

# Oracle® MiniCluster S7-2 Installation Guide

**ORACLE®**

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# Contents

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<b>Using This Documentation</b> .....	9
Product Documentation Library .....	9
Feedback .....	9
<b>Installation and Configuration Checklists</b> .....	11
Pre-Installation Checklist .....	11
Hardware Installation and Cabling Checklist .....	12
Software Configuration Checklist .....	13
<b>Preliminary Tasks</b> .....	15
Initial Configuration Tasks .....	15
Using the Initial Configuration Tool .....	15
▼ Without Using the Initial Configuration Tool .....	33
▼ Download the MiniCluster Component Bundle .....	36
<b>Understanding the MiniCluster</b> .....	39
Understanding the Compute Node .....	39
Overview (Compute Node) .....	39
Front Panel Components (Compute Node) .....	41
Rear Panel Components (Compute Node) .....	42
Understanding the Storage Array .....	43
Front Panel Components (Storage Array) .....	43
Rear Panel Components (Storage Array) .....	45
HDD/SSD Drives (Storage Array) .....	46
<b>Confirming Specifications</b> .....	47
Confirming Specifications (Compute Node) .....	47
Physical Specifications (Compute Node) .....	47

Electrical Specifications (Compute Node) .....	48
Environmental Specifications (Compute Node) .....	48
Airflow Precautions (Compute Node) .....	49
Confirming Specifications (Storage Array) .....	50
Physical Specifications (Storage Array) .....	50
Electrical Specifications (Storage Array) .....	50
Environmental Specifications (Storage Array) .....	51
Airflow Precautions (Storage Array) .....	51
<b>Preparing for Installation</b> .....	<b>53</b>
Preparing to Install the Compute Node .....	53
Shipping Kit (Compute Node) .....	53
Handling Precautions (Compute Node) .....	54
ESD Precautions (Compute Node) .....	55
Installation Tools (Compute Node) .....	55
Preparing to Install the Storage Array .....	56
Precautions (Storage Array) .....	56
Installation Tools (Storage Array) .....	57
<b>Installing the MiniCluster</b> .....	<b>59</b>
Stabilizing the Rack .....	59
Rack Compatibility .....	59
Rack Cautions .....	60
▼ Stabilize the Rack .....	61
Installing the Compute Node .....	62
▼ Install the Rackmount Hardware .....	63
▼ Mark the Rackmount Location .....	65
▼ Install AC Power Cables and Slide-Rails .....	66
▼ Attach Tool-less Slide-Rail Assemblies .....	67
▼ Install the Compute Node Into the Slide-Rail Assemblies .....	70
▼ Install the Cable Management Arm .....	72
▼ Remove the Cable Management Arm .....	83
Installing the Storage Array .....	88
▼ Install the Rail Kit .....	89
▼ Install the Storage Array in the Rack .....	95

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<b>Connecting Cables</b> .....	99
Identifying Ports (Compute Node) .....	99
USB Ports .....	100
SER MGT Port .....	100
NET MGT Port .....	101
Gigabit Ethernet Ports .....	102
SAS Ports (Compute Node) .....	103
SAS Ports (Storage Array) .....	105
Understanding MiniCluster Connections .....	105
▼ Connect the Management Network .....	106
Connect the 10GbE Client Access Network .....	107
▼ Connect to the 10GbE Client Access Network Through 10GbE NIC .....	108
▼ Connect to the 10GbE Client Access Network Through NET 2/NET 3 Ports .....	109
▼ Connect the 10GbE Private Network .....	111
▼ Connect the Base Storage Array to the Compute Nodes .....	112
▼ Connect Additional Storage Arrays to the Compute Nodes .....	114
▼ Connect the SER MGT Cable .....	117
<b>Powering On MiniCluster for the First Time</b> .....	119
▼ Connect the Power Cords .....	119
Oracle ILOM System Console (Compute Node) .....	121
Power On MiniCluster .....	121
▼ Power On the Storage Array .....	122
▼ Power On the Compute Nodes for the First Time .....	123
<b>Configuring the MiniCluster</b> .....	125
Software Configuration Overview .....	125
▼ Assign a Static IP Address to the NET MGT Port .....	126
▼ Log In To Compute Node 1 (Oracle ILOM) .....	128
▼ Copy Configuration Files to Compute Node 1 .....	129
▼ Perform Initial Configuration .....	130
▼ (If Needed) Download and Install the MiniCluster Core Software .....	137
▼ Transfer and Install the MiniCluster Component Bundle .....	138
▼ Log In To the MCMU BUI for the First Time .....	140
▼ Create the Install Administrator Account .....	143
▼ Approve the New Install Administrator Account .....	144

▼ Finish Setting Up the Install Administrator Account .....	145
▼ Finish Setting Up the Supervisor Account .....	147
▼ Set Up MiniCluster .....	148
<b>Creating a Database Virtual Machine Group (Initial Installation) .....</b>	<b>153</b>
Understanding the Database Virtual Machine Group .....	153
Database Virtual Machine Group Profile Overview .....	154
Database Home Overview .....	159
Database Instance Overview .....	160
▼ Create a Database Virtual Machine Group Profile .....	163
▼ Deploy a Database Virtual Machine Group .....	172
▼ Create a Database Home .....	174
▼ Create a Database Instance .....	175
<b>Creating an Application Virtual Machine Group (Initial Installation) .....</b>	<b>179</b>
Understanding Application Virtual Machine Groups .....	179
Application Virtual Machine Group Overview .....	179
Virtual Machines Overview .....	180
▼ Create an Application Virtual Machine Group .....	181
<b>Performing Post-Installation Configurations .....</b>	<b>191</b>
▼ Configure the Oracle Engineered System Hardware Manager Password .....	191
▼ Configure the mctuner Notification Email Address .....	191
<b>Index .....</b>	<b>193</b>



## Using This Documentation

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- **Overview** – Describes how to install and configure Oracle's MiniCluster S7-2 hardware and software
- **Audience** – System administrators and authorized service providers
- **Required knowledge** – Advanced experience installing enterprise servers

## Product Documentation Library

Documentation and resources for this product and related products are available at <https://docs.oracle.com/en/engineered-systems/minicluster-s7-2/>.

## Feedback

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



# Installation and Configuration Checklists

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Following are checklists that you can use to verify that you have completed the necessary tasks to install and configure your MiniCluster:

- [“Pre-Installation Checklist” on page 11](#)
- [“Hardware Installation and Cabling Checklist” on page 12](#)
- [“Software Configuration Checklist” on page 13](#)

## Pre-Installation Checklist

Order	Procedure	Description	Task Completed?
1.	Gather system-specific networking configuration information and enter into DNS.	<ul style="list-style-type: none"> <li>■ Download the Initial Configuration tool and enter the necessary information into the tool, including:                             <ul style="list-style-type: none"> <li>■ Management network information:                                     <ul style="list-style-type: none"> <li>■ DNS servers</li> <li>■ NTP servers</li> <li>■ Default router</li> </ul> </li> <li>■ Client access network information:                                     <ul style="list-style-type: none"> <li>■ DNS servers</li> <li>■ NTP servers</li> <li>■ Default router</li> </ul> </li> </ul> </li> <li>■ Generate IP addresses (use only IPv4 addresses):                             <ul style="list-style-type: none"> <li>■ System-level: 12 total (2 on the management network and 10 on the client access network)</li> <li>■ DB VM group: 2 per VM and 3 SCAN (7 total for a 2-node RAC)</li> <li>■ App VM group: 1 per VM</li> </ul> </li> <li>■ Enter system-level information into DNS and use Check IP to verify information was entered into DNS correctly. Ensure that DNS is configured with IPv4 IP addresses.</li> </ul> <p>See <a href="#">“Initial Configuration Tasks” on page 15.</a></p>	
2.	Download and extract the MiniCluster component bundle.	See <a href="#">“Download the MiniCluster Component Bundle” on page 36.</a>	

## Hardware Installation and Cabling Checklist

Order	Procedure	Description	Task Completed?
1.	Mount the compute nodes and storage array in a rack, if necessary.	See <a href="#">“Installing the MiniCluster” on page 59.</a>	
2.	Connect to the NET MGT port.	You must connect to the NET MGT port as part of the software configuration process. Connect a Category 5 (or better) RJ-45 cable from the NET MGT ports on both compute nodes to your network switch or hub. See <a href="#">“Connect the Management Network” on page 106.</a>	
3.	Connect the 10GbE client access network.	Connect from both compute nodes to the 10GbE client access network through either: <ul style="list-style-type: none"> <li>■ 10GbE NIC installed in PCIe slot 1 in each compute node</li> <li>■ NET 2 and NET 3 ports on the compute nodes</li> </ul> See <a href="#">“Connect the 10GbE Client Access Network” on page 107.</a>	
4.	Connect the 10GbE private network.	The 10GbE private network transfers data between the two compute nodes. It is also used for the RAC interconnect when Oracle RAC is installed on the MiniCluster.  Connect the NET 0 and NET 1 ports from one compute node to the other compute node.  See <a href="#">“Connect the 10GbE Private Network” on page 111.</a>	
5.	Connect the storage arrays to the compute nodes.	Connect the storage arrays to the compute nodes using: <ul style="list-style-type: none"> <li>■ SAS cards installed in PCIe slots 2 and 3 in the compute nodes</li> <li>■ I/O modules in the storage arrays</li> </ul> See <a href="#">“Connect the Base Storage Array to the Compute Nodes” on page 112</a> and <a href="#">“Connect Additional Storage Arrays to the Compute Nodes” on page 114.</a>	
6.	Connect to the SER MGT port.	Connect to the SER MGT port to assign a static IP address to the NET MGT port.  Connect a Category 5 (or better) RJ-45 cable from the SER MGT port on compute node 1 to a terminal device.  See <a href="#">“Connect the SER MGT Cable” on page 117.</a>	
7.	Connect the power cords and power on the storage array and two compute nodes.	<ul style="list-style-type: none"> <li>■ For the storage array, plug the power cords to the two power supplies, and push the on/off switches on both power supplies to the on (I) position.</li> <li>■ For the two compute nodes, plug the power cords to the two power supplies. Power on the compute nodes by either pressing the System Power buttons on both compute nodes or entering <code>start /SYSTEM</code> at the ILOM prompt.</li> </ul> See <a href="#">“Powering On MiniCluster for the First Time” on page 119.</a>	

## Software Configuration Checklist

Order	Procedure	Description	Task Completed?
1.	Assign IP address to NET MGT port.	See <a href="#">“Assign a Static IP Address to the NET MGT Port”</a> on page 126.	
2.	Configure the MiniCluster using <code>installmc</code> .	<ul style="list-style-type: none"> <li>■ If you used the Initial Configuration Tool earlier:               <ol style="list-style-type: none"> <li>1. Connect to the Oracle ILOM on the first compute node through the NET MGT port. Log in as the <code>mcinstall</code> user, then run <code>installmc --init</code> to create a temporary IP address for the compute node.</li> <li>2. Transfer the <code>userinputs.txt</code> and <code>omcips.txt</code> configuration files to the first compute node.</li> </ol> <p>See <a href="#">“Log In To Compute Node 1 (Oracle ILOM)”</a> on page 128 and <a href="#">“Copy Configuration Files to Compute Node 1”</a> on page 129.</p> </li> <li>■ Run <code>installmc --deploy</code> to go through the first half of the system setup. See <a href="#">“Perform Initial Configuration”</a> on page 130.</li> </ul>	
3.	Transfer and install the MiniCluster component bundle.	See <a href="#">“Transfer and Install the MiniCluster Component Bundle”</a> on page 138.	
4.	Create and approve the Install Administrator and Supervisor accounts.	<ul style="list-style-type: none"> <li>■ In a browser, start the MCMU BUI on the first compute node. In the MCMU Registration window, type the necessary information to create the Install Administrator and Supervisor accounts, including:               <ul style="list-style-type: none"> <li>■ Email address of the new Install Administrator</li> <li>■ Email address of the Supervisor</li> <li>■ User name for the Supervisor</li> </ul> <p>See <a href="#">“Log In To the MCMU BUI for the First Time”</a> on page 140 and <a href="#">“Create the Install Administrator Account”</a> on page 143.</p> </li> <li>■ On the first compute node, bring up the mail that was sent to the <code>mcinstall</code> user. Use the information in that mail to approve the Install Administrator account. See <a href="#">“Approve the New Install Administrator Account”</a> on page 144 and <a href="#">“Finish Setting Up the Install Administrator Account”</a> on page 145.</li> </ul>	
5.	Finish setting up Supervisor account.	See <a href="#">“Finish Setting Up the Supervisor Account”</a> on page 147.	
6.	Complete second half of system setup.	See <a href="#">“Set Up MiniCluster”</a> on page 148.	
7.	(Optional) Create a database virtual machine group.	<p>As part of the initial configuration, you are provided with a walk-through on creating a database virtual machine group, which consists of these steps:</p> <ol style="list-style-type: none"> <li>1. Creating and deploying a database virtual machine group</li> <li>2. Creating an Oracle database home</li> <li>3. Creating an Oracle database instance</li> </ol> <p>See <a href="#">“Creating a Database Virtual Machine Group (Initial Installation)”</a> on page 153.</p>	
8.	(Optional) Create an application virtual machine group.	<p>As part of the initial configuration, you are provided with a walk-through on creating an application virtual machine group. See <a href="#">“Creating an Application Virtual Machine Group (Initial Installation)”</a> on page 179.</p>	

## Software Configuration Checklist

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Order	Procedure	Description	Task Completed?
9.	Configure the mctuner notification email address.	Refer to the section "Configure the mctuner Notification Email Address (CLI)" in the <i>Oracle MiniCluster S7-2 Administration Guide</i> .	

## Preliminary Tasks

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There are certain preliminary tasks that you can complete prior to receiving your MiniCluster, which will reduce the amount of setup time you will go through when your MiniCluster arrives at your site.

- [“Initial Configuration Tasks” on page 15](#)
- [“Download the MiniCluster Component Bundle” on page 36](#)

## Initial Configuration Tasks

Before receiving your MiniCluster, complete the following initial configuration tasks:

- Gather certain system-specific configuration information, such as the name you will be applying to your MiniCluster, the IP addresses you will use for the system, and so on.
- If possible, enter this configuration information into DNS prior to receiving your MiniCluster.

You can use the MiniCluster Initial Configuration tool to perform the initial configuration tasks, or you can perform the configuration tasks without using the Initial Configuration tool.

- [“Using the Initial Configuration Tool” on page 15](#)
- [“Without Using the Initial Configuration Tool” on page 33](#)

## Using the Initial Configuration Tool

Run the Initial Configuration tool on any system outside of the MiniCluster to provide initial configuration information for your MiniCluster, though at some point in the procedure, you will need to run the tool on the same network where you will be installing the MiniCluster. When you finish providing all the necessary configuration information, the tool generates two text configuration files (`userinputs.txt` and `omcips.txt`) that you copy to the first MiniCluster compute node to complete the configuration process.

- “Bring Up Initial Configuration Tool” on page 16
- “Provide General Configuration Information” on page 17
- “Provide Management Network Configuration Information” on page 19
- “Provide Client Network Configuration Information” on page 22
- “Provide Remaining Configuration Information” on page 27
- “Generate IP Mapping Information for DNS” on page 28

## ▼ Bring Up Initial Configuration Tool

### 1. Log in to My Oracle Support (MOS).

Go to the My Oracle Support (MOS) site:

<https://support.oracle.com/>

and click on the Sign In button to log in to the site.

### 2. Access the MiniCluster MOS note 2153282.1 that contains information on downloading the Initial Configuration tool.

Enter 2153282.1 in the search field in the upper right corner of the page, or in the search field beneath the Enter search terms text lower on the page, and locate the MiniCluster MOS note (Oracle MiniCluster S7-2 Software Download Center).

### 3. Locate the section in the MOS note that provides information on the *latest* version of the Initial Configuration tool.

Click on the Latest Release link at the top of the MOS note, or on the MiniCluster Initial Configuration Tool link beneath the Latest Release link, to go to the section in the MOS note with the latest version of the Initial Configuration tool.

### 4. Click on the patch ID link for the latest version of the Initial Configuration Tool.

The Initial Configuration tool is contained within a patch. Clicking on the patch ID brings you to the download page for this particular patch.

### 5. Follow the instructions in the patch page to download the patch zip file that contains the Initial Configuration tool.

Download the patch zip file onto any system, such as a laptop. Note that the information in the Platform or Language field on the patch page refers to the OS that runs on the MiniCluster itself, not the OS for the system where you will be running the tool. The Initial Configuration tool can be run on a Windows, Solaris or Linux environment.

You will use the Initial Configuration tool to enter system-level configuration information for your MiniCluster. At one point later in the Initial Configuration tool process, the tool uses the



information that you enter to verify system-level IP addresses and host names on the network, so at that point, you must run the tool on the same network where you will be installing the MiniCluster. However, if necessary, you can enter the majority of the configuration information into the tool on any system, without being connected to the same network where the MiniCluster will be installed. These procedures will tell you when you are at the point when you must be connected to the same network where you will be installing the MiniCluster.

**6. Extract the downloaded patch zip file.**

A TAR file and README text file are created.

**7. Extract the TAR file.**

The `UserInput` directory is created.

**8. Change to the `UserInput` directory and start the Initial Configuration tool.**

- In a Windows environment, double-click the `config-tool.bat` file or enter the following in a terminal window from the directory containing the file:

```
config-tool
```

- In a Solaris or Linux environment, enter the following in a terminal window from the directory containing the file:

```
./config-tool.sh
```

The Initial Configuration tool window appears.

**9. Begin entering the general configuration information into the Initial Configuration tool.**

Go to [“Provide General Configuration Information” on page 17](#).

## ▼ Provide General Configuration Information

Make the following selections in the General pane.

**1. Provide information in the Machine field, if necessary.**

- Select the type of MiniCluster system that you ordered. Only valid option is S7-2.
- If you have a previously-completed configuration file that you want to import, click the Import Configuration File button and navigate to the `userinputs.txt` file that you want to import. The remaining fields in this screen automatically populate with the information that you provided in the previously-completed configuration file.

---

**Note** - Do not attempt to import an `omcips.txt` file into the Initial Configuration tool. While an `omcips.txt` file could contain similar previously-completed configuration information, the Initial Configuration tool recognizes and imports information only from a `userinputs.txt` file and will not recognize and import any information from an `omcips.txt` file.

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**2. In the Hostname Prefix field, enter the system-level host name prefix to be used for your MiniCluster.**

Specify up to 6 alphanumeric characters or fewer. For example, `mc2`.

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**Tip** - Because the host name prefix will be used along with the domain name to generate host names for components in the system, using a short host name prefix, such as `mc2`, will make the component-level host names shorter and less cumbersome.

---

**3. In the Domain Name field, enter the domain name for your company.**

The name can contain alphanumeric characters, periods (`.`), and hyphens (`-`). The name must start with an alphanumeric character. This field cannot be empty.

Together, these Hostname Prefix and Domain Name fields are used when host names are generated for components in the system.

For example, a value of `mc2` as the system-level host name prefix and `us.example.com` as the domain name results in the following host names generated for components in the system:

- `mc2-n1-ilom.us.example.com` for the Oracle ILOM host name for the service processor in the first compute node
- `mc2-n1.us.example.com` for the host name for the first compute node
- `mc2-n2-ilom.us.example.com` for the Oracle ILOM host name for the service processor in the second compute node
- `mc2-n2.us.example.com` for the host name for the second compute node

And so on.

**4. Provide the management network configuration information.**

Go to [“Provide Management Network Configuration Information”](#) on page 19.

## ▼ Provide Management Network Configuration Information

Ideally, the management network should be on a separate subnet from the client network, but they can be on the same subnet, if necessary.

### 1. In the Network Settings pane, click the Management Network tab.

The configuration fields for the management network is displayed.

The screenshot shows the Oracle MiniCluster Initial Configuration Tool window. The 'Network Settings' pane is active, with the 'Management Network' tab selected. The 'Management Network Settings' section contains the following fields:

- Management IP Address Compute Node 1: [Text Input]
- Management IP Address Compute Node 2: [Text Input]
- Gateway IP Address: [Text Input]
- CIDR Prefix: [Text Input] / [Text Input]
- DNS Server 1: [Text Input]
- DNS Server 2: [Text Input]
- DNS Server 3: [Text Input]
- NTP Server 1: [Text Input]
- NTP Server 2: [Text Input]
- VLAN ID: [Text Input]
- Port VLAN ID: [Text Input]

The 'Miscellaneous' section includes:

- Time Zone: America/Los\_Angeles
- Storage Array No.: 1

The 'Security Profile' section has three radio buttons: CIS Equivalent, PCI DSS (selected), and STIG. A descriptive text for PCI DSS is provided: 'PCI DSS complies with the PCI DSS standard defined by the Payment Card Industry Security Standards Council.'

Buttons for 'Review', 'Reset', and 'Exit' are located at the bottom right of the window.

### 2. Enter two IP addresses for the management network in the Management IP Address Compute Node 1 and Compute Node 2 fields.

The two management network IP addresses do not have to be consecutive, but they should be on a separate subnet from the client network IP addresses.

### 3. Enter the gateway IP address for the management network in the Gateway IP Address field.

**4. Enter the CIDR equivalent of the subnet mask for the management network in the CIDR Prefix field.**

For example, 24. Ideally, the management network should be on a separate subnet from the client network, but they can be on the same subnet, if necessary.

Use this table to find the CIDR equivalent of your subnet mask.

Subnet Mask	CIDR Prefix
255.255.255.255	/32
255.255.255.254	/31
255.255.255.252	/30
255.255.255.248	/29
255.255.255.240	/28
255.255.255.224	/27
255.255.255.192	/26
255.255.255.128	/25
255.255.255.0	/24
255.255.254.0	/23
255.255.252.0	/22
255.255.248.0	/21
255.255.240.0	/20
255.255.224.0	/19
255.255.192.0	/18
255.255.128.0	/17
255.255.0.0	/16
255.254.0.0	/15
255.252.0.0	/14
255.248.0.0	/13
255.240.0.0	/12
255.224.0.0	/11
255.192.0.0	/10
255.128.0.0	/9
255.0.0.0	/8
254.0.0.0	/7
252.0.0.0	/6
248.0.0.0	/5
240.0.0.0	/4

Subnet Mask	CIDR Prefix
224.0.0.0	/3
192.0.0.0	/2
128.0.0.0	/1
0.0.0.0	/0

**5. Enter the IP addresses for the management domain name servers in the DNS Server 1, 2, and 3 fields.**

At least one DNS server IP address must be provided. The entries for the DNS servers can be the same, or they can be different, from the entries for the DNS servers that you will provide in the Management Network tab.

**6. Enter the IP addresses for the management Network Time Protocol servers in the NTP Server 1 and 2 fields.**

At least one NTP server IP address must be provided. The entries for the NTP servers can be the same, or they can be different, from the entries for the NTP servers that you will provide in the Management Network tab.

---

**Note** - Verify that you have the correct management DNS and NTP server entries in these fields before proceeding. Once you have completed the initial installation of your system, you cannot change the management DNS and NTP server entries without resetting your MiniCluster system. Note that this is only true for the *management* DNS and NTP servers; you can change the *client* DNS and NTP servers after initial installation.

---

**7. Determine if you want to set up a VLAN configuration on the management network.**

- If you do not want to set up a VLAN configuration on the management network, leave the two VLAN fields blank. Go to [“Provide Client Network Configuration Information” on page 22](#).
- If you want to set up a VLAN configuration on the management network, determine if you want to set up a tagged VLAN configuration or an untagged (port-based) VLAN configuration.
  - **VLAN ID** — If you want to set up a tagged VLAN configuration on the management network, enter the VLAN tag ID.
  - **Port VLAN ID** — If you want to set up an untagged (port-based) VLAN configuration on the management network, enter the port VLAN ID.

**8. Provide the client network configuration information.**

Go to [“Provide Client Network Configuration Information” on page 22](#).

## ▼ Provide Client Network Configuration Information

Ideally, the client network should be on a separate subnet from the management network, but they can be on the same subnet, if necessary.

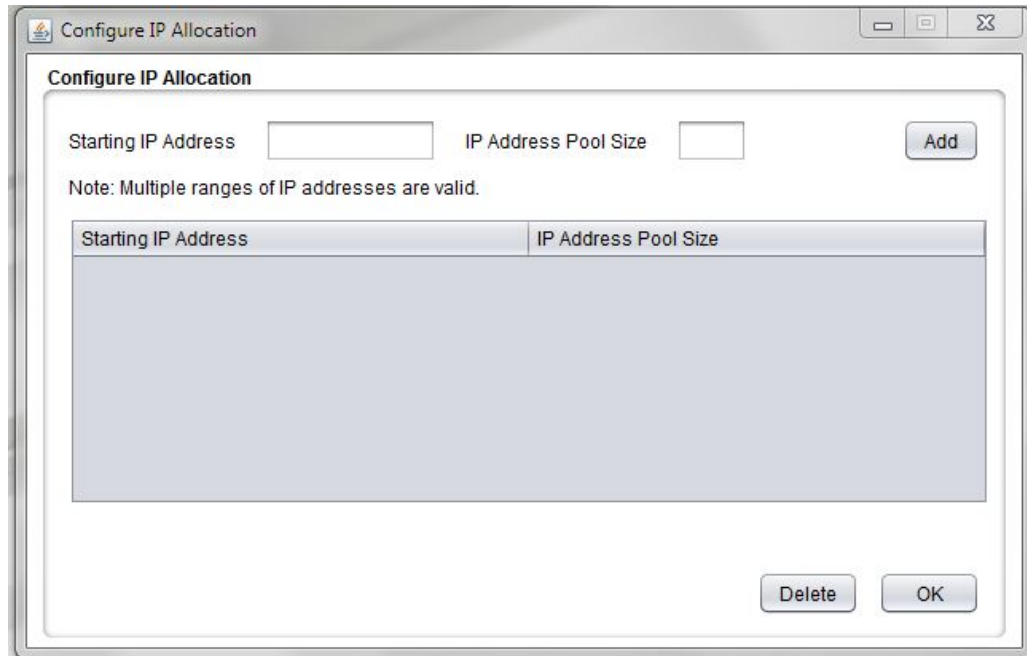
### 1. In the Network Settings pane, click the Client Network tab.

The configuration fields for the client access network is displayed.

The screenshot shows the Oracle MiniCluster Initial Configuration Tool window. The 'General' section includes fields for Machine (S7-2), Hostname Prefix, and Domain Name. The 'Network Settings' section has two tabs: 'Management Network' and 'Client Network'. The 'Client Network Settings' pane is active, showing a 'Configure IP Allocation' button and fields for Starting IP Address, IP Address Pool Size, Gateway IP Address, CIDR Prefix, DNS Server 1-3, NTP Server 1-2, Network Redundancy Type (IPMP), Load Balancing Policy (L4), Configured LACP Mode (Active), VLAN ID, Port VLAN ID, and Client Connectivity (Copper). The 'Miscellaneous' section includes Time Zone (America\_Los\_Angeles) and Storage Array No. (1). The 'Security Profile' section has radio buttons for CIS Equivalent, PCI DSS (selected), and STIG. At the bottom right are 'Review', 'Reset', and 'Exit' buttons.

### 2. Click on the Configure IP Allocation button.

The Configure IP Allocation window appears.



**3. Enter the starting IP address for the client access network and the IP address pool size.**

Information that you enter into this tool will assign IP addresses for the client access network. The first twelve IP addresses will be assigned to components at the system level (for example, for the two compute nodes and the kernel zone), and the remaining IP addresses will be used for the database and application virtual machines that you create later on.

- **Starting IP address** — The starting IP address for the IP addresses assigned to the client access network.
- **IP Address Pool Size** — The total number of IP addresses that you need for the client access network. Beginning with the starting IP address you entered above, this number represents the number of consecutive IP addresses that will be available for the system-level components, such as compute nodes, and the client access network when creating database or application virtual machines and groups.

You need at least twelve IP addresses for the client access network for the system-level components. The additional number of IP addresses that you need for virtual machines and groups varies, depending on the number of virtual machines and groups you create.

However, the maximum number of IP addresses that you need for virtual machines and groups is typically around 45.

**4. Click the Add button.**

The starting IP and IP address pool size information is populated into the table on this page.

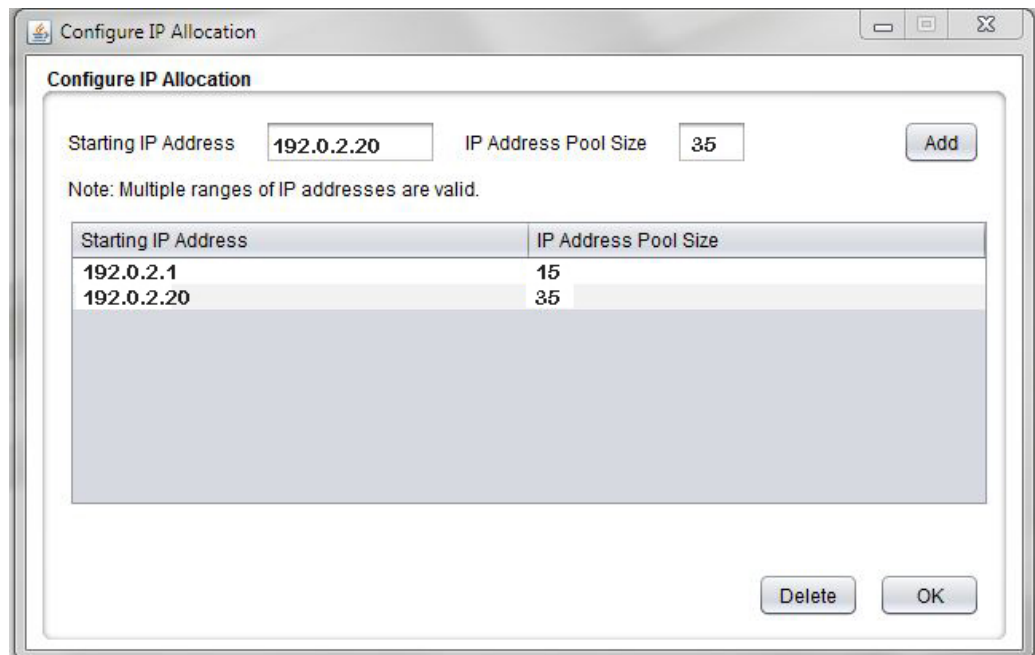
**5. Add additional IP addresses for the client access network, if necessary.**

You can add additional sets of IP addresses for the client access network by entering additional starting IP addresses and IP pool size information in those fields, and clicking the Add button for each set. Each set of new starting IP addresses and IP address pool size is populated into the table each time, as shown here.

---

**Note** - All IP addresses on the client network must be from the same IP subnet. Multiple subnets on the same client network are not supported.

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**Tip** - Consecutive IP addresses are assigned for each range that you enter into the Configure IP Allocation window, starting with the entry that you put into the Starting IP Address field for that range. However, if you need to have individual, non-consecutive IP addresses for the client access network, enter each IP address in the Starting IP Address field, and enter 1 in the IP Address Pool Size, then click the Add button. Repeat this process to configure multiple non-consecutive IP addresses for the client access network.

---

**6. Verify that the information that you entered in the Configure IP Allocation window is correct.**

To delete a set of IP addresses from the list, select that set of address and click Delete.

You can access this window again from the main Initial Configuration tool window. However, once you have completed the Initial Configuration tool process and you have generated the IP addresses, the only way to change the IP address pool information is to completely rerun these procedures again.

---

**Note** - Even though this IP address pool information will be set once you complete the Initial Configuration tool process, you can add additional IP addresses to the client access network IP address pool using the MiniCluster BUI. Refer to the *Oracle MiniCluster S7-2 Administration Guide* for more information.

---

**7. When you finish entering the information in the Configure IP Allocation window, click OK.**

The Configure IP Allocation window disappears, and the IP address information is populated with the information that you entered in the Configure IP Allocation window.

If you provided information for more than one set of IP addresses in the Configure IP Allocation window, then the IP address information will reflect everything that you entered in the Configure IP Allocation window. For example, if you entered information for two sets of IP addresses, and entered 25 for the IP pool size for each of those two sets of IP addresses, you would see 50 in the IP Pool Size field.

You can click the Configure IP Allocation button again to view or edit the IP addresses that you entered for the client access network.

**8. Enter the gateway IP address for the client access network in the Gateway IP Address field.**

**9. Enter the subnet mask for the client network in the CIDR Prefix field.**

For example, 23. See [Step 4](#) in “[Provide Management Network Configuration Information](#)” on [page 19](#) for the table to find the CIDR equivalent of your subnet mask.

Ideally, the client network should be on a separate subnet from the management network, but they can be on the same subnet, if necessary.

**10. Enter the IP addresses for the client domain name servers in the DNS Server 1, 2, and 3 fields.**

At least one IP address must be provided, starting with the DNS Server 1 field. The entries for the DNS servers can be the same, or they can be different, from the entries for the DNS servers that you provided in the Management Network tab.

**11. Enter the IP addresses for the client Network Time Protocol servers in the NTP Server 1 and 2 fields.**

At least one IP address must be provided, starting with the NTP Server 1 field. The entries for the NTP servers can be the same, or they can be different, from the entries for the NTP servers that you provided in the Management Network tab.

---

**Note** - If you find that you need to change the client DNS or NTP server entries at any time after the initial installation is complete, you can make those changes through the MCMU BUI. Refer to the *Oracle MiniCluster S7-2 Administration Guide* for those instructions. Note that you cannot change the *management* DNS or NTP server entries after the initial installation without a system reset.

---

**12. In the Network Redundancy Type field, determine the method that you want to use to make the client access network highly available.**

Options are IPMP (IP network multipathing) or LACP (link aggregation control protocol).

---

**Note** - Do not choose LACP unless you are certain that your switch is properly configured to support LACP.

---

If you select LACP, complete the following fields:

- **Load Balancing Policy** — The load balancing policy. Options are L4, L2, or L3.
- **Configured LACP Mode** — The configured LACP mode. Options are:
  - **Active** — Enables LACP unconditionally.
  - **Passive** — Enables LACP only when an LACP device is detected.

**13. Determine if you want to set up a VLAN configuration on the client access network.**

- If you do not want to set up a VLAN configuration on the client access network, leave the two VLAN fields blank. Go to [Step 14](#).

- If you want to set up a VLAN configuration on the client access network, determine if you want to set up a tagged VLAN configuration or an untagged (port-based) VLAN configuration.

---

**Note** - Do not choose a VLAN configuration unless you are certain that your switch is properly configured to support VLANs.

---

- **VLAN ID** — If you want to set up a tagged VLAN configuration on the client access network, enter the VLAN tag ID.
- **Port VLAN ID** — If you want to set up an untagged (port-based) VLAN configuration, enter the port VLAN ID.

**14. In the Client Connectivity field, select the method that you will use to connect the MiniCluster to the 10GbE client access network.**

Options are:

- **Copper** — Choose this option if you are connecting to the client access network through the NET 2 and NET 3 ports, using Category 6/6E (RJ45) Ethernet cabling.
- **Fiber** — Choose this option if you are connecting to the client access network through the 10GbE NIC, using either of the these two cables:
  - QSFP to 4x SFP copper splitter cable
  - MPO to 4x LC duplex fiber optic splitter cable

See [“Connect the 10GbE Client Access Network” on page 107](#) for more information.

**15. Provide the remaining configuration information.**

Go to [“Provide Remaining Configuration Information” on page 27](#).

## ▼ Provide Remaining Configuration Information

**1. In the Miscellaneous pane, enter this information:**

- **Time Zone** — Time zone where the MiniCluster will be installed. For example, America/Los\_Angeles.
- **Storage Array No.** — The number of storage arrays that you are connecting as part of the initial installation. Options are 1 or 2.

---

**Note** - Select **only** the number of storage arrays that you are connecting as part of the initial installation in this field. If you are connecting a single storage array as part of the initial installation but you plan to connect a second storage array at a later date (after the installation is complete), select 1 for this field. You can add another storage array through the MiniCluster software when you install the second storage array at the later date.

---

**2. In the Security Profile pane, enter this information:**

- **Security Profile** — Sets the security profile at the system level and for the global zone. Options are:
  - **CIS Equivalent** — Satisfies requirements comparable and equivalent to benchmarks set forth by Center for Internet Security (CIS).
  - **PCI DSS** — Complies with the Payment Card Industry Data Security Standard (PCI DSS) standard defined by the Payment Card Industry Security Standards Council.
  - **STIG** — Satisfies the organizations requiring security controls and compliance with Security Technical Implementation Guides for Oracle Solaris 11 published by the United States Defense Information Systems Agency.

---

**Note** - Consider your choice for the Security Profile carefully. Once you have completed these procedures and exit out of the Initial Configuration tool, you will not be able to change this system-level option afterwards.

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**3. Generate the IP mapping information for DNS.**

Go to [“Generate IP Mapping Information for DNS”](#) on page 28.

▼ **Generate IP Mapping Information for DNS**

**1. When you finish entering the necessary information into the Initial Configuration tool, click the appropriate button at the bottom of the screen.**

- **Review** — Begins the review process to verify that all the information entered in the tool is valid. Go to [Step 2](#).
- **Reset** — Clears all the fields in the tool.
- **Exit** — Exits out of the tool.

**2. Verify the summary information.**

A screen appears with a summary of the information that you entered, including the IP address and host name mapping for the management and client access networks.

The screenshot shows the Oracle MiniCluster Initial Configuration Tool interface. It is divided into two main panes: 'UserInput Summary' and 'IP Hostname Mapping'.

**UserInput Summary**

Name	Value
Machine Type	S7-2
MiniCluster Prefix	mc2 us.example.com
Domain Name	us.acme.com
Management IP 1	105.8
Management IP 2	105.9
Management Gateway IP	105.1
Management Subnet Mask	24
Management DNS Server	2.2
Management NTP Server	1.1
Start IP	1.1.1
IP Count	50
Gateway IP	1.1
Subnet Mask	23
DNS Server	2.2
NTP Server	1.1
Network Redundancy Type	IPMP
Client Connectivity	Copper
Shared Application Storage	6
Time Zone	America/Los_Angeles
Security Profile	CIS Equivalent

**IP Hostname Mapping**

IP Address	MiniCluster Hostname	DNS Hostname	Status
105.8	mc2-n1-1lom.us.example.com		
105.9	mc2-n1-1lom.us.example.com		
1.1	mc2-n1-us.example.com		
1.2	mc2-n2-us.example.com		
1.1.3	mc2ss01.us.example.com		
1.1.4	mc2ss02.us.example.com		
1.1.5	mc2ss01-vip.us.example.com		
1.1.6	mc2ss02-vip.us.example.com		
1.1.7	mc2ss-nfsvip.us.example.com		
1.1.8	mc2ss-scan.us.example.com		
1.1.9	mc2ss-scan.us.example.com		
1.1.10	mc2ss-scan.us.example.com		
1.1.11			
1.1.12			
1.1.13			
1.1.14			
1.1.15			
1.1.16			
1.1.17			
1.1.18			
1.1.19			
1.1.20			
1.1.21			
1.1.22			
1.1.23			

Note: Use "Check IP" to ensure that "MiniCluster Hostname" and "DNS Hostname" match

Buttons: Back, Save, Exit

### 3. Enter the necessary information shown in the IP Hostname Mapping pane into DNS.

The IP address information that you provided in the IP Allocation pane is displayed.

The first 12 IP addresses, which have hostnames provided automatically through the tool, are for the management network (2 IP addresses) and client access network (10 IP addresses) for the system-level components. Enter all 12 of these system-level IP address and host names into DNS before proceeding. These 12 IP addresses are automatically used for these system-level components:

- On the management network, Oracle ILOM for the service processors (SPs) in compute nodes 1 and 2 (two IP addresses and host names)
- On the client access network:
  - Host names for compute nodes 1 and 2 (two IP addresses and host names)

- Host names for kernel zones on compute nodes 1 and 2 (two IP addresses and host names)
- Oracle RAC VIP for kernel zones on compute nodes 1 and 2 (two IP addresses and host names)
- NFS VIP (one IP address and host name)
- SCAN IP addresses for system-level Oracle RAC (three IP addresses and host names)

The remaining unassigned IP addresses on the client access network will be used later on when you create virtual machines.

**4. Determine if you are running the Initial Configuration tool on a system that is on the same network where the MiniCluster will be installed.**

The next step verifies that the IP Hostname Mapping information was entered into DNS correctly and assumes that you are connected to the same network where the MiniCluster will be installed.

- If you are running the Initial Configuration tool on a system that is on the same network where the MiniCluster will be installed, go to [Step 5](#).
- If you are *not* on the same network where the MiniCluster will be installed, you can continue with these instructions at this time without verifying that the information was entered into DNS correctly. However, you must return to these instructions later on, when you are able to run the Initial Configuration tool on the same network that the MiniCluster will be installed on, and verify the information prior to setting up the MiniCluster.

If you are postponing the DNS check until a later date, continue to [Step 7](#) to generate the necessary configuration files, including the `userinputs.txt` file, and continue with the remaining preliminary configuration tasks. At a later date, when you are on the same network where the MiniCluster will be installed (but prior to receiving your MiniCluster), click the Import Configuration File button described in [“Provide General Configuration Information” on page 17](#) to import the `userinputs.txt` that you generated, then repeat these instructions from this point to use the Check IP button to verify the DNS information before setting up your MiniCluster.

**5. After you have entered the system-level IP addresses and host names into DNS, click the Check IP button.**

The tool checks DNS to verify you entered the information into DNS properly where the status should be matched or available.

A progress bar appears at the bottom of the screen, providing status for this check.

**6. Verify that the system-level IP addresses and host names were entered into DNS properly.**

---

**Note** - The unreachable part in the Status field is expected, because you are running this IP check before you set up your MiniCluster.

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---

**Note** - Any result other than matched or unreachable indicates that there is a problem.

---

- If you see matched/unreachable in the Status field for *all* of the system-level fields, then you entered the system-level IP addresses and host names into DNS properly. Go to [Step 7](#).
- If you see unmatched/unreachable in the Status field for any of the system-level fields, then there was an issue with the DNS entry. Either verify the entries in DNS, or click the Back button to go to the previous screen to correct the IP addresses. Then repeat this step until all the system-level IP addresses and host names are shown as matched/unreachable in the Status field.

---

**Tip** - You can also change the entries in the IP Address and MiniCluster Hostname columns (the first and second columns) by double-clicking in any field in those columns. Change the information in either of those columns to correspond with the entries in the DNS Hostnames column, then click the Check IP button again.

---

Do not proceed with these procedures until you see matched/unreachable in the Status field for *all* of the system-level fields.

**7. Click the appropriate button in the summary screen.**

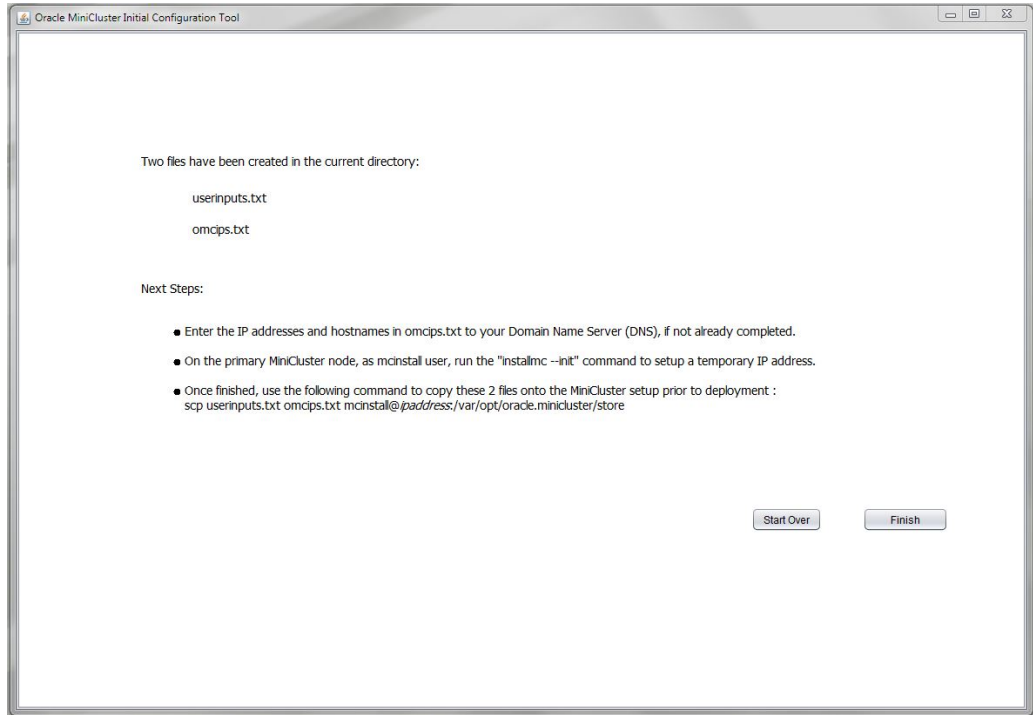
---

**Note** - If you ran the Initial Configuration tool previously, you might already have two configuration files generated from that earlier run. Clicking Save in this step will overwrite those previously-generated configuration files, so if you want to save those earlier files, rename them or move them to a different location before clicking Save here.

---

- **Save** — Generates the necessary configuration files and saves them in the same directory as the Initial Configuration tool. Go to [Step 8](#).
- **Back** — Takes you back to the tool screen.
- **Exit** — Exits out of the tool.

**8. Verify that the configuration files were generated correctly.**



The tool generates the `userinputs.txt` and `omcips.txt` files, which you need to complete the initial configuration procedure. The files are copied into the same directory where you ran the tool. Note this location for future use.

---

**Note** - Do not manually edit the `userinputs.txt` or `omcips.txt` files. These files can only contain information that was generated through the Initial Configuration tool. You can rename the names of the files, if necessary, but you should retain the `userinputs` and `omcips` aspects of the file names to distinguish the file types (for example, `mc2-userinputs.txt` and `mc2-omcips.txt`).

---

**9. Click the appropriate button.**

- **Start Over** — Runs the Initial Configuration tool again.
- **Finish** — Closes the Initial Configuration tool.



**10. Download the MiniCluster Component Bundle.**

See [“Download the MiniCluster Component Bundle” on page 36.](#)

## ▼ Without Using the Initial Configuration Tool

If you do not want to use the Initial Configuration tool to gather the necessary system-specific configuration information, provide the necessary system-level configuration information in these tables.

**1. Provide system-level configuration information in this table.**

You will use the information in this table when you manually enter information using `installmc --deploy` later in this document.

Field	Description	Entry
Unique prefix for MiniCluster	System-level host name prefix to be used for your MiniCluster. Specify up to 6 characters or fewer. For example: mc2.  The host name prefix and domain name entries are used when host names are generated for components in the system, such as mc2-n1.us.example.com for the host name for the first compute node.	
Netmask in CIDR form	Subnet mask for the client access network in CIDR form. For example, 23.	
First IP address (range 1)	Starting IP address for the IP addresses assigned to the client access network..	
Count of IP addresses (range 1)	Total number of IP addresses that you need for the client access network. This number represents the number of consecutive IP addresses that will be available for the client access network when creating database or application virtual machine groups, beginning with the starting IP address you entered above.	
Starting IP address and pool size (additional ranges)	(Optional) If you want additional separate sets of IP addresses, provide the starting IP addresses and pool sizes for those additional IP address sets.	
Default gateway address	Gateway IP address for the client access network. For example,.	
Domain name	Domain name for your company. The name can contain alphanumeric characters, periods (.), and hyphens (-). The name must start with an alphanumeric character. This field cannot be empty. For example, us.example.com.  The host name prefix and domain name entries are used when host names are generated for components in the system, such as mc2-n1.us.example.com for the host name for the first compute node.	
DNS servers	IP address for the domain name servers. At least one IP address must be provided in the first DNS server location.	

Field	Description	Entry
NTP servers	IP address for the Network Time Protocol servers. At least one IP address must be provided in the first NTP server location.	
[ILOM] Netmask in CIDR form	Subnet mask for the management network in CIDR form. For example, 24.	
[ILOM] IP address of first compute node	ILOM IP address of the first compute node.	
[ILOM] IP address of second compute node	ILOM IP address of the second compute node.	
[ILOM] Default gateway address	Gateway IP address for the management network.	
[ILOM] DNS servers	IP address for the domain name servers for the management network. At least one IP address must be provided in the first DNS server location.	
[ILOM] NTP servers	IP address for the Network Time Protocol servers for the management network. At least one IP address must be provided in the first NTP server location.	
Type of cable to be used to connect to client access network.	Type of cable that you will use to connect the MiniCluster to the 10GbE client access network. Options are copper or fiber. See <a href="#">“Connect the 10GbE Client Access Network” on page 107</a> for more information.	
Client access network high availability type	Method that you want to use to make the client access network highly available. Options are IPMP (IP network multipathing) or AGGR (data link aggregation).	
Location 1	First level of time zone information. For example, America.	
Location 2	Second level of time zone information. For example, Los Angeles.	
PCI DSS Compliance	Allows you to enable Payment Card Industry Data Security Standard (PCI DSS) compliance, if necessary. Options are Yes or No.	
Security Keystore Type	Functions that are used in the Oracle Solaris cryptographic framework. Default choice: pkcs11.	pkcs11
VLAN ID information (optional)	If you want to set up a tagged VLAN configuration on the client access network, enter the VLAN tag ID.	
Port VLAN information (optional)	If you want to set up an untagged (port-based) VLAN configuration on the client access network, enter the port VLAN ID.	
[ILOM] VLAN ID information (optional)	If you want to set up a tagged VLAN configuration on the management network, enter the VLAN tag ID.	
[ILOM] Port VLAN information (optional)	If you want to set up an untagged (port-based) VLAN configuration on the management network, enter the port VLAN ID.	

**2. Provide system-specific IP address and host name information in this table.**

The information that you are providing in this table is the same information that normally would be generated automatically by the Initial Configuration tool.

To complete this table correctly:

- Enter the starting IP address for range 1 for the client access network that you entered in the previous table as the first IP address in this table.
- Use consecutive IP addresses for each IP address for the client access network after the starting IP address.
- Use the unique host name prefix for MiniCluster that you entered in the previous table as the *hostname-prefix* in this table. For example, mc2.
- Use the domain name that you entered in the previous table as *domainname* in this table. For example, us.example.com.

System-Level Component	IP Address Entry	Host Name Entry	Host Name Format	Example
Oracle ILOM for the service processors in the <i>first</i> compute node			<i>hostname-prefix-n1-ilom.domainname</i>	mc2-n1-ilom.us.example.com
Oracle ILOM for the service processors in the <i>second</i> compute node			<i>hostname-prefix-n1-ilom.domainname</i>	mc2-n1-ilom.us.example.com
Client network host name for the <i>first</i> compute node			<i>hostname-prefix-n1.domainname</i>	mc2-n1.us.example.com
Client network host name for the <i>second</i> compute node			<i>hostname-prefix-n2.domainname</i>	mc2-n2.us.example.com
Client network host name for kernel zone on the <i>first</i> compute node			<i>hostname-prefixss01.domainname</i>	mc2ss01.us.example.com
Client network host name for kernel zone on the <i>second</i> compute node			<i>hostname-prefixss02.domainname</i>	mc2ss02.us.example.com
Oracle RAC VIP for kernel zone on client network on the <i>first</i> compute node			<i>hostname-prefixss01-vip.domainname</i>	mc2ss01-vip.us.example.com
Oracle RAC VIP for kernel zone on client network on the <i>second</i> compute node			<i>hostname-prefixss02-vip.domainname</i>	mc2ss02-vip.us.example.com
Network File Storage (NFS) VIP on client network			<i>hostname-prefixss-nfsvip.domainname</i>	mc2ss-nfsvip.us.example.com
First of three SCAN IP addresses for system-level Oracle RAC on			<i>hostname-prefixss-scan.domainname</i>	mc2ss-scan.us.example.com

System-Level Component	IP Address Entry	Host Name Entry	Host Name Format	Example
client network in your MiniCluster				
Second of three SCAN IP addresses for system-level Oracle RAC on client network in your MiniCluster			<i>hostname-prefixss-scan.domainname</i>	mc2ss-scan.us.example.com
Third of three SCAN IP addresses for system-level Oracle RAC on client network in your MiniCluster			<i>hostname-prefixss-scan.domainname</i>	mc2ss-scan.us.example.com

**3. Enter the system-specific IP address and host name information from the previous table into DNS.**

Prior to setting up your MiniCluster, you must enter certain system-specific IP address and host name information into DNS.

**4. Download the MiniCluster Component Bundle.**

See “[Download the MiniCluster Component Bundle](#)” on page 36.

## ▼ Download the MiniCluster Component Bundle

In this procedure, you are downloading the MiniCluster component bundle, which is contained in a series of patch zip files. You are only downloading these patch zip files at this point, and you will move the MiniCluster component bundle files to the compute nodes later in the overall installation process.

**1. Access the MiniCluster MOS note 2153282.1, if you are not already there:**

**a. Log in to My Oracle Support (MOS).**

Go to the My Oracle Support (MOS) site:

<https://support.oracle.com/>

and click on the Sign In button to log in to the site.

**b. Access the MiniCluster MOS note 2153282.1 that contains information on downloading the MiniCluster component bundle.**

Enter 2153282.1 in the search field in the upper right corner of the page, or in the search field beneath the Enter search terms text lower on the page, and locate the MiniCluster MOS note (Oracle MiniCluster S7-2 Software Download Center).

**2. Locate the section in the MOS note that provides information on the *latest* version of the MiniCluster component bundle.**

Click on the Latest Release link at the top of the MOS note, or on the MiniCluster Component Bundle link beneath the Latest Release link, to go to the section in the MOS note with the latest version of the MiniCluster component bundle.

**3. Click on the patch ID link for the latest version of the MiniCluster component bundle.**

The MiniCluster component bundle is contained within a patchset. Clicking on the patch ID brings you to the download page for this particular patchset.

**4. Follow the instructions in the patch page to download the patch zip files that contain the MiniCluster component bundle.**

Download the patch zip files onto any system, such as a laptop. Note that the information in the Platform or Language field on the patch page refers to the OS that runs on the MiniCluster itself, not the OS for the system where you will be downloading the patch zip files. You can download the patch zip files for the MiniCluster component bundle onto any system that runs the Windows, Solaris or Linux operating systems.

**5. Extract the downloaded patch zip files.**

A set of TAR files are created.

At this point in the process, you have downloaded and extracted the necessary MiniCluster component bundle files onto your system. You will move the MiniCluster component bundle files to the compute nodes later in the overall installation process.

**6. Familiarize yourself with the MiniCluster.**

See [“Understanding the MiniCluster” on page 39](#).

### Related Information

- [“Understanding the MiniCluster” on page 39](#)
- [“Confirming Specifications” on page 47](#)
- [“Preparing for Installation” on page 53](#)
- [“Installing the MiniCluster” on page 59](#)
- [“Connecting Cables” on page 99](#)
- [“Powering On MiniCluster for the First Time” on page 119](#)

- [“Configuring the MiniCluster” on page 125](#)

# Understanding the MiniCluster

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These topics provide an overview of the compute node and storage array, and highlight the key components.

- [“Understanding the Compute Node” on page 39](#)
- [“Understanding the Storage Array” on page 43](#)

## Understanding the Compute Node

These topics provide information on the compute node.

- [“Overview \(Compute Node\)” on page 39](#)
- [“Front Panel Components \(Compute Node\)” on page 41](#)
- [“Rear Panel Components \(Compute Node\)” on page 42](#)

## Overview (Compute Node)

This topic provides a high-level introduction to the main components and capabilities of the compute node.

Component	Description
Chassis	Rack-mountable server.
CPU	Two processors: 8-core, 4.267GHz, 130W each, installed on the motherboard assembly, for a total of 16 cores.
Memory	16 DDR4 DIMM slots: <ul style="list-style-type: none"><li>■ Each processor module supports 8 DIMMs for a total of 16 DIMMs.</li><li>■ Fully populated with 32-GB DIMMs, for a maximum of 512 GB of system memory.</li></ul>
I/O expansion	Three low profiles x8 PCIe Gen3 slots. All slots support x8 PCIe cards, two slots support x16 PCIe cards mechanically.

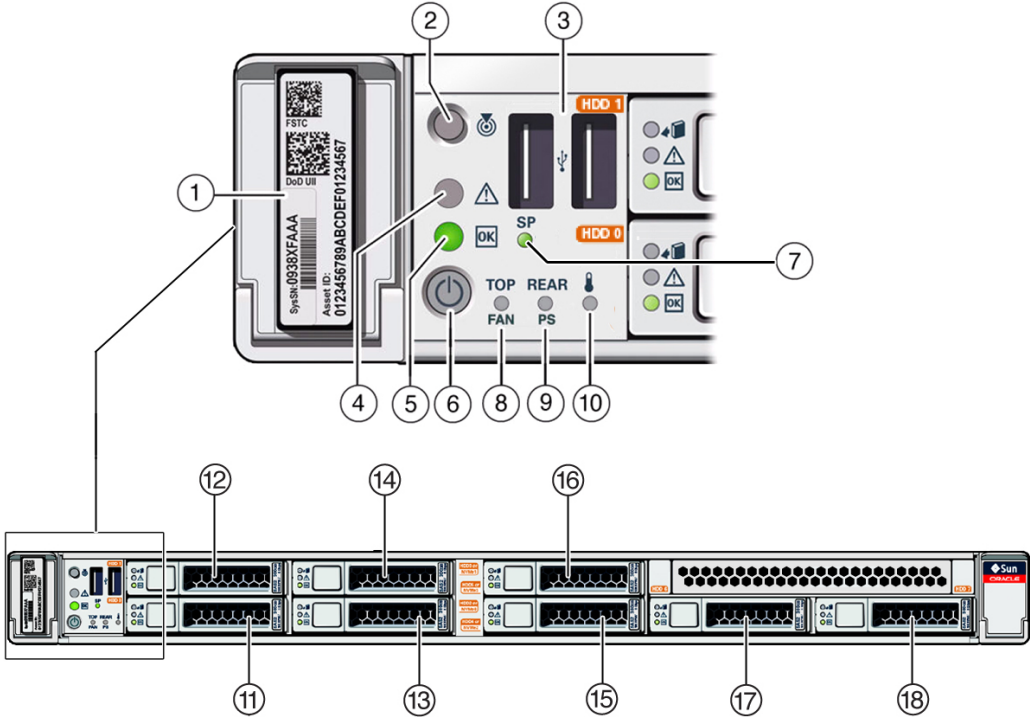
Component	Description
Storage devices	For internal storage, the server provides: <ul style="list-style-type: none"><li>■ Eight 2.5-inch drive bays accessible through the front panel. Six of the eight drive bays populated with 1200 GB hard disk drives, used for the OS and zpools for MiniCluster.</li><li>■ Internal SAS HBA card.</li></ul>
USB ports	Two external USB 2.0 ports (front panel).
Ethernet ports	Four 10GbE 100/1000/10000 Mbps, RJ-45-based ports on the rear panel.
Power supplies	Two hot-swappable A266 1.2kW (N+1).
Cooling fans	Four hot-swappable, redundant fans at chassis front (top-loading).
SP	Oracle Integrated Lights Out Manager (Oracle ILOM).

### Related Info

- [“Front Panel Components \(Compute Node\)” on page 41](#)
- [“Rear Panel Components \(Compute Node\)” on page 42](#)
- [“Understanding the Storage Array” on page 43](#)



## Front Panel Components (Compute Node)



No.	Description	No.	Description
1	Serial number	10	Server Overtemp LED (amber)
2	Locator LED (white)	11	Drive 0 (HDD/SDD)
3	Two USB 2.0 connectors	12	Drive 1 (HDD/SDD)
4	Service Action Required LED (amber)	13	Drive 2 (HDD/SDD) or NVMe 0
5	Power/OK LED (green)	14	Drive 3 (HDD/SDD) or NVMe 1
6	Power button	15	Drive 4 (HDD/SDD) or NVMe 2
7	SP OK/Fault LED (green or amber)	16	Drive 5 (HDD/SDD) or NVMe 3
8	Fan Service Action Required LED (amber)	17	Drive 6 (HDD/SDD)

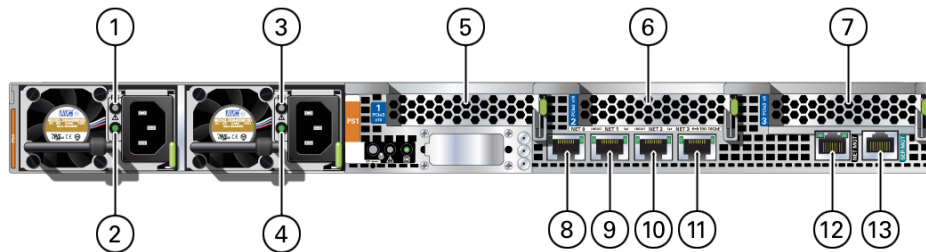
No.	Description	No.	Description
9	PS Service Action Required LED (amber)	18	Drive 7 (HDD/SDD)

### Related Info

- [“Overview \(Compute Node\)” on page 39](#)
- [“Rear Panel Components \(Compute Node\)” on page 42](#)
- [“Understanding the Storage Array” on page 43](#)

## Rear Panel Components (Compute Node)

**Note** - You must follow the proper sequence when connecting cables to the compute node. Do not connect the power cords until all data cables have been connected.



No.	Description	No.	Description
1	Power supply 0 Fault LED	8	NET 0 10/100/1000 port
2	Power supply 0 OK LED	9	NET 1 10/100/1000 port
3	Power supply 1 Fault LED	10	NET 2 10/100/1000 port
4	Power supply 1 OK LED	11	NET 3 10/100/1000 port
5	PCIe card slot 1	12	NET MGT port
6	PCIe card slot 2	13	SER MGT/RJ-45 serial port
7	PCIe card slot 3		

### **Related Info**

- [“Overview \(Compute Node\)” on page 39](#)
- [“Front Panel Components \(Compute Node\)” on page 41](#)
- [“Understanding the Storage Array” on page 43](#)

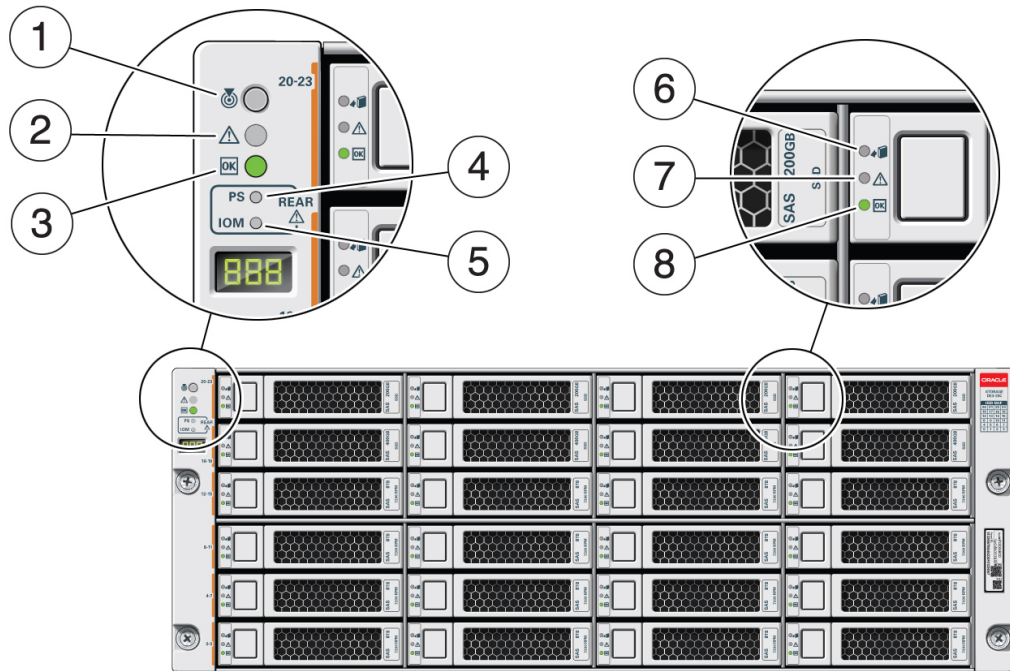
## **Understanding the Storage Array**

These topics describe the storage array.

- [“Front Panel Components \(Storage Array\)” on page 43](#)
- [“Rear Panel Components \(Storage Array\)” on page 45](#)
- [“HDD/SSD Drives \(Storage Array\)” on page 46](#)

## **Front Panel Components (Storage Array)**

The storage array front panel components are listed below.



No.	Description
1	Storage array Locate indicator
2	Storage array fault indicator
3	Storage array OK/power indicator
4	Storage array power supply fault indicator
5	Storage array IO module fault indicator
6	Drive Ready-to-Remove indicator
7	Drive fault indicator
8	Drive power/activity indicator

### Related Info

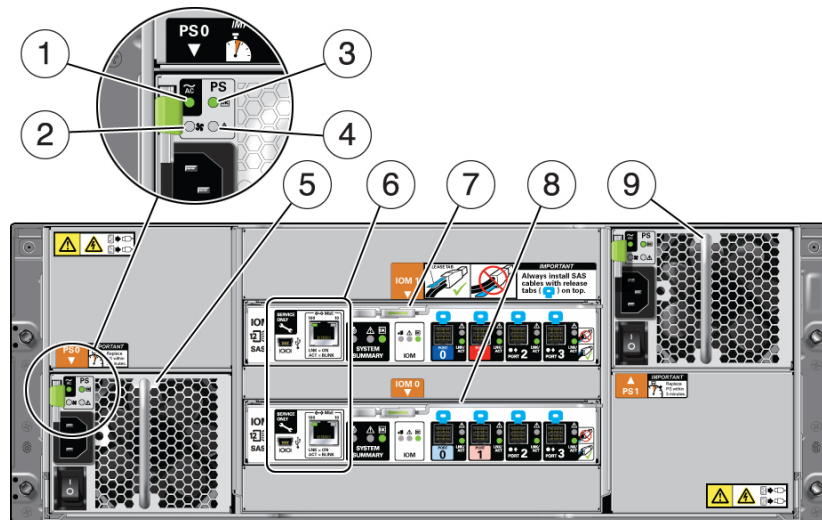
- [“Rear Panel Components \(Storage Array\)” on page 45](#)
- [“HDD/SSD Drives \(Storage Array\)” on page 46](#)
- [“Understanding the Compute Node” on page 39](#)

## Rear Panel Components (Storage Array)

The storage array rear panel components are listed below.



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



No.	Description
1	AC power indicator
2	Fan fail indicator
3	Power supply status 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

### Related Info

- [“Front Panel Components \(Storage Array\)” on page 43](#)
- [“HDD/SSD Drives \(Storage Array\)” on page 46](#)
- [“Understanding the Compute Node” on page 39](#)

## HDD/SSD Drives (Storage Array)

The storage array contains 24 SAS-2 drives, which are either hard disk drives (HDD) or the solid state drives (SSDs). The storage array supports the following HDD/SSD drives:

- 14 x 1.6 TB or 3.2 TB 3.5-inch SSDs (for database virtual machine groups)
- 4 x 200 GB 3.5-inch SSDs (for REDO logs for database virtual machine groups)
- 6 x 8 TB or 10 TB 7200 rpm 3.5-inch SAS-3 HDDs (for shared storage for application or database virtual machine groups)

### Related Info

- [“Front Panel Components \(Storage Array\)” on page 43](#)
- [“Rear Panel Components \(Storage Array\)” on page 45](#)
- [“Understanding the Compute Node” on page 39](#)

# Confirming Specifications

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These topics provide the technical information and airflow precautions you need to install the compute node and storage array.

- [“Confirming Specifications \(Compute Node\)” on page 47](#)
- [“Confirming Specifications \(Storage Array\)” on page 50](#)

## Confirming Specifications (Compute Node)

Following are the specifications for the compute node:

- [“Physical Specifications \(Compute Node\)” on page 47](#)
- [“Electrical Specifications \(Compute Node\)” on page 48](#)
- [“Environmental Specifications \(Compute Node\)” on page 48](#)
- [“Airflow Precautions \(Compute Node\)” on page 49](#)

## Physical Specifications (Compute Node)

Description	U.S.	Metric
Rack units	1U	1U
Height	1.68 in.	4.26 cm
Width	17.185 in.	43.65 cm
Depth	29 in.	73.7 cm
Weight (without rackmount kit)	43 lb	19.5 kg
Minimum service clearance (front)	36 in.	91.44 cm
Minimum service clearance (rear)	36 in.	91.44 cm
Minimum airflow clearance (front)	2 in.	5.08 cm

Description	U.S.	Metric
Minimum airflow clearance (rear)	3 in.	7.62 cm

## Electrical Specifications (Compute Node)

Description	Value
Operating Input Range	100 to 120 VAC; 200 to 240 VAC; 50-60 Hz
Max Operating Input Current per cord at 100VAC	8.6 A
Max Operating Input Current per cord at 200VAC	4.1 A
Max operating input power at 100VAC	851 W
Max operating input power at 200VAC	819 W
Maximum heat dissipation	2904 BTU/hr
	3064 KJ/hr
Maximum standby power	23.4 W

For information on power specifications, use the power calculator at:

<https://www.oracle.com/it-infrastructure/power-calculators/>

## Environmental Specifications (Compute Node)

**TABLE 1** Temperature, Humidity, Acoustic, and Elevation Specifications

Specification	Operating	Nonoperating
Ambient temperature	<ul style="list-style-type: none"> <li>■ Maximum range: 41°F to 95°F (5°C to 35°C) up to 2,953 feet (900 meters)</li> <li>■ Optimal: 69.8°F to 73.4°F (21°C to 23°C)</li> </ul> <p><b>Note</b> - Maximum ambient operating temperature is derated by 1 degree C per 300 meters of elevation beyond 900 meters, up to a maximum altitude of 3,000 meters.</p>	-40°F to 154°F (-40°C to 68°C)
Relative humidity	<ul style="list-style-type: none"> <li>■ 10% to 90% noncondensing, short term 23°F to 113°F (-5°C to 55°C)</li> <li>■ 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)</li> </ul>	Up to 93% noncondensing 95°F (35°C) maximum wet bulb
Altitude	Up to 9,840 feet (3,000 meters)	Maximum 39,370 feet (12,000 meters)



Specification	Operating	Nonoperating
Acoustic noise	<p><b>Note</b> - In China markets, regulations may limit installations to a maximum altitude of 6,562 feet (2,000 meters).</p> <ul style="list-style-type: none"> <li>Maximum condition: 7.1 Bels A weighted</li> <li>Idle condition: 7.0 Bels A weighted</li> </ul>	Not applicable

**TABLE 2** Shock and Vibration Specifications

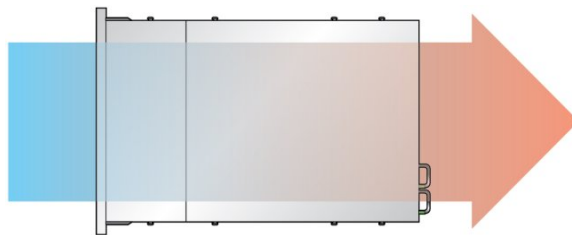
Description	Operating	Nonoperating
Shock	3.5 Gs, 11 ms half-sine	Roll-off: 1.25-inch roll-off free fall, front to back rolling directions
Vibration	0.15 G (z-axis), 0.10 G (x-, y-axes), 5-500Hz swept sine	Threshold: 13-mm threshold height at 0.65 m/s impact velocity 0.5 G (z-axis), 0.25 G (x-, y-axes), 5-500Hz swept sine

## Airflow Precautions (Compute Node)



**Caution** - Proper airflow is essential for keeping the server's internal temperatures within a safe operating range.

Air flows from the front to the rear of the server.



Follow these guidelines to ensure unrestricted airflow in the server:

- Adhere to the minimum airflow clearance specifications. See [“Physical Specifications \(Compute Node\)” on page 47](#).
- Install the server so the front faces the cool aisle and the rear faces the warm aisle.

- Do not direct warm air into the server.
- Prevent recirculation of air within a rack or cabinet.
- When servicing server internal components, ensure that air ducts, baffles, and filler panels are properly installed.
- Route cables so they do not interfere with airflow.

## Confirming Specifications (Storage Array)

Following are the specifications for the storage array:

- [“Physical Specifications \(Storage Array\)” on page 50](#)
- [“Electrical Specifications \(Storage Array\)” on page 50](#)
- [“Environmental Specifications \(Storage Array\)” on page 51](#)
- [“Airflow Precautions \(Storage Array\)” on page 51](#)

## Physical Specifications (Storage Array)

Description	U.S.	Metric
Rack units	4U	4U
Height	6.89 in.	174.9 mm
Width	17.65 in.	448 mm
Depth	21.96 in.	557.9 mm
Weight (without rackmount kit)	83 lb	38 kg
Minimum service clearance (front)	48.5 in.	1232 mm
Minimum service clearance (rear)	36 in.	914.4 mm
Minimum airflow clearance (front)	2 in.	50.8 mm
Minimum airflow clearance (rear)	3 in.	76.2 mm

## Electrical Specifications (Storage Array)

Description	Value
Voltage	100 to 240 VAC

Description	Value
Input current	8 to 4 A
Frequency	50 to 60 Hz

## Environmental Specifications (Storage Array)

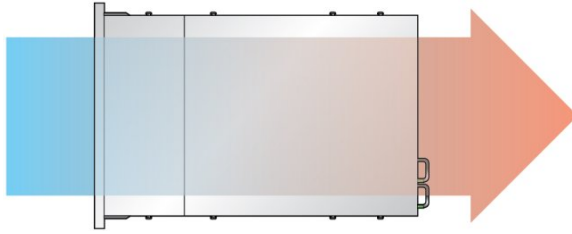
Specification	Operating	Nonoperating
Ambient temperature	Maximum: 5°C to 35°C (41°F to 95°F) up to 1829 meters (6000 feet) Optimal: 21°C to 23°C (69.8°F to 73.4°F) Short-term maximum: -5°C to 55°C (23°F to 131°F)	-40°C to 70°C (-40°F to 158°F)
Relative humidity	5% to 85% RH, non condensing, not to exceed 0.024 kg water/kg dry air (0.053 lb. water/2.205 lbs. dry air) Short-term 5% to 90% RH, non condensing, not to exceed 0.024 kg of water/kg dry air (0.053 lb. water/2.205 lbs. dry air)	93%, non condensing, 40°C (104°F) maximum wet bulb
Elevation (Company requirement)	Maximum 3000 meters (9840 feet) at 40°C (104°F)	Maximum 12,000 meters (39,370 feet)
Elevation (NEBS requirement)	-60 meters to 1800 meters (-200 feet to 5905 feet) at 40°C (104°F) 1800 meters to 4000 meters (5905 feet to 13,123 feet) at 30°C (86°F)	Maximum 12,000 meters (39,370 feet)

## Airflow Precautions (Storage Array)



**Caution** - Proper airflow is essential for keeping the storage array's internal temperatures within a safe operating range.

Air flows from the front to the rear of the storage array.



Follow these guidelines to ensure unrestricted airflow in the storage array:

- Adhere to the minimum airflow clearance specifications. See [“Physical Specifications \(Storage Array\)”](#) on page 50.
- Install the storage array so the front faces the cool aisle and the rear faces the warm aisle.
- Do not direct warm air into the storage array.
- Prevent recirculation of air within a rack or cabinet.
- When servicing storage array internal components, ensure that air ducts, baffles, and filler panels are properly installed.
- Route cables so they do not interfere with airflow.

# Preparing for Installation

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These topics detail the precautions to follow and the tools to assemble prior to installing the compute node and storage array:

- [“Preparing to Install the Compute Node” on page 53](#)
- [“Preparing to Install the Storage Array” on page 56](#)

## Preparing to Install the Compute Node

These topics detail the precautions to follow and the tools to assemble prior to installing the compute node.

Step	Description	Links
1.	Confirm that you received all the items you ordered.	<a href="#">“Shipping Kit (Compute Node)” on page 53</a>
2.	Review safety and ESD precautions	<a href="#">“Handling Precautions (Compute Node)” on page 54</a> <a href="#">“ESD Precautions (Compute Node)” on page 55</a>
3.	Verify that you have the correct tools.	<a href="#">“Installation Tools (Compute Node)” on page 55</a>

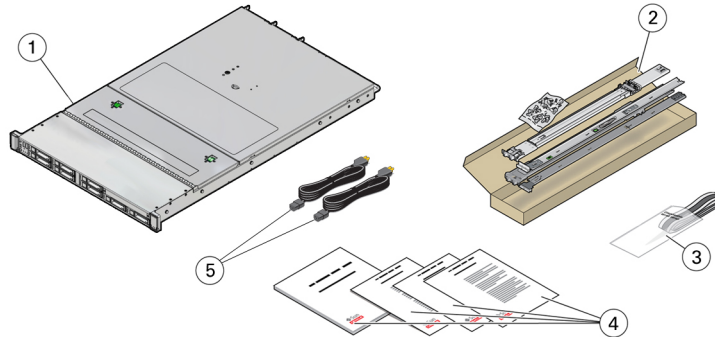
## Shipping Kit (Compute Node)

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**Note** - When you receive your server, place it in the environment where you will install it. Leave it in its shipping crate at its final destination for 24 hours. This resting period prevents thermal shock and condensation.

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Verify that you have received all of the components that ship with your server.



No.	Description
1	Server
2	Rackmount kit
3	Antistatic wrist strap
4	Printed documents
5	2 AC power cords

---

**Note** - The shipping kit might also contain PCIe slot fillers that were removed from the server when PCIe cards were installed in the factory. Save these fillers and use them to cover PCIe slots when cards are removed from the server.

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### Related Information

- [“Preparing for Installation” on page 53](#)

## Handling Precautions (Compute Node)



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**Caution** - Deploy the antitilt bar on the equipment rack before beginning an installation.

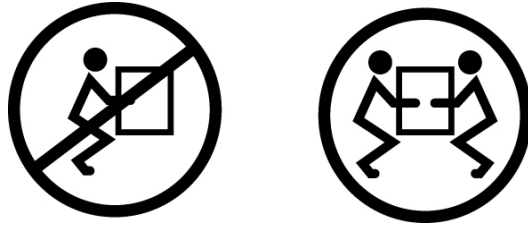
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**Caution** - The compute node weighs approximately 43 lb (19.5 kg). Two people are required to lift and mount this 1U server into a rack enclosure when using the procedures in this document.

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**Caution** - When completing a two-person procedure, always communicate your intentions clearly before, during, and after each step to minimize confusion.

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#### Related Information

- [“Confirming Specifications” on page 47](#)
- [“Installing the MiniCluster” on page 59](#)

## ESD Precautions (Compute Node)

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



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**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.

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#### Related Information

- [“Handling Precautions \(Compute Node\)” on page 54](#)

## Installation Tools (Compute Node)

- 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

- [“Handling Precautions \(Compute Node\)” on page 54](#)
- [“ESD Precautions \(Compute Node\)” on page 55](#)

## Preparing to Install the Storage Array

These topics detail the precautions to follow and the tools to assemble prior to installing the storage array.

Step	Description	Links
1.	Review safety and ESD precautions	<a href="#">“Precautions (Storage Array)” on page 56</a>
2.	Verify that you have the correct tools.	<a href="#">“Installation Tools (Storage Array)” on page 57</a>

## Precautions (Storage Array)

Observe the following cautions when installing the storage array into a rack using the supplied rail kit. Note that if your rail kit shipped with installation instructions, use those instructions instead.

- Always load equipment into a rack from the bottom up so that it will not become top-heavy and tip over. Deploy the anti-tip bar to prevent the rack from tipping during equipment installation.
- Ensure that the temperature in the rack does not exceed the controller's maximum ambient rated temperatures. Consider the total airflow requirements of all equipment installed in the rack to ensure that the equipment is operated within its specified temperature range.
- Do not remove a component if you do not have an immediate replacement. The storage array must not be operated without all components in place.



- Do not lift the storage array by the handles on the power supply with fan modules; they are not designed to take the weight.

### Related Information

- [“Installation Tools \(Storage Array\)” on page 57](#)

## Installation Tools (Storage Array)

To install the storage array, you need the following tools:

- Phillips head No. 2 screwdriver that is a minimum of 4 inches long.
- A mechanical lift is highly recommended because the storage array can weigh approximately 110 lbs (50 kg). At least three people are required: two to install the storage array and one spotter to engage the rails. If a mechanical lift is not available, remove the power supply with fan modules to reduce the weight.

Use one of the following racks for the storage array:

- Sun Rack II 1042/1242 cabinet 310
- Any 19-inch wide, 4-post, EIA-compatible rack or cabinet with a front-to-back depth between vertical cabinet rails of 61 cm to 91 cm (24 in. to 32 in.). The cabinet must have either 9.5 mm square holes or 7 mm round holes. Cabinets must be able to support the weight of all equipment contained within them.

Position the rack where the storage array is to be installed adjacent to the rack where the controller is installed, if separate. Stabilize the cabinet and lock the casters. To facilitate access, remove doors from cabinets.

### Related Information

- [“Precautions \(Storage Array\)” on page 56](#)



# Installing the MiniCluster

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These topics describe how to install the compute node and storage array into a rack:

- [“Stabilizing the Rack” on page 59](#)
- [“Installing the Compute Node” on page 62](#)
- [“Installing the Storage Array” on page 88](#)

## Stabilizing the Rack

These topics describe how to stabilize the rack when installing the compute nodes and storage array.

- [“Rack Compatibility” on page 59](#)
- [“Rack Cautions” on page 60](#)
- [“Stabilize the Rack” on page 61](#)

## Rack Compatibility

Check that your rack is compatible with the slide rail and CMA options. The optional slide rails are compatible with a wide range of equipment racks that meet the following standards.

Item	Requirement
Structure	4-post rack (mounting at both front and rear). 2-post racks are not compatible.
Rack horizontal opening and unit vertical pitch	Conforms to ANSI/EIA 310-D-1992 or IEC 60927 standards.
Rack rail mounting hole sizes	Only 9.5-mm square hole and M6 round mounting holes are supported. All other sizes, including 7.2-mm, M5, or 10-32 mounting holes, are <i>not</i> supported.
Distance between front and rear mounting planes	Minimum: 24.5 in. (622 mm).

Item	Requirement
	Maximum: 35.25 in. (895 mm).
Clearance depth in front of front mounting plane	Distance to front cabinet door is at least 1.06 in. (27 mm).
Clearance depth behind front mounting plane	Distance to rear cabinet door is at least 35.5 in. (900 mm) with the CMA, or 30.4 in. (770 mm) without the CMA.
Clearance width between front and rear mounting planes	Distance between structural supports and cable troughs is at least 18 in. (456 mm).
Compute node dimensions	Depth: 29.0 in. (737 mm). Width: 17.5 in. (445 mm).
Storage array dimensions	Height: 3.45 in. (87.6 mm). Depth: 24.8 in. (630 mm). Width: 19 in. (483 mm). Height: 6.9 in. (175 mm).

### Related Information

- [“Rack Cautions” on page 60](#)
- [“Stabilize the Rack” on page 61](#)

## Rack Cautions



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



**Caution - Elevated Operating Ambient Temperature.** If the 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, install the equipment only in an environment compatible with the maximum ambient temperature (T<sub>ma</sub>) specified for the server.



**Caution - Reduced Air Flow.** Install the equipment in a rack so that the amount of air flow is adequate for the safe operation of the equipment.



**Caution - Mechanical Loading.** Mount the equipment in the rack so that the weight is distributed evenly. A hazardous condition can exist with uneven mechanical loading.



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**Caution - Circuit Overloading.** Do not overload the power supply circuits. Before connecting the server to the supply circuit, review the equipment nameplate power ratings and consider the effect that circuit overloading might have on overcurrent protection and supply wiring.

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**Caution - Reliable Grounding.** Maintain reliable grounding of rackmounted equipment. Give particular attention to supply connections other than direct connections to the branch circuit (for example, use of power strips).

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**Caution -** Do not use slide rail mounted equipment as a shelf or a work space.

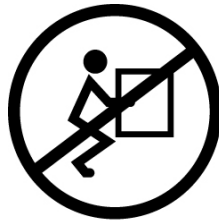
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**Caution -** The compute node weighs approximately 43 lb (19.5 kg). Two people are required to lift and mount this 1U server into a rack enclosure when using the procedures in this document.

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**Caution -** The storage array weighs approximately 82 lb (37.2 kg). If no mechanical lift is available, three people are required to lift and mount it into a rack.

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### Related Information

- [“Rack Compatibility” on page 59](#)
- [“Stabilize the Rack” on page 61](#)

## ▼ Stabilize the Rack



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**Caution -** To reduce the risk of personal injury, stabilize the rack by extending all antitilt devices before installing the server.

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Refer to the rack documentation for detailed instructions for the following steps.

1. **Read the rack cautions and stabilize the rack.**  
See [“Rack Cautions” on page 60](#).
2. **Open and remove the front and rear doors from the rack.**
3. **To prevent the rack cabinet from tipping during the installation, stabilize the cabinet using all antitilt mechanisms provided.**
4. **If there are leveling feet beneath the rack to prevent it from rolling, extend these leveling feet fully downward to the floor.**

#### Related Information

- [“Rack Compatibility” on page 59](#)
- [“Rack Cautions” on page 60](#)

## Installing the Compute Node

These topics describe how to install the compute node into a rack using the rail assembly in the rackmount kit. Perform these procedures if you purchased the rail assembly.

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**Note** - In this guide, the term rack means either an open rack or a closed cabinet.

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Step	Description	Links
1.	Ensure that your rack is compatible with the server requirements.	<a href="#">“Rack Compatibility” on page 59</a>
2.	Review the cautions for working with racks.	<a href="#">“Rack Cautions” on page 60</a>
3.	Use antitilt mechanisms to ensure that the rack does not tip when the server is installed.	<a href="#">“Stabilize the Rack” on page 61</a>
4.	Prepare the slide rails, mounting brackets, and slide rail assemblies for server installation.	<a href="#">“Install the Rackmount Hardware” on page 63</a> <a href="#">“Mark the Rackmount Location” on page 65</a> <a href="#">“Install AC Power Cables and Slide-Rails” on page 66</a> <a href="#">“Attach Tool-less Slide-Rail Assemblies” on page 67</a>

Step	Description	Links
5.	Install the server in the rack.	<a href="#">“Install the Compute Node Into the Slide-Rail Assemblies” on page 70</a>
6.	(Optional) Install the CMA.	<a href="#">“Install the Cable Management Arm” on page 72</a>

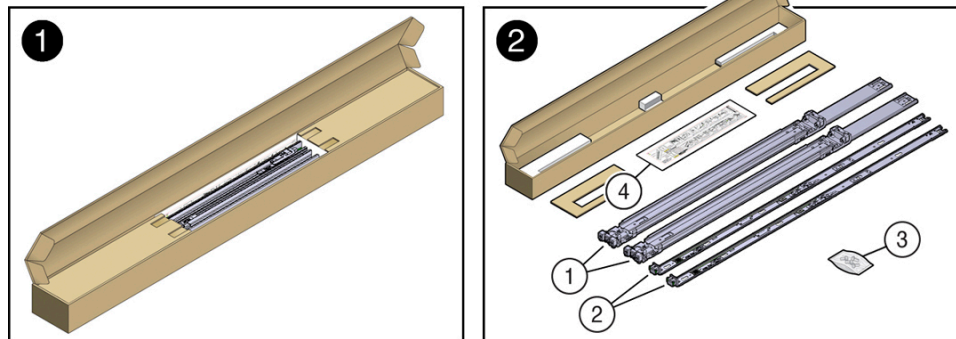
## ▼ Install the Rackmount Hardware

Complete the following task to remove the mounting brackets from the slide rail assemblies before installation.

### 1. Unpack the slide rails.

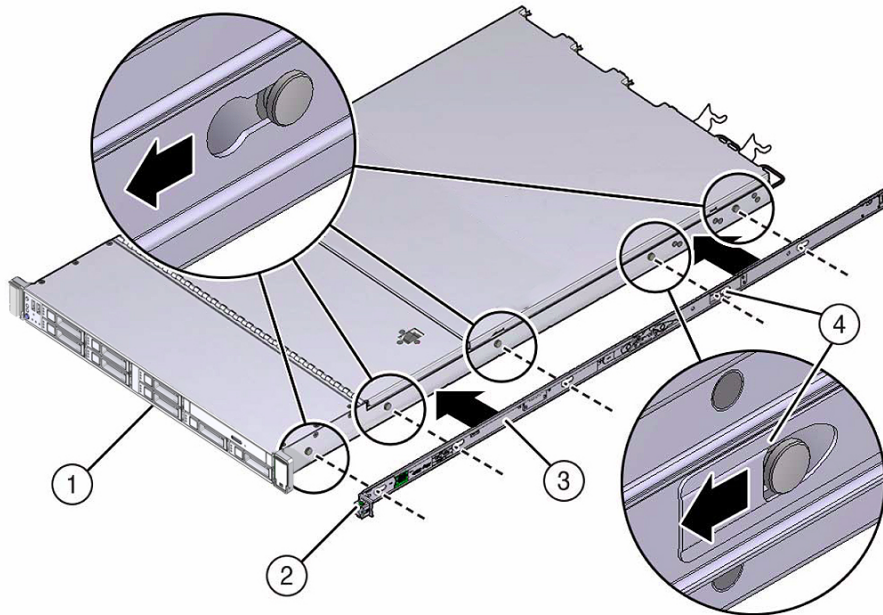
The rackmount kit contains two slide-rails, two mounting brackets, and optional securing screws.

**Note** - Refer to the rackmount kit installation card for instructions on how to install your server into a four-post rack, using the slide-rail and cable management arm options.



No.	Description
1	Slide-rails
2	Mounting brackets
3	Four M4 x 5 fine-pitch mounting bracket securing screws (optional)
4	Installation card

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



No.	Description
1	Chassis front
2	Slide-rail lock
3	Mounting bracket
4	Mounting bracket clip

3. **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.**
4. **Verify that the rear locating pin has engaged the mounting bracket clip.**

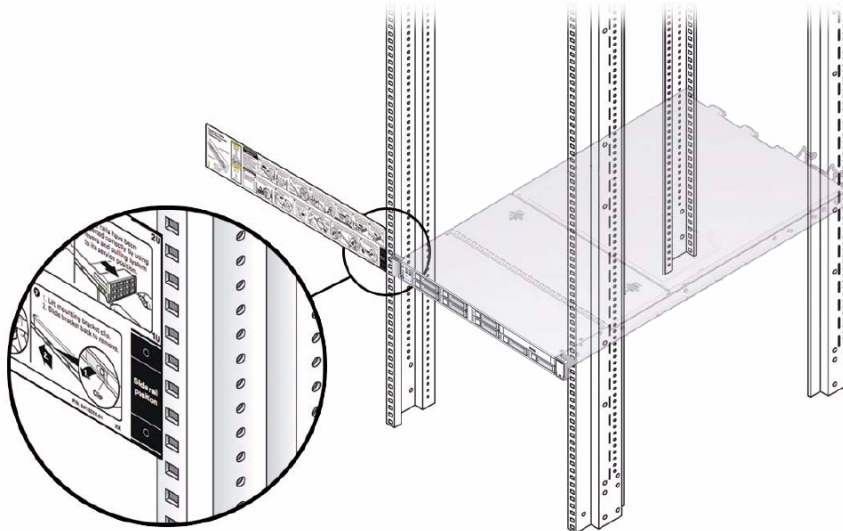


5. Repeat [Step 2](#) through [Step 4](#) to install the remaining mounting bracket on the other side of the server.
6. **Mark the rackmount location.**  
See [“Mark the Rackmount Location”](#) on page 65.

## ▼ Mark the Rackmount Location

1. **Ensure that there is at least 1 rack unit (1U) of vertical space in the rack cabinet to install the server.**
2. **Place the rackmount installation card against the front rails.**

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

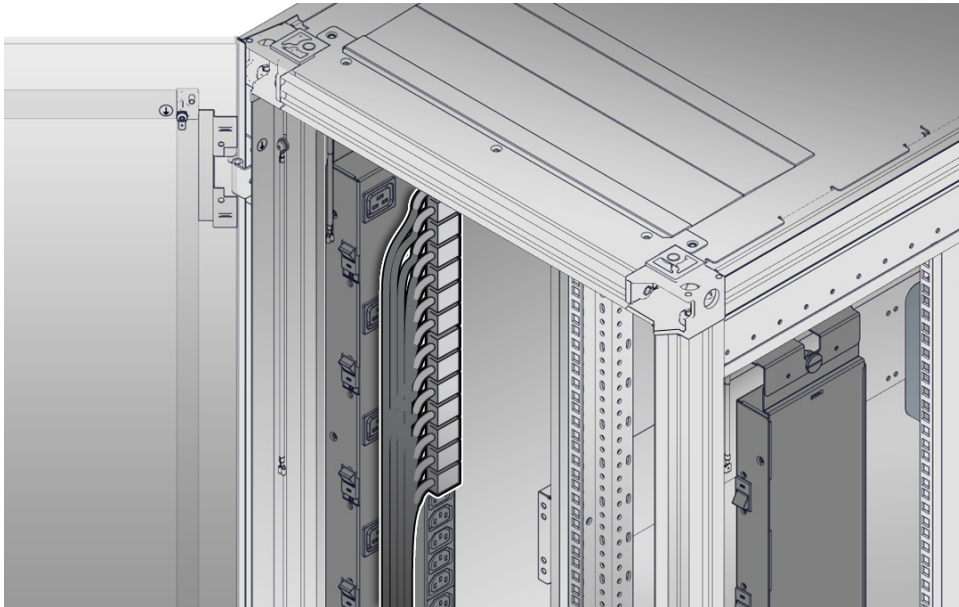


3. **Mark the mounting holes for the front slide-rails.**
4. **Mark the mounting holes for the rear slide-rails.**

5. **Install the AC power cables and slide-rails.**  
See [“Install AC Power Cables and Slide-Rails”](#) on page 66.

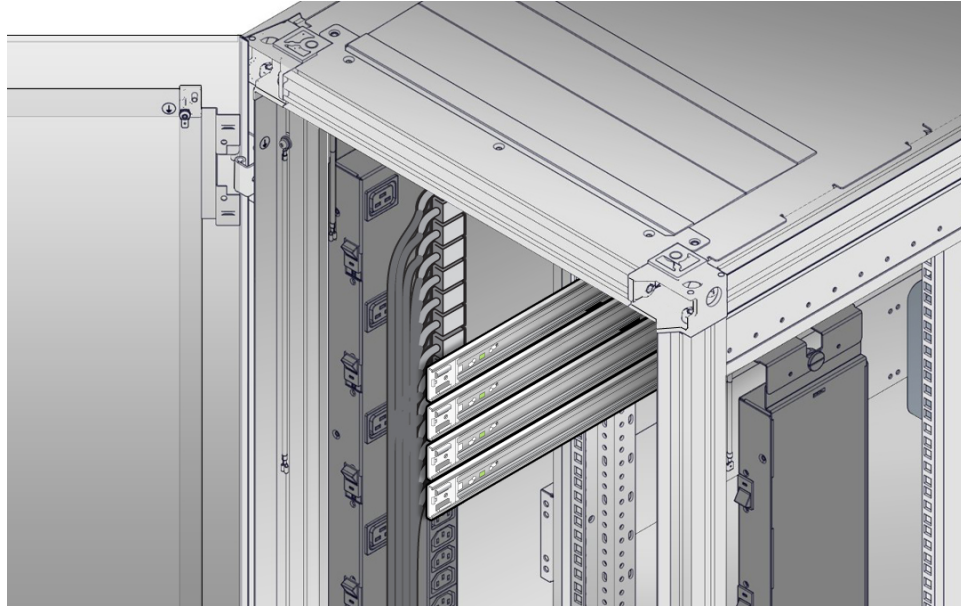
## ▼ Install AC Power Cables and Slide-Rails

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 67](#).



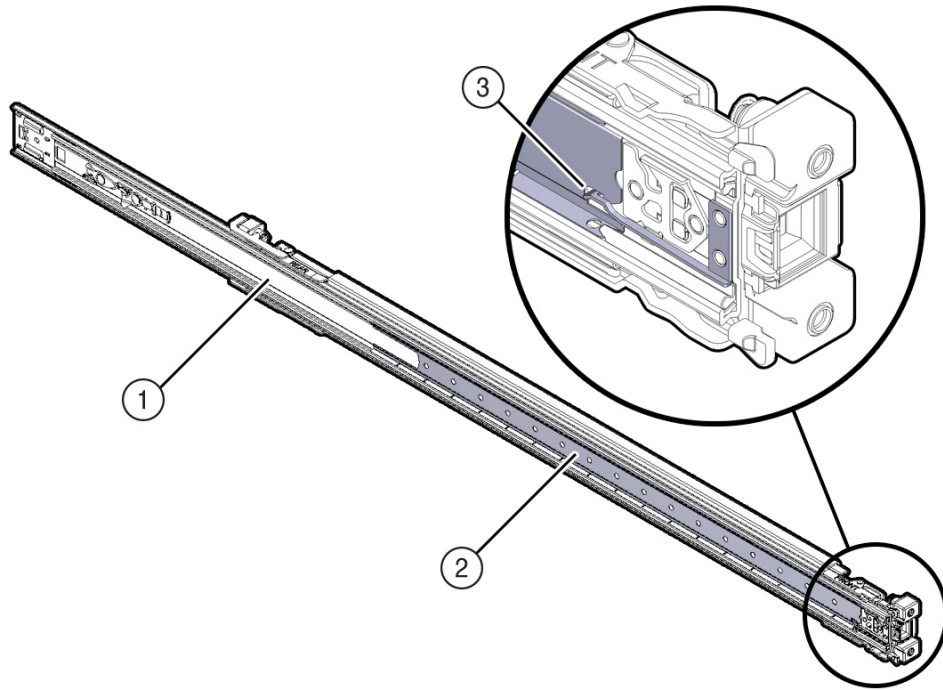
**3. Attach the tool-less slide-rail assemblies.**

See [“Attach Tool-less Slide-Rail Assemblies” on page 67](#).

**▼ Attach Tool-less Slide-Rail Assemblies**

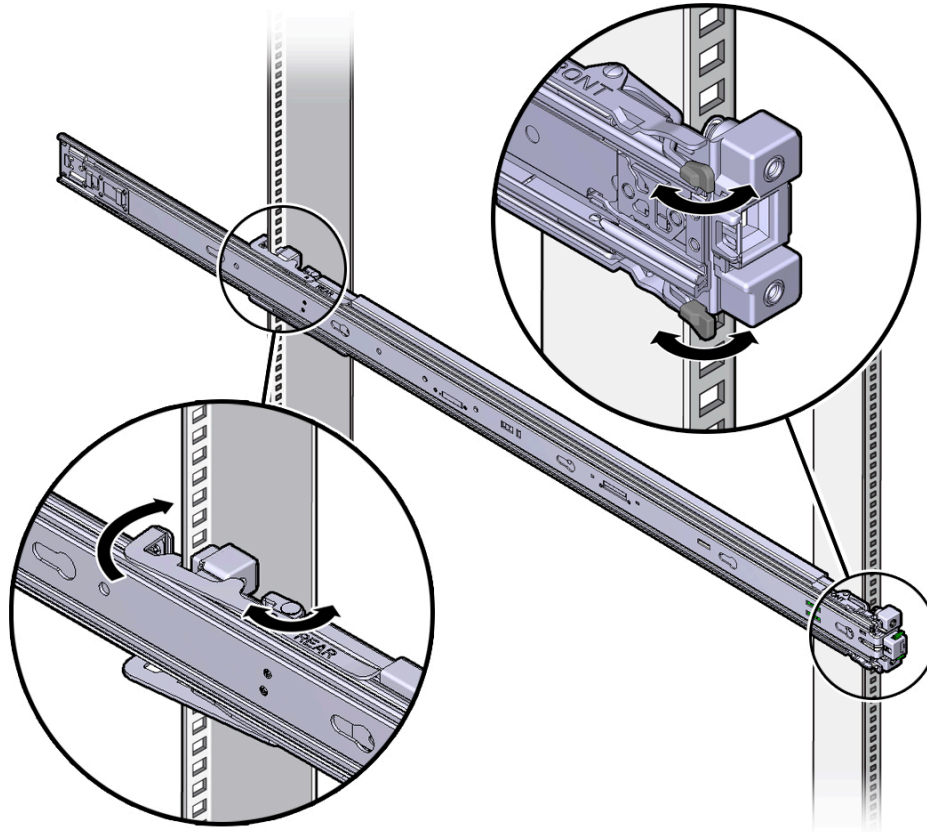
Use this procedure to attach tool-less slide-rail assemblies to the rack.

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



No.	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.
5. Install the compute node into the slide-rail assemblies.  
See [“Install the Compute Node Into the Slide-Rail Assemblies”](#) on page 70.

## ▼ Install the Compute Node Into the Slide-Rail Assemblies

Use this procedure to install the 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 server. Attempting this procedure alone could result in equipment damage or personal injury.

---



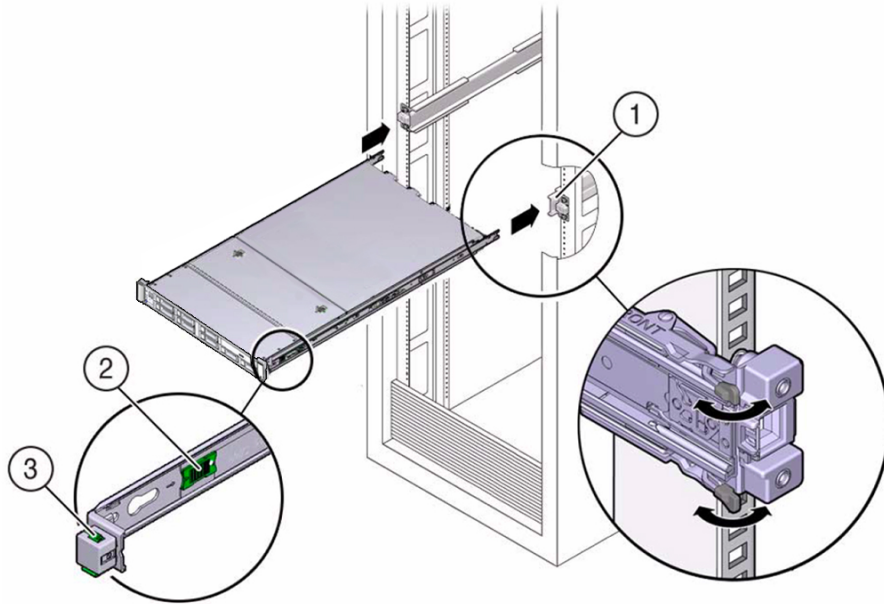
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**Caution** - Always load equipment into a rack from the bottom up so that the rack will not become top-heavy and tip over. Extend your rack's anti-tilt bar to prevent the rack from tipping during equipment installation.

---

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

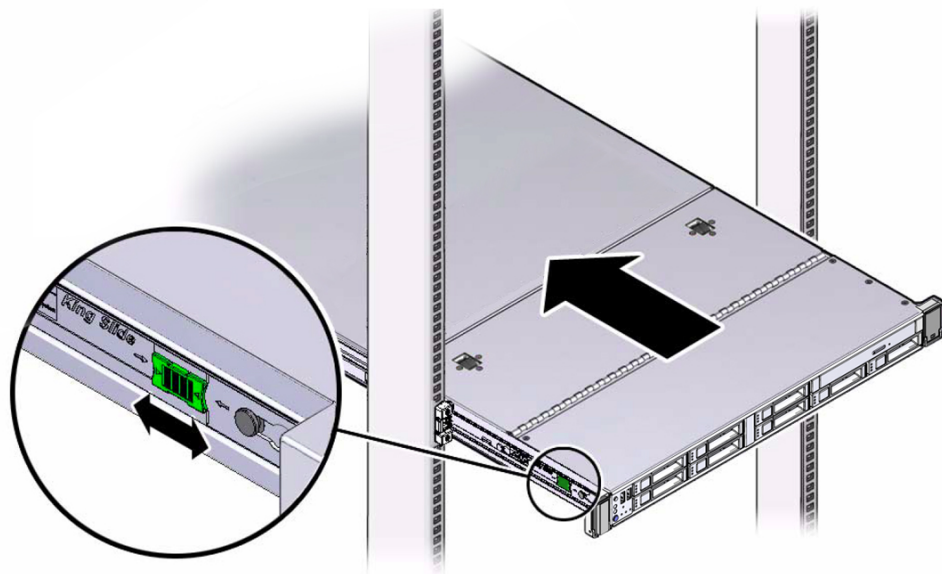
3. **Insert the mounting brackets into the slide-rails, and then push the server into the rack until the mounting brackets encounter the slide-rail stops (approximately 30 cm, or 12 inches).**



No.	Description
1	Inserting mounting bracket into slide-rail
2	Slide-rail release button
3	Slide-rail lock

4. **Simultaneously push and hold the green slide-rail release buttons on each mounting bracket while you push the server into the rack. Continue pushing the 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 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.

---

**5. Install the cable management arm.**

See [“Install the Cable Management Arm” on page 72.](#)

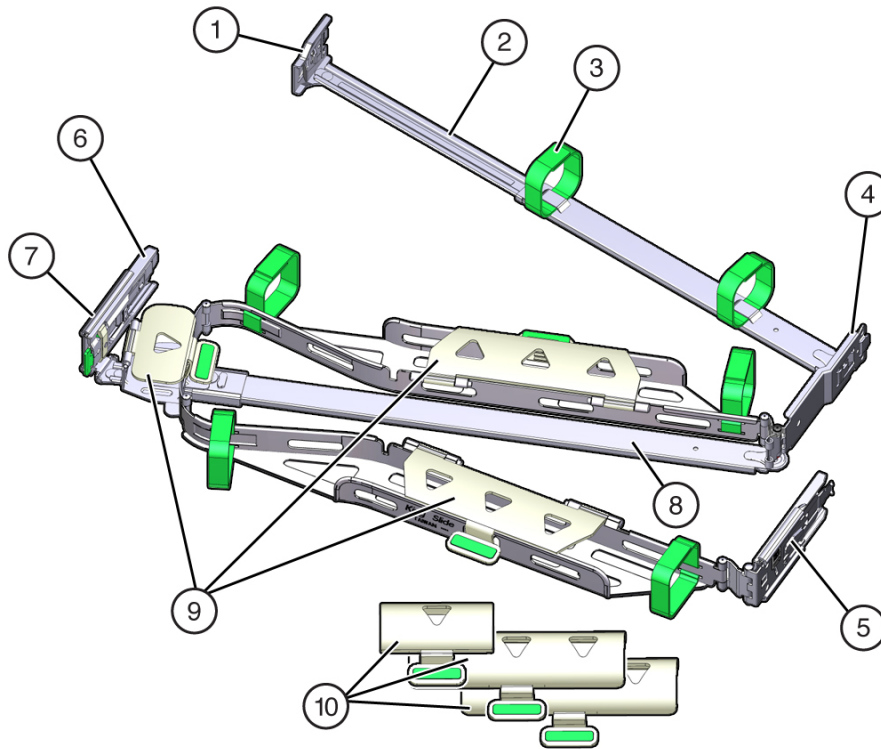
**▼ Install the Cable Management Arm**

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

**1. Unpack the CMA.**



The following figure shows the CMA components.



No.	Description	No.	Description
1	Connector A	6	Connector D
2	Front slide bar	7	Slide-rail latching bracket (used with connector D)
3	Velcro straps (6)	8	Rear slide bar
4	Connector B	9	Compute node cable covers
5	Connector C	10	Compute node cable covers

2. **Ensure that the correct cable covers for your server are installed on the CMA.**  
The compute node uses the flat cable covers.
3. **Ensure that the six Velcro straps are threaded into the CMA.**

---

**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. This prevents the Velcro straps from interfering with the expansion and contraction of the slide bar when the server is extended out of the rack and returned into the rack.

---

4. **To make it easier to install the CMA, extend the 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 server.**

---

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

---

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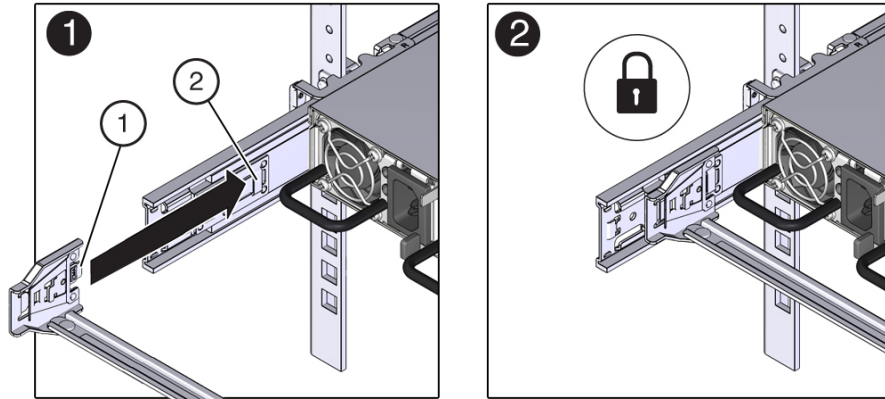
**Note** - Throughout this installation procedure, support the CMA and do not allow it to hang under its own weight until it is secured at all four attachment points.

---

6. **To install the CMA's connector A into the left 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 (callout 1) goes into the slide-rail's front slot (callout 2).

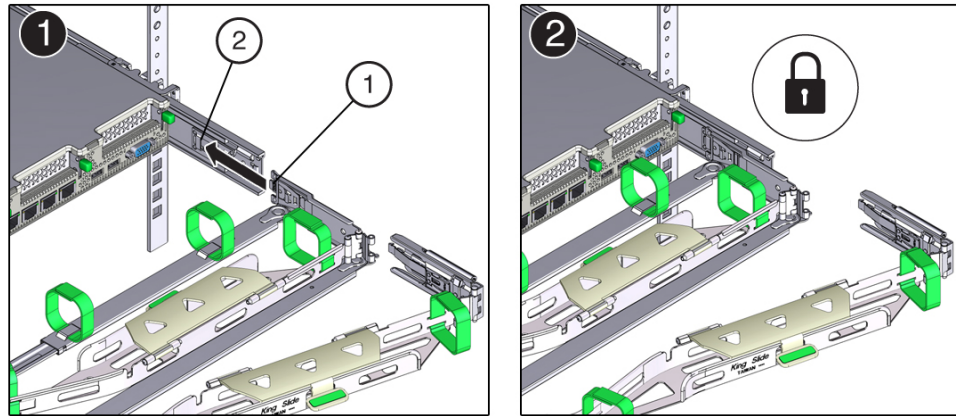
- b. Gently tug on the left side of the front slide bar to verify that connector A is properly seated.



- 7. 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 (callout 1) goes into the slide-rail front slot (callout 2).

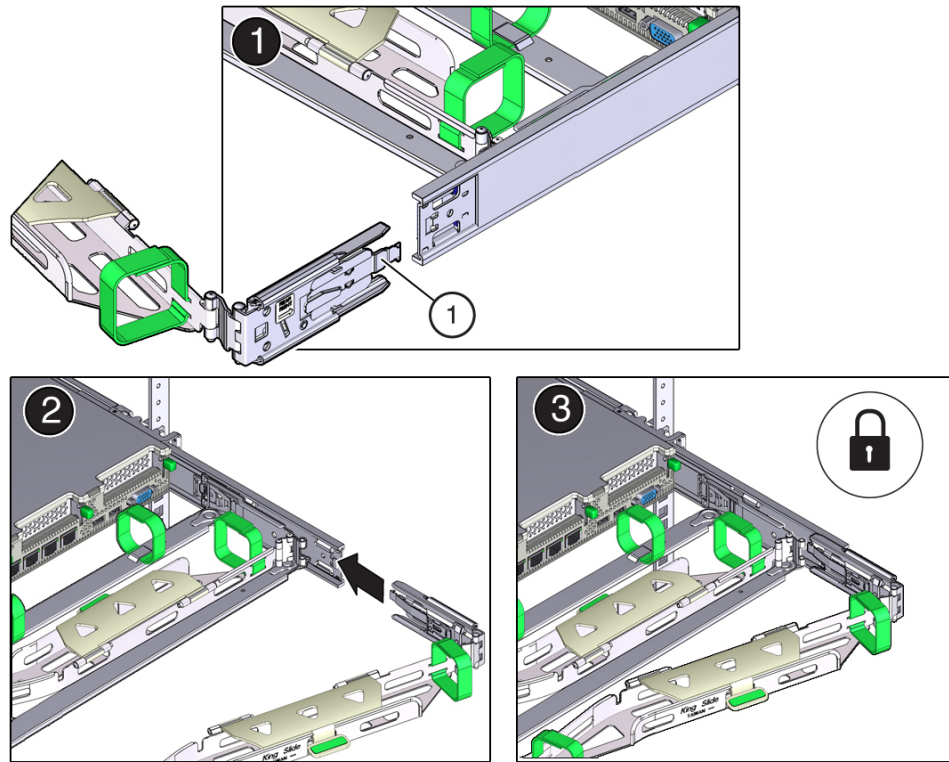
- b. Gently tug on the right side of the front slide bar to verify that connector B is properly seated.



No.	Description
1	Connector B tab
2	Right slide-rail front slot

- 8. 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 (server side) of the right slide-rail (frame 1).

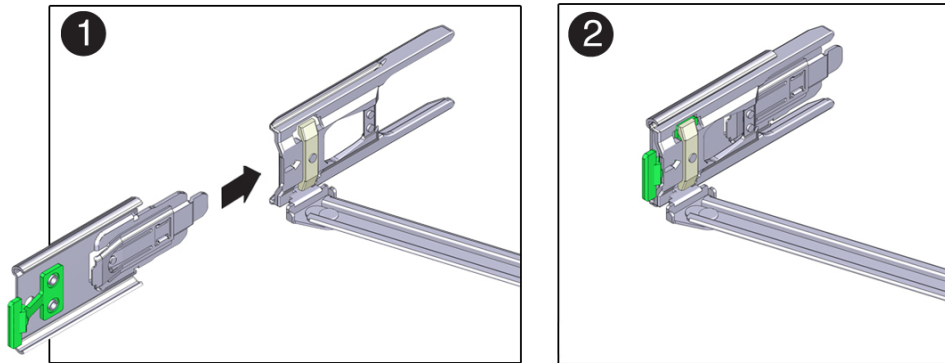


- b. Insert connector C into the right slide-rail until it locks into place with an audible click (frames 2 and 3).
- c. Gently tug on the right side of the CMA's rear slide bar to verify that connector C is properly seated.
9. To prepare the CMA's connector D for installation, remove the tape that secures 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. 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.

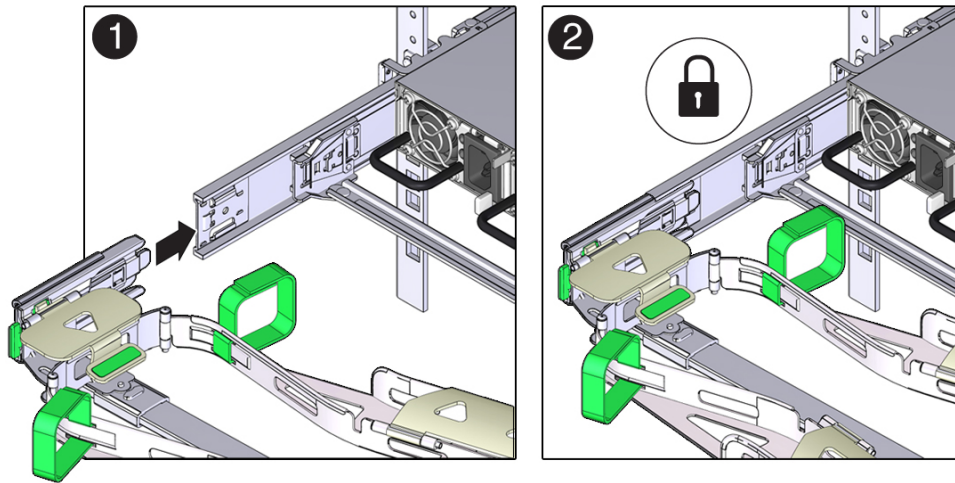
---

- b. Gently tug on the left side of the CMA's rear 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. 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 server is extended.




---

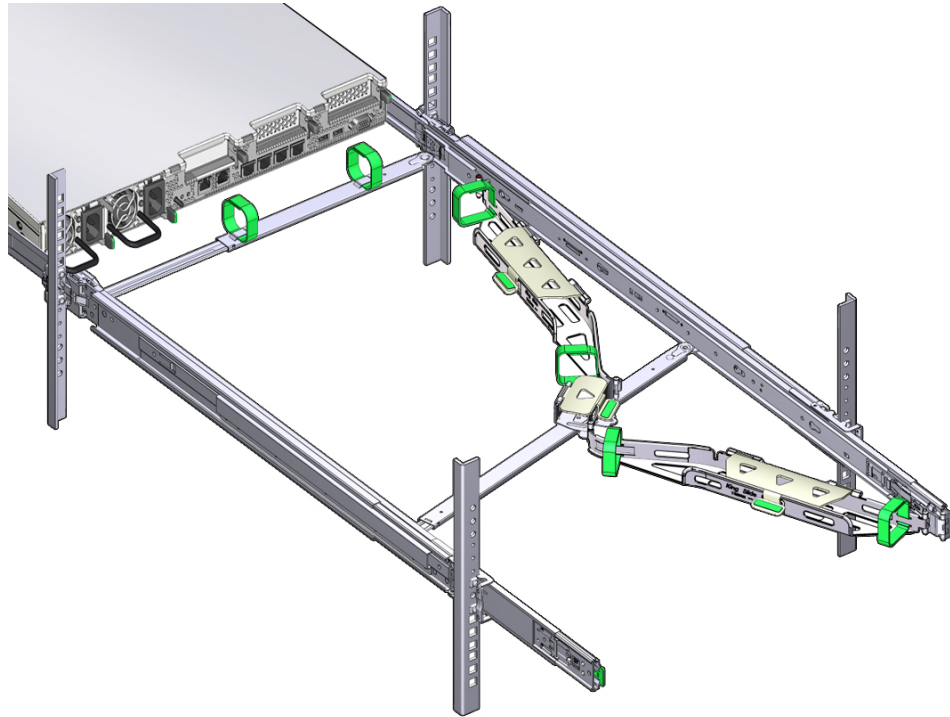
**Caution** - To reduce the risk of personal injury, stabilize the expansion rack cabinet and extend all anti-tilt devices before extending the server from the rack.

---

For instructions for stabilizing the rack, see [“Stabilize the Rack” on page 61](#).

- b. Slowly pull the server out of the rack until the slide-rails reach their stops.
- c. Inspect the attached cables for any binding or kinks.

- d. Verify that the CMA extends fully with the slide-rails.



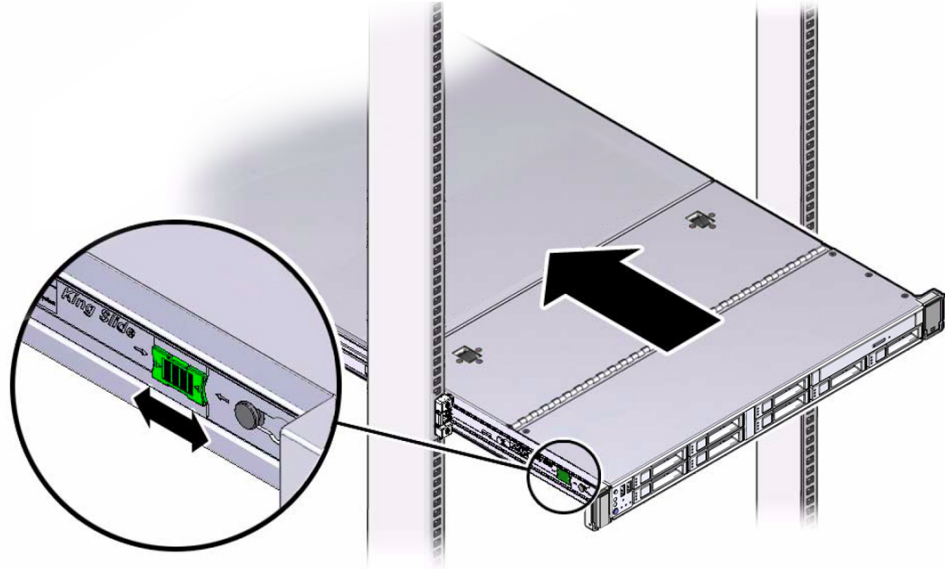
13. Return the server to the rack.
  - a. Simultaneously pull and hold the two green release tabs (one on each side of the server) toward the front of the server while you push the server into the rack. As you push the server into the rack, verify that the CMA retracts without binding.



---

**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 server.

---



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

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

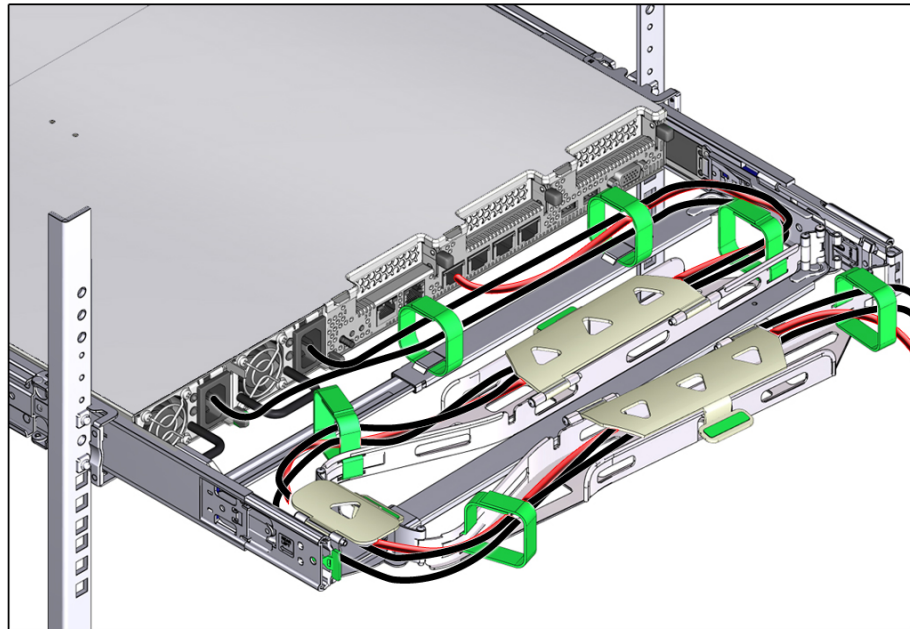
- 14. Connect cables to the server, as required.**  
Instructions for connecting the server cables are provided in [“Connecting Cables” on page 99](#).
- 15. Open the CMA cable covers, route server cables through the CMA's cable troughs, close the cable covers, and secure the cables with the six Velcro 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 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 server to which they are attached; otherwise, the cables might snag on other equipment installed in the rack when the 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 server is extended from the rack and returned to the rack.

---

17. **Install the storage array into the rack.**  
See [“Installing the Storage Array” on page 88](#).

### Related Information

- [“Remove the Cable Management Arm” on page 83](#)

## ▼ Remove the Cable Management Arm

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

Before you begin this procedure, refer to [“Install the Cable Management Arm” on page 72](#) 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 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 server from the rack.

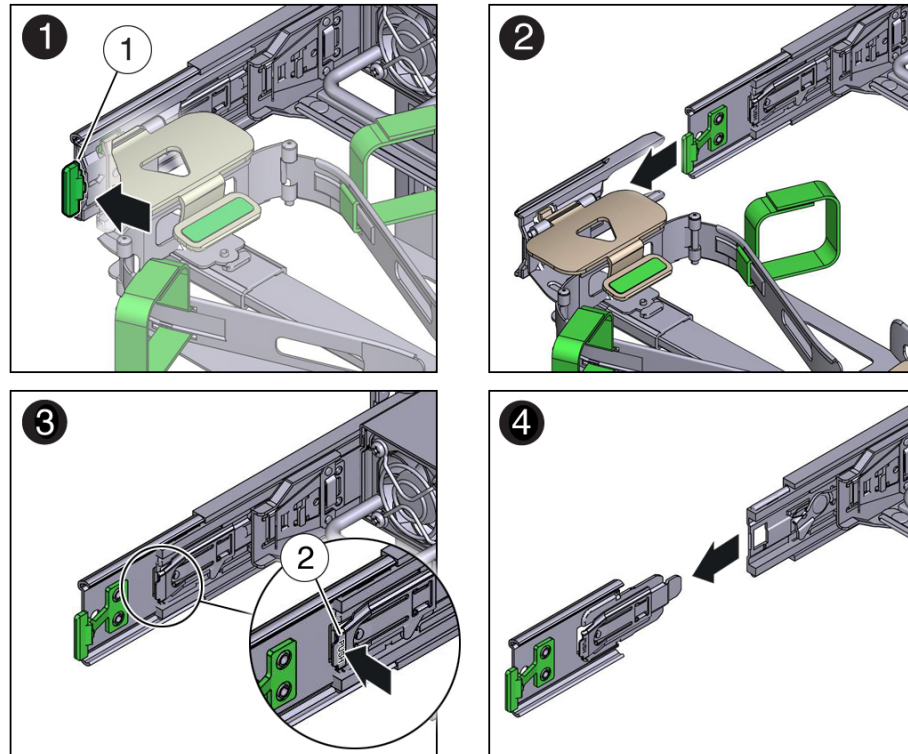
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For instructions for stabilizing the rack, see [“Stabilize the Rack” on page 61](#).

2. **To make it easier to remove the CMA, extend the server approximately 13 cm (5 inches) out of the front of the rack.**
3. **Remove the cables from the CMA.**
  - a. **Disconnect all cables from the rear of the server.**
  - b. **If applicable, remove any additional Velcro straps that were installed to bundle the cables.**

- c. **Unwrap the six Velcro straps that are securing the cables.**
  - d. **Open the three cable covers to the fully opened position.**
  - e. **Remove the cables from the CMA and set them aside.**
- 4. 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.



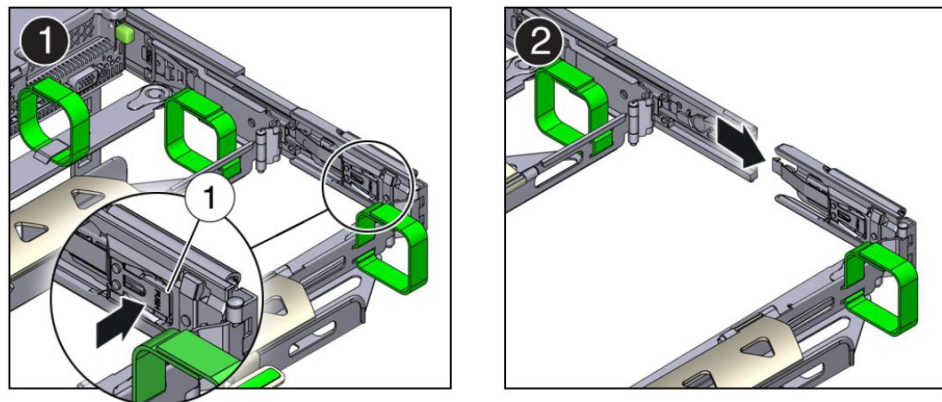
No.	Description
1	Connector D release tab (green)
2	Slide-rail latching bracket release tab (labeled PUSH)

- b. Use your right hand to support the CMA and use your left thumb to push in (toward the left) on the slide-rail 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).

**5. 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).

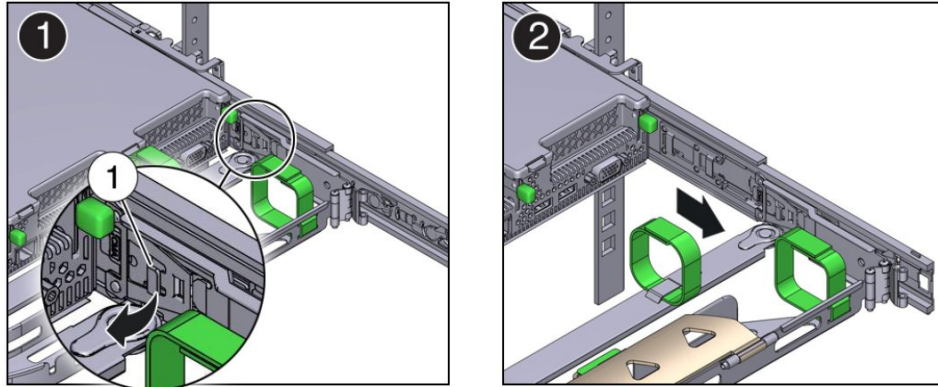


No.	Description
1	Connector C release tab (labeled PUSH)

**6. 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).

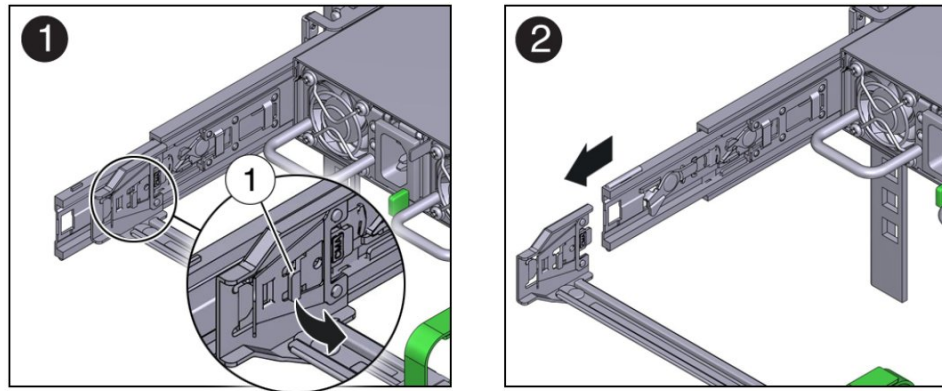


No.	Description
1	Connector B release lever

7. 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).



No.	Description
1	Connector A release lever

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

### Related Information

- [“Install the Cable Management Arm” on page 72](#)

## Installing the Storage Array

This section describes how to install the storage array into the rack.

The storage array requires four standard mounting units (4RU) of vertical space in the cabinet.

- Ensure that your site meets the requirements in [“Confirming Specifications \(Storage Array\)” on page 50](#)



- Ensure that the rack meets the requirements in [“Rack Compatibility” on page 59](#)

---

**Note** - The rail kit included with the storage array can only be used with EIA compliant 9.5 mm square hole racks or 7.0 mm diameter round hole racks.

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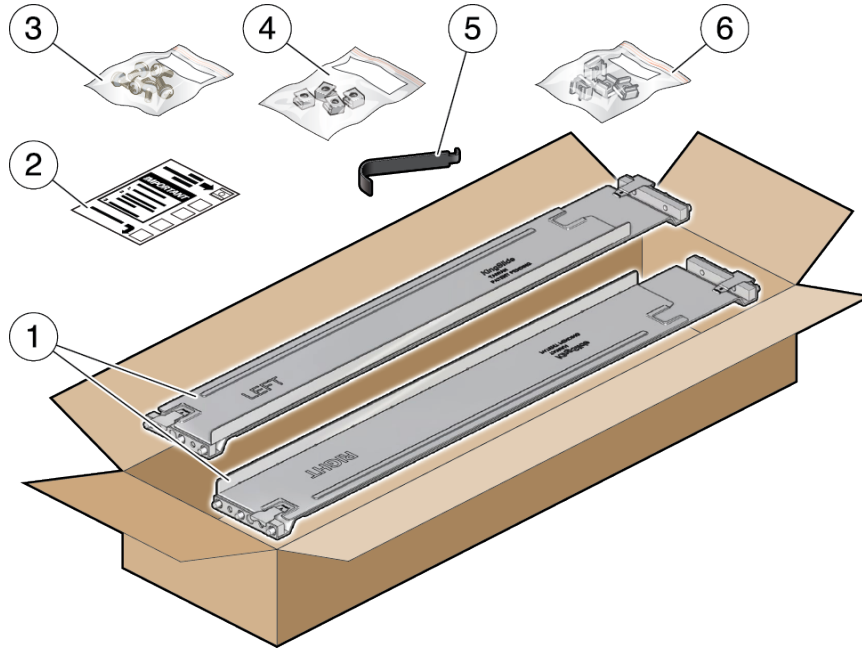
- Observe all precautions in [“Rack Cautions” on page 60](#)

Step	Description	Links
1	Install the rail kit for the storage array.	<a href="#">“Install the Rail Kit” on page 89</a>
.		
2.	Install the storage array in the rack.	<a href="#">“Install the Storage Array in the Rack” on page 95</a>

## ▼ Install the Rail Kit

- 1. Starting at the bottom of the cabinet, locate the appropriate rack unit (RU) height.**  
Storage shelves must be installed below the server nodes to prevent the rack from tipping.
- 2. Open the storage array rail kit box and find the cage nut packets included with the kit, and confirm if your rack uses square or round holes.**  
The cage nut packets include a special template for either round or square hole racks for positioning the cage nuts.

**Note** - The following steps show rail kit installation with a square hole rack. The same steps would apply for a round hole rack.



No.	Description
1	Two adjustable storage array rails
2	Hard copy document
3	Six rear 10-32 7mm shipping screws (2 are spares)
4	Four round 7mm 10-32 cage nuts per set (2 are spares). Only one set is required, either square or round.
5	Cage nut tool
6	Four square 9.5mm 10-32 cage nuts per set (2 are spares). Only one set is required, either square or round.

**3. Attach the storage array rails to the rack, as follows:**

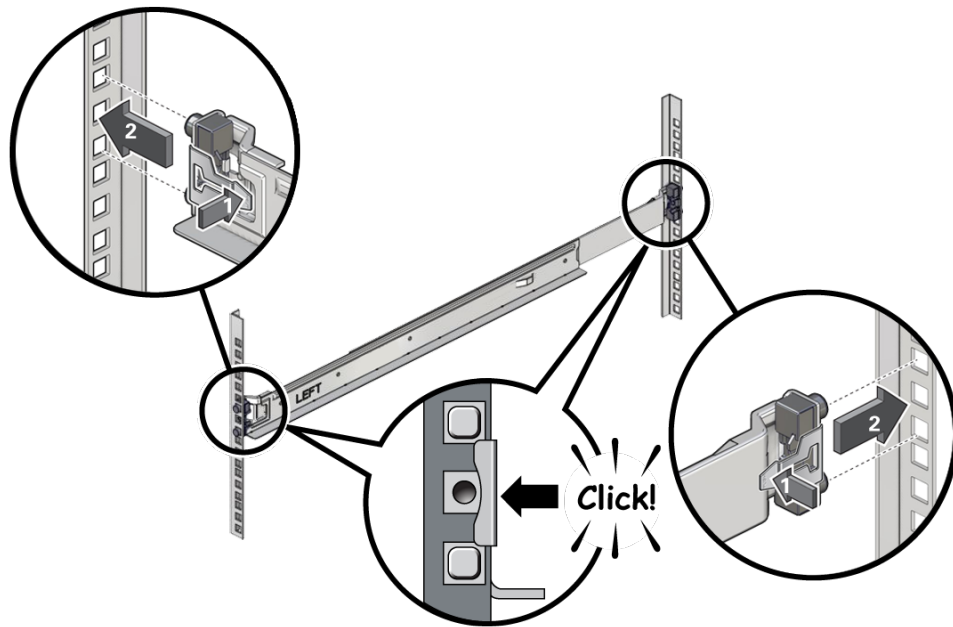
- a. Orient the rail so that the stamped label (LEFT or RIGHT) is facing the inside of the rack.
- b. Adjust the rail length to fit the front and rear of the rack.

---

**Note** - Mark which rack rail holes you will be using to ensure the storage array rails are installed evenly and correctly the first time.

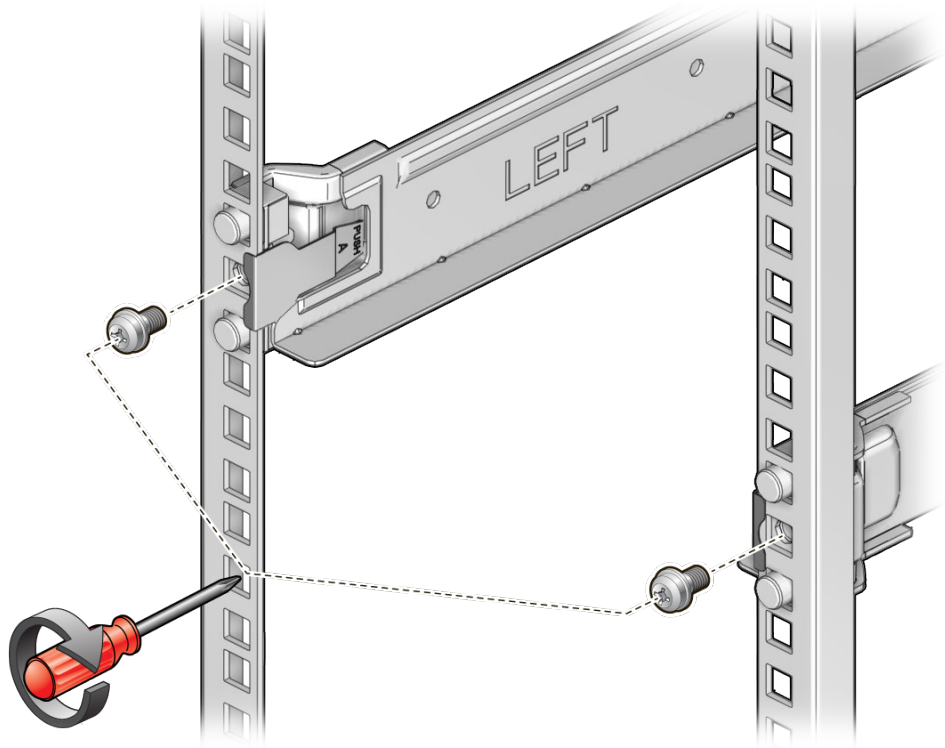
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- c. Hold open the rail clamp at each end of the rail by pressing the clamp lever [1] and insert both ends of the rail into the appropriate rack holes [2].



- d. Close the rail clamps over the rails by releasing the clamp lever.  
You will hear an audible click as the clamps lock in place over the rack rails.
- e. Repeat [Step 3a](#) through [Step 3d](#) for the second rail.

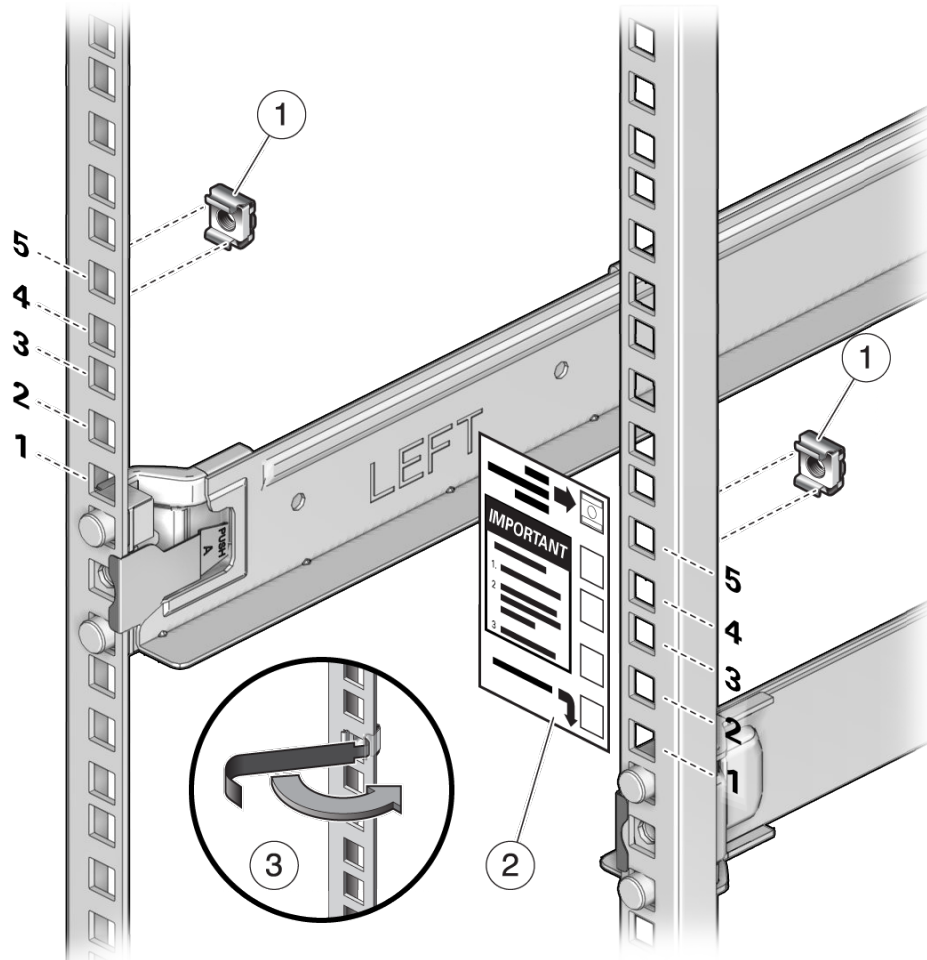
4. Install one screw through the rack and into the rear of each rail.



5. Install the front cage nuts.



**Caution** - Installing the storage array without the front cage nuts will cause the storage array to be unstable. You would then need to remove the storage array from the rack to install the cage nuts.



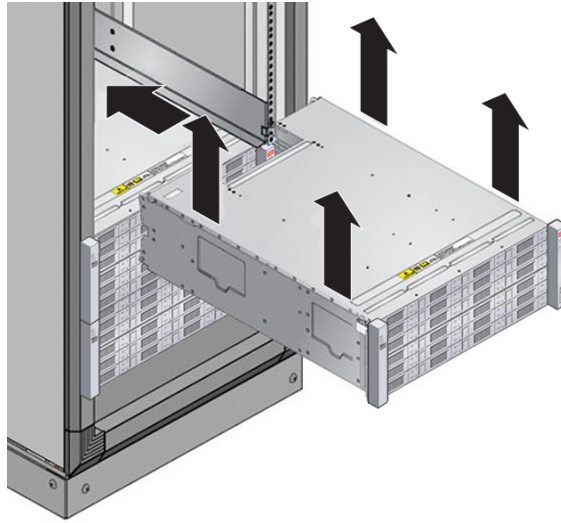
No.	Description
1	Cage nuts
2	Template

No.	Description
3	Cage nut tool

- a. Use the template to determine cage nut placement.
  - b. Retrieve a cage nut and hook one lip of the nut into the appropriate rail hole.
  - c. Insert the tip of the cage nut insertion tool through the rail hole [3] and hook the other lip of the cage nut. Pull the cage nut through the hole until the lip snaps into place.
  - d. Repeat [Step 5a](#) through [Step 5c](#) for the second cage nut.
6. Install the storage array in the rack.  
See [“Install the Storage Array in the Rack” on page 95](#).

## ▼ Install the Storage Array in the Rack

1. Using a mechanical lift or three people, one at each side of the storage array and one in front, carefully lift and rest the storage array on the bottom ledge of the left and right rails. Do not lift using the power supply handles.



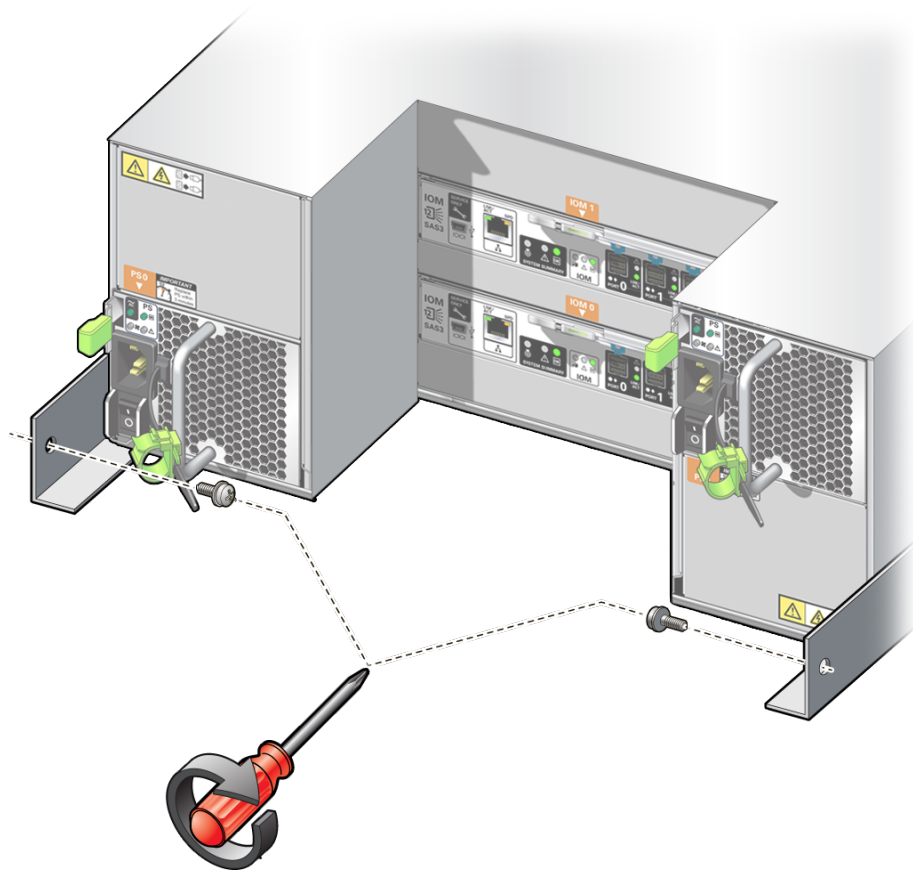
2. Carefully slide the storage array into the cabinet. Ensure that the storage array is fully seated within the rails. If removing the storage array to reset it, support it at all times.

3. Secure the front of the storage array using the four captive securing screws [1 - 4].





4. To secure the storage array in the rack for shipping, install a screw in each rear storage array chassis ear.



5. Repeat these steps if you have an additional storage array to install.
6. Connect the cables.  
See [“Connecting Cables”](#) on page 99.



# Connecting Cables

---

These tasks describe how to connect cables for the compute nodes and the storage array.

Step	Description	Links
1.	Review the ports on the compute nodes and storage array.	<a href="#">“Identifying Ports (Compute Node)” on page 99</a> <a href="#">“SAS Ports (Storage Array)” on page 105</a>
2.	Understand the MiniCluster connections.	<a href="#">“Understanding MiniCluster Connections” on page 105</a>
3.	Connect the management network.	<a href="#">“Connect the Management Network” on page 106</a>
4.	Connect the 10GbE client access network.	<a href="#">“Connect the 10GbE Client Access Network” on page 107</a>
5.	Connect the 10GbE private network.	<a href="#">“Connect the 10GbE Private Network” on page 111</a>
6.	Connect the base storage array to the compute nodes.	<a href="#">“Connect the Base Storage Array to the Compute Nodes” on page 112</a>
7.	Connect additional storage arrays to the compute nodes, if applicable.	<a href="#">“Connect Additional Storage Arrays to the Compute Nodes” on page 114</a>
8.	Connect the SER MGT cable.	<a href="#">“Connect the SER MGT Cable” on page 117</a>

## Identifying Ports (Compute Node)

These topics provide the pin descriptions of the ports.

- [“USB Ports” on page 100](#)
- [“SER MGT Port” on page 100](#)
- [“NET MGT Port” on page 101](#)
- [“Gigabit Ethernet Ports” on page 102](#)
- [“SAS Ports \(Compute Node\)” on page 103](#)

## USB Ports

Two USB 3.0 ports can be accessed from the rear of the server and two USB 2.0 ports from the front. See [“Understanding the Compute Node” on page 39](#) for the location of the USB ports. The USB ports support hot-plugging. You can connect and disconnect USB cables and peripheral devices while the server is running, without affecting server operations.

Each USB 2.0 port supplies 5V output at 500 mA.

Each USB 3.0 port supplies 5V output at 900 mA.

---

**Note** - You can connect up to 126 devices to each of the four USB controllers (two ports in front, two ports in the rear), for a total of 504 USB devices per server.

---



---

No.	Description
1	+5V supply
2	Data -
3	Data +
4	Ground

---

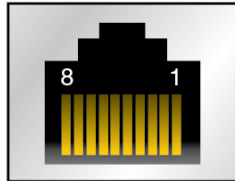
### Related Information

- [“SER MGT Port” on page 100](#)
- [“NET MGT Port” on page 101](#)
- [“Gigabit Ethernet Ports” on page 102](#)
- [“SAS Ports \(Compute Node\)” on page 103](#)

## SER MGT Port

The SER MGT RJ-45 port, located on the rear panel, provides a TIA/EIA-232 serial Oracle/ Cisco standard connection to the SP. This port is the default connection to the Oracle ILOM SP.

For DTE to DTE communications, you can use the supplied RJ-45 to DB-9 crossover adapter with a standard RJ-45 cable to achieve the required null modem configuration. See [“Rear Panel Components \(Compute Node\)” on page 42](#) for the location of the SER MGT port.



Pin	Signal Description	Pin	Signal Description
1	Request to Send	5	Ground
2	Data Terminal Ready	6	Receive Data
3	Transmit Data	7	Data Set Ready
4	Ground	8	Clear to Send

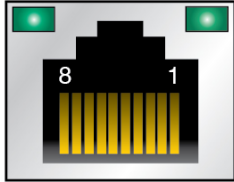
## Related Information

- [“Connect the SER MGT Cable” on page 117](#)
- [“USB Ports” on page 100](#)
- [“NET MGT Port” on page 101](#)
- [“Gigabit Ethernet Ports” on page 102](#)
- [“SAS Ports \(Compute Node\)” on page 103](#)

## NET MGT Port

The NET MGT RJ-45 port, located on the rear panel, provides an optional Ethernet connection to the SP. The NET MGT port is an optional connection to Oracle ILOM on the SP. The SP NET MGT port uses an RJ-45 cable for a 10/100BASE-T connection. If your network does not use a DHCP server, this port will not be available until you configure network settings through the SER MGT port. See [“Rear Panel Components \(Compute Node\)” on page 42](#) for the location of the NET MGT port.

This port does not support connections to Gigabit networks.



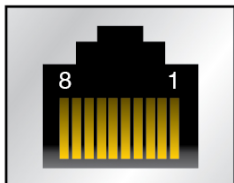
Pin	Signal Description	Pin	Signal Description
1	Transmit Data +	5	No Connect
2	Transmit Data –	6	Receive Data –
3	Receive Data +	7	No Connect
4	No Connect	8	No Connect

### Related Information

- [“Connect the Management Network” on page 106](#)
- [“USB Ports” on page 100](#)
- [“SER MGT Port” on page 100](#)
- [“Gigabit Ethernet Ports” on page 102](#)
- [“SAS Ports \(Compute Node\)” on page 103](#)

## Gigabit Ethernet Ports

Four RJ-45 Ethernet ports (NET 0, NET 1, NET 2, and NET 3) can be accessed from the rear panel. The Ethernet interfaces operate at 100 Mbps, 1000 Mbps, and 10000 Mbps. See [“Rear Panel Components \(Compute Node\)” on page 42](#) for the location of the Ethernet ports.



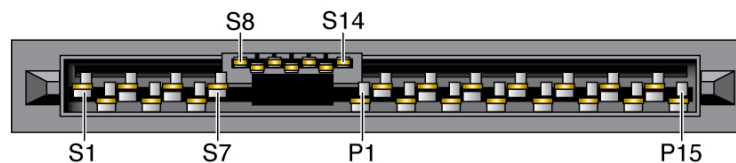
Pin	Signal Description	Pin	Signal Description
1	Transmit/Receive Data 0 +	5	Transmit/Receive Data 2 –
2	Transmit/Receive Data 0 –	6	Transmit/Receive Data 1 –
3	Transmit/Receive Data 1 +	7	Transmit/Receive Data 3 +
4	Transmit/Receive Data 2 +	8	Transmit/Receive Data 3 –

## Related Information

- [“Connect the 10GbE Private Network” on page 111](#)
- [“Connect to the 10GbE Client Access Network Through NET 2/NET 3 Ports” on page 109](#)
- [“USB Ports” on page 100](#)
- [“SER MGT Port” on page 100](#)
- [“NET MGT Port” on page 101](#)
- [“SAS Ports \(Compute Node\)” on page 103](#)

## SAS Ports (Compute Node)

The eight SAS connectors are located on the drive backplane inside the server. Four of the connectors also can be used by NVMe drives.



This table lists the pinouts for the SAS connector.

Segment	Pin	Signal	Note
Signal segment	S1	Gnd	Second mate
(S1 to S7)	S2	TX+	Transmit from PHY to hard drive
	S3	TX-	

Segment	Pin	Signal	Note	
Back-side signal (S8 to S14)	S4	Gnd	Second mate	
	S5	RX-	Receive from hard drive to PHY	
	S6	RX+		
	S7	Gnd	Second mate	
	S8	Gnd	Second mate	
	S9			
	S10			
	S11	Gnd	Second mate	
	S12			
	S13			
	S14	Gnd	Second mate	
	Power segment (P1 to P15)	P1	3.3V	Not supported
		P2	3.3V	Not supported
		P3	3.3V	Not supported
P4		Gnd	First mate	
P5		Gnd	Second mate	
P6		Gnd	Second mate	
P7		5.0V	Pre-charge, second mate	
P8		5.0V		
P9		5.0V		
P10		Gnd	Second mate	
P11		Reserved	Should be grounded	
P12		Gnd	First mate	
P13		12.0V	Pre-charge, second mate	
P14		12.0V		
P15		12.0V		

---

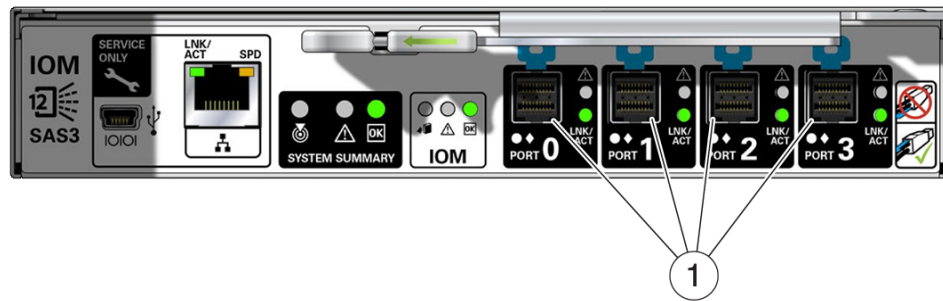
### Related Information

- [“SAS Ports \(Storage Array\)” on page 105](#)
- [“Connect the Base Storage Array to the Compute Nodes” on page 112](#)
- [“Connect Additional Storage Arrays to the Compute Nodes” on page 114](#)
- [“USB Ports” on page 100](#)
- [“SER MGT Port” on page 100](#)
- [“NET MGT Port” on page 101](#)
- [“Gigabit Ethernet Ports” on page 102](#)



## SAS Ports (Storage Array)

The SAS ports at the rear of the storage array are used to connect the storage arrays to the compute nodes and to other storage arrays.



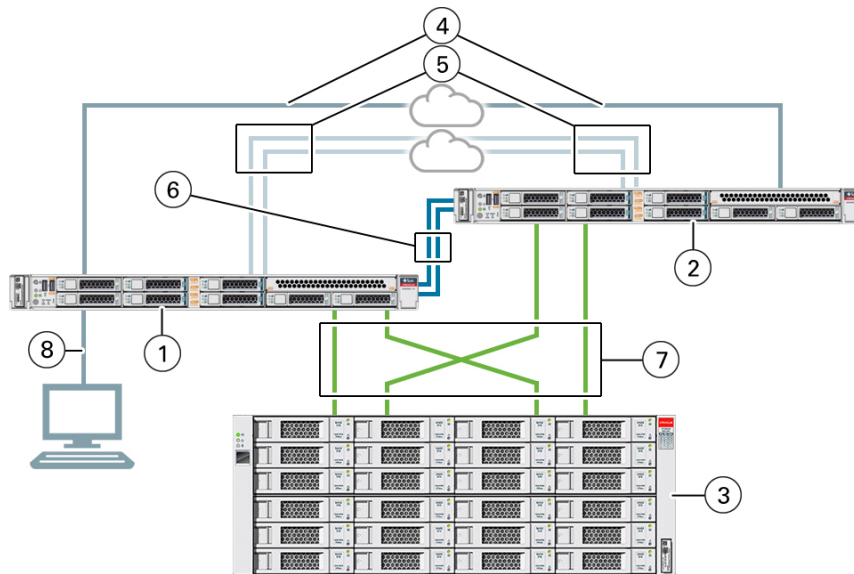
1	SAS ports
---	-----------

### Related Information

- [“SAS Ports \(Compute Node\)”](#) on page 103
- [“Connect the Base Storage Array to the Compute Nodes”](#) on page 112
- [“Connect Additional Storage Arrays to the Compute Nodes”](#) on page 114

## Understanding MiniCluster Connections

This figure shows the MiniCluster connections and where you can find more information for the cabling procedures for each connection.



No.	Description	Links
1	Compute node 1	<a href="#">“Identifying Ports (Compute Node)” on page 99</a>
2	Compute node 2	<a href="#">“Identifying Ports (Compute Node)” on page 99</a>
3	Storage array	<a href="#">“SAS Ports (Storage Array)” on page 105</a>
4	Management network connections	<a href="#">“Connect the Management Network” on page 106</a>
5	Client access network connections	<a href="#">“Connect the 10GbE Client Access Network” on page 107</a>
6	Private network connections	<a href="#">“Connect the 10GbE Private Network” on page 111</a>
7	Storage array connections	<a href="#">“Connect the Base Storage Array to the Compute Nodes” on page 112</a>
8	SER MGT connection to compute node 1	<a href="#">“Connect the SER MGT Cable” on page 117</a>

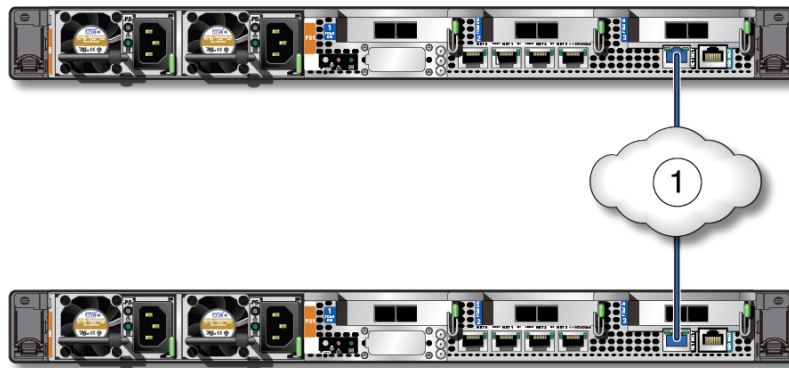
## ▼ Connect the Management Network

The SP network management port is labeled NET MGT. After the initial server configuration, you can connect to the SP over an Ethernet network using this NET MGT port.

If your network uses a DHCP server to assign IP addresses, the DHCP server assigns an IP address to this NET MGT port. With this IP address, you can connect to the SP using an SSH connection. If your network does not use DHCP, this NET MGT port is not accessible until

you configure the network settings through the SER MGT port. For instructions, see [“Assign a Static IP Address to the NET MGT Port”](#) on page 126.

1. **On the first compute node (compute node 1), connect a Category 5 (or better) RJ-45 cable from the NET MGT port to the network switch or hub.**



No.	Description
1	Management network

2. **For the second compute node (compute node 2), repeat [Step 1](#) to make the same connections for that compute node to the management network.**
3. **Connect the 10GbE client access network.**  
See [“Connect the 10GbE Client Access Network”](#) on page 107.

#### Related Information

- [“NET MGT Port”](#) on page 101

## Connect the 10GbE Client Access Network

There are several options available for connecting to the 10GbE client access network, depending on the type of cabling that you want to use to connect to the 10GbE switches connected to the client access network:

- **QSFP to 4x SFP+ splitter cable** — Copper cabling, see [“Connect to the 10GbE Client Access Network Through 10GbE NIC” on page 108](#).
- **MPO to 4x LC duplex splitter cable** — Fiber optic cabling, see [“Connect to the 10GbE Client Access Network Through 10GbE NIC” on page 108](#).
- **CAT6 cable** — Category 6/6E (RJ45) Ethernet cabling, see [“Connect to the 10GbE Client Access Network Through NET 2/NET 3 Ports” on page 109](#).

## ▼ Connect to the 10GbE Client Access Network Through 10GbE NIC

### 1. Determine which type of cabling you will use to connect to the 10GbE client access network through the 10GbE NIC.

- **QSFP to 4x SFP+ splitter cable** — Copper cabling. Additional transceivers are not needed for this cable.
- **MPO to 4x LC duplex splitter cable** — Fiber optic cabling. Additional transceivers are needed for this cable, both for the 10GbE NICs in the compute nodes and for the 10GbE switch. Order and install these transceivers before proceeding with these instructions.

Both cables have a single connector at one end and split into four connectors at the other end, though you will only use two of these four connectors.

### 2. Locate the 10GbE NIC installed in PCIe slot 1 on compute node 1.

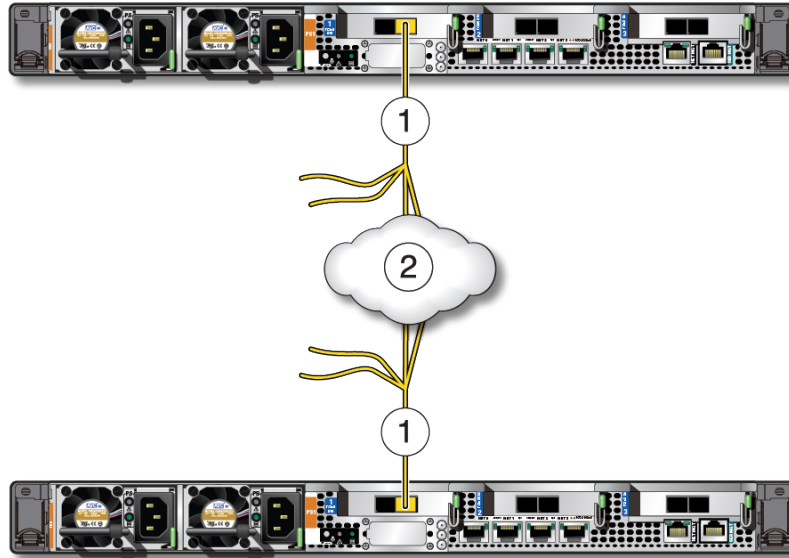
### 3. Connect the single-connector end of the cable to the P 0 port (the rightmost port, or port A) in the 10GbE NIC.

The leftmost port (P 1, or port B) is inactive (unused).

### 4. On the four-connector end of the cable, connect the first two ends of the cable (labeled A and B, or 1 and 2) to the 10GbE switches connected to the client access network, leaving the other two ends of the cable (C and D, or 3 and 4) unconnected.

If you want to isolate network traffic on two ports, connect the other ends of the Ethernet cables to two different 10GbE switches to create two independent networks for client access.

- Repeat [Step 2](#) to [Step 4](#) on compute node 2 to make the same connections for that compute node to the 10GbE client access network.



No.	Description
1	Connections from 10GbE NIC on compute nodes 1 and 2
2	Client access network through 10GbE switch

- Connect the 10GbE private network.**  
See [“Connect the 10GbE Private Network”](#) on page 111.

## ▼ Connect to the 10GbE Client Access Network Through NET 2/NET 3 Ports

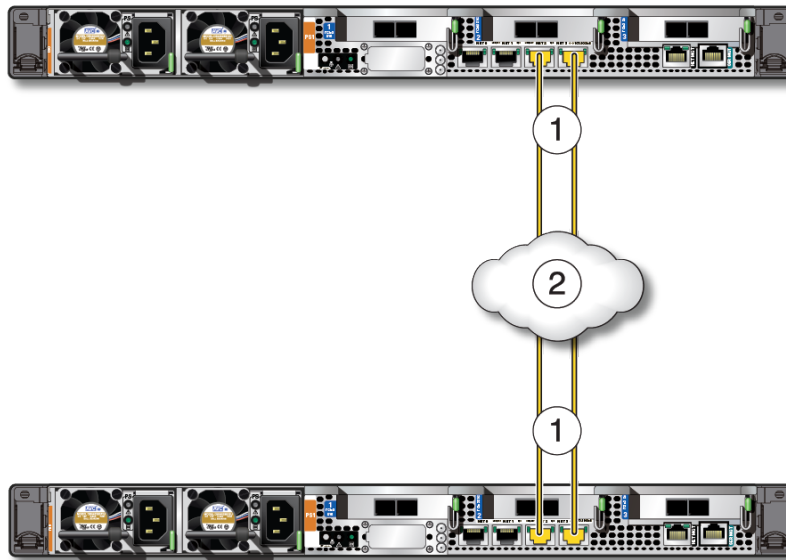
Use two Category 6/6E (CAT6, RJ45) Ethernet cables for this connection.

- Locate the NET 2 and NET 3 ports on compute node 1.**

2. **Connect one end of the two CAT6 Ethernet cables to the NET 2 and NET 3 ports on compute node 1.**
3. **Connect the other ends of the two CAT6 Ethernet cables to the 10GbE switches connected to the client access network.**

If you want to isolate network traffic on two ports, connect the other ends of the Ethernet cables to two different 10GbE switches to create two independent networks for client access.

4. **Repeat [Step 1](#) to [Step 3](#) on compute node 2 to make the same connections for that compute node to the 10GbE client access network.**



No.	Description
1	Connections from NET 2 and NET 3 ports on compute nodes 1 and 2
2	Client access network through 10GbE switch

5. **Connect the 10GbE private network.**  
See [“Connect the 10GbE Private Network”](#) on page 111.

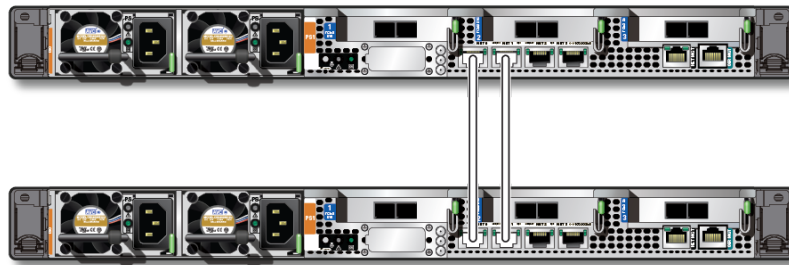
## Related Information

- [“Gigabit Ethernet Ports” on page 102](#)

## ▼ Connect the 10GbE Private Network

The 10GbE private network transfers data between the two compute nodes. This network is also used for the RAC interconnect when Oracle RAC is installed on the MiniCluster.

1. **Locate the NET 0 and NET 1 ports in the first compute node.**
2. **Connect two Category 5 (or better) cables to the two ports in the first compute node.**
3. **Locate the NET 0 and NET 1 ports in the second compute node.**
4. **Connect the other ends of the two cables to the two ports in the second compute node.**
  - **Connect the NET 0 port from the first compute node to the NET 0 port on the second compute node.**
  - **Connect the NET 1 port from the first compute node to the NET 1 port on the second compute node.**



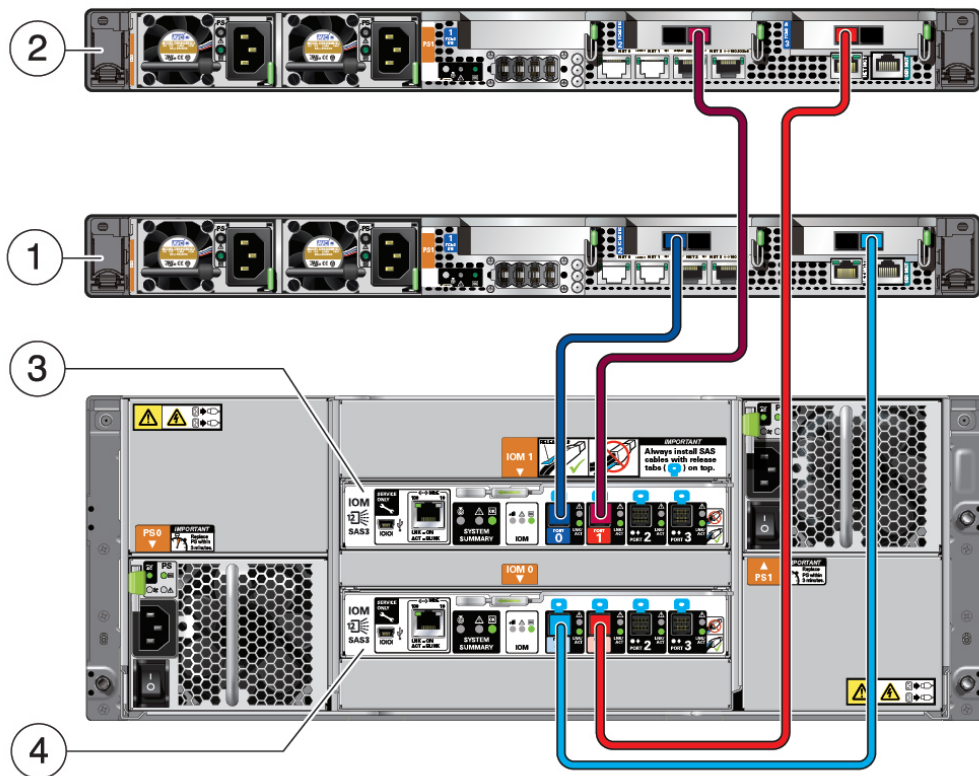
5. **Connect the base storage array to the compute nodes.**  
See [“Connect the Base Storage Array to the Compute Nodes” on page 112](#).

### Related Information

- [“Gigabit Ethernet Ports” on page 102](#)

## ▼ Connect the Base Storage Array to the Compute Nodes

1. Locate the two SAS cards installed in PCIe slots 2 and 3 in the two compute servers.
2. Locate the SAS ports on IOM 0 and 1 at the rear of the storage array.
3. Connect the base storage array to the compute nodes.





No.	Description
2	Compute node 2
1	Compute node 1
3	Top I/O module (IOM 1) in base storage array
4	Bottom I/O module (IOM 0) in base storage array

**a. Connect the dark red SAS cable.**

- On compute node 2, connect to the dark red port (SAS 1) in the SAS card installed in PCIe slot 2.
- On the storage array, connect to the dark red port (port 1) in the top I/O module (IOM 1).

**b. Connect the light red SAS cable.**

- On compute node 2, connect to the light red port (SAS 0) in the SAS card installed in PCIe slot 3.
- On the storage array, connect to the light red port (port 1) in the bottom I/O module (IOM 0).

**c. Connect the dark blue SAS cable.**

- On compute node 1, connect to the dark blue port (SAS 0) in the SAS card installed in PCIe slot 2.
- On the storage array, connect to the dark blue port (port 0) in the top I/O module (IOM 1).

**d. Connect the light blue SAS cable.**

- On compute node 1, connect to the light blue port (SAS 1) in the SAS card installed in PCIe slot 3.
- On the storage array, connect to the light blue port (port 0) in the bottom I/O module (IOM 0).

**4. Determine if you have additional storage arrays that you want to connect.**

- If you have additional storage arrays that you want to connect, go to [“Connect Additional Storage Arrays to the Compute Nodes” on page 114](#).
- If you do not have additional storage arrays to connect, go to [“Connect the SER MGT Cable” on page 117](#).

**Related Information**

- [“SAS Ports \(Compute Node\)” on page 103](#)
- [“SAS Ports \(Storage Array\)” on page 105](#)
- [“Connect Additional Storage Arrays to the Compute Nodes” on page 114](#)

▼ **Connect Additional Storage Arrays to the Compute Nodes**

1. **Locate the two SAS cards installed in PCIe slots 2 and 3 in the two compute servers.**



No.	Description
2	Compute node 2
1	Compute node 1
3	Top I/O module (IOM 1) in the second storage array
4	Bottom I/O module (IOM 0) in the second storage array

**a. Connect the dark blue SAS cable.**

- On compute node 2, connect to the dark blue port (SAS 0) in the SAS card installed in PCIe slot 2.
- On the second storage array, connect to the dark blue port (port 0) in the top I/O module (IOM 1).

**b. Connect the light blue SAS cable.**

- On compute node 2, connect to the light blue port (SAS 1) in the SAS card installed in PCIe slot 3.
- On the second storage array, connect to the light blue port (port 0) in the bottom I/O module (IOM 0).

**c. Connect the dark red SAS cable.**

- On compute node 1, connect to the dark red port (SAS 1) in the SAS card installed in PCIe slot 2.
- On the second storage array, connect to the dark red port (port 1) in the top I/O module (IOM 1).

**d. Connect the light red SAS cable.**

- On compute node 1, connect to the light red port (SAS 0) in the SAS card installed in PCIe slot 3.
- On the second storage array, connect to the light red port (port 1) in the bottom I/O module (IOM 0).

3. **Connect the SER MGT cable to the terminal device.**

See [“Connect the SER MGT Cable” on page 117](#).

**Related Information**

- [“SAS Ports \(Compute Node\)” on page 103](#)
- [“SAS Ports \(Storage Array\)” on page 105](#)
- [“Connect the Base Storage Array to the Compute Nodes” on page 112](#)

## ▼ Connect the SER MGT Cable

The SP serial management port is labeled SER MGT. This port is the default connection between the SP and a terminal or a computer. You must make this connection so that you can assign a static IP address to the NET MGT port later in this document.



---

**Caution** - Do not attach a modem to this port.

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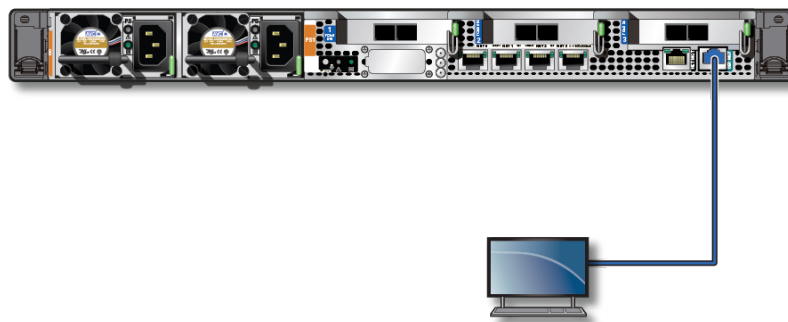
1. **On the first compute node (compute node 1), connect a Category 5 (or better) RJ-45 cable from the SER MGT port to a terminal device or an NTS server.**

When connecting a DB-9 cable, use an adapter to perform the crossovers given for each connector.

---

**Note** - Do not connect a terminal to the SER MGT port on the second compute node (compute node 2). The SER MGT port connection is necessary only for the first compute node.

---



2. **Configure a terminal or terminal emulator with these settings:**

- 9600 baud
- 8 bits
- No parity
- 1 Stop bit
- No handshake

A null modem configuration is needed, meaning the transmit and receive signals are reversed (crossed over) for DTE to DTE communications. You can use the supplied RJ-45 crossover adapters with a standard RJ-45 cable to achieve the null modem configuration.

---

**Note** - If you power on the compute node for the first time and do not have a terminal or terminal emulator (PC or workstation) connected to the SP SER MGT port, you will not see system messages.

---

### Related Information

- [“SER MGT Port” on page 100](#)

# Powering On MiniCluster for the First Time

---

These topics include instructions for powering on MiniCluster for the first time and configuring the Oracle Solaris OS.

Step	Description	Links
1.	Connect the power cords to the storage array and compute nodes.	<a href="#">“Connect the Power Cords” on page 119</a>
2.	Power on the storage array and compute nodes, and start the Oracle ILOM system console on the compute nodes.	<a href="#">“Oracle ILOM System Console (Compute Node)” on page 121</a> <a href="#">“Power On MiniCluster” on page 121</a>

## ▼ Connect the Power Cords



---

**Caution** - Do not attach power cords to the power supplies on the compute nodes until you have connected the compute nodes to a serial terminal or a terminal emulator (PC or workstation). The compute nodes go into Standby mode and Oracle ILOM on the SP initializes as soon as power cables connect the power supplies to an external power source. System messages might be lost after 60 seconds if a terminal or terminal emulator is not connected to the SER MGT ports before power is applied.

---

---

**Note** - Oracle ILOM signals a fault if both power supplies on each compute node are not cabled at the same time, because that is a nonredundant condition. Do not be concerned with this fault in this situation.

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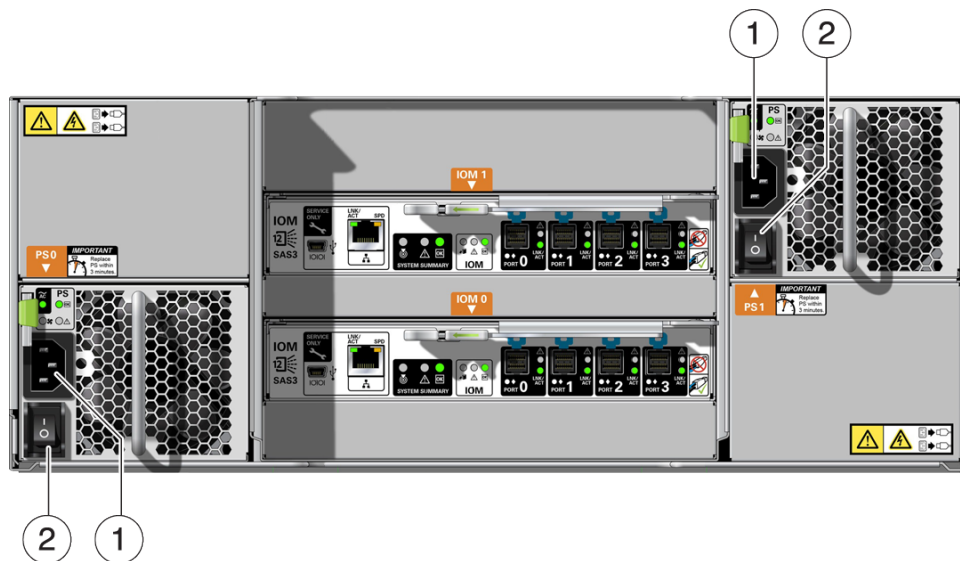
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**Note** - To guarantee redundancy, connect the power cords to separate and independent power sources.

---

1. **Connect the power cords to the separate external AC power sources, and supply power to the external power sources.**

2. **Route the power cords from the separate AC power sources to the rear of the compute nodes and storage array.**
3. **Ensure that you meet these electrical safety measures before applying power to the storage array:**
  - Provide a suitable power source with electrical overload protection to meet the power supply input voltage range of 100 to 240 VAC, 50 to 60 Hz. The storage arrays are compatible with 100 to 120 VAC or 200 to 240 VAC sources. The power source must not be overloaded by the total number of storage arrays in the rack.
  - Ensure that the power source provides a reliable earth connection for each storage array and the rack.
  - Ensure that the power source is easily accessible because the power cord is the main disconnect device for the storage array.
4. **For the storage array, plug a power cord into the power connector in each power supply.**



1	Power connectors
2	Power switches

5. **For the compute nodes, connect the power cords to the power supplies.**



When the power cords are connected, the SP initializes and the power supply LEDs illuminate. After a few minutes, the SP login prompt is displayed on the terminal device. At this time, the host is not initialized or powered on.

### Related Information

- [“Oracle ILOM System Console \(Compute Node\)” on page 121](#)
- [“Power On MiniCluster” on page 121](#)

## Oracle ILOM System Console (Compute Node)

When you power on the server, the boot process begins under the control of the Oracle ILOM system console. The system console displays status and error messages generated by firmware-based tests that are run during system startup.

---

**Note** - To see these status and error messages, connect a terminal or terminal emulator to the SER MGT before applying power to the server. See [“Connect the SER MGT Cable” on page 117](#).

---

After the system console finishes its low-level system diagnostics, the SP initializes and runs a suite of higher level diagnostics. When you access the SP using a device connected to the SER MGT port, you see the output of the Oracle ILOM diagnostics.

By default, the SP configures the NET MGT port automatically, retrieving network configuration settings using DHCP and allowing connections using SSH.

For a more detailed discussion on configuring the system console and connecting terminals, refer to the administration guide for your server.

### Related Information

- [“Connect the Power Cords” on page 119](#)
- [“Power On MiniCluster” on page 121](#)

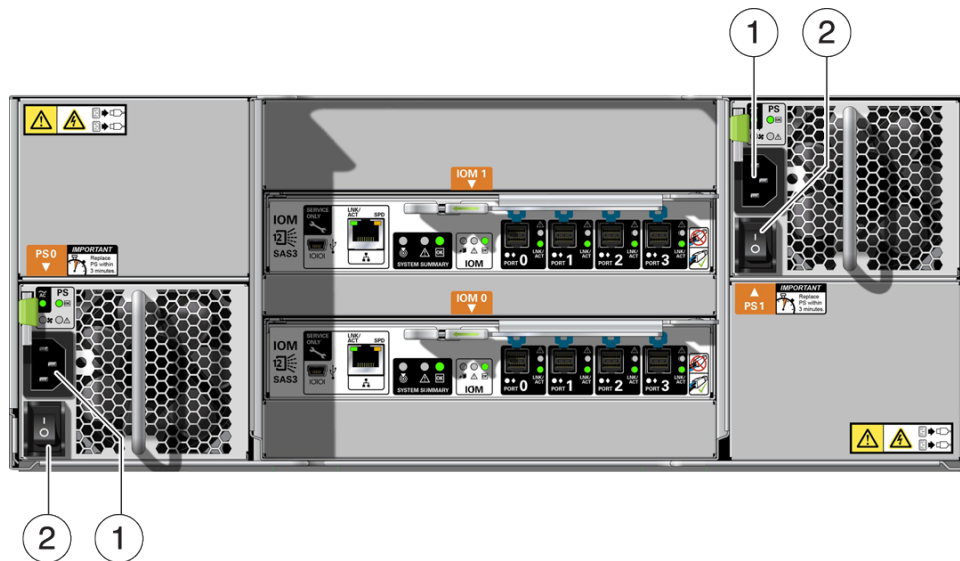
## Power On MiniCluster

These topics describe how to power on MiniCluster:

- [“Power On the Storage Array” on page 122](#)
- [“Power On the Compute Nodes for the First Time” on page 123](#)

## ▼ Power On the Storage Array

1. **Push the on/off switches on the power supplies to the on (I) position.**  
Powering on can take several minutes.



1	Power connectors
2	Power switches

2. **Ensure that the system Power LED on the front of the storage array is lit a steady green, and that each Fan Module LED on the rear of the power supplies is lit a steady green.**

### Related Information

- [“Power On the Compute Nodes for the First Time” on page 123](#)

## ▼ Power On the Compute Nodes for the First Time

1. **Connect a terminal device to the SER MGT port on compute node 1.**

See [“Connect the SER MGT Cable” on page 117](#).

2. **At the terminal device, log in to the SP.**

Use these initial credentials:

```
login: root
Password: welcome1
. . .
->
```

---

**Note** - The initial credentials enable first-time login and access to Oracle ILOM. To build a secure environment, you must change the password of the default Administrator account as soon as possible. Refer to [“Change the Default Oracle ILOM root Passwords” in Oracle MiniCluster S7-2 Security Guide](#). If you find this default Administrator account has already been changed, contact your system administrator to obtain an Oracle ILOM user account with Administrator privileges.

---

For more information about administration tasks such as changing passwords, adding accounts, and setting account privileges, refer to the Oracle ILOM documentation.

3. **Power on both compute nodes using one of these methods.**

- **Press the System Power button at the front of the compute nodes.**

- **For compute node 1, at the Oracle ILOM prompt, type:**

```
-> start /System
Are you sure you want to start /System (y/n)? y
```

The initialization might take several minutes to complete. The compute nodes are completely powered on when the OK LED at the front of the system is lit a steady green.

To cancel the initialization, press the #. (Hash+Dot) keys to return to the Oracle ILOM prompt. Then type: stop /System

4. **(Optional) Redirect the host output to display on the serial terminal device.**

```
-> start /HOST/console
Are you sure you want to start /SP/console (y/n)? y
Serial console started.
. . .
```

### **Related Information**

- [“Power On the Storage Array” on page 122](#)

# Configuring the MiniCluster

---

These topics describe the initial software configuration for the MiniCluster.

- [“Software Configuration Overview” on page 125](#)
- [“Assign a Static IP Address to the NET MGT Port” on page 126](#)
- [“Log In To Compute Node 1 \(Oracle ILOM\)” on page 128](#)
- [“Copy Configuration Files to Compute Node 1” on page 129](#)
- [“Perform Initial Configuration” on page 130](#)
- [“\(If Needed\) Download and Install the MiniCluster Core Software” on page 137](#)
- [“Transfer and Install the MiniCluster Component Bundle” on page 138](#)
- [“Log In To the MCMU BUI for the First Time” on page 140](#)
- [“Create the Install Administrator Account” on page 143](#)
- [“Approve the New Install Administrator Account” on page 144](#)
- [“Finish Setting Up the Install Administrator Account” on page 145](#)
- [“Finish Setting Up the Supervisor Account” on page 147](#)
- [“Set Up MiniCluster” on page 148](#)

## Software Configuration Overview

After you complete the hardware installation and cabling procedures, and power on the compute nodes in your MiniCluster, you then must go through the software configuration process. As part of that process, you need to decide on the following:

- How you want your MiniCluster set up (all database virtual machine groups, all application virtual machine groups, or a mixture of the two)
- How many total virtual machine groups you want

When you first get the MiniCluster, the Oracle Solaris OS is preinstalled on both compute nodes. Once you boot up both compute nodes, you then must go through the MiniCluster-specific initial installation procedures.

The `mcinstall` user is set up at Oracle before the MiniCluster is shipped to your site. The `mcinstall` user is given the main system administrator role for MiniCluster, similar to the traditional `root` user role. Only the `mcinstall` user can go through the initial installation and administration procedures.

### Related Information

- [“Assign a Static IP Address to the NET MGT Port” on page 126](#)

## ▼ Assign a Static IP Address to the NET MGT Port

1. **Verify that all the hardware cabling is complete, especially the 10GbE private network cabling.**

Part of the initial installation process uses the 10GbE private network to reassign the static IP address on compute node 2. Do not proceed with these instructions if you have not completed the 10GbE private network cabling procedure. See [“Connect the 10GbE Private Network” on page 111](#).

2. **Power on the storage array and both compute nodes.**

See [“Powering On MiniCluster for the First Time” on page 119](#).

3. **Connect to Oracle ILOM through the SER MGT port on compute node 1.**

See [“Connect the SER MGT Cable” on page 117](#). Log in using the initial credentials (see [“Power On the Compute Nodes for the First Time” on page 123](#)). You only need to connect to Oracle ILOM on compute node 1, not compute node 2.

4. **Assign the Oracle ILOM host name to the service processor (SP) on compute node 1:**

```
-> set /SP hostname=hostname-ilom
```

where *hostname* is the Oracle ILOM host name for the SP on compute node 1 that you entered into DNS in [“Preliminary Tasks” on page 15](#), but without the domain name. For example, if you used `mc2-n1-ilom.us.example.com` for the DNS entry, enter this for this command:

```
-> set /SP hostname=mc2-n1-ilom
```

5. **Set the SP to accept a static IP address.**

```
-> set /SP/network pendingipdiscovery=static
Set 'pendingipdiscovery' to 'static'
```

## 6. Set the IP address for the SP.

```
-> set /SP/network pendingipaddress=service-processor-IPaddr
Set 'pendingipaddress' to 'service-processor-IPaddr'
```

where *service-processor-IPaddr* is the Oracle ILOM IP address for the SP on compute node 1 that you entered into DNS in [“Preliminary Tasks” on page 15](#).

## 7. Set the IP address for the SP gateway.

```
-> set /SP/network pendingipgateway=gateway-IPaddr
Set 'pendingipgateway' to 'gateway-IPaddr'
```

where *gateway-IPaddr* is the gateway that you entered in the Initial Configuration tool or in the table in [“Preliminary Tasks” on page 15](#).

## 8. Set the netmask for the SP.

```
-> set /SP/network pendingipnetmask=netmask
Set 'pendingipnetmask' to 'netmask'
```

where *netmask* is the netmask (subnet mask) that you entered in the Initial Configuration tool or in the table in [“Preliminary Tasks” on page 15](#). The information that you provided for the subnet mask was in CIDR format. For example, if you used the CIDR format of 22 for the subnet mask, use 255.255.252.0 for this command. See [“Provide Management Network Configuration Information” on page 19](#) for the table that provides the subnet mask to CIDR mapping.

## 9. Verify that the parameters were set correctly.

The code example shows parameters that have been set to convert an SP from a DHCP configuration to a static configuration.

```
-> show /SP/network -display properties
/SP/network
Properties:
  commitpending = (Cannot show property)
  dhcp_server_ip = none
  ipaddress = xxx.xxx.xxx.xxx
  ipdiscovery = dhcp
  ipgateway = xxx.xxx.xxx.xxx
  ipnetmask = 255.255.xxx.0
  macaddress = 00:21:28:6F:A7:BB
  managementport = /SYS/MB/SP/NETMGMT
  outofbandmacaddress = 00:21:28:xx:xx:xx
  pendingipaddress = xxx.xxx.xxx.xxx
  pendingipdiscovery = static
  pendingipgateway = xxx.xxx.xxx.xxx
```

```
pendingipnetmask = 255.255.255.0
pendingmanagementport = /SYS/MB/SP/NETMGMT
sidebandmacaddress = 00:21:F8:xx:xx:xx
state = enabled
```

**10. Commit the changes.**

```
set /SP/network commitpending=true
Set 'commitpending' to 'true'
```

**11. Type the show /SP/network command again to verify that the parameters have been updated.**

The NET MGT port is now accessible.

**12. Log in to compute node 1.**

Go to [“Log In To Compute Node 1 \(Oracle ILOM\)”](#) on page 128.

## ▼ Log In To Compute Node 1 (Oracle ILOM)

**1. On compute node 1, connect to the Oracle ILOM on the SP using the NET MGT port.**

Use the settings that you provided in [“Assign a Static IP Address to the NET MGT Port”](#) on page 126. For example, connect to the Oracle ILOM on the SP on compute node 1 by using a terminal emulator and typing:

```
# ssh root@ILOM-IPaddress
```

where *ILOM-IPaddress* is the Oracle ILOM IP address that you assigned to the service processor on the first compute node in [“Assign a Static IP Address to the NET MGT Port”](#) on page 126.

Use the initial credentials (see [“Power On the Compute Nodes for the First Time”](#) on page 123).

---

**Note** - After the initial installation is complete, change the default ILOM password for both compute nodes. Refer to the *Oracle MiniCluster S7-2 Administration Guide* for those instructions.

---

**2. Connect to the host console.**

```
start /HOST/console
```

Type **y** when you see the question Are you sure you want to start /HOST/console (y/n).

**3. Log in to compute node 1.**



Use the initial credentials:

- mcinstall
- welcome1

4. **Determine if you used the Initial Configuration tool or not when you completed the procedures in “[Preliminary Tasks](#)” on page 15.**
  - **If you used the Initial Configuration tool to complete the preliminary configuration tasks, then you have the two configuration files that were generated as part of that process.**  
Go to “[Copy Configuration Files to Compute Node 1](#)” on page 129.
  - **If you did not use the Initial Configuration tool to complete the preliminary configuration tasks, or if you do not want to copy the two configuration files to compute node 1, enter the necessary information manually.**  
Go to “[Perform Initial Configuration](#)” on page 130.

## ▼ Copy Configuration Files to Compute Node 1

1. **Type the installation command and provide the necessary information to create a temporary IP address for compute node 1.**

---

**Note** - If the `installmc` command is not recognized, you might have to type the full path to the installation command: `/var/opt/oracle.minicluster/bin/installmc --init`

---

```
compute-node-1% installmc --init
Enter Temporary IP addresses :
Enter Netmask in CIDR form (valid range: 8-28) :
Enter Default Gateway Address :
Type of Cable Used to Connect Network Ports with the 10 GbE Switch: Copper/Fiber :
```

where:

- Temporary IP address is the IP address on the client access network for compute node 1 that you entered into DNS in “[Preliminary Tasks](#)” on page 15.
- Netmask in CIDR form is the netmask (subnet mask) for the client access network that you entered in the Initial Configuration tool or in the table in “[Preliminary Tasks](#)” on page 15. For example, 23.
- Default gateway address is the gateway for the client access network that you entered in the Initial Configuration tool or in the table in “[Preliminary Tasks](#)” on page 15.

- Type of cable that you used to connect the MiniCluster to the 10GbE client access network (copper or fiber). See [“Connect the 10GbE Client Access Network” on page 107](#) for more information.

After you enter all the necessary information, after 15 or 20 seconds, an Input Summary screen appears.

In the Do you want to change the inputs? line, type **N** if all the information is correct, or **Y** if you need to redo any of the information that you entered.

This screen appears:

```

-----
Initialization of Temporary IP Complete.
Please copy over omcips.txt,userinputs.txt to /var/opt/oracle.minicluster/store if you
have generated them using the offline tool.
Then, run installmc --deploy to continue with Firstnet setup
-----

```

2. **Locate the two configuration files that were generated using the Initial Configuration tool (userinputs.txt and omcips.txt).**  
See [“Preliminary Tasks” on page 15](#).
3. **From the remote system where you ran the Initial Configuration tool, transfer those two configuration files to the /var/opt/oracle.minicluster/store directory on compute node 1.**

From a terminal window, type:

```
remote-system# scp userinputs.txt omcips.txt mcinstall@ipaddress:/var/opt/oracle.
minicluster/store
```

where *ipaddress* is the temporary IP address that you entered in [Step 1](#).

If you use a tool such as WinSCP to transfer the two configuration files to compute node 1, use the temporary IP address that you entered in [Step 1](#), and log in as `mcinstall`, with the initial credentials (see [“Log In To Compute Node 1 \(Oracle ILOM\)” on page 128](#)).

4. **Perform the initial configuration of the system.**  
Go to [“Perform Initial Configuration” on page 130](#).

## ▼ Perform Initial Configuration

1. **From compute node 1, type the deployment command to continue the initial configuration process.**

---

**Note** - If the `installmc` command is not recognized, you might have to type the full path to the deployment command: `/var/opt/oracle.minicluster/bin/installmc --deploy`

---

```
compute-node-1% installmc --deploy
```

The `installmc` window appears.

```
+-----+
| Oracle MiniCluster v1.0 :: Initial System Install |
+-----+
```

```
Ready to setup MiniCluster? (Y/N)(Y):
```

## 2. Type **y** to start the initial system configuration.

- If you copied the `userinputs.txt` and `omcips.txt` configuration files to the `/var/opt/oracle.minicluster/store` directory on compute node 1, then the initial system configuration steps will be performed automatically for you. The information that you entered earlier is displayed.

If you want to use the existing configuration information, type **y**. Go to [Step 3](#).

If you do not want to use that configuration information, type **n**. You will be prompted to enter the information manually. Enter the necessary information that you gathered in [“Preliminary Tasks” on page 15](#) at the appropriate prompts.

- If you did not copy the two configuration files to the correct directory on compute node 1, then this message appears:

```
[INFO  ] Configuring Firstnet..
[INFO  ] userinputs.txt does not exist in /var/opt/oracle.minicluster/store
[INFO  ] omcips.txt does not exist in /var/opt/oracle.minicluster/store
Did not find the userinputs.txt or omcips.txt files in /var/opt/oracle.minicluster/
store. Do you wish to continue and generate the data now ? (Y/N)(N):
```

Type **y** to continue the initial system configuration process, and type the necessary information that you gathered in [“Preliminary Tasks” on page 15](#) at the appropriate prompts.

```
Enter Unique Prefix for this MiniCluster :
Enter Netmask in CIDR form (valid range: 8-28) :
Enter First IP address in IP addresses range 1 :
Enter Count of IP addresses reserved for range 1 :
Do you want to input more IP addresses range? Enter Y/N (Y):
Enter Default Gateway Address :
Enter Domain Name :
Enter Comma Separated List of IP Addresses of DNS Servers :
```

```
Enter Comma Separated List of NTP Servers :
[ILOM] Enter Netmask in CIDR form (valid range: 8-31) for ILOM :
[ILOM] Enter ILOM IP address of first compute node :
[ILOM] Enter ILOM IP address of second compute node :
[ILOM] Enter Default Gateway Address for ILOM :
[ILOM] Enter Comma Separated List of IP Addresses of DNS Servers for ILOM :
[ILOM] Enter Comma Separated List of NTP Servers for ILOM :
Type of Cable Used to Connect Network Ports with the 10 GbE Switch: Copper/Fiber :
Enter CAN HA type (IPMP/AGGR) :
Enter your location 1 :
Enter your location 2 :
Enable PCI DSS Compliance: Yes/No (No):
Enter Security Keystore Type [Choose: pkcs11] :
VLAN ID is optional. Do you want to input this value? Enter Y/N (N):
Port VLAN ID is optional. Do you want to input this value? Enter Y/N (N):
[ILOM] VLAN ID for ILOM is optional. Do you want to input this value? Enter Y/N (N):
[ILOM] Port VLAN ID for ILOM is optional. Do you want to input this value? Enter Y/N
(N):
```

An input summary page is generated. Type **Y** if you are satisfied with the information displayed or **N** if you want to change the information displayed.

```
----- Input Summary -----
MACHINE_TYPE = S7-2
OMC_UPREFIX = mc2
FIRST_PUBLIC_IP = xx.xxx.xx.xx
IPCOUNT = 50
GATEWAY = xx.xxx.xx.xx
NETMASK_CIDR = 22
DOMAIN_NAME = us.example.com
DNS_SERVER_LIST = xx.xxx.xx.xx,yy.yyy.yy.yy
NTP_SERVER_LIST = xx.xxx.xx.xx
CAN_CABLE_TYPE = COPPER
FIRST_ILOM_IP = xx.xxx.xx.xx
SECOND_ILOM_IP = xx.xxx.xx.xx
ILOM_GATEWAY = xx.xxx.xx.xx
ILOM_NETMASK_CIDR = 24
ILOM_DNS_SERVER_LIST = xx.xxx.xx.xx,yy.yyy.yy.yy
ILOM_NTP_SERVER_LIST = xx.xxx.xx.xx
CAN_HA = YES
CAN_HA_TYPE = IPMP
SS_DISK_COUNT = 6
TZ = America/Los_Angeles
PCI_DSS_COMPL = NO
```

```
KEYSTORE_TYPE = pkcs11
```

```
Do you want to change the inputs? Enter Y/N (N):
```

### 3. Verify that the initial system configuration process completes successfully.

The `installmc --deploy` command goes through these processes:

Number	Step
1	Gather user inputs
2	Prepare for system install
3	Interconnect setup
4	Configure explorer
5	Check system readiness
6	Verify topology
7	Prepare network interfaces
8	Configure client access network on node 1
9	Configure client access network on node 2
10	Configure NTP client, set password policy and setup Apache web server

- **Steps 1 through 3 complete automatically.**
- **Enter Explorer information at Step 4 in the initial system configuration process.**

Explorer output enables Oracle's engineers to perform assessments of the system by applying the output against knowledge-based rules engine. For more information on Explorer, refer to the following documents:

- Chapter 2, "Oracle Explorer Data Collector," in [Services Tools Bundle \(STB\) User's Guide](#)
- [Oracle Explorer FAQ](#)

```
[INFO ] STEP 1: Check Package Version and Gather User Input COMPLETED
[INFO ] STEP 2: Prepare for System Install STARTED
[INFO ] Invoked by OS user: mcinstall
...
[INFO ] STEP 2: Prepare for System Install COMPLETED
[INFO ] STEP 3: Interconnect Setup STARTED
...
[INFO ] STEP 3: Interconnect Setup COMPLETED
[INFO ] STEP 4: Configure Explorer STARTED
```

```
[INFO ] Log file path : mcn:/var/opt/oracle.minicluster/setup/logs/
omc_explorer_062716_143325.log
[INFO ] Configuring explorer...
[INFO ] Setting up explorer
```

Absolute path of the Explorer output top location?

- Provide the standard information for your company at the appropriate prompts.
- Press Return to accept the default entries at these prompts:
  - Absolute path of the Explorer output top location? [/var/explorer/output]
  - Select the Explorer default transport upload method from this list:
    - 1) Using Diagnostic Assistant (DA)
    - 2) Other transport
    - 3) None[Using Diagnostic Assistant (DA)]
  - Do you want to configure Diagnostic Assistant to save credentials (y/n)? [y]
- Enter a dash (-) at the Solaris zones prompt:

Solaris zones:

By default, Explorer collects data from all running local zones when the option `-w localzones` is specified. If you wish to limit data collection to only some of the local zones, enter the names of those zones below. Separate multiple zone names with a comma ','.

Comma-separated list of zone names or '-' for all zones []:

Note that you will not be able to schedule a cron job for Explorer, as shown in the message that appears as part of Step 4 in the initial system configuration process:

```
[INFO ] Please do not schedule any cron job to run the Explorer, as cron entries
will be removed and not run on the MiniCluster.
```

- **Steps 5 through 10 complete automatically.**

---

**Note** - Do not interrupt this process. Wait until you see the message `Configuring Firstnet Completed` before proceeding. It normally takes 1 to 2 hours to complete these steps.

---

#### 4. Verify that the process completed successfully.

The process has completed successfully when you see the message `Configuring Firstnet Completed`.

If the process fails at any point:

**a. Locate the log file that contains information on the point where the failure occurred.**

Usually, the error message provides a pointer to a log file, such as this:

```
Log file path : mc2-n1:/var/opt/oracle.minicluster/setup/logs/mcmu_062016_142110.log
```

**b. Use the information in the log file to determine where the failure occurred and fix the error.**

For example, if the process failed at Step 6 (Verify topology), locate the issue (such as a problem with the cable connections) and fix the issue.

---

**Note** - You can fix issues related to the hardware connections (such as incorrect cable connections) or issues such as incorrect DNS entries, where you could use the MiniCluster tools to resolve the issue. Do not make any manual modifications outside of the MiniCluster tools. If you are not able to resolve the issue, open a Service Request through My Oracle Support (<http://support.oracle.com/>).

---

- If the error occurred at the last step that was run before the failure occurred, then run the remaining steps starting at that particular step. For example, if the failure occurred at Step 6, and the process stopped at Step 6, then fix the error and run the system setup again starting at Step 6. Go to [Step 4d](#) in this case.
- If the error occurred at an earlier point but the process didn't stop until a later step, then you must undo the last step and each successfully completed step until you reach the step where the failure occurred. For example, if the failure occurred at Step 6, but the process continued and didn't stop until Step 8, fix the error, then undo Steps 8, 7 and 6, and then run the system setup again starting at Step 6. Go to [Step 4c](#).

**c. Undo the last step and each step that was successfully completed, including the step where the failure occurred.**

```
mcmu setupmc -u step-number
```

For example, if the failure occurred at Step 6, but the process didn't stop until Step 8, type:

```
mcmu setupmc -u 8
mcmu setupmc -u 7
mcmu setupmc -u 6
```

**d. Run the remaining system setup steps.**

Steps 1-10 in the system setup process would normally be run as part of the process. If the process failed at Step 6, then run Steps 6-10.

To run the remaining steps one a time:

```
mcmu setupmc -s step-number
```

For example, type:

```
mcmu setupmc -s 6
```

To run the remaining steps as a range:

```
mcmu setupmc -s starting-step-number-ending-step-number
```

For example, type:

```
mcmu setupmc -s 6-10
```

---

**Note** - For more information on performing MCMU CLI procedures, refer to the *Oracle MiniCluster S7-2 Administration Guide*.

---

**5. Note the BUI login information in the completed output.**

Successful completion yields output similar to this:

```
-----  
Please download the MiniCluster Component Bundle from Oracle MiniCluster S7-2 Software  
Download Center (My Oracle Support Doc ID: 2153282.1) and follow the instructions if  
not done already.  
If you download the Bundle on your local host, transfer files to both MiniCluster nodes  
by executing step 1 on both nodes  
1.scp <path-on-local-host>/mc-*-sfw.tar.a* mcinstall@<ip-or-host-of-node>:/var/  
tmp
```

If you downloaded the Bundle directly on MiniCluster nodes, then make sure both nodes have the Bundle under /var/tmp directory.

```
Then run these steps -  
2.cd /var/tmp on both the nodes and extract the files using  
3.cat mc-*-sfw.tar.a? | gtar -x -C /var/opt/oracle.minicluster/ -f -
```

Please use browser user interface (BUI) to complete the system and tenant setup URL:

```
https://compute-node1-hostname/MCMU -OR- https://compute-node1-IP-address/MCMU  
Administrator login ID: mcinstall. password: *****
```



If you want to continue using Command Line Interface(CLI) and are currently connected via ILOM,  
login back to the host as mcinstall user, using public hostname or IP Address, then follow these steps -

- 1.Register mcinstall user using 'mcmu user --create -u mcinstall -e <email> -n <fullname> -p <phone>' command
  - 2.Supervisor must check email and register 'mcinstall' user to activate account
  - 3.Change mcinstall user password using 'mcmu user --changepswd -u mcinstall' command
  - 4.Continue with setup using 'mcmu setupmc -s all' command
- 

where the *compute-node1-hostname* and *compute-node1-IP-address* is the same information that was provided in the IP Hostname Mapping screen or the *omcips.txt* file that was generated as part of the process in “Using the Initial Configuration Tool” on page 15.

---

**Note** - In some situations, the core software on your MiniCluster is older and needs to be updated. In that situation, you will see a similar message, telling you to also download the MiniCluster Core Software from the download center. In that case, locate the latest release of the MiniCluster Core Software and install that software using the instructions in the MiniCluster MOS note 2153282.1.

---

6. **Transfer and install the MiniCluster component bundle onto both compute nodes.**

Go to “Transfer and Install the MiniCluster Component Bundle” on page 138.

## ▼ (If Needed) Download and Install the MiniCluster Core Software

This software provides the MiniCluster management software, Solaris OS, and SRU repository files. The core software is installed on MiniCluster at the factory, however it might not be the latest version. If you see a message telling you that your core software is out of date when you run the `installmc --deploy` command during the initial installation, download and install the core software.

Depending on your network capabilities and the size of the zip files, the download can take a significant amount of time.

1. **On a system other than MiniCluster, go to <https://support.oracle.com>, and sign into MOS.**
2. **Search for 2153282.1.**

This MOS document is the MiniCluster S7-2: Software Download Center and provides access to MiniCluster downloads.

**3. In Doc ID 2153282.1, click the Latest Release link.**

You are directed to the latest downloads.

**4. Open and review the Release Notes.**

Click the MiniCluster Release Notes link under MiniCluster Core Software section.

**IMPORTANT** – Information in the Release Notes supersedes instructions in this guide. Refer to the MiniCluster Release Notes for your version of the software.

**5. Begin the download process for the MiniCluster Core Software.**

To begin the download process, click the patch number in the MiniCluster Core Software section, then click the download button.

**6. Unzip the downloaded files.**

**7. Follow the installation instructions in the Release Notes.**

## ▼ Transfer and Install the MiniCluster Component Bundle

In this procedure, you are transferring the MiniCluster component bundle files that you downloaded in [“Download the MiniCluster Component Bundle” on page 36](#) to both MiniCluster compute nodes and installing those component bundle files.

**1. Locate the MiniCluster component bundle files that you downloaded earlier.**

See [“Download the MiniCluster Component Bundle” on page 36](#).

**2. From the remote system where you downloaded the MiniCluster component bundle files, transfer those component bundle files to the /var/tmp directory on compute node 1.**

From a terminal window, type:

```
remote-system# scp path-on-remote-system/mc-*-sfw.tar.a* mcinstall@ipaddress:/var/tmp
```

where *ipaddress* is the IP address for compute node 1 that was provided in the output screen after `installmc --deploy` was successfully completed. You can also find the IP address for compute node 1 in the `omcips.txt` file that was generated as part of the process in [“Using the Initial Configuration Tool” on page 15](#).

If you use a tool such as WinSCP to transfer the component bundle files to compute node 1, use the IP address for compute node 1, and log in as `mcinstall`, with the initial credentials (see [“Log In To Compute Node 1 \(Oracle ILOM\)” on page 128](#)).

3. **On compute node 1, change to the `/var/tmp` directory.**

4. **Concatenate and extract the component bundle packages to the `/var/opt/oracle.minicuster/` directory.**

```
compute-node-1% cat component-bundle.tar.a? | gtar -x -C /var/opt/oracle.minicuster/ -f -
```

The `a?` portion of the command is essentially a wild card entry, encompassing TAR files that end with `.aa`, `.ab`, and so on.

For example, if the component bundle packages are named `mc-1.1.13-sfw.tar.aa` to `mc-1.1.13-sfw.tar.ah`, type:

```
compute-node-1% cat mc-1.1.13-sfw.tar.a? | gtar -x -C /var/opt/oracle.minicuster/ -f -
```

5. **Log in to compute node 2 as the `mcinstall` user.**

```
# ssh mcinstall@compute-node2-IP-address
```

where `compute-node2-IP-address` is the IP address on the client access network for compute node 2 that you entered into DNS in [“Preliminary Tasks” on page 15](#). You can also find the IP address for compute node 2 in the `omcips.txt` file that was generated as part of the process in [“Using the Initial Configuration Tool” on page 15](#).

Use the same initial credentials used for compute node 1 (see [“Log In To Compute Node 1 \(Oracle ILOM\)” on page 128](#)).

6. **Repeat [Step 2](#) to [Step 4](#) to copy the same MiniCluster component bundle files to the `/var/tmp` directory on compute node 2.**

You can copy the component bundle files from either the remote system or from compute node 1 to the `/var/tmp` directory on compute node 2.

7. **Disconnect from the Oracle ILOM connection through the NET MGT port, if necessary.**

Once the `installmc` process was completed, both compute nodes should be reachable directly from the client access network. Disconnect from the Oracle ILOM connection through the NET MGT port.

8. **Log in to the MiniCluster Configuration Utility browser user interface (MCMU BUI) for the first time.**

See [“Log In To the MCMU BUI for the First Time” on page 140](#).

---

**Note** - You can also use the CLI to set up the MiniCluster at this point. Refer to the *Oracle MiniCluster S7-2 Administration Guide* for those instructions. Log in as `mcinstall` using the IP address on the client access network for compute node 1.

---

## ▼ Log In To the MCMU BUI for the First Time

### 1. Start the MCMU BUI.

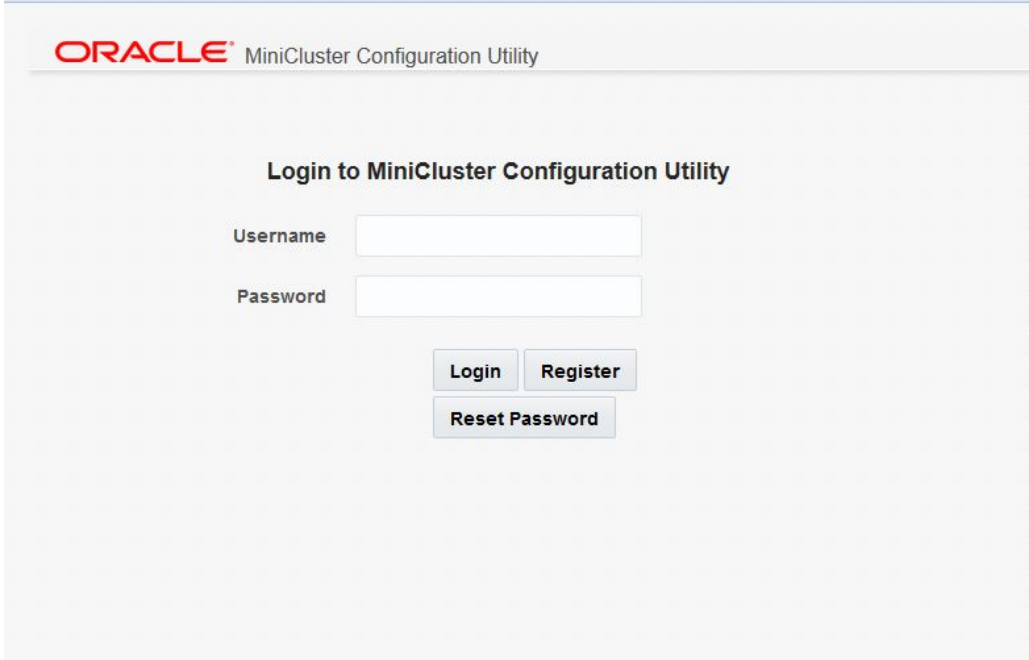
Open a web browser and type:

`https://compute-node1-hostname/MCMU/`

where the *compute-node1-hostname* was provided in the output when `installmc` was completed. This compute node 1 client access network hostname was also in [“Using the Initial Configuration Tool” on page 15](#). For example:

`https://mc2-n1.us.example.com/MCMU/`

The login window appears.



The screenshot shows the Oracle MiniCluster Configuration Utility login page. At the top, the Oracle logo is followed by the text "MiniCluster Configuration Utility". Below this, the heading "Login to MiniCluster Configuration Utility" is centered. There are two input fields: "Username" and "Password". Below the input fields are three buttons: "Login", "Register", and "Reset Password".

---

**Note** - In some situations, you might see a window stating that your connection is not secure. If this occurs, add a security exception so that you can access the MCMU BUI.

---

**2. Log in to the system as the mcinstall user.**

For the first access, use the initial credentials:

- mcinstall
- welcome1

**3. Click Login.**

The MiniCluster Install Administrator Account Registration window appears.

The screenshot shows the 'MiniCluster Install Administrator Account Registration' window. At the top, the Oracle logo is followed by the text 'MiniCluster Configuration Utility'. Below this is the title 'MiniCluster Install Administrator Account Registration'. The form contains several input fields with associated labels and validation messages:

- \*Email**: A text input field with the message 'Required: Please enter a valid email' below it.
- Title**: A text input field.
- \*Full Name**: A text input field with the message 'Required: Please enter your full name - may contain english alphabet - +\_ only. Spaces are allowed in between words.' below it.
- Organization**: A text input field.
- Department**: A text input field.
- \*Phone Number**: A text input field with the message 'Required: Please enter a valid phone number - may contain only digits.' below it.
- Address**: A large text area for entering the address.
- \*Supervisor Username**: A text input field.
- \*Supervisor FullName**: A text input field with the message 'Required: Please enter full name of the supervisor - may contain english alphabet - +\_ only. Spaces are allowed in between words.' below it.
- \*Supervisor email**: A text input field.

At the bottom of the form, there are two buttons: 'Register' and 'Cancel'.

#### 4. Create the Install Administrator account.

See [“Create the Install Administrator Account” on page 143.](#)

## ▼ Create the Install Administrator Account

Set up two accounts as part of this process:

- **Install Administrator** — A MiniCluster-specific user account. The Install Administrator has full administrative privileges, and can perform all BUI and CLI operations, and approve new users.
- **Supervisor** — An existing user account outside of the MiniCluster. The Supervisor role is used to provide a second layer in the approval process (for example, if you want to include your company's Human Resources department in the approval process for any new user being created).

Whenever you create a new user account, *two* users approve that new user account: the Install Administrator and the supervisor. Both of those users get the approval email, and both need to approve any new user.

### 1. Type the necessary information for the Install Administrator in the appropriate fields.

- Email address
- Title
- Full Name

### 2. Type the necessary company information in the appropriate fields.

- Organization
- Department
- Phone number
- Address

### 3. Type the necessary information for the Supervisor in the appropriate fields.

The Supervisor role is outside of the MiniCluster and is used to provide a second layer in the approval process.

- Supervisor User name
- Supervisor Full Name
- Supervisor email

4. **Click the Register button at the bottom of the page when you have filled in all the fields in this registration page.**
5. **Approve the Install Administrator account that you just created.**  
See [“Approve the New Install Administrator Account”](#) on page 144.

## ▼ Approve the New Install Administrator Account

1. **Access the email account for the Install Administrator that you entered in the Install Administrator Account Registration screen.**

2. **Locate the mail from the `mcinstall` user.**

You see mail similar to this, where you are asked to approve the new Install Administrator account that you just created:

```
Dear MiniCluster Administrator,  
A new user has been created and is awaiting your action. Please approve or deny  
registration of user Joe Smith, as Primary Admin by following the link provided:  
https://compute-node1-hostname/MCMU/admin\_approve/  
mcinstall/749cee7610a4e594ee867b243a22cae537fe77b81b92c4aad33d8befbd8e8611/approve/
```

3. **Copy the approval link URL string from the mail.**

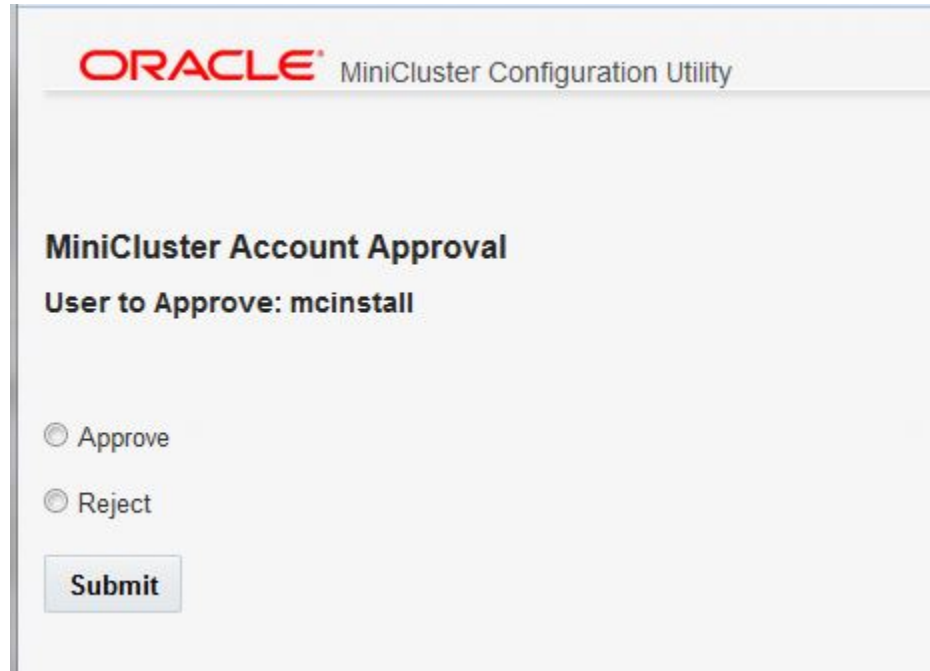
For example, using the example output, you would copy this approval link URL string:

```
https://compute-node1-hostname/MCMU/admin\_approve/  
mcinstall/749cee7610a4e594ee867b243a22cae537fe77b81b92c4aad33d8befbd8e8611/  
approve/
```

4. **In a web browser, paste the approval link URL from the mail and press Return.**



The approval screen appears.

The screenshot shows a web-based approval interface. At the top, the Oracle logo is displayed in red, followed by the text "MiniCluster Configuration Utility". Below this, the main heading is "MiniCluster Account Approval" in bold black text. Underneath, it says "User to Approve: mcinstall". There are two radio button options: "Approve" and "Reject". At the bottom of the form is a "Submit" button.

5. **Select Approve, then click Submit.**
6. **Access the email sent to the supervisor account email and repeat [Step 3](#) through [Step 5](#).**  
A screen appears, confirming that the Install Administrator account has been approved.
7. **Complete the setup for the new Install Administrator account.**  
Go to "[Finish Setting Up the Install Administrator Account](#)" on page 145.

## ▼ **Finish Setting Up the Install Administrator Account**

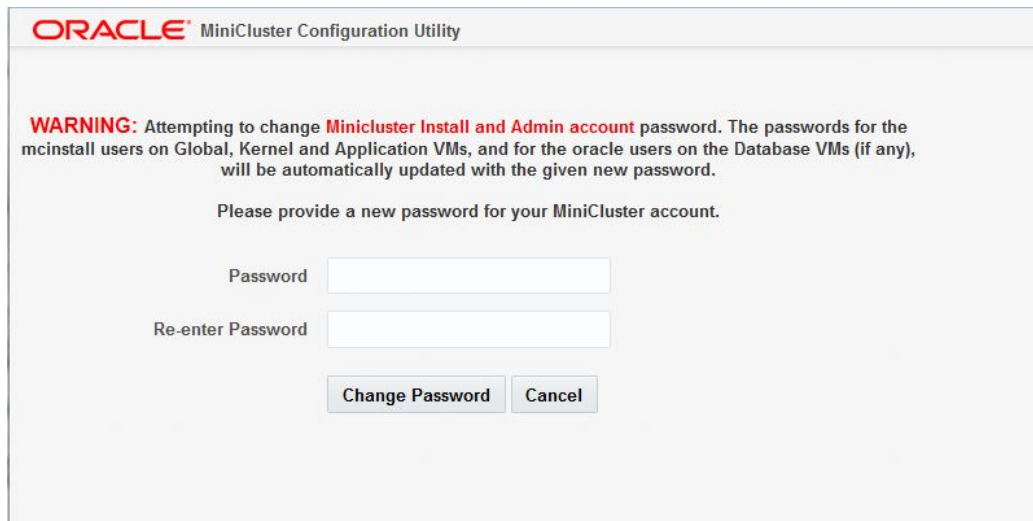
1. **Click the [Return to the MCMU LOGIN](#) page link in the approval page, or access <https://compute-node1-hostname/MCMU/> again.**  
The login window appears.

**2. Log in to the system as the `mcinstall` user again.**

Use the initial credentials (see [“Log In To the MCMU BUI for the First Time”](#) on page 140).

**3. Click Login.**

The MiniCluster Install and Administrator Account password reset window appears.



The screenshot shows a web-based interface titled "ORACLE MiniCluster Configuration Utility". It features a warning message in red text: "WARNING: Attempting to change Minicluster Install and Admin account password. The passwords for the mcinstall users on Global, Kernel and Application VMs, and for the oracle users on the Database VMs (if any), will be automatically updated with the given new password." Below the warning, it prompts the user: "Please provide a new password for your MiniCluster account." There are two input fields: "Password" and "Re-enter Password". At the bottom, there are two buttons: "Change Password" and "Cancel".

**4. Change to a unique password for the new Install Administrator.**

Note these password restrictions:

- Should have a length of at least 14 characters
- Should not be the same as previous 10 passwords
- Should differ from the previous password by at least 3 characters
- Should contain a minimum of:
  - 1 digit
  - 1 uppercase letter
  - 2 alphabetic characters
  - 1 non-alphabetic character
- User name and password should not be identical

**5. Click Change Password.**

A window appears, prompting you to change the password for the Supervisor account.

**6. Finish setting up the Supervisor account.**

Go to [“Finish Setting Up the Supervisor Account”](#) on page 147.

**▼ Finish Setting Up the Supervisor Account**

You entered information on the Supervisor account in the Account Registration page earlier, where you provided information such as the Supervisor user name, and the full name and email address for the person or group who will be using the Supervisor account. Change the password for the Supervisor account using these instructions.

**1. Log in to the Supervisor account with the default settings.**

Use the initial credentials. See [“Log In To the MCMU BUI for the First Time”](#) on page 140.

**Login to MiniCluster Configuration Utility**

Supervisor password still at default, please contact the supervisor to change to continue.

Username	<input type="text"/>
Password	<input type="password"/>

**2. Click Reset Password.**

The password reset page for the Supervisor account appears.

Please provide a new password for your MiniCluster account.

Password

Re-enter Password

**3. Change to a unique password for the Supervisor.**

Note these password restrictions:

- Should have a length of at least 14 characters
- Should not be the same as previous 10 passwords
- Should differ from the previous password by at least 3 characters
- Should contain a minimum of:
  - 1 digit
  - 1 uppercase letter
  - 2 alphabetic characters
  - 1 non-alphabetic character
- User name and password should not be identical

**4. Click Change Password.**

The MCMU login page appears.

**5. Go to the next installation task.**

See [“Set Up MiniCluster” on page 148](#).

## ▼ Set Up MiniCluster

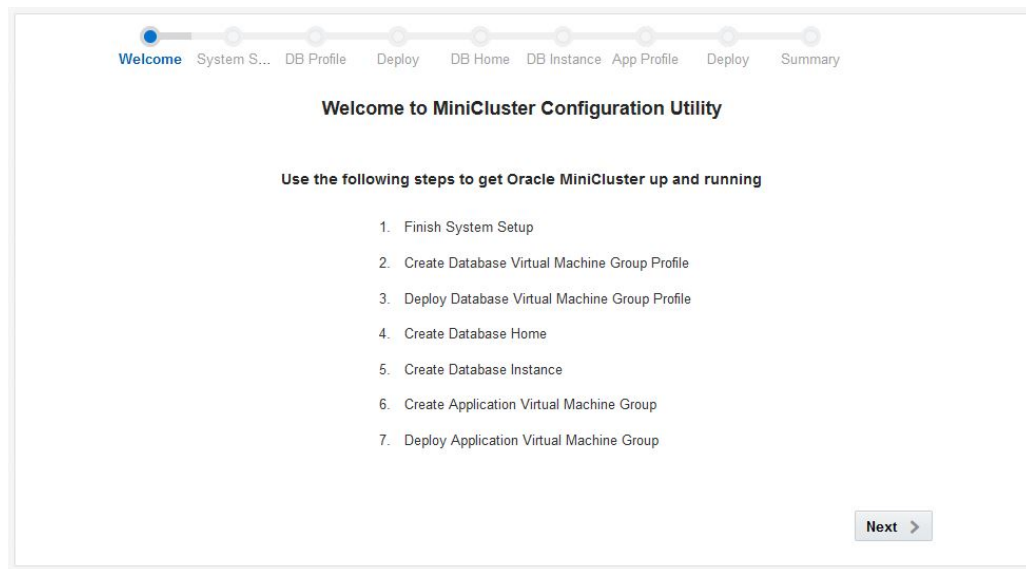
**1. Log in to the Install Administrator account with the new password.**

- **User name** — mcinstall

- **Password** — The password for the mcinstall user that you set in [“Finish Setting Up the Install Administrator Account”](#) on page 145.

**2. Click Login.**

The Welcome to MiniCluster Configuration Utility page appears.



**3. Click on the Next button at the bottom of the page.**

The System Setup page appears.

#	Step	Type of Action	Status
8	Configure Client Access Network on Node 1	Run Cancel	Finished
9	Configure Client Access Network on Node 2	Run Cancel	Finished
10	Configure NTP Client and Setup Apache Web Server	Run Cancel	Finished
11	Check Configuration and IP Mappings	Run Cancel	-
12	Configure ILOM Network	Run Cancel	-
13	Storage: Create Storage Alias, Reset JBOD(s) and Partition All Disks in All JBOD(s)	Run Cancel	-

**Progress**

**4. Verify that you have downloaded and installed the MiniCluster component bundle onto *both* compute nodes.**

Certain steps in the remaining initial configuration process will fail if you have not installed the MiniCluster component bundle on both compute nodes. See [“Transfer and Install the MiniCluster Component Bundle” on page 138](#) for more information.

**5. Locate the first step that needs to be run and click the Run button, or click the Run All Steps button.**

As part of the process in [“Perform Initial Configuration” on page 130](#), you went through Steps 1 to 10 using the `installmc` tool. So those steps should be shown as Finished in the Status column.

Complete the remaining steps in this System Setup page, either by clicking the Run button for each step, or by clicking the Run All Steps button. Clicking the Run All Steps button will begin the process after the last completed step (in this case, after Step 10). It normally takes about 3 to 4 hours to run all of the remaining steps in this page. Click Hide Detail to provide less detail or Show Detail to provide more detail for all of the steps that are run on this screen.

This table lists the remaining steps from the System Setup page and what happens in each step. For each step, the following actions are valid:

- **Run** — Runs this particular step.
- **Cancel** — If this step is running, you can cancel the process by clicking this button.

Number	Step
11	Check configuration and IP mappings
12	Configure Oracle ILOM network
13	Storage: Create storage alias, reset JBODs & partition all disks in all JBODs
14	Calibrate all disks in all JBODs
15	Shared storage setup: Configure & secure kernel zones
16	Shared storage setup: Install Oracle Grid Infrastructure 12c in kernel zones
17	Shared storage setup: Apply GI PSU
18	Shared storage setup: Configure ACFS & mount the shared file system in global zones
19	Apply global zones security settings

**6. When all the steps have run successfully, click the appropriate button.**

- To verify that all the steps were run successfully, click the Verify All Steps button. All of the System Setup steps are rerun and verified.
- To continue to the next procedure, click the Continue button. The Create Profile page appears.

**7. (Optional) Create a database virtual machine group as part of this initial installation.**

Go to [“Creating a Database Virtual Machine Group \(Initial Installation\)” on page 153](#).





# Creating a Database Virtual Machine Group (Initial Installation)

---

As part of the initial configuration of your MiniCluster, you are provided with a walk-through to create a database virtual machine group. These topics provide conceptual information on the database virtual machine group, and the procedures for creating one as part of the initial configuration.

If you decide not to create a database virtual machine group as part of the initial configuration, you can click on the Skip button in any screen, which advances you to the Application Virtual Machine Group part of the initial configuration (see [“Creating an Application Virtual Machine Group \(Initial Installation\)” on page 179](#) for more information). You can create a database virtual machine group manually at any point later on using the instructions in the *Oracle MiniCluster S7-2 Administration Guide*.

- [“Understanding the Database Virtual Machine Group” on page 153](#)
- [“Create a Database Virtual Machine Group Profile” on page 163](#)
- [“Deploy a Database Virtual Machine Group” on page 172](#)
- [“Create a Database Home” on page 174](#)
- [“Create a Database Instance” on page 175](#)

## Understanding the Database Virtual Machine Group

You must complete three basic sets of procedures to create a database virtual machine group:

- [“Database Virtual Machine Group Profile Overview” on page 154](#), which consists of:
  - Setting up the database virtual machine group profiles
  - Setting up the virtual machines within the database virtual machine group
  - Setting up the database cluster for the virtual machines in this virtual machine group
- [“Database Home Overview” on page 159](#)
- [“Database Instance Overview” on page 160](#)

## Database Virtual Machine Group Profile Overview

A database virtual machine group can be thought of as a collection of virtual machines. You might create a virtual machine group for a specific purpose or for a specific group in your organization. For example, you might create a virtual machine group specifically for the legal department in your organization.

You create a profile for the virtual machine group that you want to create. A virtual machine group profile gathers all the system-level information for this particular virtual machine group, including:

- Number of virtual machines on each compute node that will be members of this virtual machine group
- Number of cores from each compute node that will be assigned to each virtual machine in this virtual machine group
- Management network host names and IP addresses for the virtual machine group and virtual machines in the virtual machine group

The virtual machine group profile allows you to keep track of the amount of system resources that you are assigning to the virtual machine group and the number of management network IP addresses that are being used for the virtual machine group.

At the end of the creation process for a database virtual machine group profile, the MiniCluster software provides you a list of management network host names and IP addresses that you must enter into DNS. When you have finished entering the necessary information into DNS, you then deploy the virtual machine group using the information you provided in the profile.

Setting up a database virtual machine group profile consists of the following processes:

- [“Database Virtual Machine Group Overview” on page 154](#)
- [“Virtual Machines Overview” on page 156](#)
- [“Clusters Overview” on page 158](#)

## Database Virtual Machine Group Overview

When you create a database virtual machine group, you assign certain characteristics to that virtual machine group, including:

- **Name of virtual machine group** — Name for this particular database virtual machine group.

- **ASM disk group redundancy** — Level of redundancy for the disks in the storage array that will be used for this database virtual machine group. You can set the redundancy to either normal (protection against a single disk failure) or high (protection against two disk failures).
- **Number of virtual machines on each compute node** — Number of virtual machines that you will create on each compute node specifically for this database virtual machine group, between one and four virtual machines on each compute node.

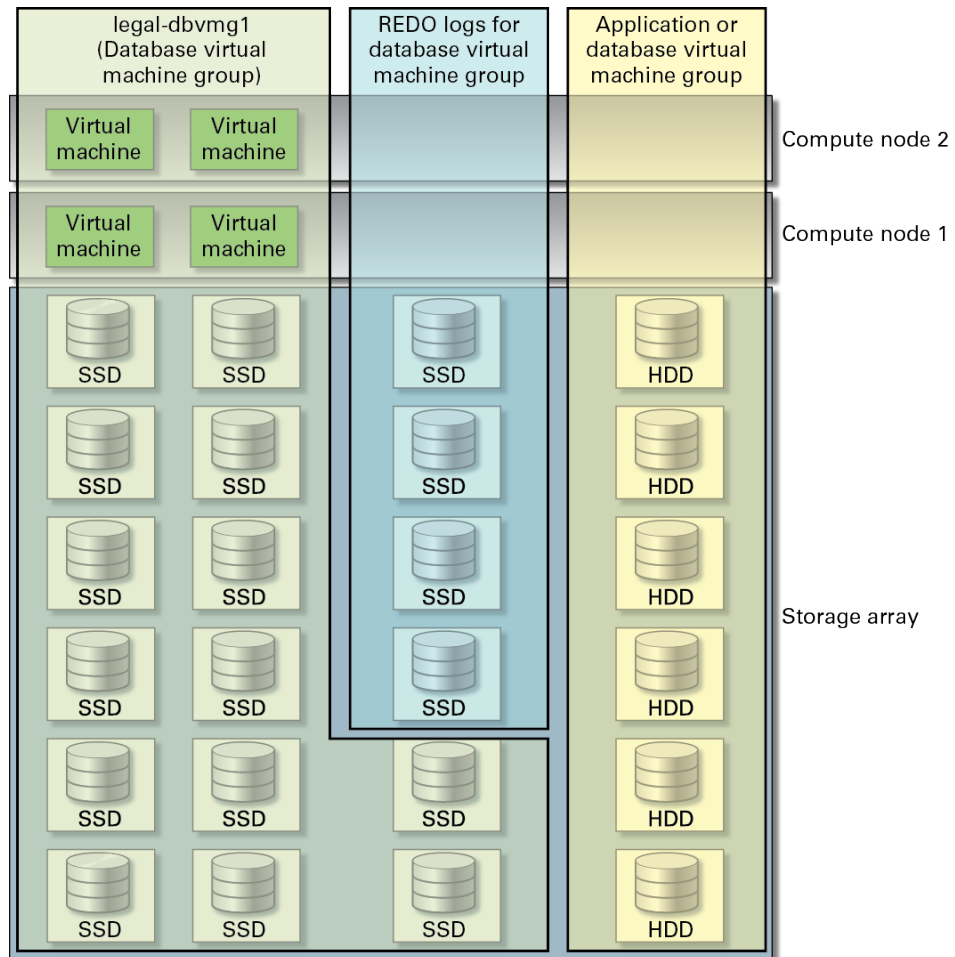
Note that the storage array has the following disks, used for the following purposes:

- 14 SSDs, used by the database virtual machine group. The data from the database virtual machine group is double-mirrored (normal redundancy) or triple-mirrored (high redundancy).
- 4 SSDs, used for the REDO logs for the database virtual machine group (always set at high redundancy).
- 6 HDDs, used for the shared storage exported to database and application virtual machines.

For example, assume that you want to create a database virtual machine group for the legal department with the following characteristics:

- Database virtual machine group named `legal-dbvmg1`
- Normal redundancy, where data is mirrored across two sets of seven SSDs in the storage array for this virtual machine group
- Two virtual machines created on each compute node to be used with this virtual machine group

This figure represents how you could envision this database virtual machine group.



At this point in the process, you have only defined how you want the virtual machine group to be set up. The next step in the process is to define how you want the individual virtual machines within this virtual machine group to be set up. See [“Virtual Machines Overview” on page 156](#) for more information on setting up the virtual machines within a virtual machine group.

## Virtual Machines Overview

You must first define how you want the virtual machine group to be set up before you can start providing information on the virtual machines within that virtual machine group. See [“Database](#)

[Virtual Machine Group Overview](#)” on page 154 for more information on setting up a virtual machine group.

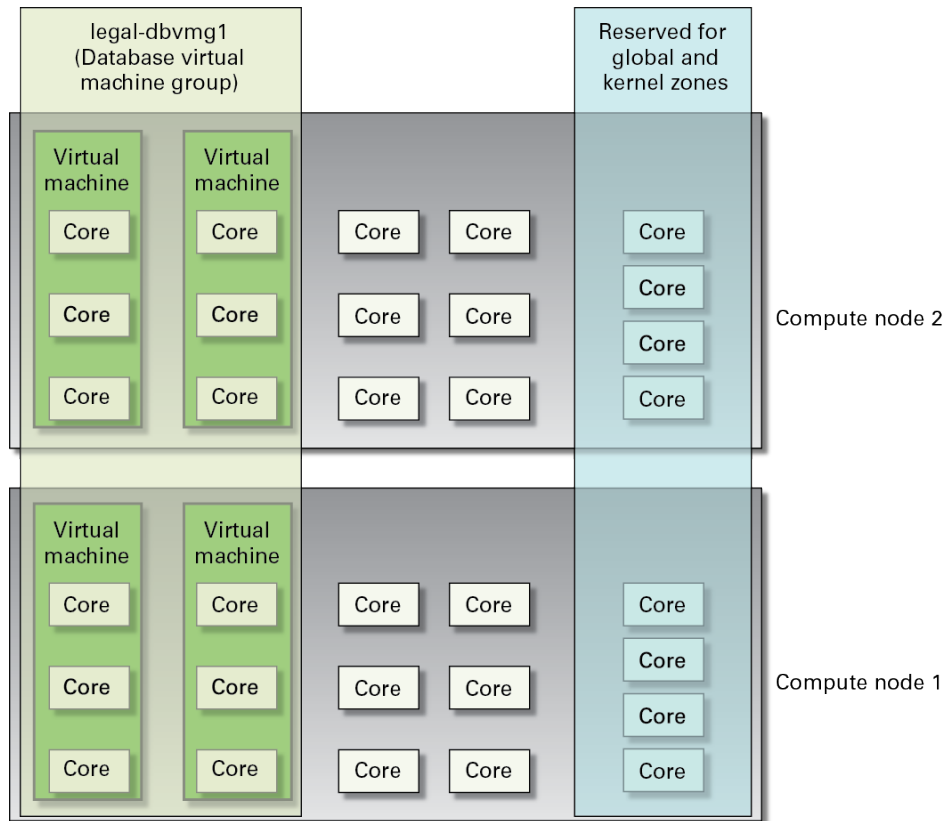
Part of the process for setting up a virtual machine group is to determine how many virtual machines will be part of this virtual machine group, and which compute node those virtual machines will reside on. You can then define the following characteristics of each virtual machine within this virtual machine group:

- Unique name for each virtual machine within this virtual machine group
- Number of cores from each compute node that will be assigned to each virtual machine in this virtual machine group
- Host name that you will assign to each virtual machine so that each virtual machine can be accessed through the 10GbE client access network

Note the following restrictions for usable cores within each compute node:

- Each compute node has a maximum of sixteen cores.
- Of those sixteen cores on each compute node, two cores are reserved for the global zone and two cores are reserved for the kernel zone, leaving twelve cores available for the database and application virtual machine groups.

For example, assume you want to have six cores total from each compute node for the database virtual machine group, and you would have the remaining six cores from each compute node available for the application virtual machine groups. If you have two virtual machines on each compute node for the database virtual machine group, you could therefore have three cores from each compute node assigned to each virtual machine in this virtual machine group. This figure represents how you could envision how these virtual machines would be set up for this virtual machine group.



Once you have set up the virtual machines in the virtual machine group, you can now provide information on the cluster that you will be creating for the virtual machines in this virtual machine group. See [“Clusters Overview” on page 158](#) for more information.

## Clusters Overview

The Create Clusters screen is where you set up Oracle Grid Infrastructure, which is the software that consists of Oracle Clusterware and Oracle Automatic Storage Management (Oracle ASM).

When you create clusters, you are essentially clustering all the virtual machines from both compute nodes together within a virtual machine group. For the most part, the screen for creating clusters is automatically populated based on the information you provided in the earlier screens. However, you must provide a SCAN name for the database cluster that you are setting up.

Oracle Database clients connect to the database using SCANS. The SCAN and its associated IP addresses provide a stable name for clients to use for connections, independent of the virtual machines that make up the cluster.

The SCAN is a virtual IP name that is associated with the entire cluster. The SCAN works by resolving multiple IP addresses in the cluster handling public client connections. When a client submits a request, the SCAN listener listening on a SCAN IP address and the SCAN port is made available to a client. Because all services on the cluster are registered with the SCAN listener, the SCAN listener replies with the address of the local listener on the least-loaded node where the service is currently being offered. Finally, the client establishes connection to the service through the listener on the node where service is offered. All of these actions take place transparently to the client, without any explicit configuration required in the client.

## Database Home Overview

Before you can create a database home, you must first create a database virtual machine group. See [“Database Virtual Machine Group Profile Overview” on page 154](#) for more information.

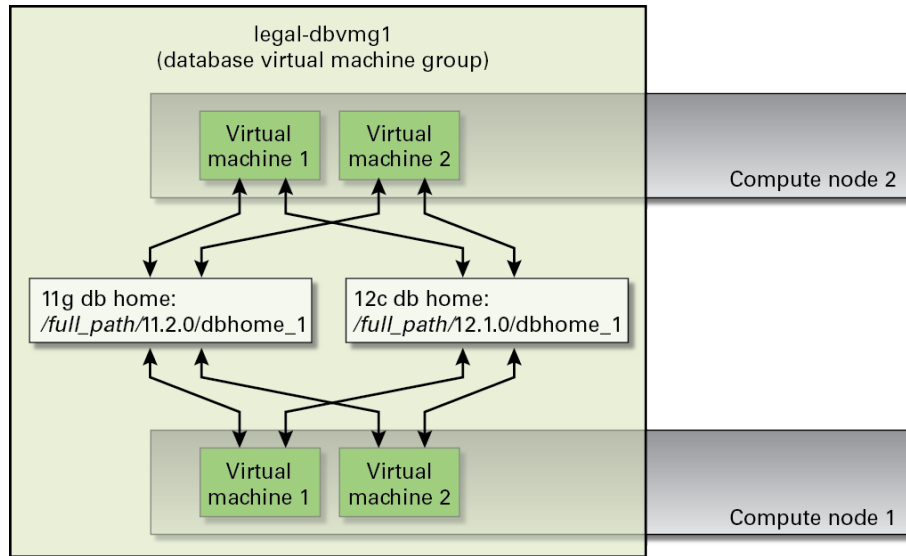
Once you have created a database virtual machine group and you have the virtual machines within that virtual machine group set up, you must then create one or more database homes for the virtual machines within this database virtual machine group. When you create a database home, you are providing the following:

- Specific virtual machine group where you want to create the database home
- Information on the database version that you want (11g or 12c)
- Directory path for the Oracle Database. The default is `/u01/app/oracle/product/release_number/dbhome_number` (for example, `/u01/app/oracle/product/12.1.0/dbhome_1`)

For example, assume you want to create two database homes in the `legal-dbz1` database virtual machine group, one for each database version:

- **11g database home** — `/u01/app/oracle/product/11.2.0/dbhome_1`
- **12c database home** — `/u01/app/oracle/product/12.1.0/dbhome_1`

This figure represents how you could envision this.



Note these:

- You could create multiple 11g or 12c database homes, each with a different directory path. For example, you could create a second 11g database home with the directory path of /u01/app/oracle/product/12.1.0/dbhome\_2.
- All the virtual machines within this particular virtual machine group have access to the database homes that you create in this particular database virtual machine group.

Once you have set up the database homes for the database virtual machine group, you can now create the database instances. See [“Database Instance Overview” on page 160](#).

## Database Instance Overview

Before you can create a database instance, you must first:

- Create a database virtual machine group, with virtual machines within that virtual machine group. See [“Database Virtual Machine Group Profile Overview” on page 154](#).
- Create one or more database homes for the database virtual machine group. See [“Database Home Overview” on page 159](#).

When you create a database instance, you must provide the following information:

- The specific virtual machines within the database virtual machine group where you want to set up the database instance



- The specific database home within that virtual machine, with a specific database version, where you want to set up the database instance
- The cluster type that you want to use for this database instance:
  - **Single** — Creates a single database instance (one virtual machine) on one compute node.
  - **RAC** — Creates an active-active clustered database instance (two virtual machines) across both compute nodes, with one virtual machine on each compute node.
  - **RAC-One Node** — Creates an active-passive clustered database instance (two virtual machines) across both compute nodes, with one virtual machine on each compute node.

The following sections provide examples of each cluster type and graphical representations for each example:

- [“Single Database Instance Example” on page 161](#)
- [“RAC or RAC-One Node Database Instance Example” on page 162](#)

## Single Database Instance Example

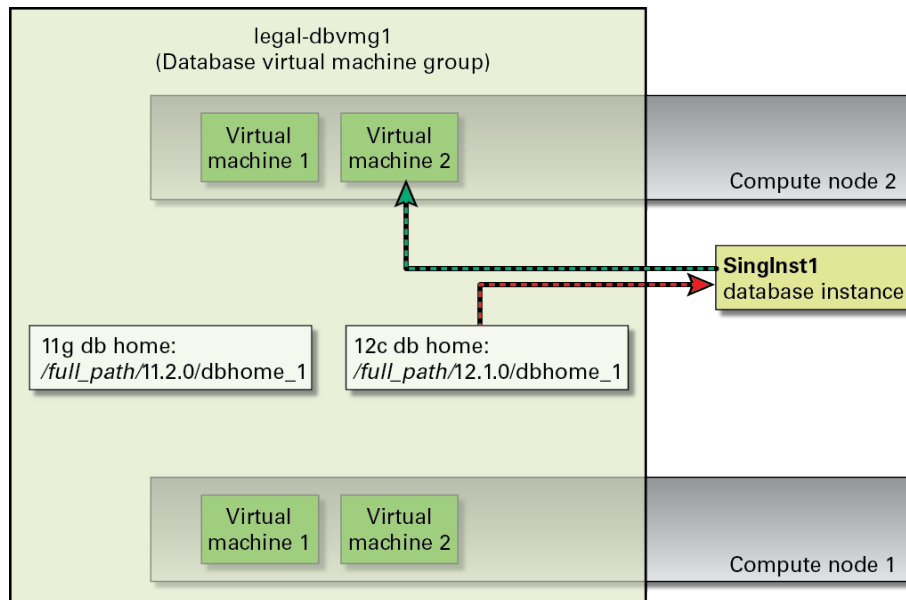
Assume that you want to create this database instance:

- Database home for database version 12c (*/full-path/12.1.0/dbhome\_1*)
- Single database instance, where the database instance is on one virtual machine (virtual machine 2) in one compute node (compute node 2)
- Name: SingIns1

In the Database Virtual Machine Group Summary page, you would locate the line with the database home that you want to use (in this example, on the line with the version 12.1.0/dbhome\_1). To create this database instance, you would first locate that specific virtual machine (virtual machine 2) on that specific compute node (compute node 2) in the Database Virtual Machine Group Summary page, then you would click on the plus sign on the 12.1.0.x line for that virtual machine on that compute node.

The Create Oracle Database Instance page appears. In this page, you would select Single for the Database Instance Type. You will also be prompted to select the virtual machines that you want to use to create the database instance. You already selected virtual machine 2 in compute node 2 in the Database Information Summary page, so this virtual machine is selected by default. Because you chose Single for the Database Instance Type, the preselected virtual machine 2 in compute node 2 is the only virtual machine available.

This figure represents this database instance example.



## RAC or RAC-One Node Database Instance Example

**Note** - The only difference between the RAC and the RAC-One Node instance types is that RAC is active-active and RAC-One Node is active-passive. This example also applies for a RAC-One Node instance.

Assume that you want to create this database instance:

- Database home for database version 12c (*full-path/12.1.0/dbhome\_1*)
- RAC database instance, where the database instance is on two virtual machines (virtual machine 2) in both compute nodes
- Name: RACIns1

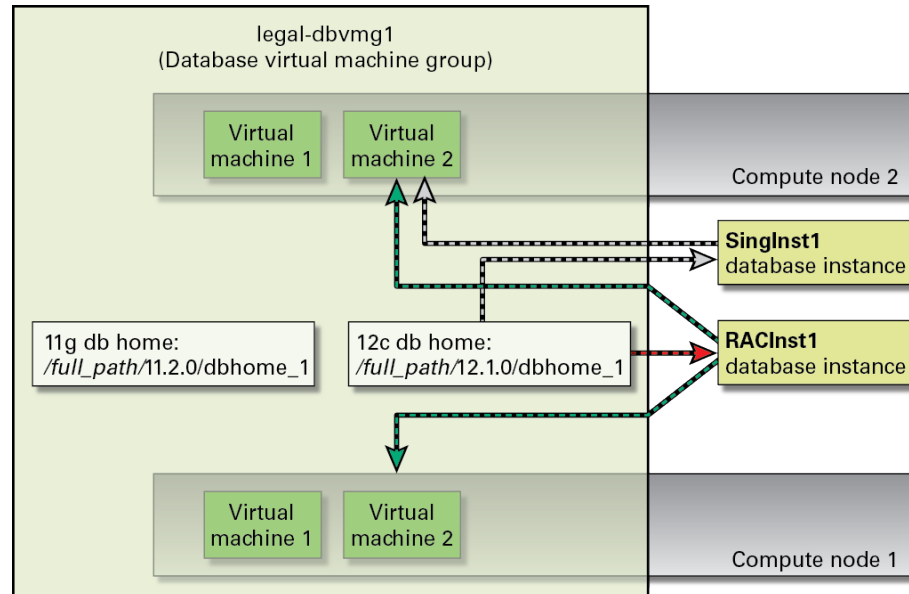
To create this database instance, you would locate virtual machine 2 on either of the compute nodes in the Database Virtual Machine Group Summary page, then you would click on the plus sign on the 12.1.0.x line for that virtual machine.

The Create Oracle Database Instance page appears. In this page, you would select RAC for the Database Instance Type. You are also prompted to select the virtual machines that you want to use to create the database instance. Because you chose RAC for the Database Instance Type,

you would only be able to select two virtual machines to use for this database instance, one from each compute node.

You already selected virtual machine 2 in either compute node 1 or compute node 2 in the Database Information Summary page, so this virtual machine is selected by default. Because you chose RAC for the Database Instance Type, you would then need to manually select the second virtual machine to be used in this RAC (in this example, virtual machine 2 in the other compute node).

This figure represents this database instance example.



## ▼ Create a Database Virtual Machine Group Profile

As part of the initial configuration of the MiniCluster, the Create Profile page is used to define the parameters of the database virtual machine that you will be creating. See [“Database Virtual Machine Group Profile Overview” on page 154](#) for an explanation of a database virtual machine group profile.

- 1. Use the Create Database Virtual Machine Group Profile page to create the profile.**

- 2. In the Virtual Machine Group Name field, type the name of the database virtual machine group that you are creating.**

The name can be up to twelve characters, and can contain letters, numbers or symbols.

- 3. In the Shared Storage field, select No or Yes.**

- **Yes** — Uses the HDDs as shared storage mounted to the virtual machines in this group
- **No** — Does not use the HDDs as shared storage mounted to the virtual machines in this group

- 4. From the Number of VMs on Node 1 field, select the number of virtual machines that you want on the first compute node for this database virtual machine group.**

You can have between 1 and 4 virtual machines on each compute node for each database virtual machine group.

- 5. From the Number of VMs on Node 2 field, select the number of virtual machines that you want on the second compute node for this database virtual machine group.**

You can have between 1 and 4 virtual machines on each compute node for each database virtual machine group. You do not have to have the same number of virtual machines on each compute node within a single database virtual machine group.

- 6. From the Security Profile menu, set the security profile for the database virtual machine group and the virtual machines within the group.**

Options are:

- **PCI-DSS** — Satisfies organizations that want to comply with the Payment Card Industry Data Security Standard (PCI DSS) standard defined by the Payment Card Industry Security Standards Council.
- **CIS Equivalent** — Satisfies organizations with stricter security requirements, comparable and equivalent to benchmarks set forth by the Center for Internet Security (CIS) and Security Technical Implementation Guidelines (STIG) assessments.
- **DISA-STIG** — Satisfies organizations requiring compliance with Security Technical Implementation Guidelines (STIG) for Oracle Solaris 11 published by the United States Defense Information Systems Agency (DISA).

You do not have to make the same selection here as you did when you performed the preliminary configuration tasks. See [“Preliminary Tasks” on page 15](#) for more information.

- 7. In the Role Separated field, select No or Yes.**

This field allows the responsibilities and privileges to be separated by role.

Separation of roles can be enabled to administer ASM and RDBMS separately. The SYSASM, SYSOPER for ASM, and SYSDBA for ASM system privileges enables the separation of the Oracle ASM storage administration privileges from SYSDBA.

- **If you select No, the following options appear.**

The screenshot shows a configuration window with a 'Role Separated' toggle set to 'No'. Below this, there are three rows of configuration options:

Field	Value	ID	Base
User Name	oracle	1001	/u01/app/oracle
DBA Group Name	dba	1002	
OINSTALL Group Name	oinstall	1001	

The following default entries are provided and cannot be changed:

- **User Name, ID and Base** — Sets the user name for the database owner, database owner ID, and database directory. Default entries:
  - Name — oracle
  - ID — 1001
  - Base — /u01/app/oracle
- **DBA Group Name and ID** — Sets the DBA group name and DBA group ID. Default entries:
  - Name — dba
  - ID — 1002
- **OINSTALL Group Name and ID** — Sets the Oracle Inventory group name and Oracle Inventory group ID. Default entries:
  - Name — oinstall
  - ID — 1001

- If you select Yes, the following options appear.

The screenshot shows the 'Role Separated' configuration window with the 'Yes' radio button selected. The configuration is organized into two main sections: Grid ASM Home OS User and RDBMS Home OS User. Each section contains fields for Name, ID, and Base.

Role	Name	ID	Base
Grid ASM Home OS User	oracle	1001	/u01/app/oracle
ASM DBA Group	asmdba	1004	
ASM Home Oper Group	asmoper	1005	
ASM Home Admin Group	asmadmin	1006	
RDBMS Home OS User	oracle	1000	/u01/app/oracle
RDBMS DBA Group	dba	1002	
RDBMS Home Oper Group	oper	1003	
ASM Home Admin Group	asmadmin	1001	

The following default entries are provided and cannot be changed:

- **Grid ASM Home OS User Name, ID and Base** — Sets the Oracle ASM owner name, Oracle ASM owner ID, and Oracle grid infrastructure directory. Default entries:
  - Name — oracle
  - ID — 1001
  - Base — /u01/app/oracle
- **ASM DBA Group Name and ID** — Sets the Oracle ASM DBA group name and Oracle ASM DBA group ID. Membership in this group enables access to the files managed by Oracle ASM. Default entries:
  - Name — asmdba
  - ID — 1004
- **ASM Home Oper Group Name and ID** — Sets the Oracle ASM operator group name and Oracle ASM operator group ID. This group of operating system users has a limited set of Oracle instance administrative privileges including starting up and stopping the Oracle ASM instance. Default entries:
  - Name — asmoper
  - ID — 1005
- **ASM Home Admin Group Name and ID** — Sets the Oracle ASM administration group name and Oracle ASM administration group ID. This group uses SQL to connect to an Oracle ASM instance as SYSASM using operating system authentication. The SYSASM privileges permit mounting and dismounting of disk groups, and other storage administration tasks. SYSASM privileges provide no access privileges on an Oracle Database instance. Default entries:
  - Name — asmadmin

- ID — 1006
  - **RDBMS Home OS User Name, ID and Base** — Sets the Oracle Database installation owner name, Oracle Database installation owner ID, and Oracle Database installation directory. Default entries:
    - Name — oracle
    - ID — 1000
    - Base — /u01/app/oracle
  - **RDBMS DBA Group Name and ID** — Sets the DBA group name and DBA group ID. Default entries:
    - Name — dba
    - ID — 1002
  - **RDBMS Home Oper Group Name and ID** — Sets the Oracle Database operator group name and Oracle Database operator group ID. Default entries:
    - Name — oper
    - ID — 1003
  - **ASM Home Admin Group Name and ID** — Sets the Oracle Inventory group name and Oracle Inventory group ID. Default entries:
    - Name — oinstall
    - ID — 1001
8. **In the Description field, type a description of the database virtual machine group that you are creating, if applicable.**
9. **In the Define Virtual Machines pane, type the following information for this database virtual machine group.**
- The Define Virtual Machines area has virtual machine creation information for both compute nodes. Type the appropriate information in the fields for each virtual machine in each compute node. The number of virtual machines that are shown in this area depends on the number of virtual machines that you entered in the Description pane for each compute node in the previous step.
- a. **Locate the pane for Virtual Machine 1 in compute node 1 (Node 1).**
  - b. **In the Public Hostname field, type the host name to be used for client network access for this virtual machine, or accept the default entry.**

This is the name that you add to your DNS. It is the hostname that is used for client access to the VM.

The client network host name is automatically populated using these pieces of information, in this order:



- Virtual machine group name that you provided in [Step 2](#)
- Virtual machine number
- MiniCluster hostname
- Compute node number

You can also create your own unique client network host name. The client network host name can be up to 25 alpha-numeric characters and can include the - (hyphen) symbol.

**c. From the Cores menu, select the number of cores that you want to have assigned to this virtual machine.**

For each VM, specify the number of cores (0 - 12). Before the creation of VMs, there are 24 cores available (12 on each node that are available for VMs). MCMU keeps track of how many cores are assigned to VMs and only enables you to select a number from what is available.

Cores that are not assigned to VMs are pooled together and are available as shared cores. If you select 0 (zero) cores, the VM uses shared cores. After the DB VM group is deployed, you can change the number of cores on the VMs using the instructions provided in the *Oracle MiniCluster S7-2 Administration Guide*.

You can assign a different number of cores to each virtual machine within a database virtual machine group.

**d. In the two Passwords fields, set a password for the oracle user and mcinstall user.**

For more information on user accounts, password policies and security profiles, see the *Oracle MiniCluster S7-2 Administration Guide*.

**e. Repeat [Step 9b](#) through [Step 9d](#) for each virtual machine in both compute nodes.**

The total number of available cores for each compute node is 12. The number of cores available for the remaining virtual machines in each compute node is reduced, based on the amount of cores that you assign to other virtual machines in your system.

**10. In the Define Cluster pane, type this information for this database virtual machine group.**

**a. In the SCAN Name field, type the SCAN name for the Oracle RAC for these virtual machines.**

The SCAN name can be up to twelve characters, and can contain letters, numbers, or symbols.

b. In the **Select GI Patch Level** field, select the patch level from the scroll-down menu.

c. In the **SYSTEM Disk Group** field, select the level of redundancy that you want for the **Oracle Cluster Registry (OCR) voting disk group, or SYSTEM disk group**.

Options are Normal or High:

- **Normal redundancy** — A disk group with normal redundancy stores three voting disks
- **High redundancy** — A disk group with high redundancy stores five voting disks

d. From the **ASM Disk Group Redundancy** menu, select the level of redundancy that you want for this database virtual machine group.

Options are Normal (double mirrored redundancy) or High (tripled mirrored redundancy).

e. In the **DATA/RECO Disk Group Split** field, select the percentage of disk space that you will be allocating to the **DATA** and **RECO** disk groups.

The horizontal scroll bar can be moved in 10% increments and shows the percentage of disk space that you want to allocate for the **DATA** disk group, with the remaining amount allotted to the **RECO** disk group. For example, if you move the horizontal scroll bar to 70%, then 70% of the disk space will be allocated to the **DATA** disk group, with the remaining 30% allocated to the **RECO** disk group.

11. **Click the Create Profile button.**

The Virtual Machine Group Profile Summary page appears.



12. **When the status is shown as completed, click the Continue button.**

The Virtual Machine Group Profile summary page appears.

Virtual Machine Group Profile Summary	
Virtual Machine Group Name	dbvmg1
SCAN Name	dbvmg1-scan
SCAN IPs	zzz.zzz.zzz.zzz.zzz.zzz.zzz.zzz.zzz.zzz
<b>Node 1 mc4-n1</b>	
<b>dbvmg1-zone-1-mc4-n1</b>	
dbvmg1-zone-1-mc4-n1	zzz.zzz.zzz.zzz
dbvmg1-zone-1-mc4-n1-vip	zzz.zzz.zzz.zzz
<b>dbvmg1-zone-2-mc4-n1</b>	
dbvmg1-zone-2-mc4-n1	zzz.zzz.zzz.zzz
dbvmg1-zone-2-mc4-n1-vip	zzz.zzz.zzz.zzz
<b>dbvmg1-zone-3-mc4-n1</b>	
dbvmg1-zone-3-mc4-n1	zzz.zzz.zzz.zzz
dbvmg1-zone-3-mc4-n1-vip	zzz.zzz.zzz.zzz
<b>dbvmg1-zone-4-mc4-n1</b>	
dbvmg1-zone-4-mc4-n1	zzz.zzz.zzz.zzz
dbvmg1-zone-4-mc4-n1-vip	zzz.zzz.zzz.zzz
<b>Node 2 mc4-n2</b>	
<b>dbvmg1-zone-1-mc4-n2</b>	
dbvmg1-zone-1-mc4-n2	zzz.zzz.zzz.zzz
dbvmg1-zone-1-mc4-n2-vip	zzz.zzz.zzz.zzz
<b>dbvmg1-zone-2-mc4-n2</b>	
dbvmg1-zone-2-mc4-n2	zzz.zzz.zzz.zzz
dbvmg1-zone-2-mc4-n2-vip	zzz.zzz.zzz.zzz
<b>dbvmg1-zone-3-mc4-n2</b>	
dbvmg1-zone-3-mc4-n2	zzz.zzz.zzz.zzz
dbvmg1-zone-3-mc4-n2-vip	zzz.zzz.zzz.zzz
<b>dbvmg1-zone-4-mc4-n2</b>	
dbvmg1-zone-4-mc4-n2	zzz.zzz.zzz.zzz
dbvmg1-zone-4-mc4-n2-vip	zzz.zzz.zzz.zzz
<p>Note: IP Addresses must now be assigned to DNS, which could take a few hours to update. You may want to record the summary information provided on this page.</p> <p>Status: IP mapping completed.</p>	
<input type="button" value="Continue"/>	

13. Enter all the host name and IP address information shown on this screen into DNS.
14. After you have entered the host name and IP address information into DNS, click the Continue button.

The Deploy Database Virtual Machine Group Profile screen appears. Go to [“Deploy a Database Virtual Machine Group” on page 172](#).

---

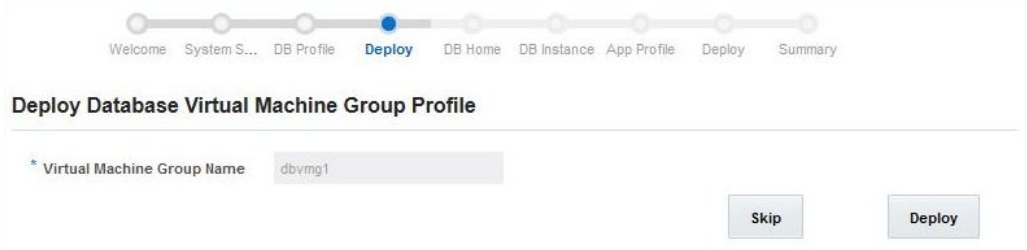
**Note** - If you need to change any information for this virtual machine group profile, you can do so later on using the instructions provided in the *Oracle MiniCluster S7-2 Administration Guide*.

---

## ▼ Deploy a Database Virtual Machine Group

1. **In the Deploy Database Virtual Machine Group Profile screen, verify that the database virtual machine group that you created is displayed.**

See [“Create a Database Virtual Machine Group Profile” on page 163](#).



Progress bar: Welcome, System S..., DB Profile, **Deploy**, DB Home, DB Instance, App Profile, Deploy, Summary

**Deploy Database Virtual Machine Group Profile**

\* Virtual Machine Group Name: dbvmg1

Skip Deploy


2. **Click the Deploy button.**

The Deploy Database Virtual Machine Group status page appears, displaying the individual steps that are performed as part of the deployment process and the status for each step. This deployment process for a new database virtual machine group could take around one or two hours. Click the Show Detail button to show more detail or Hide Detail to hide details.

**Note** - You can also click the Skip button and deploy the database virtual machine group at a later time, if necessary. Refer to the *Oracle MiniCluster S7-2 Administration Guide* for those instructions.

**Deploy Database Virtual Machine Group**

Status: Executing root.sh on dbvmg1-zone-4-mc4-n2 Remaining 19 mins



0% 100%

Step	Description	Status
1	Verify Input Data	✓
2	Insert IP Mapping	✓
3	Check template VM	✓
4	Create VMs	✓
5	Change VM /u01 Permission	✓
6	Change VM disk permission	✓
7	Edit /etc/hosts File	✓
8	Setup SSH Equivalency	✓
9	Create Disk Partition	✓
10	Create GRID response file	✓
11	Install GRID Software	✓
12	Run root.sh Script	✓
13	Run cfgtoolallcmd	✓
14	Create Diskgroup	✓
15	Patch GRID	✓
16	Add Node to GRID Cluster	0 %

3. When all of the deployment steps have successfully completed, click the Finish button.

The Create Database Home page appears. Go to [“Create a Database Home”](#) on page 174.

## ▼ Create a Database Home

See [“Database Home Overview”](#) on page 159 for more information about the database home.

**Note** - Do not click on the Refresh button in your browser while in the Create Database Home page. Doing so will return you to the Welcome to MiniCluster Configuration Utility page. If that happens, click on the DB Home link in the configuration wizard, as shown in the following figure.

1. Use the Create Database Home page to create the database home.

2. From the Select Database Version menu, select the database version.

Options are:

- 11g Enterprise Edition
- 12c Enterprise Edition
- 12c Standard Edition 2

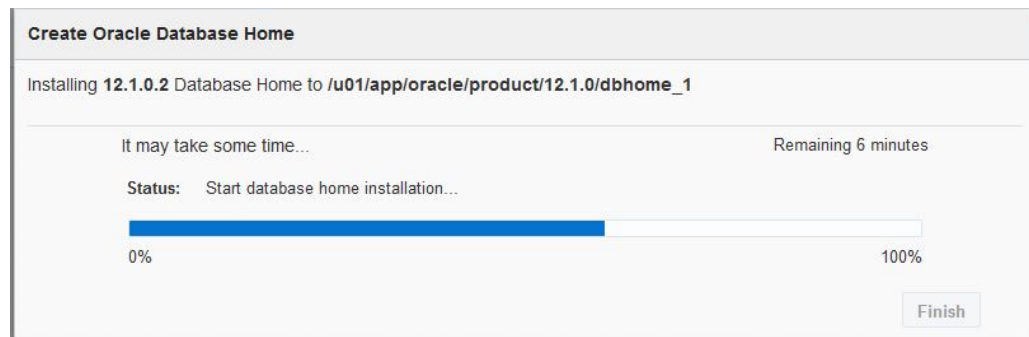
3. In the Oracle Home Path field, type the Oracle home path.

This is the directory path for the Oracle Database. The default is `/u01/app/oracle/product/release_number/dbhome_number`.

In this example, `/u01/app/oracle/product/12.1.0/dbhome_1` is used for the Oracle home path.

4. **From the Select Patch level menu, select the patch level for this Oracle database version.**
5. **Click the Create button.**

The Create Oracle Database Home status page appears. The process to create an Oracle database home could take roughly one hour.



Once you have created a database home for one virtual machine within a database virtual machine group, the MiniCluster software automatically replicates this database home information for every other virtual machine within this database virtual machine group.

6. **When the process of creating the Oracle database home has successfully completed, click the Finish button.**

The Create Database Instance page appears. Go to [“Create a Database Instance”](#) on page 175.

## ▼ Create a Database Instance

See [“Database Instance Overview”](#) on page 160 for more information about the database instance.

---

**Note** - Do not click on the Refresh button in your browser while in the Create a Database Instance page. Doing so will return you to the Welcome to MiniCluster Configuration Utility page. If that happens, click on the DB Instance link in the configuration wizard, as shown in the following figure.

---

1. Use the Create Database Instance page to create a database instance.

2. Select the template type.

The options are:

- **DW** — Creates a data warehouse type database, commonly used for analytic workloads.
- **OLTP** — Creates an online transaction processing type database, commonly used for business transaction workloads.
- **Custom** — If selected, you are prompted to browse to a DB template that you provide.

3. Select the database instance type.

The options are:



- **Single** — Creates a single database instance (one virtual machine) on one compute node.
  - **RAC** — Creates an active-active clustered database instance (two virtual machines) across both compute nodes.
  - **RAC-One Node** — Creates an active-passive clustered database instance (two virtual machines) across both compute nodes.
4. **Select the compute node where you will create the database instance.**
- **If you selected Single for the database instance type, select either compute node 1 or compute node 2.**
  - **If you selected RAC or RAC-One Node for the database instance type, both compute nodes are selected automatically.**
5. **Select the virtual machines that you will use to create the database instance.**
- **If you selected Single for the database instance type, you will only be able to select a single virtual machine on the compute node that you selected in [Step 4](#).**
  - **If you selected RAC or RAC-One Node for the database instance type, select two virtual machines from the two compute nodes (one from each compute node).**
6. **Verify the database instance version and select Yes or No for the Container Database.**
- The database instance version is automatically populated based on the database home field that you selected in [Step 5](#) of this procedure.
- The multitenant option introduced in Oracle Database 12c enables a single container database to host multiple separate pluggable databases. Choose Yes or No in the Container Database field for this option.
- If you select Yes in the Container Database field, these additional fields appear:
- **Number of PDBs** — The number of pluggable databases (PDBs), between 0 and 252.
  - **PDB Prefix** — The prefix that is to be used to generate a unique pluggable database name, up to 8 characters (letters or numbers).
7. **Type the program global area (PGA) size in MB.**
- The PGA is a memory region that contains data and control information for a server process. It is a nonshared memory created by Oracle when a server process is started.

**8. Type the system global area (SGA) size in MB.**

The SGA forms the part of the system memory (RAM) shared by all the processes belonging to a single Oracle database instance. The SGA contains all information necessary for the instance operation.

**9. Select the character set.**

Select the character set to be set as the database character set.

**10. Select the national character set.**

Select an alternate character set that enables storage of Unicode characters in a database that does not have a Unicode database character set. The options are:

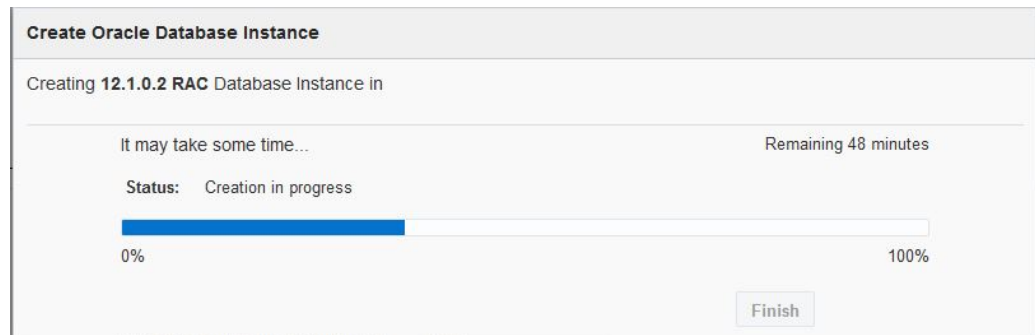
- **AL16UTF16** — Unicode 3.1 UTF-16 Universal character set
- **UTF8** — Unicode 3.1 UTF-8 Universal character set

**11. Type the database instance name.**

The database instance name can be up to 8 characters, and can use either letters or numbers.

**12. Click the Create button.**

The Create Oracle Database Instance status page appears. The process takes roughly 75 minutes to complete.



**13. When the Oracle database instance has been completed, click the Finish button.**

The Create Application Virtual Machine Group page appears. Go to [“Creating an Application Virtual Machine Group \(Initial Installation\)”](#) on page 179.

# Creating an Application Virtual Machine Group (Initial Installation)

---

As part of the initial configuration of the MiniCluster, you are provided with a walk-through for creating an application virtual machine group. These topics provide conceptual information on application virtual machine groups, and the procedures for creating one as part of the initial configuration.

If you decide not to create an application virtual machine group as part of the initial configuration, you can click on the Skip button in any screen, which advances you to the Dashboard page in the MiniCluster Configuration Tool. You can create an application virtual machine group manually at any point later on using the instructions in the *Oracle MiniCluster S7-2 Administration Guide*.

- [“Understanding Application Virtual Machine Groups” on page 179](#)
- [“Create an Application Virtual Machine Group” on page 181](#)

## Understanding Application Virtual Machine Groups

There are two basic sets of procedures that you must go through to create an application virtual machine group:

- [“Application Virtual Machine Group Overview” on page 179](#)
- [“Virtual Machines Overview” on page 180](#)

## Application Virtual Machine Group Overview

An application virtual machine group consists of one virtual machine (on one compute node) or two virtual machines (one virtual machine on each of the two compute nodes). You might create a virtual machine group for a specific purpose or for a specific group in your organization. For

example, you might create a virtual machine group specifically for the legal department in your organization.

When you create an application virtual machine group, you assign certain characteristics to that virtual machine group, including:

- **Name of virtual machine group** — Name for this particular application virtual machine group.
- **Type** — Number of virtual machines that will be part of this virtual machine group, either multiple (two virtual machines) or single (one virtual machine).
- **Shared Storage** — Whether you want to host application binaries on local storage or install the binaries in shared storage.

At this point in the process, you have only defined how you want the virtual machine group to be set up. The next step in the process is to define how you want the individual virtual machines within this virtual machine group to be set up. See [“Virtual Machines Overview” on page 180](#) for more information on setting up the virtual machines within a virtual machine group.

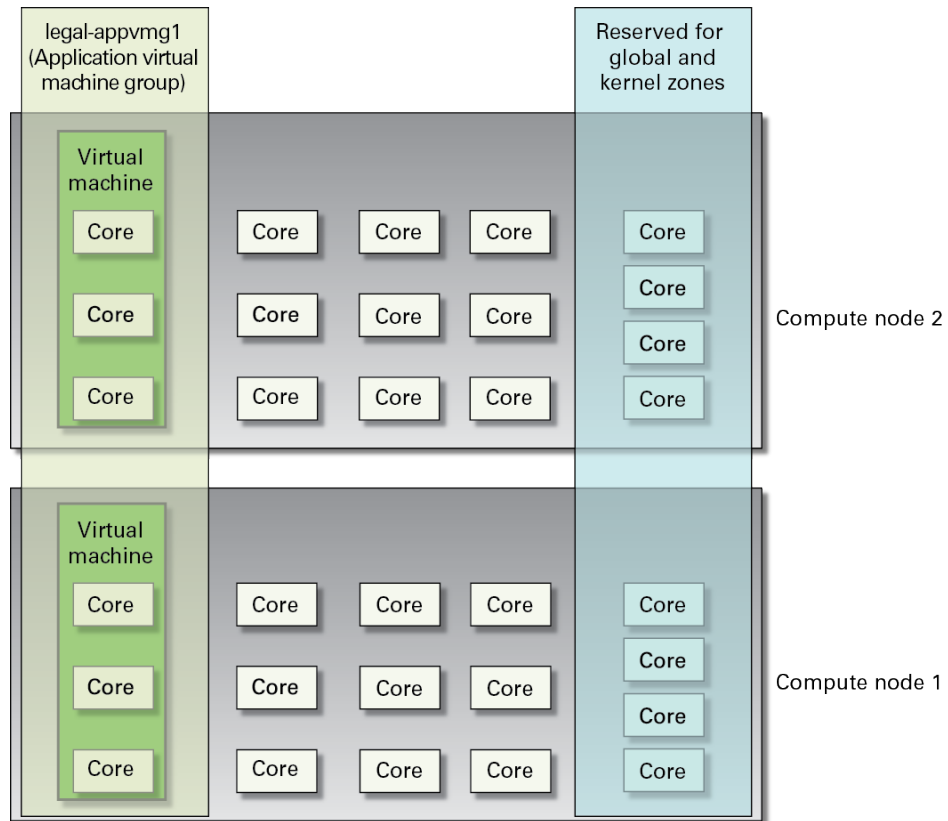
## Virtual Machines Overview

Define how you want the virtual machine group to be set up before providing information on the virtual machines within that group. See [“Application Virtual Machine Group Overview” on page 179](#) for more information on setting up a virtual machine group.

You provide this information for the individual virtual machines within a virtual machine group:

- Unique name for each virtual machine within this virtual machine group
- Number of cores from each compute node that will be assigned to each virtual machine in this virtual machine group
- Host name that you will assign to each virtual machine so that each virtual machine can be accessed through the 10GbE client access network

For example, assume you want to have three cores from each compute node assigned to each virtual machine, or six cores total for the application virtual machine group. This figure represents how you could envision how these virtual machines would be set up for this virtual machine group.



## ▼ Create an Application Virtual Machine Group

At this point in the initial installation process, you can create an application virtual machine group. If you do not want an application virtual machine group, you can now perform standard system tasks, such as adding users, creating additional virtual machine groups, and so on. Go to the *Oracle MiniCluster S7-2 Administration Guide* for more information.

1. Use the Create Application Virtual Machine Group page to create an application virtual machine group.

**Create Application Virtual Machine Group Profile**

**Application Virtual Machine Group Profile Description**

\* Virtual Machine Group Name

Number of Virtual Machines  Pair  Single

Shared Storage No  Yes

Description

VM Type Solaris 10 Branded Zones

Security Profile JASS

**Define Virtual Machines**

	mc1-n1	mc1-n2
* Public Hostname	-vm1-mc1-n1	-vm1-mc1-n2
* Cores	0	0
Username	oracle	oracle
UserID	200	200
Use Default Password	<input type="checkbox"/>	<input type="checkbox"/>
Password	<input type="text"/>	<input type="text"/>
Re-enter Password	<input type="text"/>	<input type="text"/>
Username	mcinstall	mcinstall
UserID	108	108
Use Default Password	<input type="checkbox"/>	<input type="checkbox"/>
Password	<input type="text"/>	<input type="text"/>
Re-enter Password	<input type="text"/>	<input type="text"/>

Skip Create

2. In the Application Virtual Machine Group Profile Description pane, type this information.

- **Virtual Machine Group Name** — Name of the application virtual machine group that you are creating. The name can be up to twelve characters, and can contain letters, numbers, or symbols.
- **Number of Virtual Machines:**
  - **Pair** — Creates two virtual machines (one on each node) in the group.
  - **Single** — Creates one virtual machine in the group.
- **Shared Storage** — All application virtual machines are allocated with storage space. With the shared storage option enabled, 6 HDDs on each storage array are set aside for additional storage space. For systems in highly secure environments, do not enable shared storage. For additional security information, refer to the *Oracle MiniCluster S7-2 Security Guide*.

Options for this field are:

- **Yes** — All the virtual machines in the group have access to the shared storage.
- **No** — The virtual machines will not have access to the shared storage space in the 6 HDDs.

---

**Note** - After the creation of virtual machines, you can enable or disable access to the shared storage at any time. Refer to the *Oracle MiniCluster S7-2 Administration Guide* for more information.

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- **Description** — Description of the application virtual machine group that you are creating.
- **VM Type** — Select one of the types from the drop-down list to assign the virtual machines with an OS version:
  - **Solaris 11 Native Zone** — Configures Oracle Solaris 11 OS for the application virtual machine. This is a native OS installation because the version is the same as what is installed in the global zones. Choose this VM type if you plan to use the application VM clustering feature.
  - **Solaris 10 Branded Zone** — (Introduced in v1.1.25) Configures Oracle Solaris 10 OS for the application virtual machine. This is a branded OS installation because the version is different than what is installed in the global zones. Branded zones are usually used when applications require a specific OS version.

Oracle provides quarterly Critical Patch Updates (CPUs) for Oracle Solaris 10, including Solaris 10 Containers (Branded Zones). Please review the knowledge articles titled *How to find the Oracle Solaris Critical Patch Update (CPU) Patchsets, Recommended OS Patchsets for Oracle Solaris and Oracle Solaris Update Patch Bundles* (Doc ID 1272947.1) and *How Patches and Updates Entitlement Works* (Doc ID 1369860.1). Both articles are available at [My Oracle Support](#). Take any actions necessary to patch applicable Oracle Solaris 10 Branded Zone virtual machines.

- **Security Profile** — Sets the security profile for the application virtual machine group and the virtual machines within the group. Options available vary, depending on the VM type that you selected in the previous field:
  - If you selected **Solaris 11 Native Zone** as the VM type:
    - **PCI-DSS** — Satisfies organizations that want to comply with the Payment Card Industry Data Security Standard (PCI DSS) standard defined by the Payment Card Industry Security Standards Council.
    - **CIS Equivalent** — Satisfies organizations with stricter security requirements, comparable and equivalent to benchmarks set forth by the Center for Internet Security (CIS) and Security Technical Implementation Guidelines (STIG) assessments.
    - **DISA-STIG** — Satisfies organizations requiring compliance with Security Technical Implementation Guidelines (STIG) for Oracle Solaris 11 published by the United States Defense Information Systems Agency (DISA).
  - If you selected **Solaris 10 Branded Zone** as the VM type:
    - **JASS** — JASS hardens and minimizes the OS attack surface. The configuration is based on the Solaris Security Toolkit, which enforces security controls such as RBAC, white-listed ports, protocols and services, and ensures that unnecessary services are disabled.
    - **None** — Configures the Oracle Solaris 10 branded zones with no additional security controls. This is considered a high risk configuration.

You do not have to make the same selection here as you did when you performed the preliminary configuration tasks. See [“Preliminary Tasks” on page 15](#) for more information.

**3. In the Define Virtual Machines pane, type this information.**

The Define Virtual Machines area has virtual machine creation information for both compute nodes. Type the appropriate information in the fields for each virtual machine in each compute node. The number of virtual machines that are shown in this pane depends on your choice for Type (Pair or Single) in the previous step.

- a. **If you selected Single in the Number of Virtual Machines field, select the compute node in the Select Node field.**

The information for that compute node becomes active.
- b. **Locate the area for the first virtual machine in the first compute node.**
- c. **In the Public Hostname field, type the host name to be used for client network access for this virtual machine, or accept the default entry.**



The client network host name is automatically populated using these pieces of information, in this order:

- Virtual machine group name that you provided in [Step 2](#)
- Virtual machine number
- MiniCluster hostname
- Compute node number

You can also create your own unique client network host name. The client network host name can be up to 32 characters, and can contain letters, numbers, or symbols.

**d. From the Cores field, select the number of cores that you want to have assigned to this virtual machine.**

For each VM, specify the number of cores (0 - 12). Before the creation of VMs, there are 24 cores available (12 on each node that are available for VMs). MCMU keeps track of how many cores are assigned to VMs and only enables you to select a number from what is available.

Cores that are not assigned to VMs are pooled together and are available as shared cores. If you select 0 (zero) cores, the VM uses shared cores. After the DB VM group is deployed, you can change the number of cores on the VMs using the instructions provided in the *Oracle MiniCluster S7-2 Administration Guide*.

You can assign a different number of cores to each virtual machine within a database virtual machine group.

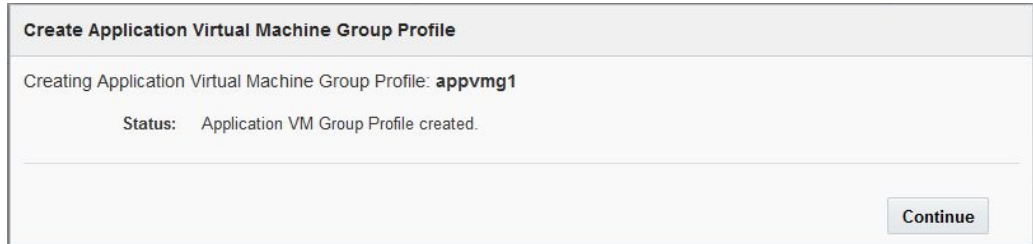
**e. In the two Passwords fields, set a password for the oracle user and mcinstall user.**

For more information on user accounts, password policies and security profiles, refer to “Managing MCMU User Accounts (BUI)” in *Oracle MiniCluster S7-2 Administration Guide*.

**f. Repeat [Step 3c](#) through [Step 3e](#) for the second virtual machine in the second compute node, if necessary.**

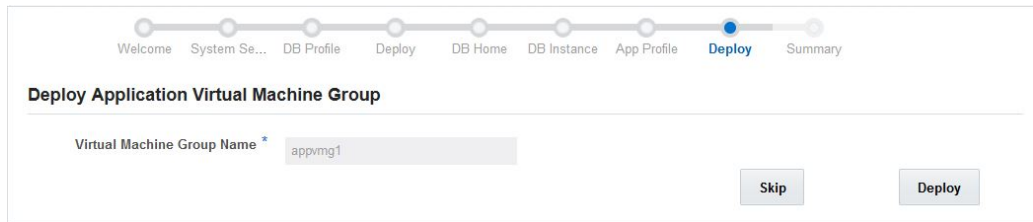
**4. Click the Create button when you have finished entering the information for the application virtual machine group.**

The Create Application Virtual Machine Group Profile page appears.



5. **When the process of creating the application virtual machine group profile has successfully completed, click the Continue button.**

The Deploy Application Virtual Machine Group page appears.



6. **In the Deploy Application Virtual Machine Group page, verify that the application virtual machine group that you created is displayed.**
7. **Click the Deploy button.**


The Create Application Virtual Machine Group status page appears, displaying the individual steps that are performed as part of the deployment process and the status of each step. Click the

Detail button to show more or less status detail. This deployment process for a new application virtual machine group could take around 15 minutes.

**Create Application Virtual Machine Group**

Deploying Application Virtual Machine Group: **appvmg1**

Status: Create VMs Remaining 10 mins

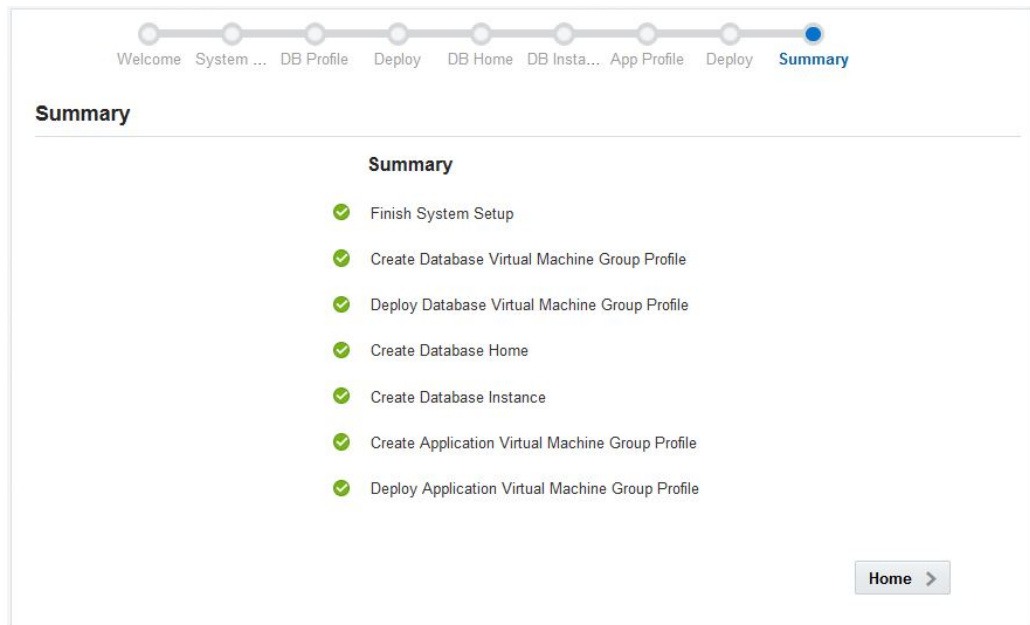


0%
100%

Step	Description	Completed
1	Verify Input Data	✔
2	Insert IP Mapping	✔
3	Check template VM	✔
4	Create VMs	1 of 2
5	Add to MCMU database	

8. **When the process of creating the application virtual machine group is complete, click the Finish button.**

The Summary page appears, showing the tasks that you completed as part of the initial installation of your MiniCluster.



**9. Click the Home button.**

The login screen appears.

**10. Log in to the MiniCluster.**

- **Username** — `mcinstall`
- **Password** — `new-unique-password`

**11. Click Login.**

The Home page in the MiniCluster Configuration Tool appears, providing system-level information for the MiniCluster.

**System Status**

**System Status** ● Good ■ Warning

**Core Usage** ■ Used ■ Unused  
75% 25%

**Virtual Machine(s)** ● 100% ■ Online ■ Offline

**Database Instance(s)** ● 100% ■ Online ■ Offline

Silicon Secured Memory	mc13-n1	✓	mc13-n2	✓
Database Accelerator Engine	mc13-n1	✓	mc13-n2	✓
SPARC Hardware Assisted Cryptography	mc13-n1	✓	mc13-n2	✓

**Compliance Information**  
Assess and report security compliance scores for the virtual machines in the system.

Administration VMs: CIS Equivalent  
Application and Database VMs: cis equivalent

Node	Virtual Machine Name	Benchmark Type	Compliance Score	Date & Time	Remarks	View Report
Node 1						
Node 2						

**Virtual Tuning Assistant Status**  
Monitors and tunes system settings automatically to ensure best practices.

Node	Virtual Machine	Status	Issues	Notices
Node 1				
Node 2				

**12. Enter the host name and IP address information for the application virtual machine group that you created into DNS.**

Refer to the *Oracle MiniCluster S7-2 Administration Guide* for instructions on accessing the screen that provides the host name and IP address information for the new application virtual machine group that you created.

**13. Perform other appropriate administration tasks, as necessary.**

- Change the Oracle Engineered System Hardware Manager password. See [“Configure the Oracle Engineered System Hardware Manager Password”](#) on page 191.
- Ensure that MiniCluster is configured securely. Refer to the [Oracle MiniCluster S7-2 Security Guide](#)

- Configure the mctuner notification email address so that, If the tuning assistant detects any issues, it sends email notifications to the email address. Refer to [“Configure the mctuner Notification Email Address \(CLI\)”](#) in *Oracle MiniCluster S7-2 Administration Guide*.
- Perform common administrative tasks such as adding MCMU users and creating additional VMs. Refer to the *Oracle MiniCluster S7-2 Administration Guide*

## Performing Post-Installation Configurations

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When the installation is complete, perform important configuration tasks.

- [“Configure the Oracle Engineered System Hardware Manager Password”](#) on page 191
- [“Configure the mctuner Notification Email Address”](#) on page 191

### ▼ **Configure the Oracle Engineered System Hardware Manager Password**

Oracle Engineered Systems Hardware Manager is a BUI-based system-level hardware management utility intended for use by Oracle Service personnel, or under their direction. The utility has an admin account. Ensure that you assign a unique password to the admin account.

For more information about the utility, refer to [“Configuring Oracle Engineered Systems Hardware Manager”](#) in *Oracle MiniCluster S7-2 Administration Guide*.

**1. Log in to the Global Zone of node1 and assume the root role.**

For instructions, refer to [“Log in to the Global or Kernel Zone”](#) in *Oracle MiniCluster S7-2 Administration Guide*.

**2. Run the following command.**

```
# /opt/oracle-eshm/bin/oeshm-pwreset
```

**3. When prompted, enter the admin password twice.**

The password is now configured.

### ▼ **Configure the mctuner Notification Email Address**

By default, the virtual tuning assistant, mctuner, is enabled on the system to ensure that the system is running with optimal tuning parameters. If the tuning assistant detects any issues, it

sends email notifications to the email address that is configured for the tuning assistant. Before that can happen, you need to configure mctuner with the appropriate email address.

- Refer to **“Configure the mctuner Notification Email Address (CLI)”** in *Oracle MiniCluster S7-2 Administration Guide*.



# Index

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## Numbers and Symbols

10GbE private network, connecting, 111

## A

antitilt legs or bar, 61

application virtual machine

defining, 184

overview, 180

application virtual machine group

creating, 181, 187

deploying, 186

overview, 179

## C

CIDR to subnet mask mapping, 20

client network

connections using copper cabling, 109

connections using fiber optic cabling, 108

Initial Configuration tool fields, 22

physical connections, 107

compute node

airflow clearance, 47

airflow guidelines, 49

attaching tool-less slide-rail assemblies, 67

connecting to storage array, 112

copying configuration files to node 1, 129

depth specification, 47

electrical specifications, 48

environmental specifications, 48

ESD precautions, 55

front panel components, 41

handling precautions, 54

height specification, 47

installing, 62

installing AC power cables and slide rails, 66

installing cable management arm, 72

installing into slide-rail assemblies, 70

installing rackmount hardware, 63

logging in to node 1 (Oracle ILOM), 128

marking rackmount location, 65

Oracle ILOM system console, 121

overview, 39

physical specifications, 47

powering on, 123

rear panel components, 42

removing cable management arm, 83

SAS connector pinouts, 103

SER MGT connection, 117

service clearance, 47

shipping kit contents, 53

weight specification, 47

width specification, 47

confirming specifications, 47

## D

database cluster

defining, 169

overview, 158

database home

creating, 174

overview, 159

database instance

creating, 175

overview, 160

- RAC
  - creating, 176
  - example, 162
- RAC-One Node
  - creating, 176
  - example, 162
- single
  - creating, 176
  - example, 161
- database virtual machine
  - defining, 168
  - overview, 156
- database virtual machine group
  - creating, 153
  - deploying, 172
  - overview, 154
- database virtual machine group profile
  - creating, 163
  - overview, 154
- DNS, IP mapping
  - at application virtual machine group level, 189
  - at database virtual machine group level, 171
  - at system level, 28
  - Check IP button in Initial Configuration tool, 30
- E**
  - Ethernet ports, pinouts, 102
- H**
  - home page, 189
- I**
  - Initial Configuration tool
    - bringing up, 16
    - Client Network tab, 22
    - Configure IP Allocation window, 22
    - description, 15
    - Management Network tab, 19
    - providing general configuration information, 17
  - initial configuration, performing, 130
  - Install Administrator account
    - approving, 144
    - completing setup, 145
    - creating, 143
  - installmc --deploy, 131
  - installmc --init, 129
- M**
  - management network, connecting, 106
  - MCMU BUI
    - logging in for first time, 140
    - welcome page, 149
- N**
  - NET MGT port, pinouts, 101
- P**
  - pinouts
    - Ethernet ports, 102
    - NET MGT port, 101
    - SER MGT port, 100
    - USB ports, 100
  - power cords, connecting, 119
  - power on system, 119
  - preliminary configuration
    - using Initial Configuration tool, 15
    - without using Initial Configuration tool, 33
- R**
  - rack
    - compatibility, 59
    - mounting holes, supported, 59
    - specifications, 59
    - stabilizing, 61
  - rackmount
    - antitilt legs or bar, extending, 61

---

- kit, 59
- racks, supported, 59
- safety warnings, 60
- stabilizing the rack, 61, 83

## S

- security profile
  - application virtual machine group level, 184
  - database virtual machine group level, 165
  - system level, 28
- SER MGT port, pinouts, 100
- shared storage
  - application virtual machine group, 183
  - database virtual machine group, 165
- site planning specifications, 47
- software configuration overview, 125
- specifications, confirming, 47
- static IP address, assigning to NET MGT port, 126
- storage array
  - airflow clearance, 50
  - airflow precautions, 51
  - connecting to compute nodes, 112
  - depth specification, 50
  - drives, 46
  - electrical specifications, 50
  - environmental specifications, 51
  - front panel components, 43
  - height specification, 50
  - installation tools, 57
  - installing, 88
  - installing in a rack, 95
  - installing rail kit, 89
  - physical specifications, 50
  - powering on, 122
  - precautions, 56
  - rear panel components, 45
  - SAS ports, 105
  - service clearance, 50
  - weight specification, 50
  - width specification, 50
- subnet mask to CIDR mapping, 20
- system setup

- steps 1 through 10, 133
- steps 11 through 19, 148

## U

- USB ports, pinouts, 100

