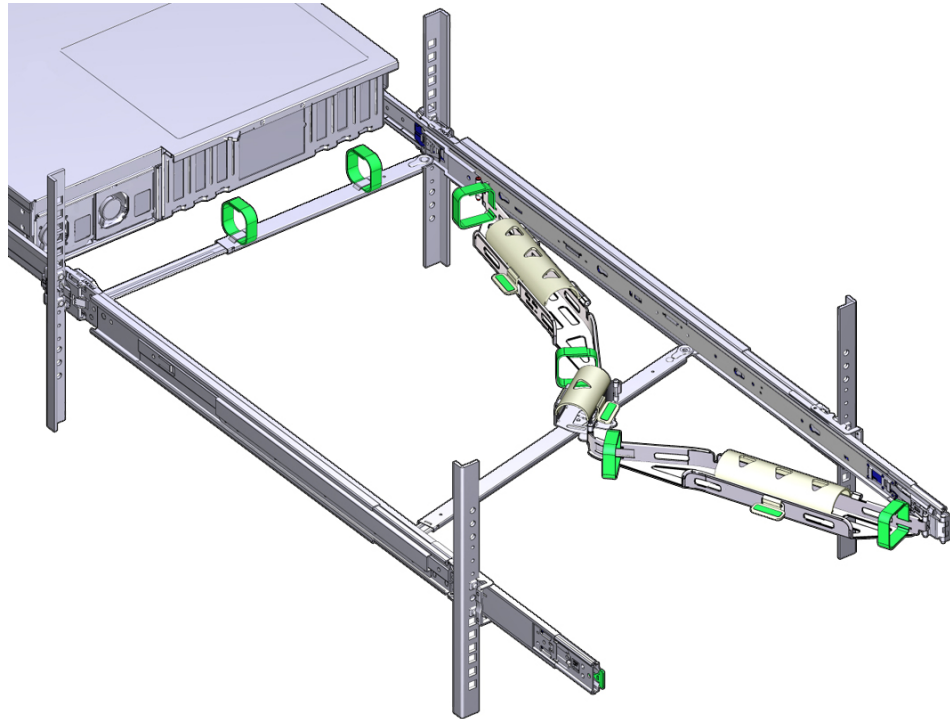
11. Gently tug on the four CMA connection points to ensure that the CMA connectors are fully seated before you allow the CMA to hang by its own weight.
12. To verify that the slide-rails and the CMA are operating properly before routing cables through the CMA:
 - a. Extend all rack anti-tilt devices to prevent the rack from tipping forward when the storage server is extended.



Caution - To reduce the risk of personal injury, stabilize the rack cabinet and extend all anti-tilt devices before extending the storage server from the rack.

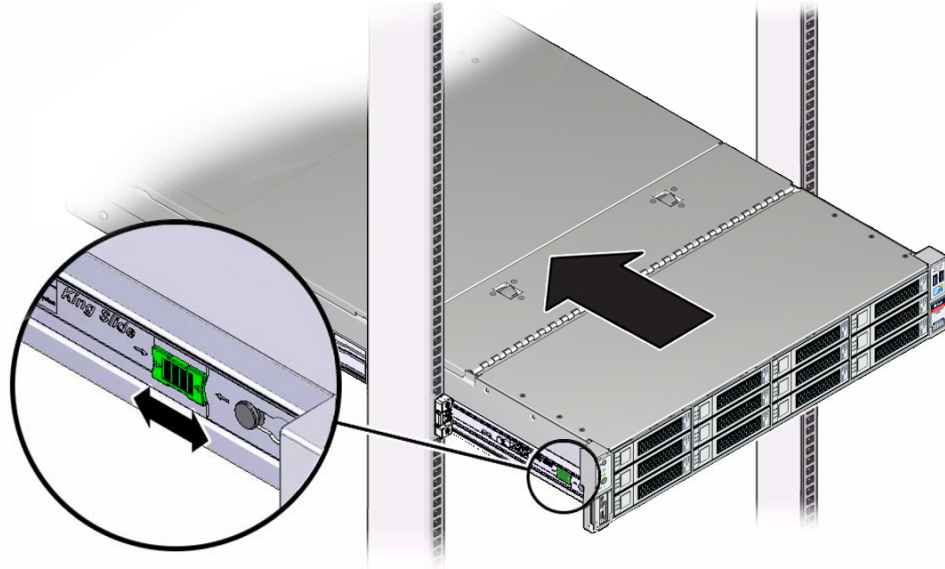
For instructions for stabilizing the rack, see [“Stabilize the Rack for Installation” on page 29](#).

- b. Extend the storage server from the front of the rack until the CMA is fully extended.**



- 13. To return the storage server to the rack:**
 - a. Simultaneously pull and hold the two green release tabs (one on each side of the storage server) toward the front of the storage server while you push the storage server into the rack. As you push the storage server into the rack, verify that the CMA retracts without binding.**

Note - To pull the green release tabs, place your finger in the center of each tab, not on the end, and apply pressure as you pull the tab toward the front of the storage server.



- b. Continue pushing the storage server into the rack until the slide-rail locks (on the front of the storage server) engage the slide-rail assemblies.**

You will hear an audible click when the storage server is in the normal rack position.

- 14. Connect cables to the storage server, as required.**

Instructions for connecting the storage server cables are provided in [“Cabling the Storage Server” on page 59](#).

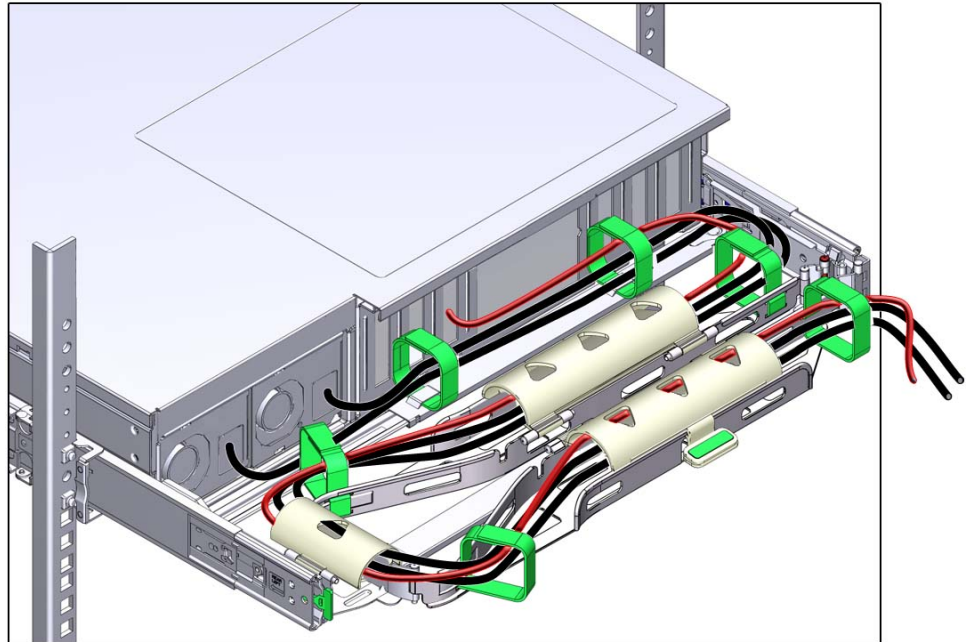
- 15. Open the CMA cable covers, route storage server cables through the CMA's cable troughs, close the cable covers, and secure the cables with the six Velcro straps.**

Route the cables through the cable troughs in this order:

- a. First through the front-most cable trough.**

- b. Then through the small cable trough.
- c. Then through the rear-most cable trough

Note - When securing the cables with the Velcro straps located on the front slide bar, ensure that the Velcro straps do not wrap around the bottom of the slide bar; otherwise, expansion and contraction of the slide bar might be hindered when the storage server is extended from the rack and returned to the rack.



16. Ensure that the secured cables do not extend above the top or below the bottom of the storage server to which they are attached; otherwise, the cables might snag on other equipment installed in the rack when the storage server is extended from the rack or returned to the rack.

Note - If necessary, bundle the cables with additional Velcro straps to ensure that they stay clear of other equipment. If you need to install additional Velcro straps, wrap the straps around the cables only, not around any of the CMA components; otherwise, expansion and contraction of the CMA slide bars might be hindered when the storage server is extended from the rack and returned to the rack.

17. Proceed to [“Verify Operation of Slide-Rails and CMA” on page 51.](#)

Related Information

- [“Verify Operation of Slide-Rails and CMA” on page 51](#)
- [“Remove the Cable Management Arm” on page 53](#)

▼ Verify Operation of Slide-Rails and CMA

Use the following procedure to ensure that the slide-rails and CMA are operating correctly.

Note - Two people should perform this procedure: one to move the storage server in and out of the rack, and one to observe the cables and CMA.

1. To prevent the rack from tipping forward when the storage server is extended, extend all rack anti-tilt devices.



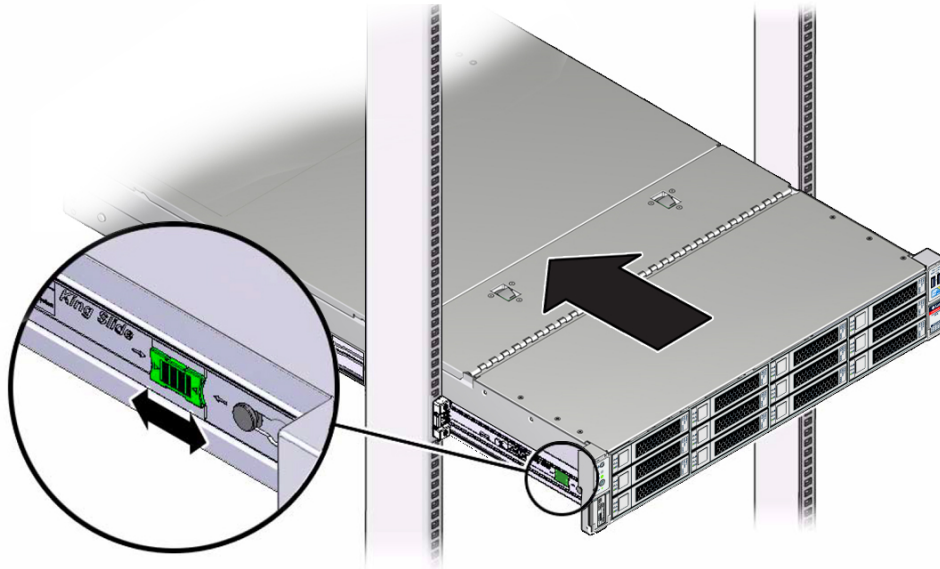
Caution - To reduce the risk of personal injury, stabilize the rack cabinet and extend all anti-tilt devices before extending the storage server from the rack.

For instructions for stabilizing the rack, see [“Stabilize the Rack for Installation” on page 29.](#)

2. Slowly pull the storage server out of the rack until the slide-rails reach their stops.
3. Inspect the attached cables for any binding or kinks.
4. Verify that the CMA extends fully with the slide-rails.
5. To return the storage server back to the rack:
6. Simultaneously pull and hold the two green release tabs (one on each side of the storage server) toward the front of the storage server while you push the

storage server into the rack. As you push the storage server into the rack, verify that the CMA retracts without binding.

Note - To pull the green release tab, place your finger in the center of the tab, not on the end, and apply pressure as you pull the tab toward the front of the storage server.



7. **Continue pushing the storage server into the rack until the slide-rail locks (on the front of the storage server) engage the slide-rail assemblies.**
You will hear an audible click when the storage server is in the normal rack position.
8. **Adjust the cable straps and the CMA, as required.**

Related Information

- [“Install the Storage Server Into the Slide-Rail Assemblies” on page 38](#)
- [“Install the Cable Management Arm” on page 40](#)

▼ Remove the Cable Management Arm

Follow this procedure to remove the cable management arm (CMA).

Before you begin this procedure, refer to the figure in [Step 1](#), and identify CMA connectors A, B, C, and D. You should disconnect the CMA connectors in the reverse order in which you installed them, that is, disconnect connector D first, then C, then B, and finally A.

Throughout this procedure, once you disconnect any of the CMA's four connectors, do not allow the CMA to hang under its own weight.

Note - References to “left” or “right” in this procedure assume that you are facing the back of the equipment rack.

1. **To prevent the rack from tipping forward when the storage server is extended, extend all rack anti-tilt devices.**



Caution - To reduce the risk of personal injury, stabilize the rack cabinet and extend all anti-tilt devices before extending the storage server from the rack.

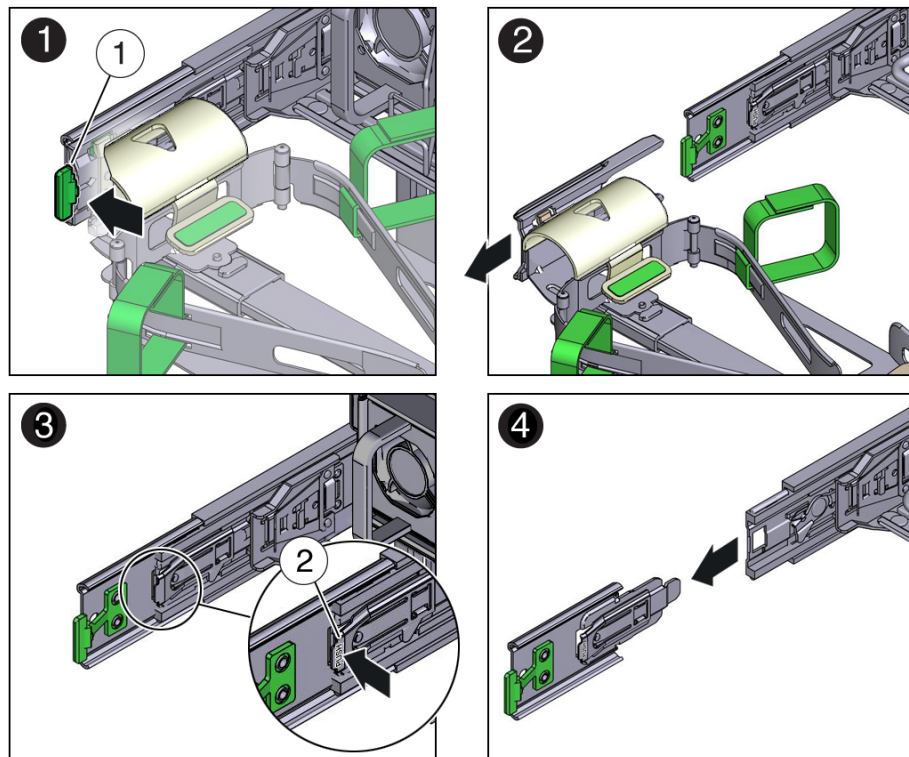
For instructions for stabilizing the rack, see [“Stabilize the Rack for Installation” on page 29](#).

2. **Disconnect all cables from the rear of the storage server.**
3. **To make it easier to remove the CMA, extend the storage server approximately 13 cm (5 inches) out of the front of the rack.**
4. **To remove the cables from the CMA:**
 - a. **If applicable, remove any additional Velcro straps that were installed to bundle the cables.**
 - b. **Unwrap the six Velcro straps that are securing the cables.**
 - c. **Open the three cable covers to the fully opened position.**
 - d. **Remove the cables from the CMA and set them aside.**
5. **To disconnect connector D:**

- a. **Press the green release tab (callout 1) on the slide-rail latching bracket toward the left and slide the connector D out of the left slide-rail [frames 1 and 2].**

When you slide connector D out of the left slide-rail, the slide-rail latching bracket portion of the connector remains in place. You will disconnect it in the next step.

Note - Once you have disconnected connector D, you must not allow the CMA to hang under its own weight. Throughout the remainder of this procedure, the CMA must be supported until all the remaining connectors are disconnected and the CMA can be placed on a flat surface.



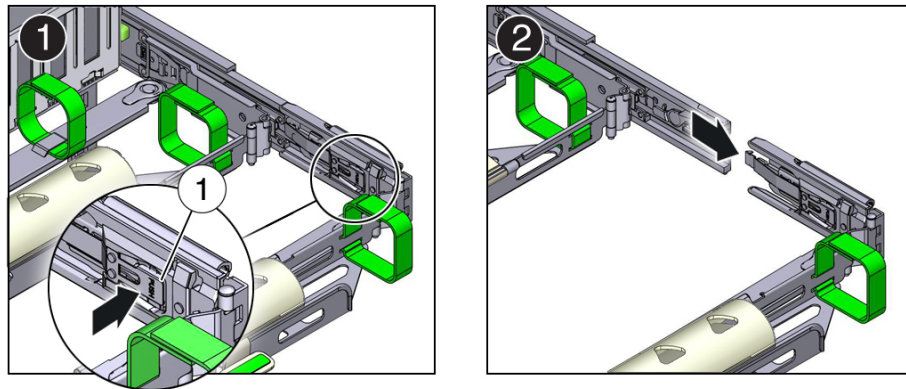
Call Out	Description
1	Connector D release tab (green)

Call Out	Description
2	Slide-rail latching bracket release tab (labeled PUSH)

- b. Use your right hand to support the CMA and use your left thumb to push in (toward the left) on the connector D latching bracket release tab labeled PUSH (callout 2), and pull the latching bracket out of the left slide-rail and put it aside [frames 3 and 4].

6. To disconnect connector C:

- a. Place your left arm under the CMA to support it.
 - b. Use your right thumb to push in (toward the right) on the connector C release tab labeled PUSH (callout 1), and pull connector C out of the right slide-rail [frames 1 and 2].

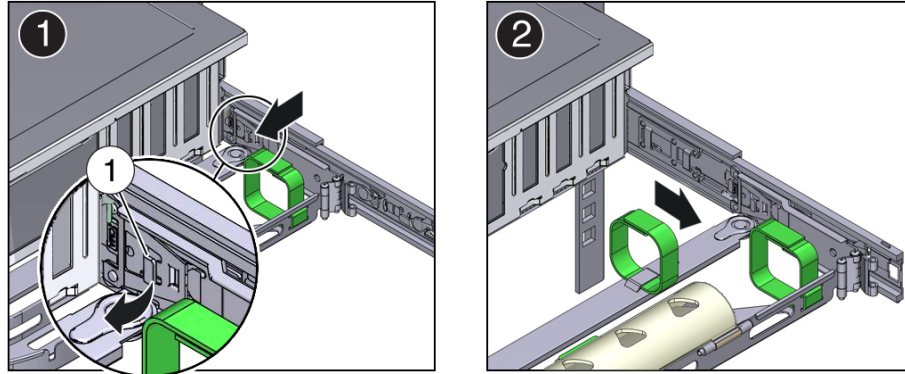


Call Out	Description
1	Connector C release tab (labeled PUSH)

7. To disconnect connector B:

- a. Place your right arm under the CMA to support it and grasp the rear end of connector B with your right hand.

- b. Use your left thumb to pull the connector B release lever to the left away from the right slide-rail (callout 1) and use your right hand to pull the connector out of the slide-rail [frames 1 and 2].

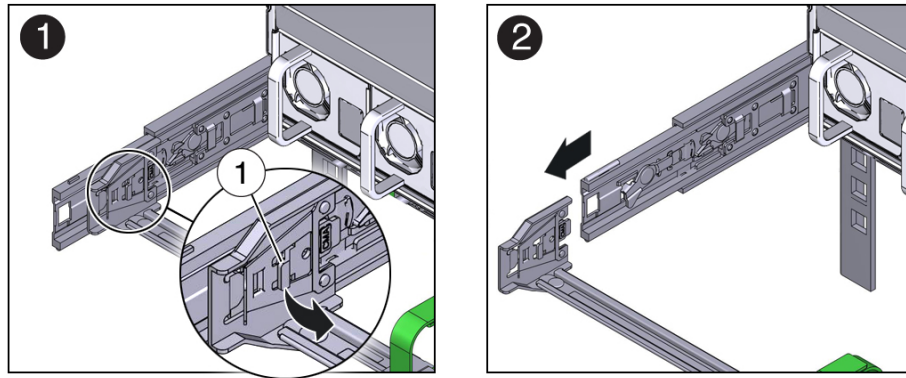


Call Out	Description
1	Connector B release lever

8. To disconnect connector A:

- a. Place your left arm under the CMA to support it and grasp the rear end of connector A with your left hand.

- b. Use your right thumb to pull the connector A release lever to the right away from the left slide-rail (callout 1), and use your left hand to pull the connector out of the slide-rail [frames 1 and 2].



Call Out	Description
1	Connector A release lever

9. Remove the CMA from the rack and place it on a flat surface.
10. Go to the front of the storage server and push it back into the rack.

Related Information

- [“Install the Cable Management Arm” on page 40](#)

Cabling the Storage Server

This section contains procedures for connecting data and storage server management cables and power cords to the storage server.

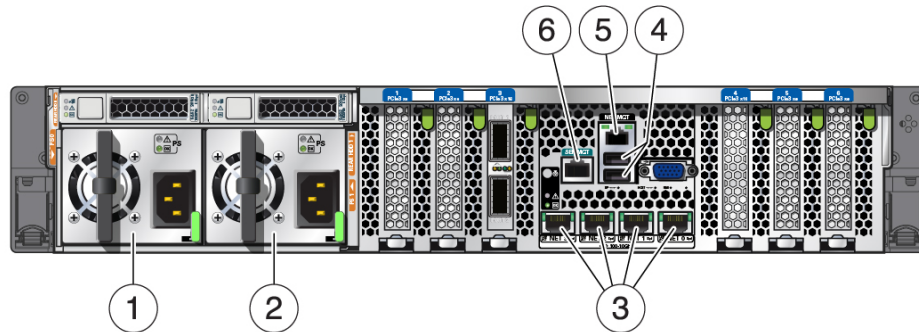
Description	Links
Review connector port locations.	“Rear Cable Connections and Ports” on page 59
Learn about storage server Ethernet ports.	“Ethernet Ports” on page 61
Connect power cords to the storage server.	“Connect the Power Cords” on page 62

Related Information

- [“Rack Installation Procedure Overview” on page 19](#)
- [“Install the Cable Management Arm” on page 40](#)

Rear Cable Connections and Ports

The following figure shows the locations of cable connectors and ports on the back of the Oracle Exadata Storage Server X5-2 High Capacity and the cables and devices that you would typically connect to them.



No.	Cable Port or Expansion Slot	Description
1	Power supply 0 input power	The storage server has two power supply connectors, one for each power supply. Do not attach power cables to the power supplies until you have finished connecting the data cables to the storage server. The storage server goes into standby power mode, and the Oracle ILOM service processor initializes when the AC power cables are connected to the power source. System messages might be lost after 60 seconds if the storage server is not connected to a terminal, PC, or workstation. Note - Oracle ILOM will signal a fault on any installed power supply that is not connected to an AC power source, since it might indicate a loss of redundancy.
2	Power supply 1 input power	The storage server has two power supply connectors, one for each power supply. Do not attach power cables to the power supplies until you have finished connecting the data cables to the storage server. The storage server goes into standby power mode, and the Oracle ILOM service processor initializes when the AC power cables are connected to the power source. System messages might be lost after 60 seconds if the storage server is not connected to a terminal, PC, or workstation. Note - Oracle ILOM will signal a fault on any installed power supply that is not connected to an AC power source, since it might indicate a loss of redundancy.
3	Ethernet ports (NET 3, NET 2, NET 1, NET 0)	The four 10-Gigabit Ethernet ports enable you to connect the system to the network. See “Ethernet Ports” on page 61 for more information.
4	USB ports (USB 0, USB 1)	The two USB ports support hot-plugging. You can connect and disconnect USB cables and peripheral devices while the storage server is running without affecting system operations.
5	Network management port (NET MGT)	The service processor NET MGT port is the optional connection to the Oracle ILOM service processor. The NET MGT port is configured by default to use Dynamic Host Configuration Protocol (DHCP). The service processor NET MGT port uses an RJ-45 cable for a 10/100/1000BASE-T connection.

No.	Cable Port or Expansion Slot	Description
6	Serial management port (SER MGT)	The service processor SER MGT port uses an RJ-45 cable and is the default connection to the Oracle ILOM service processor. This port supports local connections to the storage server and only recognizes Oracle ILOM command-line interface (CLI) commands. Typically you connect a terminal or terminal emulator to this port. Note - This port does not support network connections.

Related Information

- [“Ethernet Ports” on page 61](#)
- [“Connect the Power Cords” on page 62](#)

Ethernet Ports

The storage server has four RJ-45 10-Gigabit Ethernet (10GbE) network connectors, labeled NET 3, NET 2, NET 1, and NET 0, from left to right on the storage server rear panel. Use these ports to connect the storage server to the network.

The LEDs located above each NET port are Link/Activity (left) and Speed (right) indicators for each port. The following table lists the Ethernet transfer rates and the Speed LED color.

Connection Type	IEEE Terminology	Speed LED Color	Transfer Rate
Fast Ethernet	100BASE-TX	Off	100 Mbits/sec
Gigabit Ethernet	1000BASE-T	Amber	1,000 Mbits/sec
10 Gigabit Ethernet	10GBASE-T	Green	10,000 Mbits/sec

Related Information

- [“Rear Cable Connections and Ports” on page 59](#)
- [“Connect the Power Cords” on page 62](#)

▼ Connect the Power Cords



Caution - Do not connect the power cords to the storage server until the you have made the SP and host networking connections. The storage server includes a service processor (SP) that is used to configure and boot the host system. Connecting the SP and host networking cables first enables you to properly configure the host system and view SP messages.

1. **For each installed power supply, connect one grounded storage server power cord to a grounded electrical outlet.**

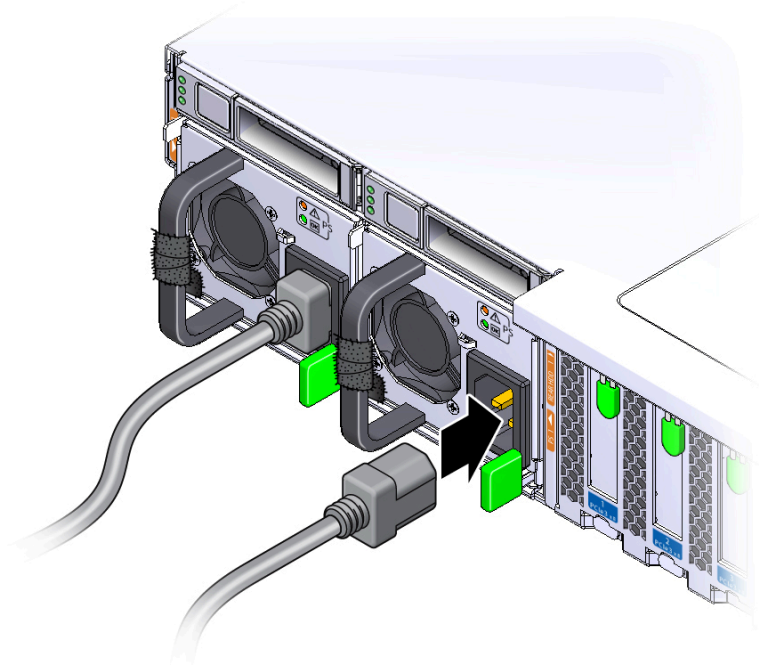
Note - The storage server is equipped with two power supplies. Connect them to separate power sources to provide power redundancy. The storage server can operate with one power source; however, having only one power source reduces the redundancy.

2. **Connect the storage server power cords to the power supply AC connectors on the back panel of the storage server and use a Velcro strap to secure them to the storage server.**

When power is connected, the storage server boots into standby power mode:

- The SP OK/Fault LED flashes while the SP is starting, and the main Power/OK LED remains off until the SP is ready.
- After a few minutes, the main Power/OK LED slowly flashes the standby blink pattern (0.1 seconds on, 2.9 seconds off), indicating that the SP (and Oracle ILOM) is ready for use. In standby power mode, the storage server is not initialized or fully powered on at this point.

For the location of the status indicator LEDs, see [“Front Panel Status Indicators, Connectors, and Drives”](#) on page 11 and [“Back Panel Status Indicators, Connectors, Drives, and PCIe Slots”](#) on page 12.



Caution - Do not operate the storage server unless all fans, component heatsinks, air baffles, and the top cover are installed. Damage to storage server components can occur if the storage server is operated without adequate cooling mechanisms.

Note - Do not apply main power to the rest of the storage server until you are ready to configure a preinstalled operating system or perform a fresh installation of an operating system. At this point, power is supplied only to the SP and the power supply fans.

Related Information

- [“Rear Cable Connections and Ports”](#) on page 59
- [“Ethernet Ports”](#) on page 61

Troubleshooting Installation Issues

This section provides troubleshooting information, a technical support worksheet, and information about the location of the system serial number.

Description	Links
References for troubleshooting and diagnostics.	“References for Troubleshooting and Diagnostics” on page 65
Gather information and contact technical support.	“Technical Support Information Worksheet” on page 66
Locate the system serial number.	“Locating the Storage Server Serial Number” on page 66

Related Information

- [“Rack Installation Procedure Overview” on page 19](#)
- Oracle Integrated Lights Out Manager (ILOM) 3.2 Documentation Library at: <https://www.oracle.com/goto/ilom/docs>

References for Troubleshooting and Diagnostics

The *Oracle Server X5-2L Service Manual* provides product-specific information about troubleshooting problems, refer to [“Troubleshooting and Diagnostics” in *Oracle Exadata Storage Server X5-2 High Capacity Service Manual*](#)

Knowledge articles, white papers, and product updates are available through the Oracle Support portal:

<https://support.oracle.com>

Technical Support Information Worksheet

If the troubleshooting information fails to solve your problem, use the following table to collect information that you might need to communicate to Oracle Service personnel.

System Configuration Information Needed	Your Information
Service contract number	
System model	
Operating system	
System serial number (For instructions for locating this number, see “Locating the Storage Server Serial Number” on page 66.)	
Peripherals attached to the system	
Email address and phone number for you and a secondary contact	
Street address where the system is located	
Superuser password	
Summary of the problem and the work being done when the problem occurred	
IP address	
Server name (system host name)	
Network or Internet domain name	
Proxy server configuration	

Locating the Storage Server Serial Number

During a service call, you might need your storage server's serial number. Record this number for future use. Use one of the following methods to locate your storage server's serial number:

- On the front panel of the storage server, look to the left side of the chassis and below the status LEDs.
- Locate the Customer Information Sheet (CIS) attached to your storage server packaging. This sheet includes the serial number.
- From the Oracle ILOM CLI, type the `show /System` command.

Related Information

- [“Front Panel Status Indicators, Connectors, and Drives” on page 11](#)

Locating the Exadata Database Machine Rack Serial Numbers and JobID Label

During a service call, you might need the serial numbers and the JobID label from the Exadata Database Machine rack. Record these numbers for future use. You will find the system serial numbers and JobID label in the following physical locations:

- Look for the Large System Serial Number label and JobID label on the front of the rack, inside the door, on the left vertical strut starting at rack unit (RU) 23 and going down.
- Look for the Small System Serial Number label on the top left portion of the cabinet from the rear above the power distribution unit (PDU).

Related Information

- [“Front Panel Status Indicators, Connectors, and Drives” on page 11](#)

Index

A

agency compliance specifications, 18

C

cable management arm (CMA)
 installing on storage server, 40
 uninstalling, 53
 verifying operation, 51
cabling, required cable connections, 59

D

documentation
 for server, 7

E

environmental specifications, 16

I

installing storage server
 spares kit components, 14
installing storage server into a rack, 25
installing storage server, tools required, 27

M

mounting brackets, installing, 30

P

physical specifications, 15

R

rack installation, 25
rackmount
 kit, 25
 rail assembly, 25
 stabilizing the rack, 29, 47, 51, 53
rail assembly, 25

S

shipping cartons
 checking for damage, 13
shipping cartons contents, 13
slide-rails
 verifying operation, 51
spares kit components, installing, 14
specifications
 agency compliance, 18
 physical, 15
support worksheet, 66

T

tool-less slide-rail assemblies, installing, 35

W

worksheet, support, 66

