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Preface

This preface contains the following sections:

- Audience, page v
- Conventions, page v
- Related Documentation, page vii
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- Obtaining Documentation and Submitting a Service Request, page vii

Audience

This guide is intended primarily for data center administrators who use Cisco UCS Director and/or Cisco UCS Director Express and who have responsibilities and expertise in one or more of the following:

- Server administration
- Storage administration
- Network administration
- Network security
- Virtualization and virtual machines

Conventions

<table>
<thead>
<tr>
<th>Text Type</th>
<th>Indication</th>
</tr>
</thead>
<tbody>
<tr>
<td>GUI elements</td>
<td>GUI elements such as tab titles, area names, and field labels appear in <strong>this font</strong>. Main titles such as window, dialog box, and wizard titles appear in <strong>this font</strong>.</td>
</tr>
<tr>
<td>Document titles</td>
<td>Document titles appear in <strong>this font</strong>.</td>
</tr>
<tr>
<td>TUI elements</td>
<td>In a Text-based User Interface, text the system displays appears in <strong>this font</strong>.</td>
</tr>
</tbody>
</table>
### Conventions

<table>
<thead>
<tr>
<th><strong>Text Type</strong></th>
<th><strong>Indication</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>System output</td>
<td>Terminal sessions and information that the system displays appear in <strong>this font</strong>.</td>
</tr>
<tr>
<td>CLI commands</td>
<td>CLI command keywords appear in <strong>this font</strong>. Variables in a CLI command appear in <strong>this font</strong>.</td>
</tr>
<tr>
<td>[ ]</td>
<td>Elements in square brackets are optional.</td>
</tr>
<tr>
<td>{x</td>
<td>y</td>
</tr>
<tr>
<td>[x</td>
<td>y</td>
</tr>
<tr>
<td>string</td>
<td>A nonquoted set of characters. Do not use quotation marks around the string or the string will include the quotation marks.</td>
</tr>
<tr>
<td>&lt; &gt;</td>
<td>Nonprinting characters such as passwords are in angle brackets.</td>
</tr>
<tr>
<td>[ ]</td>
<td>Default responses to system prompts are in square brackets.</td>
</tr>
<tr>
<td>!, #</td>
<td>An exclamation point (!) or a pound sign (#) at the beginning of a line of code indicates a comment line.</td>
</tr>
</tbody>
</table>

---

**Note**

Means *reader take note*. Notes contain helpful suggestions or references to material not covered in the document.

**Tip**

Means *the following information will help you solve a problem*. The tips information might not be troubleshooting or even an action, but could be useful information, similar to a Timesaver.

**Caution**

Means *reader be careful*. In this situation, you might perform an action that could result in equipment damage or loss of data.

**Timesaver**

Means *the described action saves time*. You can save time by performing the action described in the paragraph.
Related Documentation

Cisco UCS Director Documentation Roadmap
For a complete list of Cisco UCS Director documentation, see the Cisco UCS Director Documentation Roadmap available at the following URL: http://www.cisco.com/en/US/docs/unified_computing/ucs/ucs-director/doc-roadmap/b_UCSDirectorDocRoadmap.html.

Cisco UCS Documentation Roadmaps
For a complete list of all B-Series documentation, see the Cisco UCS B-Series Servers Documentation Roadmap available at the following URL: http://www.cisco.com/go/unifiedcomputing/b-series-doc.
For a complete list of all C-Series documentation, see the Cisco UCS C-Series Servers Documentation Roadmap available at the following URL: http://www.cisco.com/go/unifiedcomputing/c-series-doc.

The Cisco UCS B-Series Servers Documentation Roadmap includes links to documentation for Cisco UCS Manager and Cisco UCS Central. The Cisco UCS C-Series Servers Documentation Roadmap includes links to documentation for Cisco Integrated Management Controller.

Documentation Feedback
To provide technical feedback on this document, or to report an error or omission, please send your comments to ucs-director-docfeedback@cisco.com. We appreciate your feedback.

Obtaining Documentation and Submitting a Service Request
For information on obtaining documentation, submitting a service request, and gathering additional information, see the monthly What's New in Cisco Product Documentation, which also lists all new and revised Cisco technical documentation.
Subscribe to the What's New in Cisco Product Documentation as a Really Simple Syndication (RSS) feed and set content to be delivered directly to your desktop using a reader application. The RSS feeds are a free service and Cisco currently supports RSS version 2.0.
Overview

This chapter contains the following sections:

- About Cisco UCS Director, page 1
- About Cisco UCS Director for VMware vSphere, page 4
- Prerequisites, page 4
- Minimum System Requirements for a Single-Node Setup, page 4
- About Licenses, page 6

About Cisco UCS Director

Cisco UCS Director (formerly Cisco Cloupia Unified Infrastructure Controller) is a 64-bit appliance that uses the following standard templates:

- Open Virtualization Format (OVF) for VMware vSphere
- Virtual Hard Disk (VHD) for Microsoft Hyper-V

Cisco UCS Director delivers unified, highly secure management for the industry's leading converged infrastructure solutions, which are based on the Cisco UCS and Cisco Nexus platforms.

Cisco UCS Director extends the unification of computing and network layers through Cisco UCS to provide data center administrators with comprehensive visibility and management capability. It supports NetApp FlexPod and ExpressPod, EMC VSPEx, and VCE Vblock systems, based on the Cisco UCS and Cisco Nexus platforms.

Cisco UCS Director automates the provisioning of resource pools across physical, virtual, and baremetal environments. It delivers native, automated monitoring for health, status, and resource utilization. For example, you can do the following using Cisco UCS Director:

- Create, clone, and deploy service profiles and templates for all servers and applications
- Monitor organizational usage, trends, and capacity across a converged infrastructure on a continuous basis, such as by viewing heat maps that show virtual machine (VM) utilization across all your data centers
- Deploy and add capacity to ExpressPod and FlexPod infrastructures in a consistent, repeatable manner
Features and Benefits

The features and benefits of Cisco UCS Director are as follows:

<table>
<thead>
<tr>
<th>Feature</th>
<th>Benefit</th>
</tr>
</thead>
</table>
| Central management       | • Provides a single interface for administrators to monitor, provision, and manage the system across physical, virtual, and bare-metal environments  
                           | • Provides a unified dashboards, reports, and heat maps, which reduce troubleshooting and performance bottlenecks |
| Self-service catalog     | • Allows end users to order and deploy new infrastructure instances following IT-prescribed policies and governance |
| Adaptive provisioning    | • Provides a real-time available capability, internal policies, and application workload requirements to optimize the availability of the right resources |
| Dynamic capacity         | • Provides continuous monitoring indicates real-time infrastructure consumption to improve capacity planning and management  
                           | management                                                                                     |
|                          | • Identifies underutilized and overutilized resources                                            |
| Multiple hypervisor      | • Supports VMware ESX, Microsoft Hyper-V, and Red Hat hypervisors                                |
| Computing management     | • Monitors, manages, and provisions physical, virtual, and bare-metal servers, as well as blades  
                           | • allows end users to implement virtual machine lifecycle management and business continuance through snapshots  
<pre><code>                       | • Allows administrators to access server utilization trending analysis                          |
</code></pre>
<table>
<thead>
<tr>
<th>Feature</th>
<th>Benefit</th>
</tr>
</thead>
</table>
| Network management              | • Provides policy-based provisioning of physical and virtual switches and dynamic network topologies  
• Allows administrators to configure VLANs, virtual network interface cards (vNICs), port groups and port profiles, IP and Dynamic Host Control Protocol (DHCP) allocation, and access control lists (ACLs) across network devices. |
| Storage management              | • Provides policy-based provisioning and management of filers, virtual filers (vFilers), logical unit numbers (LUNs), and volumes  
• Provides unified dashboards that allow administrators comprehensive visibility into organizational usage, trends, and capacity analysis details. |
| Cisco CloudGenie                | • Provides mobile management from Apple iPad and iPhone and Android devices  
• Supports mobile self-service provisioning, virtual machine management, and viewing of administrative dashboards |

### Physical and Virtual Management Features

#### Physical Server Management
- Discover and collect configurations and changes
- Monitor and manage physical servers
- Perform policy-based server provisioning
- Manage blade power
- Manage the server lifecycle
- Perform server use trending and capacity analysis
- Perform baremetal provisioning using preboot execution environment (PXE) boot management

#### Virtual Computing Management
- Discover, collect, and monitor virtual computing environments
- Perform policy-based provisioning and dynamic resource allocation
- Manage the host server load and power
- Manage the VM lifecycle and snapshots
- Perform analytics to assess VM capacity, sprawl, and host utilization
### Physical Storage Management
- Discover, collect, and monitor storage filers
- Perform policy-based provisioning of vFilers
- Provision and map volumes
- Create and map Logical Unit Number (LUN) and iGroup instances
- Perform SAN zone management
- Monitor and manage network-attached storage (NAS) and SAN-based storage
- Implement storage best practices and recommendation

### Virtual Storage Management
- Discover, collect, and monitor storage of vFilers and storage pools
- Perform policy-based storage provisioning for thick and thin clients
- Create new data stores and map them to virtual device contexts (VDCs)
- Add and resize disks to VMs
- Monitor and manage organizational storage use
- Perform virtual storage trend and capacity analysis

### Physical Network Management
- Discover, collect, and monitor physical network elements
- Provision VLANs across multiple switches
- Configure Access Control Lists (ACLs) on network devices
- Configure the storage network
- Implement dynamic network topologies

### Virtual Network Management
- Add networks to VMs
- Perform policy-based provisioning with IP and DHCP allocation
- Configure and connect Virtual Network Interface Cards (vNICs) to VLANs and private VLANs
- Create port groups and port profiles for VMs
- Monitor organizational use of virtual networks

## About Cisco UCS Director for VMware vSphere
Cisco UCS Director can be hosted on VMware vSphere or vCenter, as well as HyperV Manager.

## Prerequisites
- Installation of VMware vCenter
- Configured system administrator privileges
- Cisco UCS Director deployed on a VMware vCenter host

## Minimum System Requirements for a Single-Node Setup
The minimum system requirements depend upon how many VMs you plan to manage.
For optimal performance, reserve additional CPU and memory resources. We recommend that you reserve the following resources in addition to the minimum system requirements listed in the tables below: CPU resources of more than or equal to 3000MHz, and additional memory of more than or equal to 4GB.

For information about minimum system requirements for a multi-node setup, see Minimum System Requirements for a Multi-Node Setup, on page 17.

Up to 2,000 VMs

If you plan to manage up to 2,000 VMs, the Cisco UCS Director environment must meet at least the minimum system requirements in the following table.

Table 1: Minimum System Requirements for up to 2,000 VMs

<table>
<thead>
<tr>
<th>Element</th>
<th>Minimum Supported Requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>vCPU</td>
<td>4</td>
</tr>
<tr>
<td>Memory</td>
<td>8 GB</td>
</tr>
<tr>
<td>Hard Disk</td>
<td>100 GB</td>
</tr>
</tbody>
</table>

Up to 5,000 VMs

If you plan to manage no more than 5,000 VMs, the Cisco UCS Director environment must meet at least the minimum system requirements and recommended configurations in the following tables.

Table 2: Minimum System Requirements for up to 5,000 VMs

<table>
<thead>
<tr>
<th>Element</th>
<th>Minimum Supported Requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>vCPU</td>
<td>4</td>
</tr>
<tr>
<td>Memory</td>
<td>20 GB</td>
</tr>
<tr>
<td>Hard Disk</td>
<td>100 GB</td>
</tr>
</tbody>
</table>

Table 3: Recommended Memory Configuration for Cisco UCS Director Services

<table>
<thead>
<tr>
<th>Service</th>
<th>Recommended Configuration</th>
<th>File Location</th>
<th>Parameter</th>
</tr>
</thead>
<tbody>
<tr>
<td>broker</td>
<td>256 MB</td>
<td>/opt/infra/broker/run.sh</td>
<td>-Xms -Xmx</td>
</tr>
<tr>
<td>client</td>
<td>512 MB</td>
<td>/opt/infra/client/run.sh</td>
<td>-Xms -Xmx</td>
</tr>
<tr>
<td>controller</td>
<td>256 MB</td>
<td>/opt/infra/controller/run.sh</td>
<td>-Xms -Xmx</td>
</tr>
</tbody>
</table>
### About Licenses

You must obtain a license to use Cisco UCS Director, as follows:

1. Before you install Cisco UCS Director, generate the Cisco UCS Director license key and claim a certificate (Product Access Key).
2. Register the Product Access Key (PAK) on the Cisco software license site, as described in **Fulfilling the Product Access Key**, on page 7.
3. After you install Cisco UCS Director, update the license in Cisco UCS Director as described in **Updating the License**, on page 12.
4. After the license has been validated, you can start to use Cisco UCS Director.

---

### Table 4: Minimum Database Configuration

<table>
<thead>
<tr>
<th>Element</th>
<th>Minimum Supported Configuration</th>
</tr>
</thead>
<tbody>
<tr>
<td>thread_cache_size</td>
<td>100</td>
</tr>
<tr>
<td>max_connections</td>
<td>1000</td>
</tr>
<tr>
<td>innodb_lock_wait_timeout</td>
<td>100</td>
</tr>
<tr>
<td>query_cache_size</td>
<td>128 MB</td>
</tr>
<tr>
<td>innodb_buffer_pool_size</td>
<td>4096 MB</td>
</tr>
<tr>
<td>max_connect_errors</td>
<td>10000</td>
</tr>
<tr>
<td>connect_timeout</td>
<td>20</td>
</tr>
<tr>
<td>innodb_read_io_threads</td>
<td>64</td>
</tr>
<tr>
<td>innodb_write_io_threads</td>
<td>64</td>
</tr>
</tbody>
</table>

---

### Service Configuration

<table>
<thead>
<tr>
<th>Service</th>
<th>Recommended Configuration</th>
<th>File Location</th>
<th>Parameter</th>
</tr>
</thead>
<tbody>
<tr>
<td>eventmgr</td>
<td>512 MB</td>
<td>/opt/infra/eventmgr/run.sh</td>
<td>-Xms -Xmx</td>
</tr>
<tr>
<td>idaccessmgr</td>
<td>512 MB</td>
<td>/opt/infra/idaccessmgr/run.sh</td>
<td>-Xms -Xmx</td>
</tr>
<tr>
<td>inframgr</td>
<td>8 GB</td>
<td>/opt/infra/inframgr/run.sh</td>
<td>-Xms -Xmx</td>
</tr>
<tr>
<td>Tomcat</td>
<td>1 GB</td>
<td>/opt/infra/web_cloudmgr/apache-tomcat/bin/catalina.sh</td>
<td>JAVA_OPTS=&quot;-Xms -Xmxm&quot;</td>
</tr>
</tbody>
</table>
Fulfilling the Product Access Key

Before You Begin
You need the PAK number.

Procedure

Step 1 Navigate to the Cisco Software License website: http://www.cisco.com/go/license
Step 2 In the Enter a Single PAK or TOKEN to Fulfill field, enter the PAK number.
Step 3 Click Fulfill Single PAK/TOKEN.
Step 4 Complete the additional fields in License Information to register your PAK:

<table>
<thead>
<tr>
<th>Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Organization Name</td>
<td>The organization name.</td>
</tr>
<tr>
<td>Site Contact Name</td>
<td>The site contact name.</td>
</tr>
<tr>
<td>Street Address</td>
<td>The street address of the organization.</td>
</tr>
<tr>
<td>City/Town</td>
<td>The city or town.</td>
</tr>
<tr>
<td>State/Province</td>
<td>The state or province.</td>
</tr>
<tr>
<td>Zip/Postal Code</td>
<td>The zip code or postal code.</td>
</tr>
<tr>
<td>Country</td>
<td>The country name.</td>
</tr>
</tbody>
</table>

Step 5 Click Issue Key.
The features for your license appear, and an email with the Digital License Agreement and a zipped license file is sent to the email address you provided.
Installing Cisco UCS Director

This chapter contains the following sections:

- Installing Cisco UCS Director on VMware vSphere, page 9
- Configuring the Network Interface using Shelladmin, page 11
- Changing the Default Password, page 12
- Updating the License, page 12
- Reserving System Resources, page 12
- Changing the Maximum Packet Size, page 13

Installing Cisco UCS Director on VMware vSphere

Before You Begin

You need administrator privileges to connect to VMware vSphere or vCenter.

Note

If you do not want to use DHCP, you need the following information: IP address, subnet mask, and default gateway.

Procedure

Step 1 In the VMware vSphere (or vCenter) Client login dialog box, enter your login credentials.
Step 2 Click Login.
Step 3 In the Navigation pane, choose the Data Center for Cisco UCS Director deployment.
Step 4 Choose File > Deploy OVF Template. The Deploy OVF Template window appears.
Step 5 In the Source pane, do one of the following to choose your OVF source location:

- Browse to the location, choose the file, and click Open.
• Deploy from a URL on your local area network. Replace FQDN (Fully Qualified Domain Name) with the IP address or domain name, and click Next.

Step 6  In the OVF Template Details pane, verify the details and click Next.
Step 7  In the End User License Agreement pane, read the license agreement, and click Accept.
Step 8  In the Name and Location pane, do the following:
   a) (Optional) In the Name field, edit the VM name.
   b) Choose the Data Center where Cisco UCS Director is being deployed, and click Next.
Step 9  In the Host/Cluster pane, choose the required host, cluster, or resource pool, and click Next.
Step 10 In the Dat astore pane, choose the location to store Cisco UCS Director VM files, and click Next.
Step 11 In the Disk Format pane, choose one of the following radio buttons and click Next:
   • Thin Provisioned format—To allocate storage on demand as data is written to disk.
   • Thick Provisioned (Lazy Zeroed) format—To allocate storage immediately in thick format.
   • Thick Provisioned (Eager Zeroed) format—To allocate storage in thick format. It might take longer to create disks using this option.
Step 12 In the Network Mapping pane, choose your network and click Next.
Step 13 In the IP Address Allocation pane, click Next. The DHCP check box is checked by default.
Step 14 In the Ready to Complete pane, verify the options selected, and click Finish.
Step 15 Make sure you have sufficient vCPU and memory to power on the VM.
Step 16 Power on the VM. Optionally you can configure network properties from the shelladmin.
Step 17 When the appliance starts up, do the following when you are prompted about whether to continue with DHCP or configure a static IP address:
   • If DHCP is enabled, enter no to ensure that IP addresses are assigned automatically.
   • If you want to use a static IP address, enter yes and then enter the following information:
     ◦ IP address
     ◦ Gateway
     ◦ Netmask
Step 18 When you are prompted to continue with the configuration, enter y. Wait for the appliance to boot up before you continue.
Step 19 After the appliance has booted up, copy and paste the Cisco UCS Director IP address that appears into a supported web browser to access the Login page.
Step 20 On the Login page, enter admin as the username and admin for the login password. Change your admin password after this initial login.
What to Do Next

Update your license.

Configuring the Network Interface using Shelladmin

This procedure is optional.

Procedure

Step 1 Log into the Cisco UCS Director VM console with the following credentials:
   a) User—shelladmin
   b) Password—changeme

If you have already logged into the shelladmin and changed the default password, use your new password instead.

After you have logged in, you can choose Change shelladmin password to change the default password.

Step 2 Choose Configure Network Interface.

Step 3 At the Do you want to Configure static IP [y/n] prompt, enter one of the following choices:
   • If DHCP is enabled, enter no (IP addresses are assigned automatically)
   • To configure static IP, enter yes, and then enter the following:
     ◦ IP address
     ◦ Netmask
     ◦ Gateway
     ◦ DNS Server 1
     ◦ DNS Server 2
Changing the Default Password

Procedure

Step 1 Click Administration and choose Users and Groups.

Step 2 On the Login Users pane, right-click on the admin user.

Step 3 In the Change Password dialog box, enter the new password and confirm it.

Step 4 Click Save.

Updating the License

Before You Begin

If you received a zipped license file by email, extract and save the .lic file to your local machine.

Procedure

Step 1 Choose Administration > License.

Step 2 Click on the License Keys tab.

Step 3 Click Update License.

Step 4 In the Update License dialog box, do one of the following:

- To upload a .lic file, click Browse, navigate to and select the .lic file, then click Upload.
- For a license key, check the Enter License Text check box then copy and paste the license key only into the License Text field. The license key is typically at the top of the file, after Key ->.

You can also copy and paste the full text of a license file into the License Text field.

Step 5 Click Submit.

The license file is processed, and a message appears confirming the successful update.

Reserving System Resources

For optimal performance, we recommend reserving extra system resources for Cisco UCS Director beyond the minimum system requirements listed in Minimum System Requirements for a Single-Node Setup, on page 4.
For more information about how to reserve system resources, see the VMWare documentation.

Procedure

Step 1 Log into VMware vCenter.
Step 2 Choose the VM for Cisco UCS Director.
Step 3 Shut down the VM.
Step 4 In VMware vCenter, click the Resource Allocation tab to view the current resource allocations, and click Edit.
Step 5 In the Virtual Machine Properties pane, edit resource allocations by choosing a resource and entering the new values.
Step 6 Verify that the new resource allocations have been made.

Changing the Maximum Packet Size

The default maximum packet (query) size for the Cisco UCS Director database queries is 4 MB. If one or more of your pods requires a larger size, we recommend that you increase the configuration of the maximum packet size to 100 MB. For example, the import of large open automation modules typically requires a larger packet size.

Procedure

Step 1 In the shelladmin, choose Login as Root to log in to Cisco UCS Director.
Step 2 Navigate to the /etc folder.
Step 3 Open the my.cnf file and locate the max_allowed_packet parameter.
Step 4 Change the value of the max_allowed_packet parameter to max_allowed_packet=100M
Step 5 Save the my.cnf file.
Step 6 In the shelladmin, stop and restart the Cisco UCS Director services on the every node, as follows:
   a) Choose Stop services.
   b) To verify that all services are stopped, choose Display services status.
   c) After all services have stopped on the node, choose Start services.
Changing the Maximum Packet Size
CHAPTER 3

Configuring a Multi-Node Setup

This chapter contains the following sections:

- About the Multi-Node Setup, page 15
- Minimum System Requirements for a Multi-Node Setup, page 17
- Guidelines and Limitations for a Multi-Node Setup, page 24
- Summary of Steps for Configuring a Multi-Node Setup, page 24
- Creating the Inventory Database, page 25
- Creating the Monitoring Database, page 26
- Creating the Primary Node, page 26
- Creating a Service Node, page 27
- Options for Migrating from a Standalone Appliance to a Multi-Node Setup, page 28

About the Multi-Node Setup

The multi-node setup is supported for Cisco UCS Director on a 64-bit operating system only. With a multi-node setup, you can scale Cisco UCS Director to support a larger number of VMs than is supported by a single installation of Cisco UCS Director. This setup includes the following nodes:

- One primary node
- One or more service nodes
- One monitoring database
- One inventory database

**Note**

For a multi-node setup, you have to install the license on the primary node only.
A multi-node setup improves scalability by offloading the processing of system tasks, such as inventory data collection, from the primary node to one or more service nodes. You can assign certain system tasks to one or more service nodes. The number of nodes determines how the processing of system tasks are scaled.

Node pools combine service nodes into groups and enable you to assign system tasks to more than one service node. This provides you with control over which system task is executed by which service node or group of service nodes. If you have multiple service nodes in a node pool and one of the service nodes is busy when a system task needs to be run, Cisco UCS Director uses a round-robin assignment to determine which service node should process that system task. If all service nodes are busy, you can have the primary node run the system task.

However, if you do not need that level of control over the system tasks, you can use the default task policy and add all of the service nodes to the default node pool. All system tasks are already associated with the default task policy, and the round-robin assignment will be used to determine which service node should process a system task.

If you want to have some critical tasks processed only by the primary node, you can assign those tasks to a local-run policy.

For more information about how to configure the primary node and service nodes, and how to assign system tasks, see the Cisco UCS Director Administration Guide.

### Primary Node

A multi-node setup can have only one primary node. This primary node contains the license for Cisco UCS Director.

The primary node also contains the configuration for the node pools and the service nodes, along with the list of which system tasks can be offloaded to the service nodes for processing.

### Service Nodes

A multi-node setup can have one or more service nodes. The number of service nodes in a multi-node setup depends upon the number of devices and VMs you plan to configure and manage through Cisco UCS Director.

### Database Nodes

The inventory and monitoring databases are created from the Cisco UCS Director MySQL database. The data that Cisco UCS Director collects is divided between the two databases. The multi-node setup segregates the data collection which is historically very heavy on the database into a separate database.

#### Inventory Database

A multi-node setup can have only one inventory database. This database contains the following:

- Physical and virtual accounts and their related inventory data
- Data used in the normal operation of Cisco UCS Director for all supported features
Monitoring Database

A multi-node setup can have only one monitoring database. This database contains the data that Cisco UCS Director uses for historical computations, such as aggregations and trend reports.

The parameters of the monitoring database depend upon the number of devices and VMs you plan to configure and manage through Cisco UCS Director.

Minimum System Requirements for a Multi-Node Setup

The minimum system requirements for a multi-node setup depends upon the number of VMs that need to be supported by Cisco UCS Director. The following table describes the number of VMs supported by each deployment size.

<table>
<thead>
<tr>
<th>Deployment Size</th>
<th>Number of VMs Supported</th>
</tr>
</thead>
<tbody>
<tr>
<td>Small</td>
<td>5,000 to 10,000 VMs</td>
</tr>
<tr>
<td>Medium</td>
<td>10,000 to 20,000 VMs</td>
</tr>
<tr>
<td>Large</td>
<td>20,000 to 50,000 VMs</td>
</tr>
</tbody>
</table>

Minimum System Requirements for a Small Multi-Node Setup

The small multi-node setup supports from 5,000 to 10,000 VMs. We recommend that this deployment include the following nodes:

- One primary node
- Two service nodes
- One inventory database
- One monitoring database

For optimal performance, reserve additional CPU and memory resources.

Minimum Requirements for each Primary Node and Service Node

<table>
<thead>
<tr>
<th>Element</th>
<th>Minimum Supported Requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>vCPU</td>
<td>4</td>
</tr>
<tr>
<td>Memory</td>
<td>16 GB</td>
</tr>
<tr>
<td>Hard disk</td>
<td>100 GB</td>
</tr>
</tbody>
</table>
Minimum Requirements for the Inventory Database

<table>
<thead>
<tr>
<th>Element</th>
<th>Minimum Supported Requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>vCPU</td>
<td>4</td>
</tr>
<tr>
<td>Memory</td>
<td>30 GB</td>
</tr>
<tr>
<td>Hard disk</td>
<td>100 GB (SSD Type Storage)</td>
</tr>
</tbody>
</table>

Minimum Requirements for the Monitoring Database

<table>
<thead>
<tr>
<th>Element</th>
<th>Minimum Supported Requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>vCPU</td>
<td>4</td>
</tr>
<tr>
<td>Memory</td>
<td>30 GB</td>
</tr>
<tr>
<td>Hard disk</td>
<td>100 GB (SSD Type Storage)</td>
</tr>
</tbody>
</table>

Minimum Memory Configuration for Cisco UCS Director Services on Primary and Service Nodes

<table>
<thead>
<tr>
<th>Service</th>
<th>Recommended Configuration</th>
<th>File Location</th>
<th>Parameter</th>
</tr>
</thead>
<tbody>
<tr>
<td>broker</td>
<td>512 MB</td>
<td>/opt/infra/broker/run.sh</td>
<td>-Xms -Xmx</td>
</tr>
<tr>
<td>client</td>
<td>512 MB</td>
<td>/opt/infra/client/run.sh</td>
<td>-Xms -Xmx</td>
</tr>
<tr>
<td>controller</td>
<td>512 MB</td>
<td>/opt/infra/controller/run.sh</td>
<td>-Xms -Xmx</td>
</tr>
<tr>
<td>eventmgr</td>
<td>512 MB</td>
<td>/opt/infra/eventmgr/run.sh</td>
<td>-Xms -Xmx</td>
</tr>
<tr>
<td>idaccessmgr</td>
<td>512 MB</td>
<td>/opt/infra/idaccessmgr/run.sh</td>
<td>-Xms -Xmx</td>
</tr>
<tr>
<td>inframgr</td>
<td>8 GB</td>
<td>/opt/infra/inframgr/run.sh</td>
<td>-Xms -Xmx</td>
</tr>
<tr>
<td>Tomcat</td>
<td>2 GB</td>
<td>/opt/infra/web_cloudmgr/apache-tomcat /bin/catalina.sh</td>
<td>JAVA_OPTS=&quot;$JAVA_OPTS -Xmsm -Xmxm&quot;</td>
</tr>
</tbody>
</table>

Minimum Configuration for the Inventory and Monitoring Databases

<table>
<thead>
<tr>
<th>Component</th>
<th>Minimum Supported Configuration</th>
</tr>
</thead>
<tbody>
<tr>
<td>thread_cache_size</td>
<td>1000</td>
</tr>
<tr>
<td>max_connections</td>
<td>1000</td>
</tr>
</tbody>
</table>
## Minimum System Requirements for a Medium Multi-Node Setup

The medium multi-node setup supports between 10,000 and 20,000 VMs. We recommend that this deployment include the following nodes:

- One primary node
- Three service nodes
- One inventory database
- One monitoring database

For optimal performance, reserve additional CPU and memory resources.

### Minimum Requirements for each Primary Node and Service Node

<table>
<thead>
<tr>
<th>Element</th>
<th>Minimum Supported Requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>vCPU</td>
<td>8</td>
</tr>
<tr>
<td>Memory</td>
<td>30 GB</td>
</tr>
<tr>
<td>Hard disk</td>
<td>100 GB</td>
</tr>
</tbody>
</table>

### Minimum Requirements for the Inventory Database

<table>
<thead>
<tr>
<th>Element</th>
<th>Minimum Supported Requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>vCPU</td>
<td>8</td>
</tr>
</tbody>
</table>
### Minimum Supported Requirement

<table>
<thead>
<tr>
<th>Element</th>
<th>Minimum Supported Requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Memory</td>
<td>60 GB</td>
</tr>
<tr>
<td>Hard disk</td>
<td>100 GB (SSD type storage)</td>
</tr>
</tbody>
</table>

### Minimum Requirements for the Monitoring Database

<table>
<thead>
<tr>
<th>Element</th>
<th>Minimum Supported Requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>vCPU</td>
<td>8</td>
</tr>
<tr>
<td>Memory</td>
<td>60 GB</td>
</tr>
<tr>
<td>Hard disk</td>
<td>100 GB (SSD type storage)</td>
</tr>
</tbody>
</table>

### Minimum Memory Configuration for Cisco UCS Director Services on Primary and Service Nodes

<table>
<thead>
<tr>
<th>Service</th>
<th>Recommended Configuration</th>
<th>File Location</th>
<th>Parameter</th>
</tr>
</thead>
<tbody>
<tr>
<td>broker</td>
<td>1 GB</td>
<td>/opt/infra/broker/run.sh</td>
<td>-Xms -Xmx</td>
</tr>
<tr>
<td>client</td>
<td>1 GB</td>
<td>/opt/infra/client/run.sh</td>
<td>-Xms -Xmx</td>
</tr>
<tr>
<td>controller</td>
<td>1 GB</td>
<td>/opt/infra/controller/run.sh</td>
<td>-Xms -Xmx</td>
</tr>
<tr>
<td>eventmgr</td>
<td>256 MB</td>
<td>/opt/infra/eventmgr/run.sh</td>
<td>-Xms -Xmx</td>
</tr>
<tr>
<td>idaccessmgr</td>
<td>1 GB</td>
<td>/opt/infra/idaccessmgr/run.sh</td>
<td>-Xms -Xmx</td>
</tr>
<tr>
<td>inframgr</td>
<td>12 GB</td>
<td>/opt/infra/inframgr/run.sh</td>
<td>-Xms -Xmx</td>
</tr>
<tr>
<td>Tomcat</td>
<td>4 GB</td>
<td>/opt/infra/web_cloudmgr/apache-tomcat/bin/catalina.sh</td>
<td>JAVA_OPTS=&quot;$JAVA_OPTS -Xmsm -Xmxm&quot;</td>
</tr>
</tbody>
</table>

### Minimum Inventory Database Configuration

<table>
<thead>
<tr>
<th>Component</th>
<th>Minimum Supported Configuration</th>
</tr>
</thead>
<tbody>
<tr>
<td>thread_cache_size</td>
<td>2000</td>
</tr>
<tr>
<td>max_connections</td>
<td>2000</td>
</tr>
<tr>
<td>innodb_lock_wait_timeout</td>
<td>100</td>
</tr>
<tr>
<td>Component</td>
<td>Minimum Supported Configuration</td>
</tr>
<tr>
<td>----------------------------</td>
<td>---------------------------------</td>
</tr>
<tr>
<td>query_cache_size</td>
<td>128 MB</td>
</tr>
<tr>
<td>innodb_buffer_pool_size</td>
<td>43,008 MB</td>
</tr>
<tr>
<td>max_connect_errors</td>
<td>10,000</td>
</tr>
<tr>
<td>connect_timeout</td>
<td>20</td>
</tr>
<tr>
<td>innodb_read_io_threads</td>
<td>64</td>
</tr>
<tr>
<td>innodb_write_io_threads</td>
<td>64</td>
</tr>
</tbody>
</table>

Minimum Monitoring Database Configuration

<table>
<thead>
<tr>
<th>Component</th>
<th>Minimum Supported Configuration</th>
</tr>
</thead>
<tbody>
<tr>
<td>thread_cache_size</td>
<td>2000</td>
</tr>
<tr>
<td>max_connections</td>
<td>2000</td>
</tr>
<tr>
<td>innodb_lock_wait_timeout</td>
<td>100</td>
</tr>
<tr>
<td>query_cache_size</td>
<td>128 MB</td>
</tr>
<tr>
<td>innodb_buffer_pool_size</td>
<td>43,008 MB</td>
</tr>
<tr>
<td>max_connect_errors</td>
<td>10,000</td>
</tr>
<tr>
<td>connect_timeout</td>
<td>20</td>
</tr>
<tr>
<td>innodb_read_io_threads</td>
<td>64</td>
</tr>
<tr>
<td>innodb_write_io_threads</td>
<td>64</td>
</tr>
</tbody>
</table>

Minimum System Requirements for a Large Multi-Node Setup

The large multi-node setup supports between 20,000 and 50,000 VMs. We recommend that this deployment include the following nodes:

- One primary node
- Six service nodes
- One inventory database
- One monitoring database
For optimal performance, reserve additional CPU and memory resources.

### Minimum Requirements for each Primary Node and Service Node

<table>
<thead>
<tr>
<th>Element</th>
<th>Minimum Supported Requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>vCPU</td>
<td>8</td>
</tr>
<tr>
<td>Memory</td>
<td>60 GB</td>
</tr>
<tr>
<td>Hard disk</td>
<td>100 GB</td>
</tr>
</tbody>
</table>

### Minimum Requirements for the Inventory Database

<table>
<thead>
<tr>
<th>Element</th>
<th>Minimum Supported Requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>vCPU</td>
<td>8</td>
</tr>
<tr>
<td>Memory</td>
<td>120 GB</td>
</tr>
<tr>
<td>Hard disk</td>
<td>200 GB (SSD type storage)</td>
</tr>
</tbody>
</table>

### Minimum Requirements for the Monitoring Database

<table>
<thead>
<tr>
<th>Element</th>
<th>Minimum Supported Requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>vCPU</td>
<td>8</td>
</tr>
<tr>
<td>Memory</td>
<td>120 GB</td>
</tr>
<tr>
<td>Hard disk</td>
<td>600 GB (SSD type storage)</td>
</tr>
</tbody>
</table>

### Minimum Memory Configuration for Cisco UCS Director Services on Primary and Service Nodes

<table>
<thead>
<tr>
<th>Service</th>
<th>Recommended Configuration</th>
<th>File Location</th>
<th>Parameter</th>
</tr>
</thead>
<tbody>
<tr>
<td>broker</td>
<td>2 GB</td>
<td>/opt/infra/broker/run.sh</td>
<td>-Xms -Xmx</td>
</tr>
<tr>
<td>client</td>
<td>2 GB</td>
<td>/opt/infra/client/run.sh</td>
<td>-Xms -Xmx</td>
</tr>
<tr>
<td>controller</td>
<td>2 GB</td>
<td>/opt/infra/controller/run.sh</td>
<td>-Xms -Xmx</td>
</tr>
<tr>
<td>eventmgr</td>
<td>256 MB</td>
<td>/opt/infra/eventmgr/run.sh</td>
<td>-Xms -Xmx</td>
</tr>
<tr>
<td>Service</td>
<td>Recommended Configuration</td>
<td>File Location</td>
<td>Parameter</td>
</tr>
<tr>
<td>-------------</td>
<td>---------------------------</td>
<td>-------------------------------------------------------------------------------</td>
<td>----------------------------------</td>
</tr>
<tr>
<td>idaccessmgr</td>
<td>2 GB</td>
<td>/opt/infra/idaccessmgr/run.sh</td>
<td>-Xms -Xmx</td>
</tr>
<tr>
<td>inframgr</td>
<td>24 GB</td>
<td>/opt/infra/inframgr/run.sh</td>
<td>-Xms -Xmx</td>
</tr>
<tr>
<td>Tomcat</td>
<td>8 GB</td>
<td>/opt/infra/web_cloudmgr/apache-tomcat/bin/catalina.sh</td>
<td>JAVA_OPTS=&quot;&quot;$JAVA_OPTS -Xms -Xmx&quot;</td>
</tr>
</tbody>
</table>

### Minimum Inventory Database Configuration

<table>
<thead>
<tr>
<th>Component</th>
<th>Minimum Supported Configuration</th>
</tr>
</thead>
<tbody>
<tr>
<td>thread_cache_size</td>
<td>4000</td>
</tr>
<tr>
<td>max_connections</td>
<td>4000</td>
</tr>
<tr>
<td>innodb_lock_wait_timeout</td>
<td>100</td>
</tr>
<tr>
<td>query_cache_size</td>
<td>128 MB</td>
</tr>
<tr>
<td>innodb_buffer_pool_size</td>
<td>86,016 MB</td>
</tr>
<tr>
<td>max_connect_errors</td>
<td>10,000</td>
</tr>
<tr>
<td>connect_timeout</td>
<td>20</td>
</tr>
<tr>
<td>innodb_read_io_threads</td>
<td>64</td>
</tr>
<tr>
<td>innodb_write_io_threads</td>
<td>64</td>
</tr>
</tbody>
</table>

### Minimum Monitoring Database Configuration

<table>
<thead>
<tr>
<th>Component</th>
<th>Minimum Supported Configuration</th>
</tr>
</thead>
<tbody>
<tr>
<td>thread_cache_size</td>
<td>4000</td>
</tr>
<tr>
<td>max_connections</td>
<td>4000</td>
</tr>
<tr>
<td>innodb_lock_wait_timeout</td>
<td>100</td>
</tr>
<tr>
<td>query_cache_size</td>
<td>128 MB</td>
</tr>
<tr>
<td>innodb_buffer_pool_size</td>
<td>86,016 MB</td>
</tr>
<tr>
<td>max_connect_errors</td>
<td>10,000</td>
</tr>
</tbody>
</table>
Guidelines and Limitations for a Multi-Node Setup

Before you configure a multi-node setup for Cisco UCS Director, consider the following:

- The multi-node setup is supported for Cisco UCS Director on a 64-bit operating system only.
- Your multi-node setup can have only one primary node.
- You must plan the location and IP addresses of your nodes carefully as you cannot reconfigure the types of most nodes later. You can only reconfigure a service node as a primary node. You cannot make any other changes to the type of node. For example, you cannot reconfigure a primary node as a service node or an inventory database node as a monitoring database node.
- You have to install the license on the primary node only.
- After you configure the nodes, the list of operations available in the shelladmin changes for the service nodes, the inventory database node, and the monitoring database node.

Summary of Steps for Configuring a Multi-Node Setup

This procedure provides a high-level summary of the steps involved in configuring a multi-node setup.

Plan your multi-node setup carefully. You can only change a service node to a primary node. You cannot change any other type of node after you configure it. For example, you cannot reconfigure a primary node as a service node or an inventory database node as a monitoring database node.

Procedure

**Step 1** Deploy a Cisco UCS Director VM for each node in the multi-node setup.
See Installing Cisco UCS Director on VMware vSphere, on page 9.
For example, if your multi-node setup includes a primary node, an inventory database, a monitoring database, and three service nodes, deploy six Cisco UCS Director VMs.

**Step 2** In the Cisco UCS Director shelladmin, configure the nodes in the following order:

1. Creating the Inventory Database, on page 25
2. Creating the Monitoring Database, on page 26
Creating the Primary Node, on page 26
Creating a Service Node, on page 27

Note You must create and start the inventory database and the monitoring database nodes before you configure the primary node and any service nodes.

Step 3 Update the license file in the Cisco UCS Director that will be the primary node.
You do not need to update the license file on any other node.
See Updating the License, on page 12.

Step 4 In Cisco UCS Director on the primary node, configure the system tasks as follows:
a) Create one or more node pools if you want to control the assignment of system tasks by service node, or accept the default node pool.
b) Create one or more system task policies if you want to control the assignment of system tasks by service node, or accept the default task policy.
c) Configure the service nodes.
d) Configure the primary node.
e) Assign the system tasks to system policies if you want to control the assignment of system tasks by service node.
See the Cisco UCS Director Administration Guide.

Creating the Inventory Database

Procedure

Step 1 Log into the Cisco UCS Director shelladmin on the inventory database node.
Step 2 From the Cisco UCS Director Shell menu, choose Configure Multi-Node Setup and press Enter.
Step 3 From the menu, choose Configure Inventory Database and press Enter.
Step 4 When prompted, press Enter to continue.
Step 5 To verify that the services for the inventory database are up and running, choose Display Services Status and press Enter.
You should see the following lines:

2838 ? 00:00:00 mysqld_safe
3172 ? 3-02:51:38 mysqld

After you return to the shelladmin, the menu options change to those available for an inventory database node.
Creating the Monitoring Database

**Procedure**

<table>
<thead>
<tr>
<th>Step</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step 1</td>
<td>Log into the Cisco UCS Director shelladmin on the monitoring database node.</td>
</tr>
<tr>
<td>Step 2</td>
<td>From the Cisco UCS Director Shell menu, choose Configure Multi-Node Setup and press Enter.</td>
</tr>
<tr>
<td>Step 3</td>
<td>From the menu, choose Configure Monitoring Database and press Enter.</td>
</tr>
<tr>
<td>Step 4</td>
<td>When prompted, press Enter to continue.</td>
</tr>
</tbody>
</table>
| Step 5 | To verify that the services for the monitoring database are up and running, choose Display Services Status and press Enter. You should see the following lines:  
```
2838 ? 00:00:00 mysqld_safe
3172 ? 3-02:51:38 mysqld
```
After you return to the shelladmin, the menu options change to those available for a monitoring database node. |

Creating the Primary Node

**Before You Begin**

The inventory and monitoring databases must be up and running before you create the primary node.

**Note**

Do not run any daemons on the primary database.

**Procedure**

<table>
<thead>
<tr>
<th>Step</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step 1</td>
<td>Log into the Cisco UCS Director shelladmin on the primary node.</td>
</tr>
<tr>
<td>Step 2</td>
<td>From the Cisco UCS Director Shell menu, choose Configure Multi-Node Setup and press Enter.</td>
</tr>
<tr>
<td>Step 3</td>
<td>From the menu, choose Configure Primary Node and press Enter.</td>
</tr>
</tbody>
</table>
| Step 4 | At the Provide Inventory DB IP prompt, enter the IP address assigned to the Cisco UCS Director VM for the inventory database.  
This step registers the VM as a primary node with the inventory database. |
| Step 5 | At the Provide Monitoring DB IP prompt, enter the IP address assigned to the Cisco UCS Director VM for the monitoring database.  
This step registers the VM as a primary node with the monitoring database. |
**Step 6** When prompted, press Enter to continue.

**Step 7** To verify that the services for the primary node are up and running, choose **Display Services Status** and press Enter.

You should see the following lines:

<table>
<thead>
<tr>
<th>Service</th>
<th>Status</th>
<th>PID</th>
</tr>
</thead>
<tbody>
<tr>
<td>broker</td>
<td>RUNNING</td>
<td>25677</td>
</tr>
<tr>
<td>controller</td>
<td>RUNNING</td>
<td>25715</td>
</tr>
<tr>
<td>eventmgr</td>
<td>RUNNING</td>
<td>25749</td>
</tr>
<tr>
<td>client</td>
<td>RUNNING</td>
<td>25808</td>
</tr>
<tr>
<td>idaccessmgr</td>
<td>RUNNING</td>
<td>25854</td>
</tr>
<tr>
<td>inframgr</td>
<td>RUNNING</td>
<td>25911</td>
</tr>
<tr>
<td>TOMCAT</td>
<td>RUNNING</td>
<td>25967</td>
</tr>
<tr>
<td>webservice</td>
<td>RUNNING</td>
<td>26009</td>
</tr>
</tbody>
</table>

Node Type : primary
Inventory DB( 172.29.109.135:3306 ) status : UP
Monitor DB( 172.29.109.144:3306 ) status : UP
Press return to continue ...

After you return to the shelladmin, the menu options change to those available for a primary node.

---

**Creating a Service Node**

**Before You Begin**

The inventory and monitoring databases must be up and running before you create the primary node.

**Procedure**

**Step 1** Log into the Cisco UCS Director shelladmin on the service node.

**Step 2** From the **Cisco UCS Director Shell** menu, choose **Configure Multi-Node Setup** and press Enter.

**Step 3** From the menu, choose **Configure Service Node** and press Enter.

**Step 4** At the Provide Inventory DB IP prompt, enter the IP address assigned to the Cisco UCS Director VM for the inventory database.
This step registers the VM as a service node with the inventory database.

**Step 5** At the Provide Monitoring DB IP prompt, enter the IP address assigned to the Cisco UCS Director VM for the monitoring database.
This step registers the VM as a service node with the monitoring database.

**Step 6** When prompted, press Enter to continue.

**Step 7** To verify that the services for the service node are up and running, choose **Display Services Status** and press Enter.
You should see the following lines:

<table>
<thead>
<tr>
<th>Service</th>
<th>Status</th>
<th>PID</th>
</tr>
</thead>
<tbody>
<tr>
<td>broker</td>
<td>RUNNING</td>
<td>25677</td>
</tr>
<tr>
<td>controller</td>
<td>RUNNING</td>
<td>25715</td>
</tr>
<tr>
<td>eventmgr</td>
<td>RUNNING</td>
<td>25749</td>
</tr>
<tr>
<td>client</td>
<td>RUNNING</td>
<td>25808</td>
</tr>
<tr>
<td>idaccessmgr</td>
<td>RUNNING</td>
<td>25854</td>
</tr>
<tr>
<td>inframgr</td>
<td>RUNNING</td>
<td>25911</td>
</tr>
<tr>
<td>TOMCAT</td>
<td>RUNNING</td>
<td>25967</td>
</tr>
<tr>
<td>webservice</td>
<td>RUNNING</td>
<td>26009</td>
</tr>
</tbody>
</table>

Node Type : service
Inventory DB( 172.29.109.135:3306 ) status : UP
Monitor DB( 172.29.109.144:3306 ) status : UP
Press return to continue ...

After you return to the shelladmin, the menu options change to those available for a service node.

Step 8  Repeat this procedure for every service node.

Options for Migrating from a Standalone Appliance to a Multi-Node Setup

You can choose between the following options for migrating a Cisco UCS Director, Release 4.0, standalone appliance to a multi-node setup:

- You restore a backup of the entire database from Cisco UCS Director, Release 4.0, to the Cisco UCS Director, Release 4.1, monitoring database and inventory database nodes. This option is similar to the database backup and restore you can perform through shelladmin.

- You back up the database from Cisco UCS Director, Release 4.0, separately for the inventory database and monitoring database nodes. If you choose this option, only selected database tables are backed up and restored to the monitoring and inventory databases. This option requires you to execute custom scripts from `/opt/infra`.

Note  You must upgrade to Cisco UCS Director, Release 4.1 before you can migrate to a multi-node setup and backup the database.

Migrating a Release 4.0 Standalone Appliance to a Multi-Node Setup with a Full Database Backup

This procedure restores all database tables to the inventory database and the monitoring database.
Before You Begin
You must have an FTP server with valid credentials to perform a backup and restore of the database.

Procedure

Step 1 In the shelladmin, upgrade the Cisco UCS Director, Release 4.0, standalone appliance to Cisco UCS Director, Release 4.1 with the Apply Patch option.
For more information, see the following:

- Upgrading from Cisco Unified Infrastructure Controller 3.x 32-bit to Cisco UCS Director, Release 4.1 64-bit, on page 37
- Upgrading from Cisco UCS Director, Release 4.0 to Release 4.1, on page 36

Step 2 In the shelladmin, choose Backup Database to backup the full database of the upgraded Cisco UCS Director.

Step 3 Deploy a Cisco UCS Director VM for each node in the multi-node setup.
See Installing Cisco UCS Director on VMware vSphere, on page 9.
For example, if your multi-node setup, includes a primary node, an inventory database, a monitoring database, and three service nodes, deploy six Cisco UCS Director VMs.

Step 4 In the shelladmin, configure the nodes in the following order:

1 Creating the Inventory Database, on page 25
2 Creating the Monitoring Database, on page 26
3 Creating the Primary Node, on page 26
4 Creating a Service Node, on page 27

Note You must create and start the inventory database and the monitoring database nodes before you configure the primary node and any service nodes.

Step 5 In the shelladmin, choose Stop services to stop the Cisco UCS Director services.

Step 6 Choose Restore database to import and restore the database backup that you took in Step 2.

Step 7 When prompted, choose Start services to start the Cisco UCS Director services.
After you log in to the primary node, all data from the database in the Cisco UCS Director, Release 4.0, standalone appliance should be available.

Migrating a Release 4.0 Standalone Appliance to a Multi-Node Setup with a Selected Database Backup
This procedure backs up and restores only the selected database tables required for each of the inventory database and the monitoring database.
Before You Begin

You must have an FTP server with valid credentials to perform a backup and restore of the database.

Procedure

Step 1 In the shelladmin, upgrade the Cisco UCS Director, Release 4.0, standalone appliance to Cisco UCS Director, Release 4.1 with the Apply Patch option.

For more information, see the following:

- Upgrading from Cisco Unified Infrastructure Controller 3.x 32-bit to Cisco UCS Director, Release 4.1 64-bit, on page 37
- Upgrading from Cisco UCS Director, Release 4.0 to Release 4.1, on page 36

Step 2 In the shelladmin, choose Login as Root to log in to the upgraded Cisco UCS Director.

Step 3 Back up the database tables required for the inventory database, as follows:

a) Navigate to the /opt/infra folder.

   cd /opt/infra

b) From Infra, run the dbInfraBackupRestore.sh script.

   # ./dbInfraBackupRestore.sh backup

   This script takes a database backup with the tables required for the inventory database.

c) After the script has been executed, check for an output file in /tmp folder named infra_database_backup.tar.gz.

Step 4 Back up the database tables required for the monitoring database, as follows:

a) Navigate to the /opt/infra folder.

   cd /opt/infra

b) From Infra, run the dbMonitoringBackupRestore.sh script.

   # ./dbMonitoringBackupRestore.sh backup

   This script takes a database backup with the tables required for the monitoring database.

c) After the script has been executed, check for an output file in /tmp folder named monitoring_database_backup.tar.gz.

Step 5 Deploy a Cisco UCS Director VM for each node in the multi-node setup.

See Installing Cisco UCS Director on VMware vSphere, on page 9.

For example, if your multi-node setup, includes a primary node, an inventory database, a monitoring database, and three service nodes, deploy six Cisco UCS Director VMs.

Step 6 In the shelladmin, configure the nodes in the following order:

1 Creating the Inventory Database, on page 25
2 Creating the Monitoring Database, on page 26
3 Creating the Primary Node, on page 26
4 Creating a Service Node, on page 27

Note You must create and start the inventory database and the monitoring database nodes before you configure the primary node and any service nodes.

Step 7 In the shelladmin, choose Stop services to stop the Cisco UCS Director services on the primary node and all service nodes.

Step 8 Restore the database to the inventory database, as follows:
   a) Copy the infra_database_backup.tar.gz to the /tmp folder on the node that hosts the inventory database.
   b) On the inventory database node, navigate to the /opt/infra folder.

   cd /opt/infra

   c) From Infra, run the dbInfraBackupRestore.sh script.

   # ./dbInfraBackupRestore.sh restore

   The script restores the database backup from the backup file in the /tmp folder.

Step 9 Restore the database to the monitoring database, as follows:
   a) Copy the monitoring_database_backup.tar.gz to the /tmp folder on the node that hosts the monitoring database.
   b) Navigate to the /opt/infra folder.

   cd /opt/infra

   c) From Infra, run the dbMonitoringBackupRestore.sh script.

   # ./dbMonitoringBackupRestore.sh restore

   The script restores the database backup from the backup file in the /tmp folder.

Step 10 Choose Start services on the primary node and all service nodes to start the Cisco UCS Director services.
After you log in to the primary node, all data from the database in the Cisco UCS Director, Release 4.0, standalone appliance should be available.
Restarting Cisco UCS Director

This chapter contains the following sections:

- Restarting Cisco UCS Director, page 33

**Restarting Cisco UCS Director**

If you see errors after installing Cisco UCS Director, log into the Secure Shell (SSH) client and run scripts to verify whether services are running or not.

**Procedure**

**Step 1**
Using the Cisco UCS Director IP address, log in with the following credentials:

a) User—shelladmin  
b) Password—changeme

If you have already logged into the shelladmin and changed the default password, use your new password instead.

After you have logged in, you can choose Change shelladmin password to change the default password.

**Step 2**
To display the status of all services, choose Display services status. If this option is not available, you can use SSH to restart the services.

**Step 3**
Verify that the following services appear:

1. Broker  
2. Controller  
3. Eventmgr  
4. Client  
5. Idaccessmgr  
6. Inframgr  
7. Tomcat  
8. Websock  
9. Database (mysqld)

**Note** Services that start in the background do not appear in the window.
Step 4 Choose Stop services.
Step 5 To verify that all services are stopped, choose Display services status.
Step 6 To restart services, choose Start services.
Upgrading Cisco UCS Director

This chapter contains the following sections:

- Supported Upgrade Paths, page 35
- Upgrading from Cisco UCS Director, Release 4.0 to Release 4.1, page 36
- Upgrading from Cisco Unified Infrastructure Controller 3.x 32-bit to Cisco UCS Director, Release 4.1 64-bit, page 37

Supported Upgrade Paths

The upgrade path to Cisco UCS Director, Release 4.1 depends upon your current version of Cisco UCS Director.

**Upgrading from Cisco UCS Director, Release 3.x to Release 4.1**

You cannot upgrade directly from Cisco UCS Director, Release 3.x to Release 4.1. If you plan to upgrade to Cisco UCS Director, Release 4.1 from any of the following releases, you must first upgrade to Cisco UCS Director, Release 4.0:

- 3.4.0.1
- 3.4.1.1
- 3.4.1.2
- 3.4.1.3
- 3.4.1.4

For information about how to upgrade to Cisco UCS Director, Release 4.0, see the installation and upgrade guide for that release.

**Upgrading from Cisco UCS Director, Release 4.0 to Release 4.1**

You can upgrade directly to Cisco UCS Director, Release 4.1 from any of the following releases:

- 4.0.0.2
Upgrading to Cisco UCS Director, Patch Release 4.1.0.3A

You can upgrade directly to Cisco UCS Director, Patch Release 4.1.0.3A as follows:

<table>
<thead>
<tr>
<th>Type of Setup</th>
<th>Supported Upgrade Paths</th>
</tr>
</thead>
<tbody>
<tr>
<td>Single Node Setup</td>
<td>• 4.0.x.x to 4.1.0.3A&lt;br&gt;• 4.1.0.x to 4.1.0.3A</td>
</tr>
<tr>
<td>Multi-Node Setup</td>
<td>• 4.1.0.0 directly to 4.1.0.2 or 4.1.0.3A&lt;br&gt;• 4.1.0.1 directly to 4.1.0.2 or 4.1.0.3A&lt;br&gt;• 4.1.0.2 directly to 4.1.0.3A</td>
</tr>
</tbody>
</table>

Upgrading from Cisco UCS Director, Release 4.0 to Release 4.1

Before You Begin

- Download the Cisco UCS Director, Release 4.1 patch from [http://www.cisco.com](http://www.cisco.com).
- Place the software in the FTP or HTTP server that you plan to use to install the upgrade.
- If NFS mount is used for application storage, disable it before you apply a patch. If you do not, the upgrade will fail.

Note

We recommend that you take a snapshot of the VM before you begin the upgrade. If you do this, you do not need to back up the existing configuration database through an FTP server.

Procedure

**Step 1** Start Cisco UCS Director, Release 4.0.

**Step 2** In the shelladmin, choose `Stop services` to stop all services.

**Step 3** To verify that all services are stopped, choose `Display services status`.

**Step 4** (Optional) If desired, you can choose `Backup database` to back up the Cisco UCS Director database. You do not need to back up the database if you took a snapshot of the VM before you started.
Step 5  To upgrade Cisco UCS Director to Release 4.1, choose Apply patch.

Step 6  When prompted, enter the location of the Release 4.1 patch.
ftp://username:password@hostname/IP_address/software_location_and_name

Step 7  Wait for the download and installation to complete.

Step 8  When prompted, choose Start services to start services and complete the upgrade process.

Note  After you apply the upgrade patch and complete that installation, choose the Start Services option of ShellAdmin to start/restart the Cisco UCS Director services and complete the patch process. The patch process is not complete or successful until the Cisco UCS Director services have started, the Cisco UCS Director appliance GUI is available, the login screen is displayed, and the admin user can log in to Cisco UCS Director.

All Cisco UCS Director services must be started before you attempt to perform other shelladmin procedures, such as apply additional patches, take a database backup, or restore a database from a backup.

Upgrading from Cisco Unified Infrastructure Controller 3.x 32-bit to Cisco UCS Director, Release 4.1 64-bit

Before you upgrade to Cisco UCS Director, Release 4.1, you must first install Cisco UCS Director, Release 4.0 and import the Cisco Unified Infrastructure Controller 3.x database to normalize it.

Before You Begin
• Download the following from http://www.cisco.com:
  ◦ Cisco UCS Director, Release 4.0 software
  ◦ Cisco UCS Director, Release 4.1 patch
• Place the software in the FTP or HTTP server that you plan to use to install the upgrade.
• If NFS mount is used for application storage, disable it before you apply a patch. If you do not, the upgrade will fail.
Procedure

Step 1 Start Cisco Unified Infrastructure Controller 3.x 32-bit.
Step 2 In the shelladmin, choose Stop services to stop all services in Cisco UCS Director.
Step 3 To verify that all services are stopped, choose Display services status.
Step 4 To back up the Cisco UCS Director database, choose Backup database.
Step 5 Install the Cisco UCS Director 4.0 64-bit appliance as a new appliance by following the installation instructions in Installing Cisco UCS Director on VMware vSphere, on page 9.
Step 6 In the shelladmin, choose Stop services to stop the services in Cisco UCS Director, Release 4.0.
Step 7 Choose Restore database to import and restore the backup of the Cisco Unified Infrastructure Controller 3.x 32-bit database that you took in Step 4.
When the database is imported, it is normalized so that it can be used by Cisco UCS Director, Release 4.1.
Step 8 When prompted, choose Start services to start services for Cisco UCS Director, Release 4.0.
Step 9 Upgrade Cisco UCS Director, Release 4.0 to Release 4.1 by following the upgrade instructions in Upgrading from Cisco UCS Director, Release 4.0 to Release 4.1, on page 36.

Note After you apply the upgrade patch and complete that installation, choose the Start Services option of ShellAdmin to start/restart the Cisco UCS Director services and complete the patch process. The patch process is not complete or successful until the Cisco UCS Director services have started, the Cisco UCS Director appliance GUI is available, the login screen is displayed, and the admin user can log in to Cisco UCS Director.

All Cisco UCS Director services must be started before you attempt to perform other shelladmin procedures, such as apply additional patches, take a database backup, or restore a database from a backup.
This appendix contains the following sections:

- Port List, page 39

### Port List

<table>
<thead>
<tr>
<th>Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>SSH Port</td>
<td>22</td>
</tr>
<tr>
<td>HTTP (S)</td>
<td>80/443</td>
</tr>
<tr>
<td>Citrix licensing</td>
<td>TCP 27000 &amp; 7279, 8082 (Mgmt)</td>
</tr>
<tr>
<td>Virtual Desktop Agent for Desktops</td>
<td>TCP 2598/1494/2112/2513</td>
</tr>
<tr>
<td>DHCP</td>
<td>UDP 67 &amp; 68</td>
</tr>
<tr>
<td>Active Directory</td>
<td>TCP / UDP 389/636 &amp; TCP 3268/3269</td>
</tr>
<tr>
<td>DNS</td>
<td>TCP/UDP 53</td>
</tr>
<tr>
<td>NTP</td>
<td>TCP/UDP 123</td>
</tr>
<tr>
<td>MySQL</td>
<td>3306</td>
</tr>
<tr>
<td>Cisco UCS Director + VNC Connectivity</td>
<td>8787 and 599</td>
</tr>
<tr>
<td>Cisco UCS Director + RDP Connectivity</td>
<td>3389</td>
</tr>
<tr>
<td>Cisco UCS Director + NetApp Connectivity</td>
<td>80/443/8080</td>
</tr>
<tr>
<td>Cisco UCS Director + UCSM Connectivity</td>
<td>80/443</td>
</tr>
<tr>
<td>Name</td>
<td>Description</td>
</tr>
<tr>
<td>-----------------------------------------------------------</td>
<td>---------------------------------</td>
</tr>
<tr>
<td>Cisco UCS Director + vCenter Connectivity</td>
<td>80/443</td>
</tr>
<tr>
<td>RDP</td>
<td>3389</td>
</tr>
<tr>
<td>SMB/RPC</td>
<td>TCP 135/445</td>
</tr>
<tr>
<td>Kerberos</td>
<td>TCP/UDP 88</td>
</tr>
<tr>
<td>Netbios Name (nbname)</td>
<td>TCP/UDP 137</td>
</tr>
<tr>
<td>NetBios datagram (nbdatagram)</td>
<td>TCP/UDP 138</td>
</tr>
<tr>
<td>Netbios session (nbsession)</td>
<td>TCP/139</td>
</tr>
<tr>
<td>Desktop Delivery Controller &lt;---&gt; vCenter</td>
<td>80/443</td>
</tr>
<tr>
<td>Desktop Delivery Controller &lt;---&gt; Virtual Desktops</td>
<td>8080 Thru ICA</td>
</tr>
<tr>
<td>Users (Citrix Recvr) &lt;---&gt; Virtual Desktops</td>
<td>1494, 2598, 2512, 2513</td>
</tr>
<tr>
<td>Desktop Delivery Controller &lt;---&gt; Active Directory</td>
<td>389/636 (LDAP Ports)</td>
</tr>
<tr>
<td>Virtual Desktops &lt;---&gt; Active Directory + DNS</td>
<td>389/636, 3268/3269, 53</td>
</tr>
<tr>
<td>PowerShell Agent &lt;---&gt; Xendesktop through WinRM</td>
<td>5985 / 5896</td>
</tr>
<tr>
<td>Cisco UCS Director &lt;---&gt; PowerShell Agent</td>
<td>43891</td>
</tr>
<tr>
<td>XenApp</td>
<td>TCP 80/8081</td>
</tr>
</tbody>
</table>