

# Oracle Private Cloud Appliance

## Quick Start Guide



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# Preface

This publication is part of the customer documentation set for Oracle Private Cloud Appliance Release 3.0. Note that the documentation follows the release numbering scheme of the appliance software, not the hardware on which it is installed. All Oracle Private Cloud Appliance product documentation is available at <https://docs.oracle.com/en/engineered-systems/private-cloud-appliance/index.html>.

Oracle Private Cloud Appliance Release 3.x is a flexible general purpose Infrastructure as a Service solution, engineered for optimal performance and compatibility with Oracle Cloud Infrastructure. It allows customers to consume the core cloud services from the safety of their own network, behind their own firewall.

## Audience

This documentation is intended for owners, administrators and operators of Oracle Private Cloud Appliance. It provides architectural and technical background information about the engineered system components and services, as well as instructions for installation, administration, monitoring and usage.

Oracle Private Cloud Appliance has two strictly separated operating areas, known as enclaves. The Compute Enclave offers a practically identical experience to Oracle Cloud Infrastructure: It allows users to build, configure and manage cloud workloads using compute instances and their associated cloud resources. The Service Enclave is where privileged administrators configure and manage the appliance infrastructure that provides the foundation for the cloud environment. The target audiences of these enclaves are distinct groups of users and administrators. Each enclave also provides its own separate interfaces.

It is assumed that readers have experience with system administration, network and storage configuration, and are familiar with virtualization technologies. Depending on the types of workloads deployed on the system, it is advisable to have a general understanding of container orchestration, and UNIX and Microsoft Windows operating systems.

## Feedback

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

## Conventions

The following text conventions are used in this document:

Convention	Meaning
<b>boldface</b>	Boldface type indicates graphical user interface elements associated with an action, or terms defined in text or the glossary.
<i>italic</i>	Italic type indicates book titles, emphasis, or placeholder variables for which you supply particular values.

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Convention	Meaning
monospace	Monospace type indicates commands within a paragraph, code in examples, text that appears on the screen, or text that you enter.
\$ prompt	The dollar sign (\$) prompt indicates a command run as a non-root user.
# prompt	The pound sign (#) prompt indicates a command run as the <code>root</code> user.

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## Documentation Accessibility

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## Diversity and Inclusion

Oracle is fully committed to diversity and inclusion. Oracle respects and values having a diverse workforce that increases thought leadership and innovation. As part of our initiative to build a more inclusive culture that positively impacts our employees, customers, and partners, we are working to remove insensitive terms from our products and documentation. We are also mindful of the necessity to maintain compatibility with our customers' existing technologies and the need to ensure continuity of service as Oracle's offerings and industry standards evolve. Because of these technical constraints, our effort to remove insensitive terms is ongoing and will take time and external cooperation.

# 1

## Overview

This document provides concise information to help you prepare and advance through the installation and initial configuration of Oracle Private Cloud Appliance. For comprehensive background information and complete coverage of the procedures described in this document, please refer to the [Oracle Private Cloud Appliance Installation Guide](#).

## Document Scope

As an engineered system, Oracle Private Cloud Appliance is built to be an optimized combination of specific software and hardware components. New versions of software components will be supported on existing hardware configurations, and support for new hardware components will be added as required.

The product documentation follows the release scheme of the appliance software, which may differ from the release scheme of the hardware components. The table below indicates to which hardware and software this Oracle Private Cloud Appliance Quick Start Guide applies.

Component	Versions Covered in This Document
Appliance Software	Release 3.0 (latest)
Base Rack	Oracle Private Cloud Appliance X10
Compute Nodes	Oracle Server X10 architecture



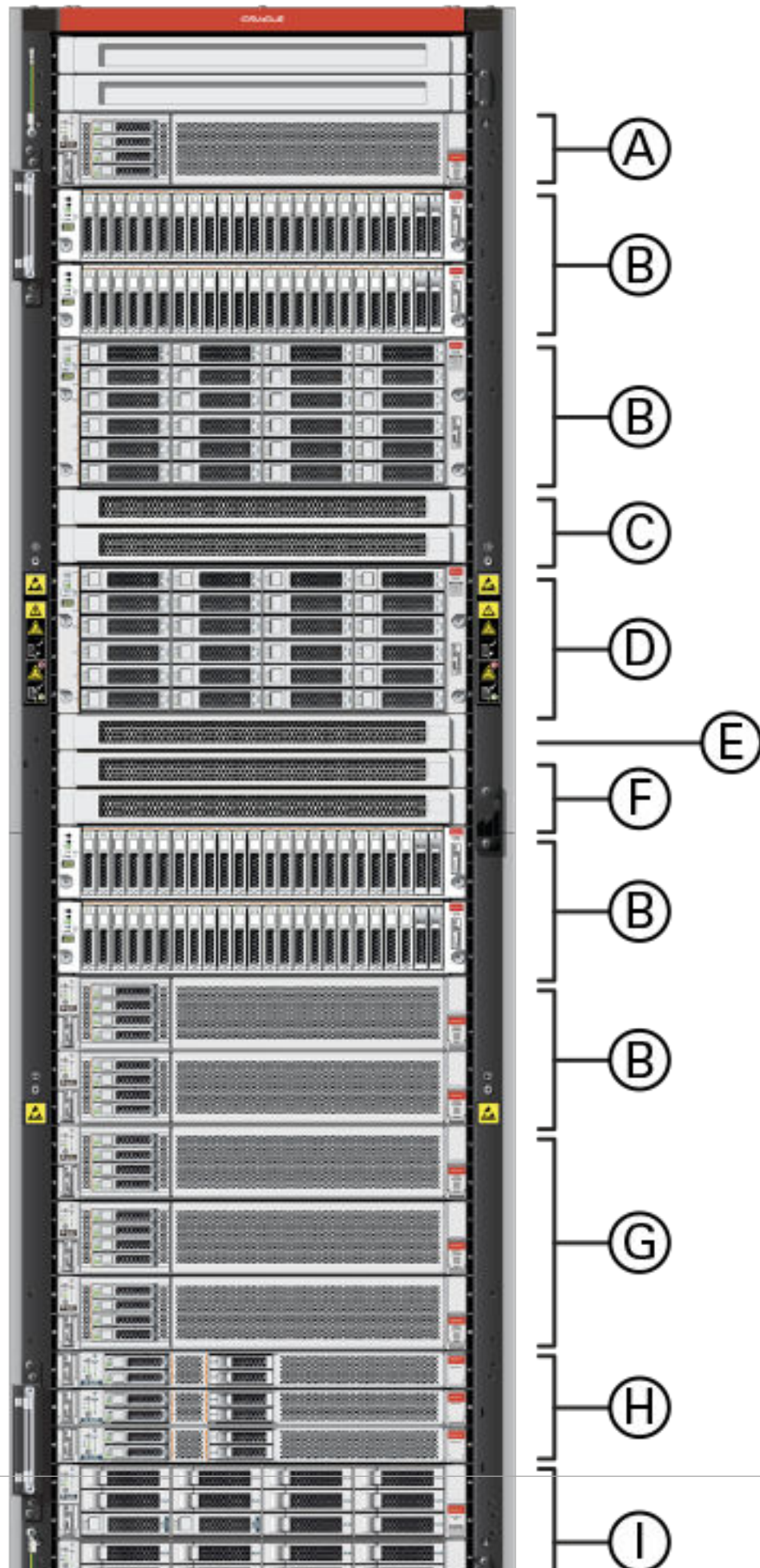
### Note:

Verify that your system configuration corresponds with the details presented in the table. If it does not, return to the [Private Cloud Appliance quick start home page](#) and select the guide that applies to your system.

## Appliance Components

Oracle Private Cloud Appliance consists of an Oracle Rack Cabinet 1242 rack, populated with the hardware components identified in the image and table below. A full rack configuration is shown, however you can customize your system to include different storage or compute capacity as needed.

Oracle Private Cloud Appliance supports flex bays, which are dedicated 4-rack-unit sections within the rack that can be used for flexible expansion of your system; adding either storage or compute resources.



**Figure Legend**

Callout	Quantity	Description
A	1	reserved space for 6th compute node
B	1 - 4	flex bay can accommodate 1-2 compute nodes, or 1-2 storage enclosures
C	2	spine switch
D	1	Oracle Storage Drive Enclosure DE3-24C disk shelf
E	1	management switch
F	2	leaf switch
G	3	compute nodes 3 required for minimum configuration
H	3	management nodes
I	2	storage controllers

## What Is In This Guide?

The following table lists the procedures you need to complete to install and configure Oracle Private Cloud Appliance at your site.

Step	Description	References
1	Review the product notes for any late-breaking information about Oracle Private Cloud Appliance.  From the documentation home page you can access the release notes for the software version installed on your system.	<ul style="list-style-type: none"><li>• <a href="#">Private Cloud Appliance product pages</a></li><li>• <a href="#">Private Cloud Appliance documentation</a></li></ul>
2	Review important safety information.	Before performing the installation, refer to the following documents: <ul style="list-style-type: none"><li>• "Oracle Engineered System Safety and Compliance Guide"</li><li>• "Important Safety Information for Oracle's Hardware Systems"</li></ul>
3	Complete the site preparation procedures. Verify all installation requirements. Fill out the <i>initial installation checklist</i> in advance. Make sure that the data center environment is ready for the installation of the appliance.	<a href="#">Prepare Installation Site</a>
4	Install the appliance rack.  When the appliance is delivered to your installation site, unpack the system, transport it to the allocated space in your data center, and make sure it is ready to be powered on for the first time.	<a href="#">Install Rack in Allocated Space</a>

Step	Description	References
5	Power on the appliance. Connect the appliance to the data center network according to the design you recorded in your installation preparations. Provide power to the appliance, switch on the necessary components in the correct order, and monitor the hardware initialization process.	<a href="#">Connect Cables and Power On</a>
6	Perform the initial appliance configuration procedure. Make sure you have your filled-out <i>initial installation checklist</i> available before you begin. Using the configuration information you collected in the checklist, work through the data screens of the initial configuration wizard and enter the required parameters.	<a href="#">Complete Initial Configuration</a>
7	Proceed with other administration tasks.	<a href="#">Next Steps</a>

# 2

## Prepare Installation Site

It is important that you plan ahead for the installation of your Oracle Private Cloud Appliance. This ensures a fluent end-to-end process with minimal risk of unplanned interruptions or delays in system initialization. Preparations include making sure that the installation site meets all installation requirements, collecting all the required configuration parameters for the data center infrastructure as well as the appliance, completing the applicable checklists, and so on.

### Review Safety Guidelines

Before your Oracle Private Cloud Appliance arrives, review the following safety precautions to ensure that the site is safe, as well as ready for delivery. Failure to observe these precautions can result in personal injury, equipment damage, or malfunction.

- Do not block ventilation openings.
- Do not install the system in a location that is exposed to direct sunlight or near a device that may become hot.
- Do not install the system in a location that is exposed to excessive dust, corrosive gases, or air with high salt concentrations.
- Do not install the system in a location that is exposed to frequent vibrations. Install the system on a flat, level surface.
- Use a power outlet that uses proper grounding. When using shared grounding, the grounding resistance must not be greater than 10 ohms. Ensure that your facility administrator or a qualified electrical engineer verifies the grounding method for the building, and performs the grounding work.
- Ensure that each grounding wire used for the system is used exclusively for the Oracle Private Cloud Appliance. Also observe the precautions, warnings, and notes about handling that appear on labels on the equipment.
- Do not place cables under the equipment or stretch the cables too tightly.
- Do not disconnect power cords from the equipment while its power is on.
- Do not place anything on top of the system or perform any work directly above it.
- If you cannot reach the connector lock when disconnecting LAN cables, then press the connector lock with a flathead screwdriver to disconnect the cable. You could damage the system board if you force your fingers into the gap rather than using a flathead screwdriver.
- Do not let the room temperature rise sharply, especially in winter. Sudden temperature changes can cause condensation to form inside the system. Allow for a sufficient warm-up period prior to server operation.
- Do not install the system near a photocopy machine, air conditioner, welding machine, or any other equipment that generates loud, electronic noises.
- Avoid static electricity at the installation location. Static electricity transferred to the system can cause malfunctions. Static electricity is often generated on carpets.
- Confirm that the supply voltage and frequency match the electrical ratings indicated on your Oracle Private Cloud Appliance.

- Do not insert anything into any Oracle Private Cloud Appliance opening, unless doing so is part of a documented procedure. The system contains high-voltage parts. If a metal object or other electrically conductive object enters an opening in the system, then it could cause a short circuit. This could result in personal injury, fire, electric shock, and equipment damage.

See also:

- Important Safety Information for Sun Hardware Systems (816-7190) included with the rack
- [Oracle Rack Cabinet 1242 Safety and Compliance Guide](#)
- [Oracle Rack Cabinet 1242 Power Distribution Units User's Guide](#)
- [Oracle Engineered System Safety and Compliance Guide \(non-Nordic\)](#)
- [Oracle Engineered System Safety and Compliance Guide \(Nordic\)](#)

## Verify Installation Requirements

The [Oracle Private Cloud Appliance Installation Guide](#) specifies in detail which requirements the installation site must meet. Checklists allow you to register the requirements you have verified and the potential adjustments needed before the installation can take place. The table guides you through the verification steps by providing links to the relevant resources.

Item	Description	Resources
Logistic requirements	<p>Review the safety guidelines. Confirm that the working environment is safe and secure at all times.</p> <p>Verify that sufficient space is available for receiving, unpacking and installing the appliance. Consider the dimensions of the product and its packaging, the delivery location, the access route to the data center room, and maintenance access to the rack after installation.</p> <p>Make sure that the required personnel is on-site, that arrangements have been made for access to the building, and that any required equipment and tools are available.</p>	<ul style="list-style-type: none"><li>• <a href="#">Space Requirements</a></li><li>• <a href="#">Logistics Checklist</a></li><li>• <a href="#">Access Route Checklist</a></li><li>• <a href="#">Safety Checklist</a></li></ul>
Data center environment requirements	<p>Verify that the data center flooring is adequate and that sufficient ventilation and cooling capacity is provided. Make sure that temperature and humidity levels are maintained within in the optimum range.</p>	<ul style="list-style-type: none"><li>• <a href="#">Flooring Requirements</a></li><li>• <a href="#">Temperature and Humidity Requirements</a></li><li>• <a href="#">Ventilation and Cooling Requirements</a></li><li>• <a href="#">Data Center Room Checklist</a></li><li>• <a href="#">Data Center Environmental Checklist</a></li></ul>

Item	Description	Resources
Electrical power requirements	<p>Ensure that power is provided reliably, protecting your systems from electrical disturbances. Verify that the appliance power distribution units correspond with the facility power supply.</p> <p>Verify that the correct circuit breakers and uninterruptable power supply are provided, and that grounding guidelines are followed.</p>	<ul style="list-style-type: none"><li>• <a href="#">Electrical Power Requirements</a></li><li>• <a href="#">Facility Power Checklist</a></li></ul>
Network infrastructure requirements	<p>The appliance connects to the data center network using high-speed Ethernet cabling. Choose the appropriate number of uplinks, cabling topology and routing design that are suitable for your operational requirements and data center infrastructure.</p> <p>Ensure that the required switches, ports, transceivers and cables are available. Verify that subnet configurations and IP address reservations have been made, and that the data center network configuration does not conflict with the appliance's reserved network resources.</p> <p>To ensure that these requirements are met, and that the appliance is integrated successfully into your data center infrastructure, complete the initial installation checklist.</p>	<ul style="list-style-type: none"><li>• <a href="#">Network Requirements</a></li><li>• <a href="#">Uplinks (concepts)</a></li><li>• <a href="#">Reserved Network Resources</a></li><li>• <a href="#">Network Specification Checklist</a></li><li>• <a href="#">Initial Installation Checklist</a></li></ul>

## Complete Integration Checklist

This section contains a checklist to help you plan for the initial installation wizard, which walks you through first boot on your Oracle Private Cloud Appliance. Work with your network and site administrators to plan the integration of the appliance into your data center. For initial configuration you can choose either a dynamic network or static network configuration. This checklist contains information for both options, but you only need data for the implementation you choose.

Items noted in the table with an asterisk (\*) are required fields for all configurations. Fields marked with a (†) are required for static network configuration, and fields marked with a (‡) are required for dynamic network configuration.

Item	Your Configuration	Description and Example
Administrator user name and password		<p>The appliance does not ship with a default administrative user account. You create an administrator account during the initial installation.</p> <p>User names and passwords have a maximum length of 100 characters. Passwords must contain at least 12 characters with at least one of each: uppercase character, lowercase character, digit, and any punctuation character (except for double quote ("") characters, which are not allowed).</p>
<b>Appliance Details</b>		
Availability Domain*	AD-1	Your on site Oracle Private Cloud Appliance is considered an availability domain and is assigned the value AD-1.
System Name*		<p>Name for your Oracle Private Cloud Appliance that will also be used as the Realm. This attribute has a maximum length of 24 characters. Acceptable characters are "a" → "z", "A" → "Z", "0" → "9", and "-".</p> <p><b>Once set this parameter cannot be changed.</b></p>
Domain*		<p>Domain name for your system which is used as the base domain for the internal network, and by Oracle Private Cloud Appliance public facing services. This attribute has a maximum length of 190 characters. Acceptable characters are "a" → "z", "A" → "Z", "0" → "9", "-"</p> <p>Example: <code>us.example.com</code></p> <p><b>Once set this parameter cannot be changed.</b></p>
Rack Name		Identify the appliance type, for example <code>pca</code> .
Description		Free text field with a 256 character limit to optionally provide a description of your appliance.
<b>Static Routing Network Details</b>		
Routing Type*		Choose static or dynamic routing based on your network topology.
Uplink Gateway†		<p>IP address for the uplink switch to the default gateway in your data center. Chose a valid IP address in customer data center subnet that the Oracle Private Cloud Appliance uplink switches are attached to.</p> <p>Example: <code>10.68.48.86</code></p>

Item	Your Configuration	Description and Example
Spine switch virtual IP <sup>†</sup>		<p>Virtual IP address which acts as the public VIP for the spine switches in your company network. Chose a valid IP address in the data center subnet that the Oracle Private Cloud Appliance uplink switches are attached to.</p> <p>Example: 10.68.49.103</p>
Uplink VLAN		<p>VLAN used to connect to an uplink switch. Chose a VLAN value between 2 and 3899. VLANs 3900 to 4095 are reserved.</p> <p>Example: 322</p>
Uplink HSRP Group		<p>Assign an HSRP group number to your appliance. Acceptable values are 0 to 255, and the default value is 151. If there are multiple Oracle Private Cloud Appliance racks connected to the same data center infrastructure switches, ensure they use <i>different</i> HSRP groups.</p>
Management node 1 IP addresses and host name*	10/25/40/100G*: 1G: host name:	<p>Static IP addresses for management node 1 in your company network.</p> <p>Provide a valid host name. An appended domain name is used if you don't provide a host name.</p>
Management node 2 IP addresses and host name*	10/25/40/100G*: 1G: host name:	<p>Static IP addresses for management node 2 in your company network.</p> <p>Provide a valid host name. An appended domain name is used if you don't provide a host name.</p>
Management node 3 IP addresses and host name*	10/25/40/100G*: 1G: host name:	<p>Static IP addresses for management node 3 in your company network.</p> <p>Provide a valid host name. An appended domain name is used if you don't provide a host name.</p>
Management virtual IP address and host name*	10/25/40/100G*: 1G: host name*:	<p>Virtual IP addresses of the management node cluster in your company network. This is the IP used to DNAT to the internal management node VIP. Oracle Private Cloud Appliance DNS will resolve Oracle Private Cloud Appliance endpoints to this IP.</p> <p>Chose a valid IP address in the data center CIDR.</p> <p>Example: 10.68.49.170</p> <p>Provide a valid host name. An appended domain name is used if you don't provide a host name.</p>

Item	Your Configuration	Description and Example
Spine switch 1 IP address*		IP address for the spine switch 1 in your company network. Chose a valid IP address in the data center subnet that the Oracle Private Cloud Appliance uplink switches are attached to. Example: 10.68.49.101
Spine switch 2 IP address*		IP address for the spine switch 2 in your company network. Chose a valid IP address in the data center subnet that the Oracle Private Cloud Appliance uplink switches are attached to. Example: 10.68.49.102
<b>Dynamic Routing Network Details</b>		
Peer 1 IP <sup>‡</sup>		Neighbor BGP IP - IP address of customer datacenter router-1 that the Oracle Private Cloud Appliance uplink switches are attached to. Example: 10.68.48.86
Peer 1 ASN <sup>‡</sup>		BGP ASN of customer datacenter router-1. Example: 64512-65533 or 4200000000-4294967294 (Note: Oracle Spine switch default ASN is 136025.)
Peer 2 IP <sup>‡</sup>		Neighbor BGP IP - IP address of customer datacenter router-2 that the Oracle Private Cloud Appliance uplink switches are attached to. Example: 10.68.48.88
Peer 2 ASN <sup>‡</sup>		BGP ASN of customer datacenter router-2 Example: 64512-65533 or 4200000000-4294967294 (Note: Oracle Spine switch default ASN is 136025.)
Uplink Gateway*		IP address for the uplink switch to the default gateway in your data center. Chose a valid IP address in customer data center subnet that the Oracle Private Cloud Appliance uplink switches are attached to. Example: 10.68.48.86
Oracle ASN		The default is 136025.
BGP Topology		Options are triangle, square, or mesh. The default is mesh.

Item	Your Configuration	Description and Example
BGP Authentication (Optional) Admin BGP Authentication		Enable BGP authentication for your network, and admin network if used.
BGP Authentication Password (Required) Admin BGP Authentication Password (Required if admin network used) Enter password in Hex format. Password must be less than 64 characters (<64).		Enter the BGP authentication password for your network, and admin network if used.
BGP KeepAlive Timer		The default is 60.
BGP Holddown Timer		The default is 180.
Enable MDA Authentication		The default is false.
<b>Uplink Details</b>		
Uplink Port Speed*		All uplink ports must have the identical speed. The options are 10, 25, 40, 100. The default is 100.
Uplink Port Count*		The number of uplink ports per spine switch. Connectivity must be identical on both spine switches to provide redundancy and load-splitting. For 100G and 40G speeds, valid values are 1, 2 and 4. For 10G and 25G ports, valid values are 1, 2, 4, 8 and 16. The default for both is 4.
Uplink VLAN MTU*		MTU size determines the maximum packet size that can be transmitted over your uplink connection. The valid range is 576 to 9216. The default is 9216.
Uplink Netmask*		Netmask of the subnet Oracle Private Cloud Appliance is connected to in your data center. Example: 255.255.252.0
Uplink Port FEC		Configure Forward Error Correct (FEC) for the uplink port. The default option is auto, with on and off as other valid options.
<b>NTP Server Details</b>		
NTP servers*		At least one valid IP address for an NTP server in your data center. You can enter multiple IP addresses in a comma-separated list. Example: 10.147.24.1, 10.211.17.1
<b>Optional Administration Network Details</b>		

Item	Your Configuration	Description and Example
Admin Networking		Enable or disable a separate Administration network to transport administrative traffic.
Management virtual IP address and host name	10/25/40/100G: 1G: host name:	Virtual IP address of the management node cluster in the administration network. This is the IP used to DNAT to the internal management node VIP. Oracle Private Cloud Appliance DNS will resolve Oracle Private Cloud Appliance endpoints to this IP. Chose a valid IP address in the administration network CIDR. Example: 10.168.141.170 Provide a valid host name. An appended domain name is used if you don't provide a host name.
Management node 1 IP addresses and host name	10/25/40/100G: 1G: host name:	Static IP addresses for management node 1 in the administration network. Provide a valid host name. An appended domain name is used if you don't provide a host name.
Management node 2 IP addresses and host name	10/25/40/100G: 1G: host name:	Static IP addresses for management node 2 in the administration network. Provide a valid host name. An appended domain name is used if you don't provide a host name.
Management node 3 IP addresses and host name	10/25/40/100G: 1G: host name:	Static IP addresses for management node 3 in the administration network. Provide a valid host name. An appended domain name is used if you don't provide a host name.
Admin DNS servers		IP addresses for 1-3 DNS servers providing name resolution in the administration network. Example: 10.168.20.31, 10.168.20.32, 10.147.36.60
Admin Port Speed		Port speed options are 10, 25, 40, 100. The port speed of your administration port can be different from the data port speed.
Admin Port Count		For 100G and 40G speeds, valid value is 1. For 10G and 25G ports, valid values are 1 to 4.
Admin HSRP Group		Assign an HSRP group number to your Administration network. Acceptable values are 0 to 255, and the default value is 152. If there are multiple Oracle Private Cloud Appliance racks connected to the same data center infrastructure switches, ensure they use <i>different</i> HSRP groups.

Item	Your Configuration	Description and Example
Admin VLAN		VLAN used to connect to the Administration network (only access mode supported). The valid range for users to select is 2 to 3899. The default is 3915, in the Oracle-reserved range.
Admin VLAN MTU		MTU size determines the maximum packet size that can be transmitted over your administration connection. The valid range is 576 to 9216. The default is 9216.
Admin Port FEC		Configure Forward Error Correct (FEC) for the administration port. The default option is auto, with on and off as other valid options.
Admin Gateway IP		IP address of the default gateway in your Administration network. Example: 10.168.141.1
Admin Netmask		Netmask of the subnet the Administration network is connected to.
Admin CIDR		CIDR range for which the default route is the Administration gateway IP.
Admin Spine 1 IP		Public IP address of spine switch 1. Needed for HSRP configuration or the spine virtual IP.
Admin Spine 2 IP		Public IP address of spine switch 2. Needed for HSRP configuration or the spine virtual IP.
Admin Spine VIP		Public virtual IP of the spine switches.
<b>DNS Server Details</b>		
DNS server 1 (Required)		IP address for primary DNS server. Example: 10.68.50.60
DNS server 2		IP address for secondary DNS server. Example: 10.147.36.60
DNS server 3		IP address for tertiary DNS server. Example: 206.233.27.1
<b>Appliance Public IP Addresses</b>		

Item	Your Configuration	Description and Example
Public IP Addresses		<p>A range of customer data center IP addresses can be used for Oracle Private Cloud Appliance components that require public IP addresses. Note: In this context, public IP addresses refer to IP addresses that have access to the data center network from the Oracle Private Cloud Appliance subnet.</p> <p>You must specify IP addresses or ranges that are routed to the Oracle Private Cloud Appliance from the data center. Route tables must be correct and consistent.</p> <p>Enter a string containing a comma separated list of valid CIDRs.</p> <p>Example:  "10.68.49.249", "10.68.50.32/32", "10.68.51.4/31"</p> <p>Partial CIDR deletion is not supported.</p>
Object Storage IP address		<p>Valid IP address for an <code>objectstorage</code> endpoint that is outside the public IP range.</p>

# 3

## Install Rack in Allocated Space

Follow the instructions in this chapter to complete the physical installation of the system at your site. Make sure that all required tools are available on-site. Refer to the section titled [Tools Required for Installation](#) in the Oracle Private Cloud Appliance Installation Guide.

### Unpack the System

The unpacking location should be determined during the site planning process.

Before unpacking the rack from the shipping carton, refer to the labels on the carton and to the instructions that they provide. After unpacking the rack, follow local laws and guidelines to recycle the packaging properly.

#### **Caution:**

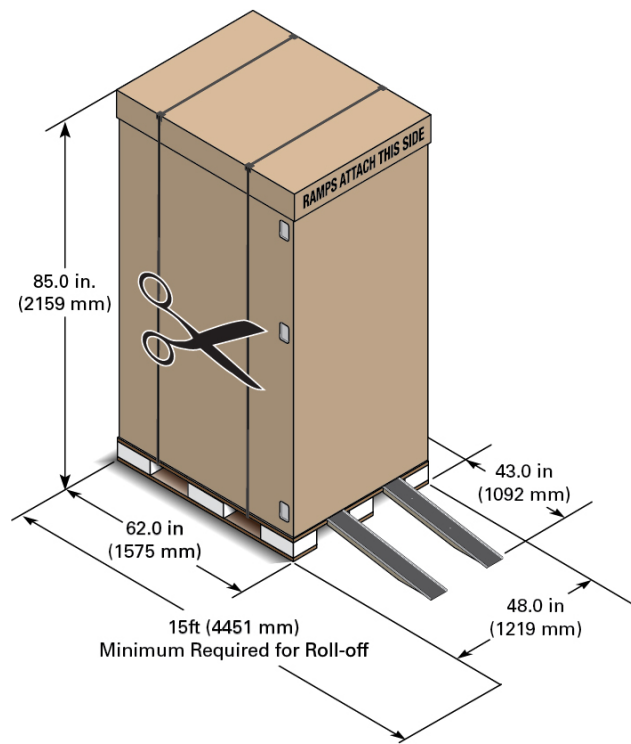
Carefully unpack the rack from the packaging and shipping pallet. Rocking or tilting the rack can cause it to fall over and cause serious injury or death. You should always use professional movers when unpacking and installing this rack.

#### **Note:**

After unpacking the rack from the packaging, save the shipping brackets used to secure the rack to the shipping pallet. You can use these shipping brackets to secure the rack permanently to the installation site floor. Do not dispose of these brackets, because you cannot order replacement brackets.

#### **Caution:**

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



## Move the System to its Allocated Space

It is preferred that at least three people push and guide the rack: one person in front and two persons in back to help guide the rack and keep people out of the path of the moving rack. When transporting configured racks from one location to another, take care to move them slowly, 0.65 meters per second (2.13 feet per second) or slower.

Carefully examine the transportation path. Avoid obstacles such as doorways or elevator thresholds that can cause abrupt stops or shocks. Go around obstacles by using ramps or lifts to enable smooth transport.

### **WARNING:**

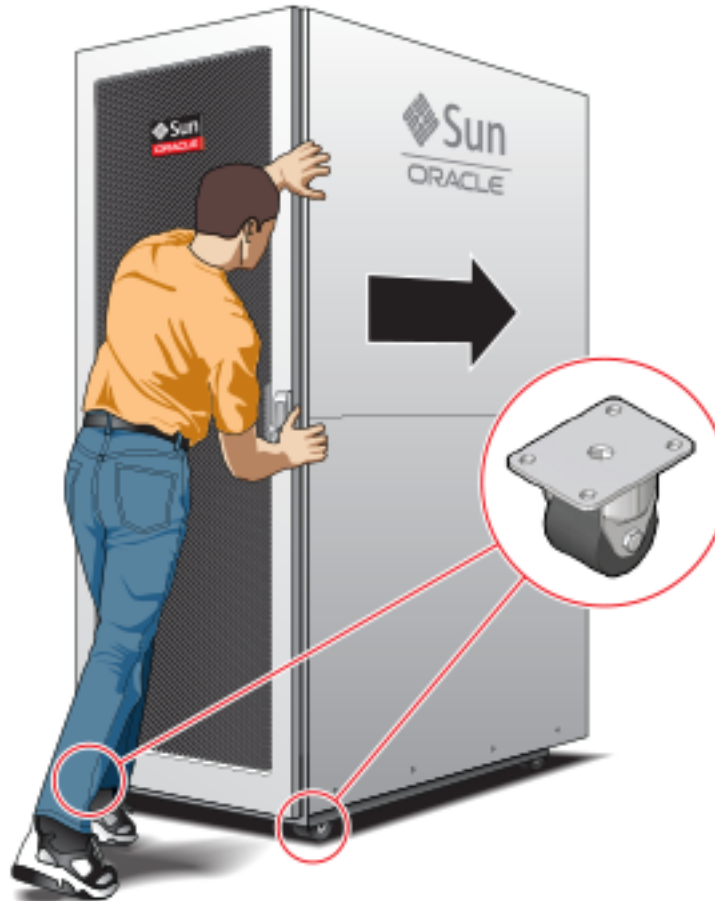
Never attempt to move a Private Cloud Appliance by pushing on the rack side panels. Pushing on the rack side panels can tip over the rack. This action can cause serious personal injury or death, as well as damage to the equipment.

1. Ensure that the rack doors are closed and secured.
2. Ensure that the leveling and stabilizing feet on the rack are raised and out of the way.
3. Push the system from the back of the rack to the installation site.

The front casters of the rack are fixed; they do not pivot. Steer the unit using the rear casters. You can safely maneuver the system by carefully pushing it from behind.

**▲ Caution:**

Never tip or rock the Private Cloud Appliance because the rack can fall over.



4. When the rack is at the installation site, verify that no components or connections have become dislodged or disconnected during transport. If necessary, re-attach components and cables properly.

## Stabilize the Appliance

Stabilize the rack by extending the rack leveling feet, and optionally using the shipping brackets to secure the rack permanently to the floor.

### Floor Cutout (Optional)

If you plan to route data or power distribution unit (PDU) power cords down through the bottom of the rack, you will need to cut a hole in the installation site floor. Cut a rectangular hole below the rear portion of the rack, between the two rear casters and behind the RETMA (Radio Electronics Television Manufacturers Association) rails.

▲ **Caution:**

Do not create a hole where the rack casters or leveling feet brackets will be placed.

### Attach Shipping Brackets (Optional)

To secure the rack to the installation floor using the shipping brackets, you must drill the appropriate holes in the floor, re-attach the shipping brackets to the rack, position the rack over the mounting holes, and attach the shipping brackets to the floor firmly with bolts and washers that suit the specific environment. Oracle does not provide mounting bolts and washers for the shipping brackets, because different floors require different bolt types and strengths.

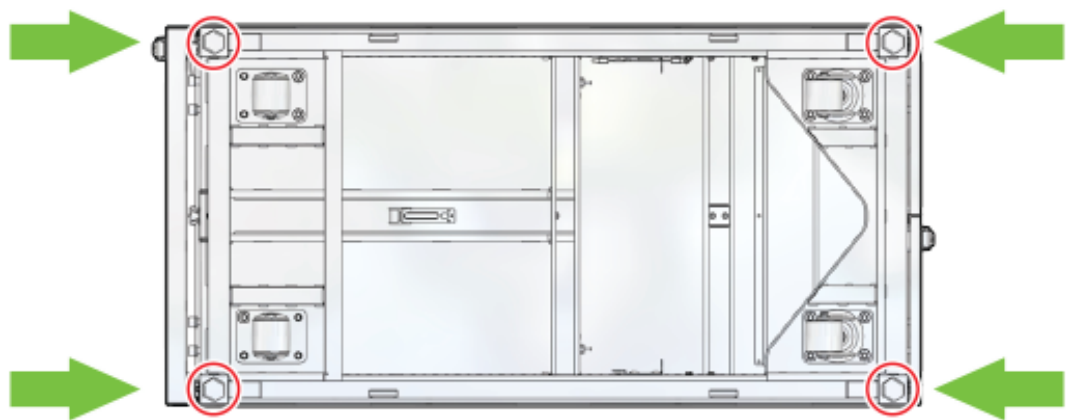
▲ **Caution:**

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

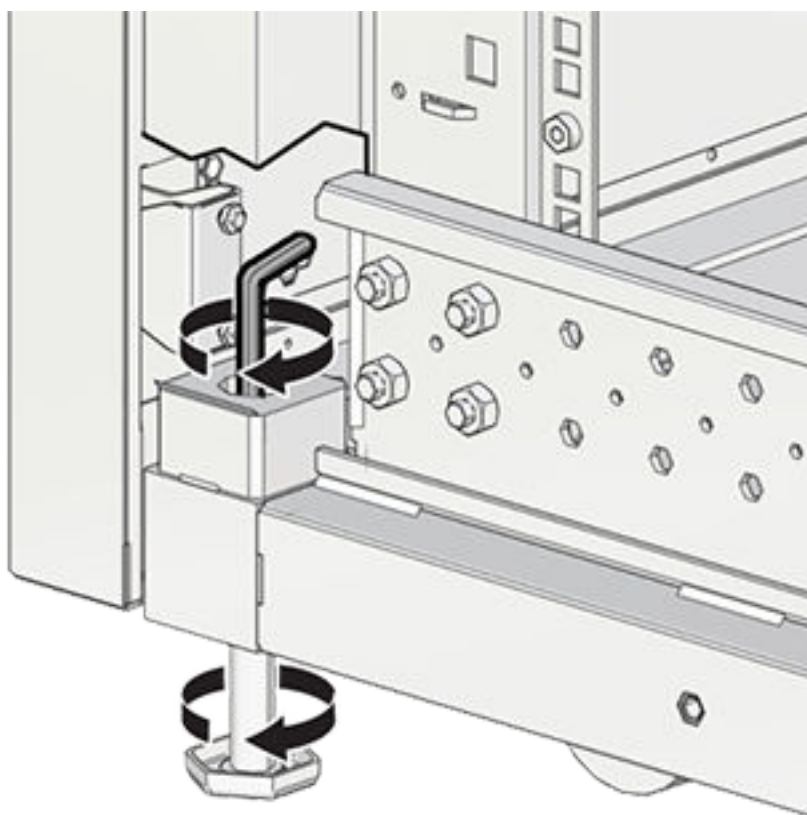
### Deploy Leveling Feet

The rack contains four leveling feet that can be lowered to share the load with the casters. This increases the footprint of the rack, which improves stability and helps prevent rack movement. When the rack is in position, the leveling feet **must** be deployed even when the rack is permanently secured to the floor. To adjust the leveling feet, do the following:

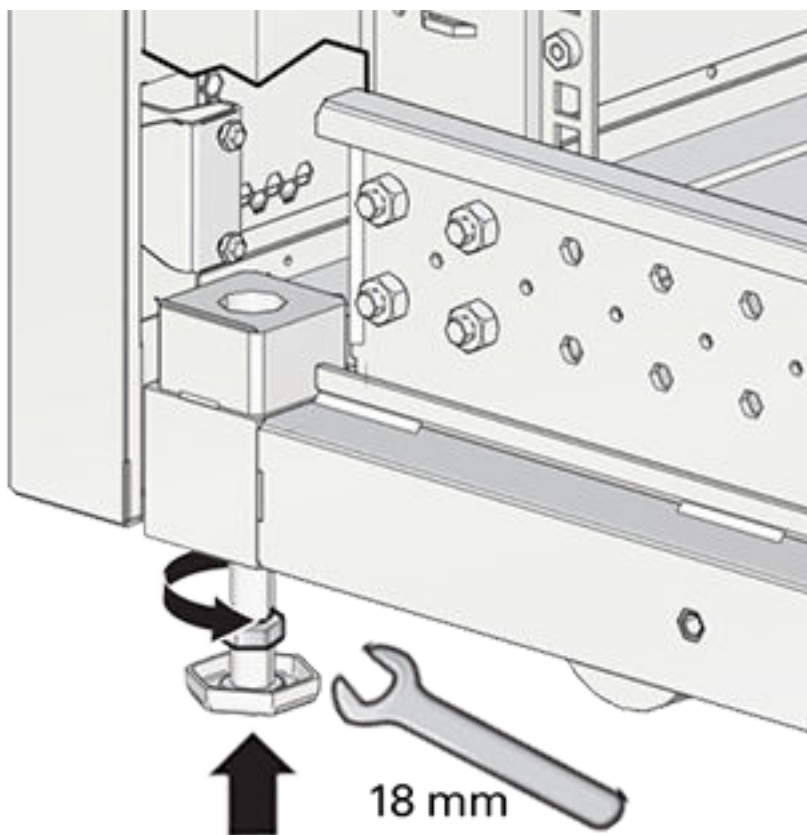
1. Locate the four leveling feet at the bottom four corners of the rack.



2. Using a 6mm hex wrench, lower the leveling feet to the floor.



3. Lock the four leveling feet using an 18mm open wrench.



**⚠ Caution:**

When the rack needs to be moved to a different location, including repacking, verify that the leveling feet have been retracted before moving the rack. Otherwise the leveling feet may become bent, or the rack could tip over.

## Attach Ground Cable

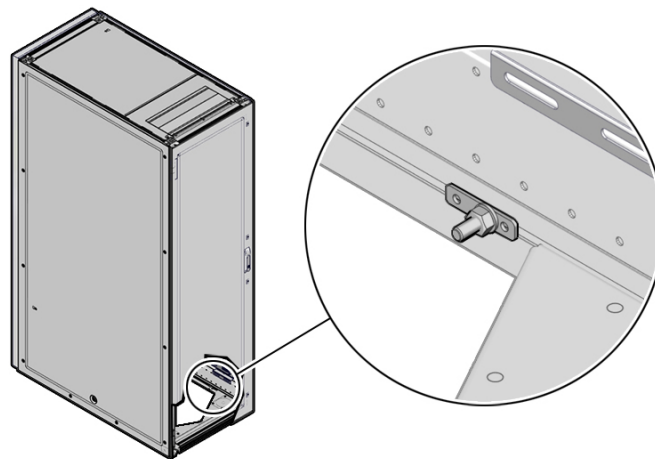
Optionally, provide additional grounding by attaching a chassis earth ground cable to the system. The additional ground point enables electrical current leakage to dissipate more efficiently. Refer to the [Oracle Private Cloud Appliance Installation Guide](#) for details.

**✎ Note:**

A grounding cable is not shipped with the Private Cloud Appliance.

1. Ensure that direct, metal-to-metal contact is made for this installation. Remove paint or coating if necessary.
2. Attach the ground cable to one of the attachment points located at the bottom rear of the system frame.

The attachment point is an adjustable bolt that is inside the rear of the system cabinet on the right side.



# 4

## Connect Cables and Power On

Follow the instructions in this chapter to connect the appliance to the data center network and to the power source.

### Inspect Appliance

When the rack is in its allocated space, but prior to applying power, visually inspect the appliance.

1. Check for rack damage.
2. Check the rack for loose or missing screws.
3. Check your appliance for the ordered configuration. Refer to the Customer Information Sheet (CIS) on the side of the packaging. Ensure that the correct connectors have been supplied for the data center facility power source.
4. Check that all cable connections are secure and firmly in place.
5. Check the site location tile arrangement for cable access and airflow.
6. Check the data center airflow that leads in to the front of the system. (See [Verify Installation Requirements](#).)

### Connect to the Network

While preparing for the installation (see [Verify Installation Requirements](#)) of your Private Cloud Appliance, you selected a physical uplink design and verified network infrastructure requirements for your configuration. Refer to the [Initial Installation Checklist](#) you filled out.

Now connect the spine switches of the appliance to your data center network according to the selected design.

1. On each spine switch, connect ports 1-4 to the data center public Ethernet network.
  - For 100Gbps or 40Gbps uplinks, use 1-4 MPO-to-MPO cable connections per spine switch.
  - For 25Gbps or 10Gbps uplinks, split spine switch ports using an MPO-to-4xLC breakout cable. Connect 1-16 uplinks per spine switch.
  - Connect the outgoing cables from the spine switches to the data center network device(s) according to your selected topology: mesh, square or triangle. For detailed information on uplink design, refer to the section titled "[Uplinks](#)" in the [Hardware Overview](#) chapter of the Oracle Private Cloud Appliance Concepts Guide.
2. If you elected to segregate the administration network from the data network, connect port 5 on each spine switch to the ports reserved for this purpose on your data center network device(s).

## Connect Workstation

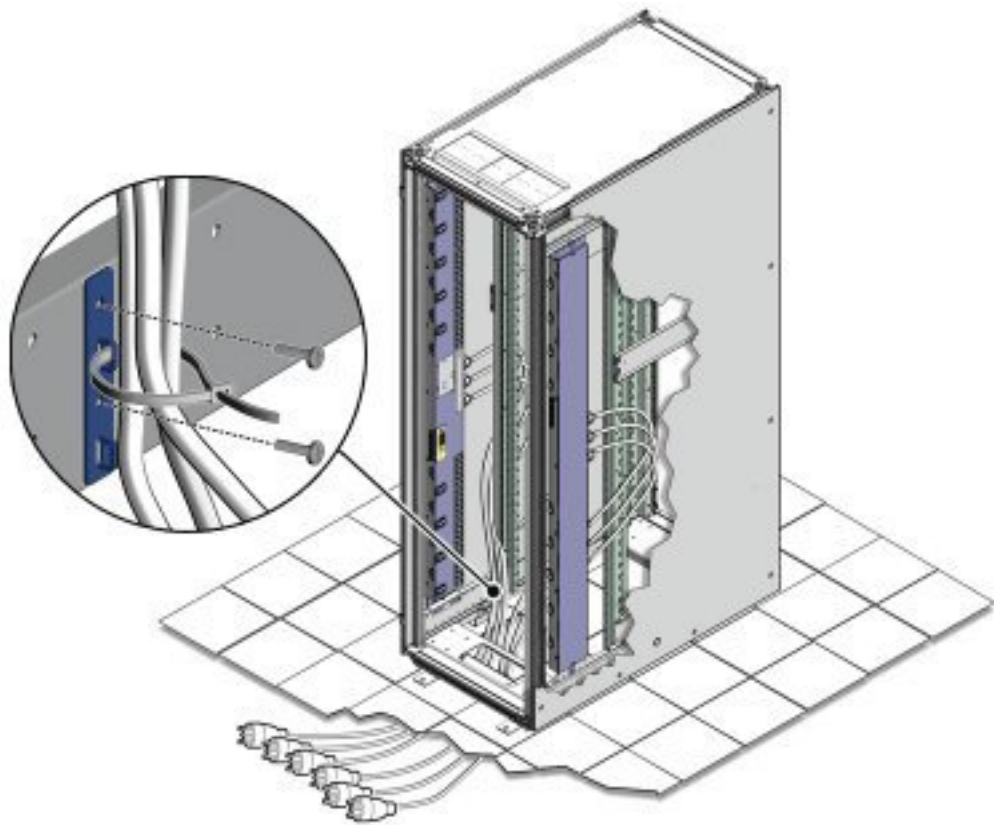
To monitor system initialization after first power-on, and to complete the initial configuration process, you need to connect a laptop or workstation to the appliance.

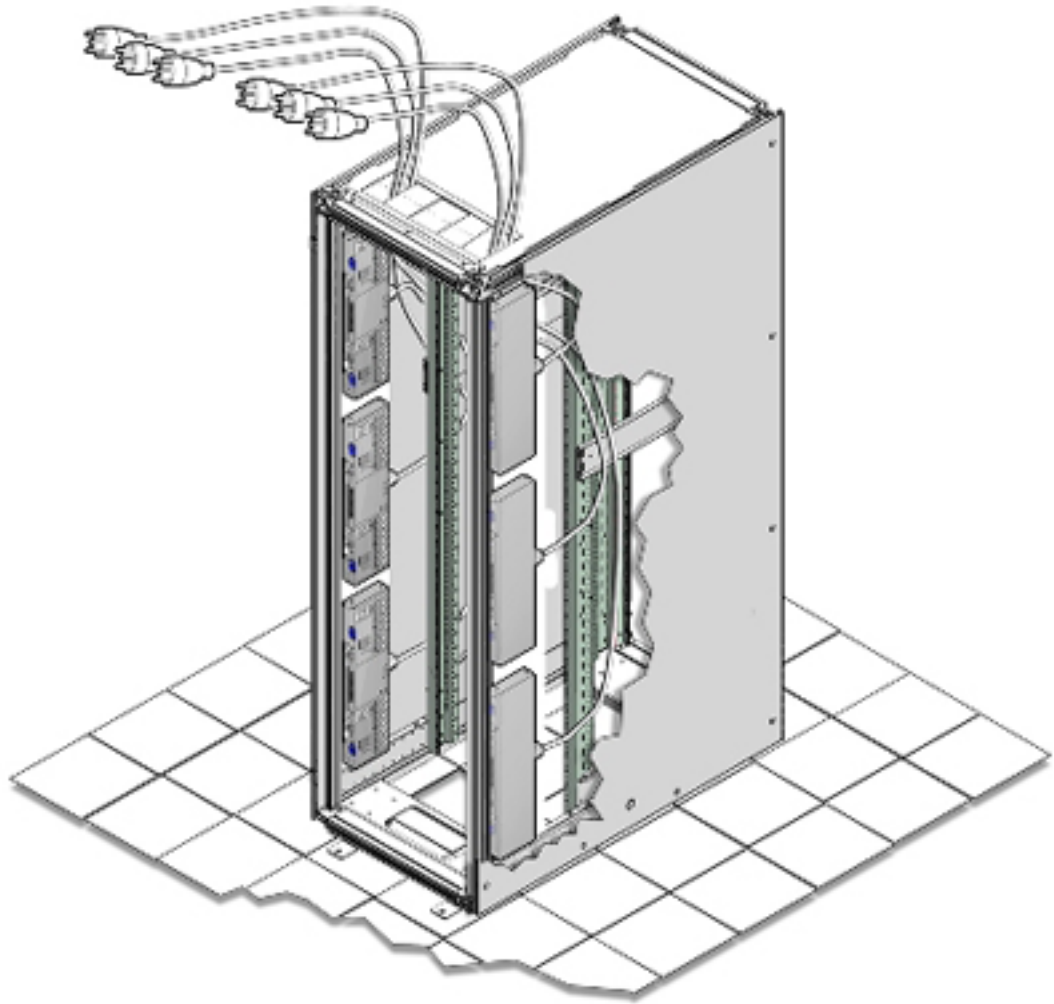
1. Connect a workstation with a web browser directly to the appliance internal management network using an Ethernet cable connected to port 2 of the 1Gbps management switch.
2. Configure the wired network connection of the workstation to use the reserved static IP address `100.96.3.254`.
3. When system initialization after first power-on has started, browse to the initial configuration interface on the virtual IP of the management node cluster at `https://100.96.2.32:30099`.

## Connect Power Cords

Review the safety guidelines. Confirm that the working environment is safe and secure at all times. Then, connect the power cords as follows:

1. Open the rear cabinet door.
2. Ensure that the correct power connectors have been supplied.
3. Unfasten the power cord cable ties.  
The ties are for shipping only and are no longer needed.
4. Route the power cords to the facility receptacles either above the rack or below the flooring, as shown in the two images below.
5. Secure the power cords in bundles.





6. Plug the power distribution unit (PDU) power cord connectors into the facility receptacles. Ensure the breaker switches are in the OFF position before connecting the power cables.

## Power On Appliance

Follow these steps to power on the appliance for the first time.

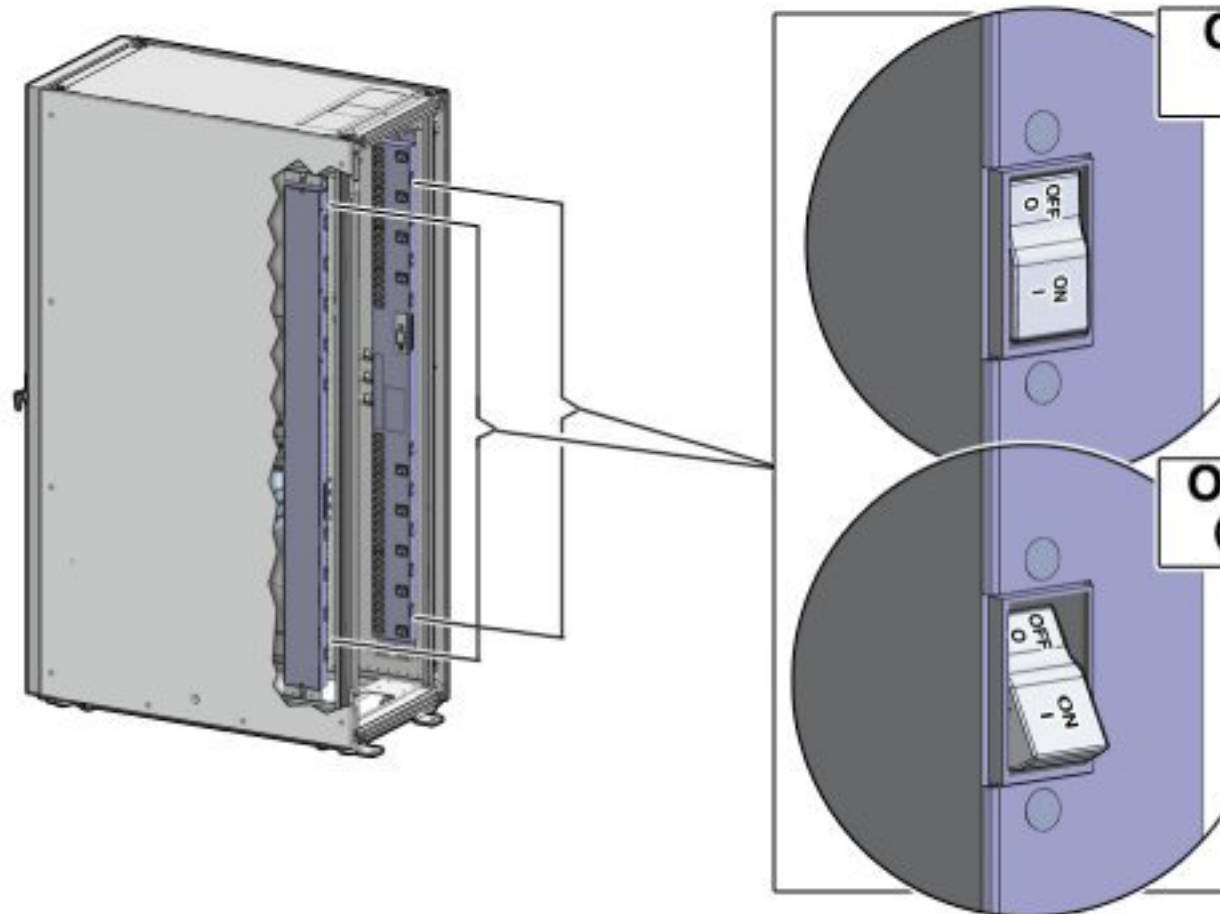
### ▲ Caution:

Once powered on, do not power down the management nodes until you have completed the [initial configuration process](#).

1. Make sure that the power switches located on the rear left and right side power supplies of the storage drive enclosure(s) are in the ON (I) position.



2. Switch on the power distribution unit (PDU) circuit breakers located on the rear of PDU A and B inside the rack. The circuit breakers are on the rear of the system cabinet as shown below. Press the ON (I) side of the toggle switch.



 **Note:**

- After power is applied, the LEDs on the all of the compute nodes and storage server heads will start to blink after approximately two minutes.
- From the rear of the rack, you can see the green LEDs on the power supply units (PSUs) on the compute nodes turn on instantly after power is applied.
- In addition, from the rear of the rack, you can see the display on the power distribution units (PDUs) illuminate once power is available.

3. Wait 20 minutes for the storage controllers to come online. Then proceed with powering on the management nodes.
4. To power on the management nodes, located in rack units 5, 6 and 7, press the Power button located on the front of each of the three nodes.

 **Note:**

A management node takes approximately five to ten minutes to power on completely. Once complete, the Power/OK LED illuminates and remains a steady green.

5. Allow the system to initialize. Do not interrupt this process.

The management nodes will verify all components within the system: switches, storage devices and compute nodes. The management nodes search for compute nodes to power on and add to the compute fabric.

 **Note:**

Powering on the compute nodes and bringing them to the ready-to-provision state should take approximately 10 minutes *per compute node*. Do not power cycle the management nodes during the discovery period.

6. When the hardware initialization is complete, proceed with the [initial configuration process](#).

# 5

## Complete Initial Configuration

The initial configuration wizard creates an administrator account, binds your system to your Oracle Cloud Infrastructure environment, and configures network connections for your appliance. During this procedure you use the configuration information you collected while preparing for the appliance installation. Refer to the [Initial Installation Checklist](#) you filled out.

### **Caution:**

Do not power down the management nodes during the initial configuration process.

1. From the Private Cloud Appliance First Boot page, create the primary administrative account for your appliance, which is used for initial configuration and will persist after the first boot process. Additional accounts can be added later.
  - a. Enter an Administrative Username.
  - b. Enter and confirm the Administrative Password.

### **Note:**

Passwords must contain a minimum of 12 characters with at least one of each: uppercase character, lowercase character, digit, and any punctuation character (except for double quote ("") characters, which are not allowed).

- c. Click Create Account & Login.

### **Important:**

At the Service Enclave Sign In page, **Do not sign in and do not refresh your browser.**

2. Open a terminal to access the Service CLI and unlock the system.
  - a. Log into one of the management nodes using the primary administrative account details you just created.

### **Note:**

Management nodes are named `pcamn01`, `pcamn02` and `pcamn03` by default. You change these names later in the configuration process.

```
$ ssh new-admin-account@pcamn01 -p 30006
Password authentication
```

```
Password:  
PCA-ADMIN>
```

- b.** At the PCA-ADMIN> prompt, enter `systemStateunlock`.

- c.** Verify the system is unlocked.

```
PCA-ADMIN> show pcaSystem  
Command: show pcaSystem  
Status: Success  
Time: 2022-09-16 12:24:28,232 UTC  
Data:  
  Id = 5709f72b-c439-4c3a-8959-758df94eff25  
  Type = PcaSystem  
  System Config State = Config System Params  
  system state locked = false
```

- d.** Close the terminal or type `exit`.

- 3.** Refresh your web browser to return to the Service Enclave Sign In page and sign in to the system with the primary administrative account.

 **Note:**

You might need to accept the self-signed SSL certificate again before signing in.

- 4.** Provide the following appliance details. Required entries are marked with an asterisk.
  - System Name\*
  - Domain\*
  - Rack Name
  - Description

## One Time Setup of Appliance Details



### Important

Once System Name and Domain are set, they CANNOT BE CHANGED.

Please enter and check these details carefully

Availability Domain

ad1

System Name \*

|

Required

Domain \*

|

I

Required

Rack Name

pca

Description

Save Changes



### Note:

The system name and domain fields support only lowercase characters. If you enter uppercase characters in these fields, they are converted to lowercase when changes are saved.

5. **Confirm the parameters you just entered are correct. Once System Name and Domain are set, they cannot be changed.** Click Save Changes when you are ready to proceed.
6. Refresh your web browser and sign in to the system with the primary administrative account.



### Note:

You might need to accept the self-signed SSL certificate again before signing in.

The Configure Network Params wizard displays.

7. Refer to the information you gathered in the [Initial Installation Checklist](#) to complete the system configuration. It is helpful to enter all this information in a text file.
8. Select either static or dynamic routing.

### **For static routing configurations**

Enter the following data center information, then click Next.

- Routing Type: Static\*
- Uplink gateway IP Address\*
- Spine virtual IP\* (comma-separated values if using the 4 port dynamic mesh topology)
- Uplink VLAN
- Uplink HSRP Group

**Configure Network Params**

1 — 2 — 3 — 4 — 5 — 6 — 7  
**Routing**    Manageme...    Uplink    NTP    Admin Net...    DNS Servers    Public IPs

Routing Type \*  
 Static

Uplink Gateway \*  
  
 Enter a value.

Spine virtual IP \*  
  
 Enter a value.

Uplink VLAN

Uplink HSRP Group

Previous    Next    Cancel    Save Changes

### **For dynamic configurations**

Enter the following data center information, then click Next.

- Routing Type: Dynamic\*
- Peer1 IP and ASN\*
- Peer2 IP and ASN
- Uplink Gateway
- Oracle ASN

 **Note:**

The default Oracle ASN is 136025. The default BGP ASN inbound path filtering does not accept your own ASN in the AS path. If there is more than one PCA site, then customers must adjust the Oracle ASN field to be unique in their datacenter network.

- BGP Topology (square, mesh, triangle), KeepAlive Timer and HoldDown Timer
- MD5 Authentication: enable or disable

### Configure Network Params

1 — 2 — 3 — 4 — 5 — 6 — 7  
 Routing    Manageme...    Uplink    NTP    Admin Net...    DNS Servers    Public IPs

Routing Type \*

Dynamic

Peer1 IP \*

Peer1 ASN \*

Peer2 IP

Peer2 ASN

Uplink Gateway

Oracle ASN

BGP Topology

BGP KeepAlive Timer

BGP HoldDown Timer

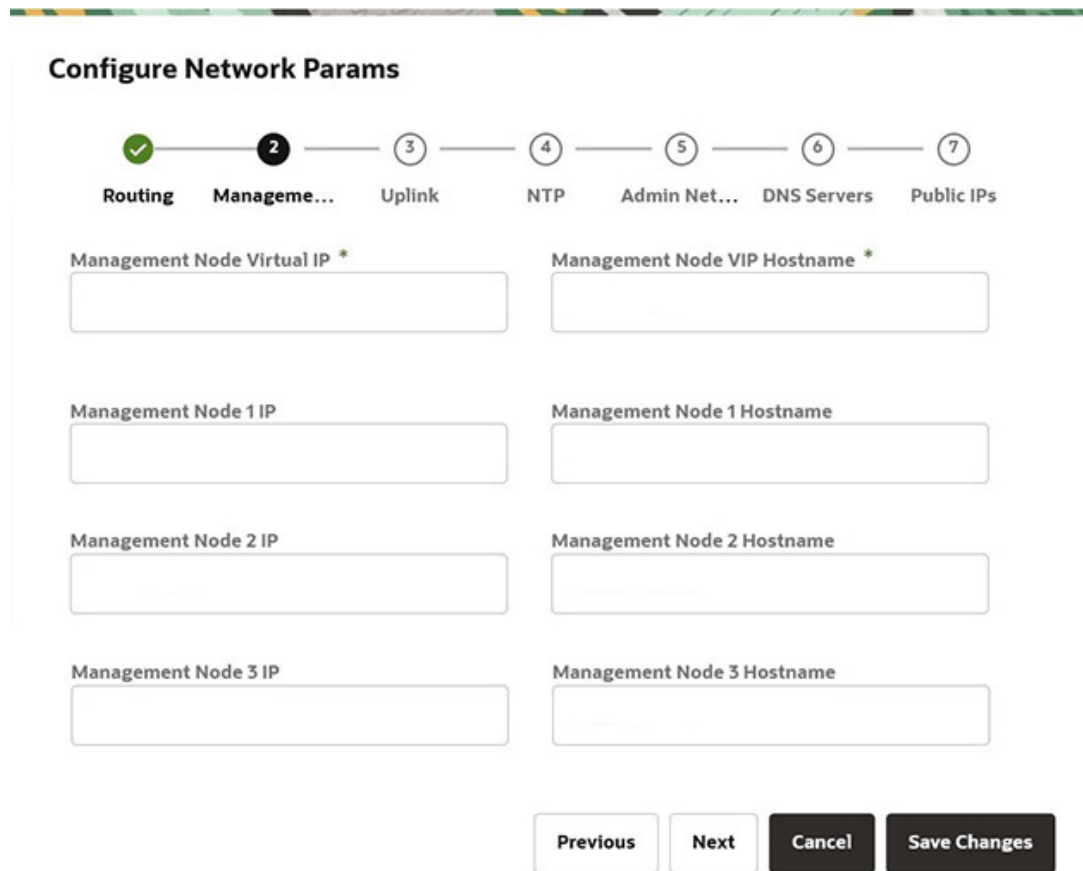
Enable MD5 Authentication

Previous    **Next**    Save Changes

 **Note:**

Communication between VCNs on different DRGs residing on a PCA rack is possible if route entries and firewall access on the customer data center network that connects the two VCNs are provided by the customer.

9. Enter a shared virtual IP and associated host name for the management node cluster; add an IP address and host name for each of the three individual management nodes; and then click Next.



### Configure Network Params

Progress: 1. Routing (✓) — 2. Management Node Cluster (●) — 3. Uplink — 4. NTP — 5. Admin Network — 6. DNS Servers — 7. Public IPs

Management Node Virtual IP \*

Management Node VIP Hostname \*

Management Node 1 IP

Management Node 1 Hostname

Management Node 2 IP

Management Node 2 Hostname

Management Node 3 IP

Management Node 3 Hostname

Previous Next Cancel Save Changes

10. Enter the following data center uplink information and then click Next.
  - IP Address for Spine Switch 1 and 2\*
  - Uplink Port Speed and Port Count\*
  - Uplink VLAN MTU and Netmask\*
  - Uplink Port FEC

 **Note:**

Uplinks ports are always configured as port-channels, even when only one uplink port count is configured. Port-channel is configured with LACP mode with LACP rate as fast.

## Configure Network Params

✓

✓

✓

4

5

6

7

Routing

Manageme...

Uplink

NTP

Admin Net...

DNS Servers

Public IPs

Spine1 IP [comma-separated list, no spaces] \*

Spine2 IP [comma-separated list, no spaces] \*

Uplink Port Speed \*

100

Uplink Port Count \*

1

Uplink VLAN MTU \*

9,216

Uplink Netmask [comma-separated list, no spaces] \*

Uplink Port FEC

AUTO

Previous

Next

Cancel

Save Changes

11. Enter the NTP configuration details and then click Next.

To specify multiple NTP servers, enter a comma separated list of IP addresses or fully qualified host names.

## Configure Network Params

Routing Management Uplink NTP Admin Net... DNS Servers Public IPs

NTP Servers (Enter up to 7 comma separated IP addresses or Fully Qualified Hostname) \*

Previous Next Cancel Save Changes

12. If you elected to segregate administrative appliance access from the data traffic, configure the administration network by entering the following mandatory and optional information and then click Next.
  - Enable Admin Networking
  - Admin Management VIP address and Hostname
  - Admin Management 1 and 2 and 3 IP address and Hostname
  - At least 1, but up to 3, Admin DNS Server IP addresses
  - Admin Port Speed, Port Count, and Admin Router Group
  - Admin VLAN, MTU, Port FEC, and Gateway IP
  - Admin IP Address for Spine Switch 1 and 2, and a shared Virtual IP
  - Admin Peer1 and Peer2 IP address and ASN for BGP
  - Admin Toplogy (Triangle, Square, Mesh)
  - Admin BGP Authentication (Enable/Disable). Keepalive Timer, Hold Down Timer, and Static Routing.

## Configure Network Params



### Admin Network

Admin Networking

Enable

Admin Management VIP \*

10.80.59.11

Admin Management VIP Hostname \*

Admin Management 1 IP \*

10.80.59.12

Admin Management 1 Hostname \*

Admin Management 2 IP \*

10.80.59.13

Admin Management 2 Hostname \*

Admin Management 3 IP \*

10.80.59.14

Admin Management 3 Hostname \*

Admin DNS Server 1 \*

Admin DNS Server 2

Admin DNS Server 3

Admin Port Speed

40

Admin Port Count

1

Admin Router Group

160

Admin VLAN

659

Admin MTU

9,100

Admin Port FEC

AUTO

Admin Gateway IP

10.80.58.1

Admin Spine1 IP <sup>~</sup> <input type="text" value="10.80.59.9"/>	Admin Spine2 IP <sup>~</sup> <input type="text" value="10.80.59.10"/>
Admin Spine Virtual IP <input type="text" value="10.80.59.8"/>	Admin Peer1 IP <input type="text"/>
Admin Peer2 IP <input type="text"/>	Admin Peer1 ASN <input type="text" value="v ^"/>
Admin Peer2 ASN <input type="text" value="v ^"/>	Admin Topology <input type="text" value="v"/>
Admin BGP Authentication <input type="text" value="v"/>	Admin BGP Keep Alive Timer <input type="text" value="v ^"/>
Admin BGP Hold Down Timer <input type="text" value="v ^"/>	Admin Static Routing <input type="text" value="v"/>

13. Enter at least one, but up to three DNS servers in the respective fields and then click Next.

### Configure Network Params

✓ ✓ ✓ ✓ ✓ ✓ 7  
 Routing Manageme... Uplink NTP Admin Net... DNS Servers Public IPs

DNS Server 1

DNS Server 2

DNS Server 3

14. Enter the data center IP addresses that the appliance can assign to resources as public IPs.

- Public IP list of CIDRs in a comma-separated list
- Object Storage Public IP (must be outside the public IP range)

**Configure Network Params**

Routing Management Uplink NTP Admin Net... DNS Servers **Public IPs**

**Public IP Ranges [no spaces]**

A comma-separated [no spaces], list of CIDRs, e.g. 10.10.0.0/16,192.168.8.0/24. These are the customer datacenter IPs ("Public IPs") that the PCA uses for OCI components that require Public IPs, for example OCI Gateways, Compute instances in Public subsets, etc. Note that they are not "Public" but instead represent IP addresses that have access in on premise networks.

**Object Storage Public IP**

Previous Next Cancel Save Changes

15. Use the Previous/Next buttons to recheck that the information you entered is correct and then click Save Changes.  
Your network configuration information does not persist until you commit your changes in the following step. If you need to change any parameters after testing begins, you must re-enter all information.

**Caution:**

Once you click Save Changes, network configuration and testing begins and can take up to 15 minutes. **Do not** close the browser window during this time.

If a problem is encountered, the Configure Network Params wizard reopens and the error is displayed.

16. At the Testing Network Parameters page, you can re-enter network configuration information or commit the changes.
  - Click Re-enter Network Configuration. You are returned to a blank Configure Network Params wizard where you must enter all your information again.
  - Click Commit Changes. The network parameters are locked. Once locked, the routing type and public IPs cannot be changed.

 **Caution:**

Once you click Commit Changes, system initialization begins and can take up to 15 minutes. **Do not** close the browser window during this time.

If a problem is encountered, the Configure Network Params wizard reopens and the error is displayed. Otherwise, a Configuration Complete message displays.

17. Click Sign Out. You are returned to the Service Enclave.
18. To continue configuration, connect to the Service Web UI at the new virtual IP address of the management node cluster: `https://<virtual_ip>:30099`.

 **Note:**

You might need to accept the self-signed SSL certificate again before signing in.

19. Verify your system configuration.
  - From the Dashboard, click Appliance to view the system details and click Network Environment to view the network configuration.
  - Alternatively, you can log in to the Service CLI as an administrator and run the following commands to confirm your entries.

```
# ssh 100.96.2.32 -l admin -p 30006
Password:
PCA-ADMIN> show pcaSystem
[...]
PCA-ADMIN> show networkConfig
[...]
```

# 6

## Next Steps

Once the initial configuration is complete, you can begin to customize the appliance for use. These are further administration tasks to consider before you enable user access to the cloud infrastructure services.

Task	Description
Set up a bastion host	After initial configuration, you may choose to connect a bastion host to the appliance internal management network. Consider it a long-term equivalent of the temporary workstation connection used during appliance initialization. See <a href="#">Optional Bastion Host Uplink</a> in the Oracle Private Cloud Appliance Installation Guide.
Enable Oracle Auto Service Request	Oracle Auto Service Request (ASR) is a software feature for support purposes. It is integrated with My Oracle Support and helps resolve problems faster by automatically opening service requests when specific hardware failures occur. Using ASR is optional: the service must be registered and enabled for your appliance. See <a href="#">Using Oracle Auto Service Request</a> in the Oracle Private Cloud Appliance Administrator Guide.
Provision the compute nodes	The appliance software detects the compute nodes that are installed in the rack and cabled to the switches. They must be provisioned by an administrator so they can host compute instances. See <a href="#">Performing Compute Node Operations</a> in the Oracle Private Cloud Appliance Administrator Guide.
Create administrator accounts	During initial configuration the primary infrastructure administrator account is set up. To provide other administrators access to the Service Enclave, create additional accounts and determine each one's authorization level. See <a href="#">Administrator Account Management</a> in the Oracle Private Cloud Appliance Administrator Guide.
Create tenancies	A tenancy is an environment where users manage cloud resources and configure virtualized workloads. From the Service Enclave, an infrastructure administrator must set up at least one tenancy. See <a href="#">Tenancy Management</a> in the Oracle Private Cloud Appliance Administrator Guide.
Integrate with Oracle Exadata	Private Cloud Appliance can be integrated with Oracle Exadata for a high-performance combination of compute capacity and database optimization. Up to 16 database nodes can be connected directly to the appliance. Refer to the following sections: <ul style="list-style-type: none"><li>• <a href="#">Optional Connection to Exadata</a> in the Oracle Private Cloud Appliance Installation Guide</li><li>• <a href="#">Creating and Managing Exadata Networks</a> in the Oracle Private Cloud Appliance Administrator Guide</li></ul>

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Task	Description
Add GPU capacity	<p>Private Cloud Appliance can be expanded with GPU nodes to enable GPU-accelerated workloads such as AI and graphics intensive applications. Up to 12 nodes in 2 GPU expansion racks can be added, for a maximum total of 48 NVIDIA L40S GPUs.</p> <p>Refer to the following sections:</p> <ul style="list-style-type: none"><li>• <a href="#">Optional GPU Expansion</a> in the "Oracle Private Cloud Appliance Installation Guide".</li><li>• <a href="#">Integrating GPU Expansion Nodes</a> in the "Oracle Private Cloud Appliance Administrator Guide"</li></ul>

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For more detailed instructions and information about using, maintaining, updating and expanding the system, refer to the online [Private Cloud Appliance documentation](#).