



Cisco UCS Director Installation on Microsoft Hyper-V Manager, Release 5.5

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Audience

This guide is intended primarily for data center administrators who use Cisco UCS Director 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

| Text Type | Indication |
|-----------------|---|
| GUI elements | GUI elements such as tab titles, area names, and field labels appear in this font . Main titles such as window, dialog box, and wizard titles appear in this font . |
| Document titles | Document titles appear in <i>this font</i> . |
| TUI elements | In a Text-based User Interface, text the system displays appears in <code>this font</code> . |

| Text Type | Indication |
|---------------|---|
| System output | Terminal sessions and information that the system displays appear in <i>this font</i> . |
| CLI commands | CLI command keywords appear in this font . Variables in a CLI command appear in <i>this font</i> . |
| [] | Elements in square brackets are optional. |
| {x y z} | Required alternative keywords are grouped in braces and separated by vertical bars. |
| [x y z] | Optional alternative keywords are grouped in brackets and separated by vertical bars. |
| string | A nonquoted set of characters. Do not use quotation marks around the string or the string will include the quotation marks. |
| < > | Nonprinting characters such as passwords are in angle brackets. |
| [] | Default responses to system prompts are in square brackets. |
| !, # | An exclamation point (!) or a pound sign (#) at the beginning of a line of code indicates a comment line. |

**Note**

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

**Caution**

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

**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.

**Timesaver**

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

**Warning****IMPORTANT SAFETY INSTRUCTIONS**

This warning symbol means danger. You are in a situation that could cause bodily injury. Before you work on any equipment, be aware of the hazards involved with electrical circuitry and be familiar with standard practices for preventing accidents. Use the statement number provided at the end of each warning to locate its translation in the translated safety warnings that accompanied this device.

SAVE THESE INSTRUCTIONS

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>.

**Note**

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, using the Cisco Bug Search Tool (BST), submitting a service request, and gathering additional information, see [What's New in Cisco Product Documentation](#).

To receive new and revised Cisco technical content directly to your desktop, you can subscribe to the [What's New in Cisco Product Documentation RSS feed](#). RSS feeds are a free service.



Overview

This chapter contains the following sections:

- [Cisco UCS Director, page 1](#)
- [Cisco UCS Director for Hyper-V, page 5](#)
- [Prerequisites, page 6](#)
- [Minimum System Requirements for a Single Node Setup, page 6](#)
- [About Licenses, page 8](#)
- [Upgrading a Single Node, page 9](#)

Cisco UCS Director

Cisco UCS Director is a complete, highly secure, end-to-end management, orchestration, and automation solution for a wide array of Cisco and non-Cisco data infrastructure components, and for the industry's leading converged infrastructure solutions based on the Cisco UCS and Cisco Nexus platforms. For a complete list of supported infrastructure components and solutions, see the [Cisco UCS Director Compatibility Matrix](#).

Cisco UCS Director 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

Management through Cisco UCS Director

Cisco UCS Director extends the unification of computing and network layers through Cisco UCS to provide you with comprehensive visibility and management of your data center infrastructure components. You can use Cisco UCS Director to configure, administer, and monitor supported Cisco and non-Cisco components. The tasks you can perform include the following:

- Create, clone, and deploy service profiles and templates for all Cisco UCS servers and compute applications.

- Monitor organizational usage, trends, and capacity across a converged infrastructure on a continuous basis. For example, you can view heat maps that show virtual machine (VM) utilization across all your data centers.
- Deploy and add capacity to converged infrastructures in a consistent, repeatable manner.
- Manage, monitor, and report on data center components, such as Cisco UCS domains or Cisco Nexus network devices.
- Extend virtual service catalogs to include services for your physical infrastructure.
- Manage secure multi-tenant environments to accommodate virtualized workloads that run with non-virtualized workloads.

Automation and Orchestration with Cisco UCS Director

Cisco UCS Director enables you to build workflows that provide automation services, and to publish the workflows and extend their services to your users on demand. You can collaborate with other experts in your company to quickly and easily create policies. You can build Cisco UCS Director workflows to automate simple or complex provisioning and configuration processes.

Once built and validated, these workflows perform the same way every time, no matter who runs the workflows. An experienced data center administrator can run them, or you can implement role-based access control to enable your users and customers to run the workflows on a self-service, as needed, basis.

With Cisco UCS Director, you can automate a wide array of tasks and use cases across a wide variety of supported Cisco and non-Cisco hardware and software data center components. A few examples of the use cases that you can automate include, but are not limited to:

- VM provisioning and lifecycle management
- Network resource configuration and lifecycle management
- Storage resource configuration and lifecycle management
- Tenant onboarding and infrastructure configuration
- Application infrastructure provisioning
- Self-service catalogs and VM provisioning
- Bare metal server provisioning, including installation of an operating system

Features and Benefits

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

| Feature | Benefit |
|--------------------|--|
| Central management | <ul style="list-style-type: none"> • Provides a single interface for administrators to monitor, provision, and manage the system across physical, virtual, and bare metal environments • Provides unified dashboards, reports, and heat maps, which reduce troubleshooting and performance bottlenecks |

| Feature | Benefit |
|-----------------------------|--|
| Self-service catalog | <ul style="list-style-type: none"> • Allows end users to order and deploy new infrastructure instances following IT-prescribed policies and governance |
| Adaptive provisioning | <ul style="list-style-type: none"> • Provides a real-time available capability, internal policies, and application workload requirements to optimize the availability of your resources |
| Dynamic capacity management | <ul style="list-style-type: none"> • Provides continuous monitoring that indicates real-time infrastructure consumption to improve capacity planning and management • Identifies underutilized and overutilized resources |
| Multiple hypervisor support | <ul style="list-style-type: none"> • Supports VMware ESX, ESXi, Microsoft Hyper-V, and Red Hat hypervisors |
| Computing management | <ul style="list-style-type: none"> • Monitors, manages, and provisions physical, virtual, and bare metal servers, as well as blades • Allows end users to implement virtual machine life-cycle management and business continuance through snapshots • Allows administrators to access server utilization trending analysis |
| Network management | <ul style="list-style-type: none"> • 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 | <ul style="list-style-type: none"> • 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. |

Physical and Virtual Management Features

| | |
|---|--|
| Physical Server Management <ul style="list-style-type: none"> • Discover and collect configurations and changes • Monitor and manage physical servers • Perform policy-based server provisioning • Manage blade power • Manage the server life cycle • Perform server use trending and capacity analysis • Perform bare metal provisioning using preboot execution environment (PXE) boot management | Virtual Computing Management <ul style="list-style-type: none"> • 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 life cycle and snapshots • Perform analytics to assess VM capacity, sprawl, and host utilization |
| Physical Storage Management <ul style="list-style-type: none"> • 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 <ul style="list-style-type: none"> • Discover, collect, and monitor storage of vFilers and storage pools • Perform policy-based storage provisioning for thick and thin clients • Create new datastores 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 <ul style="list-style-type: none"> • 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 <ul style="list-style-type: none"> • 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 |

Model-Based Orchestration

The turnkey solution in Cisco UCS Director that allows rapid creation of workflows and templates includes a task library containing many tasks, as well as out-of-the-box workflows.

Model-based orchestration and a workflow designer enable IT administrators to customize and automate infrastructure administrative and operational tasks. You can extend and customize the system to meet individual needs.

Included in the task library are Day 1 through Day 3 maintenance and update activities, as shown in the following table:

| Day-1 | Day-2 | Day-3 |
|---|--|--|
| <ul style="list-style-type: none">• Add tenants• Migrate or add applications• Integrate with enterprise systems• Use self-service portal | <ul style="list-style-type: none">• Monitor performance• Start metering and billing• Manage tenant changes• Self-service IaaS | <ul style="list-style-type: none">• Add/upgrade hardware• Repurpose |

POODLE Vulnerability

To avoid POODLE vulnerability, SSL Version 2 and SSL Version 3 are disabled on Cisco UCS Director north-bound HTTP interface by configuring Apache Tomcat to allow only TLS . Hence, any north-bound applications accessing Cisco UCS Director through REST API will be connected through TLS. Also, the browsers will be connected to Cisco UCS Director through TLS. For more information, refer <http://tools.cisco.com/security/center/content/CiscoSecurityAdvisory/cisco-sa-20141015-poodle>.

Cisco UCS Director for Hyper-V

Cisco UCS Director can be deployed in a Hyper-V environment.

**Note**

We recommend deploying Cisco UCS Director on the Hyper-V Manager host, rather than the SCVMM console.

**Note**

The appliance and bootup logs are located in the `/var/log/ucsd` directory.

- `install.log` contains the one time appliance installation logs.
- `bootup.log` contains the appliance boot-up sequence information, such as startup messages for the database and infrastructure services.

Prerequisites

- Installation of Microsoft System Center Virtual Machine Manager
- Configure a user account with SCVMM administrator privileges
- Cisco UCS Director can be deployed in any environment. If you only have a Hyper-V environment, Cisco UCS Director must be deployed on a Hyper-V host.

Minimum System Requirements for a Single Node Setup

The minimum system requirements depend upon how many VMs you plan to manage. We recommend deploying a Cisco UCS Director VM on a local datastore with a minimum of 25 Mbps I/O speed, or on an external datastore with a minimum of 50 Mbps I/O speed.

**Note**

- 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 memory reservation of more than or equal to 4GB. You should add more vCPUs if the Cisco UCS Director VM's CPU usage is consistently high.
- The minimum memory required for the `inframgr` service is automatically set during deployment. However, if you want to modify the memory for the `inframgr` service, edit the `inframgr.env` file available in the following location:

`/opt/infra/bin/inframgr.env`

In this file, update the "MEMORY_MAX" parameter to the value you want. After changing this parameter, restart the service for the changes to take effect. The default memory settings are MEMORY_MIN=128m and MEMORY_MAX=6144m.

For information about minimum system requirements for a multi-node setup, see [Cisco UCS Director Multi-Node Installation and Configuration Guide](#).

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

| Element | Minimum Supported Requirement |
|-----------|-------------------------------|
| vCPU | 4 |
| Memory | 12 GB |
| Hard Disk | 100 GB |

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

| Element | Minimum Supported Requirement |
|-----------|-------------------------------|
| vCPU | 8 |
| Memory | 20 GB |
| Hard Disk | 100 GB |

Table 3: Minimum Database Configuration

| Element | Minimum Supported Configuration |
|--------------------------|---------------------------------|
| thread_cache_size | 100 |
| max_connections | 1000 |
| innodb_lock_wait_timeout | 100 |
| query_cache_size | 128 MB |
| innodb_buffer_pool_size | 4096 MB |
| max_connect_errors | 10000 |
| connect_timeout | 20 |
| innodb_read_io_threads | 64 |
| innodb_write_io_threads | 64 |

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 8.
- 3 After you install Cisco UCS Director, update the license in Cisco UCS Director as described in [Updating the License](#), on page 14.
- 4 After the license has been validated, you can start to use Cisco UCS Director.

Fulfilling the Product Access Key

Before You Begin

You need the PAK number.

-
- Step 1** Navigate to the [Cisco Software License website](#).
- Step 2** If you are directed to the Product License Registration page, you can take the training or click **Continue to Product License Registration**.
- Step 3** On the Product License Registration page, click **Get New Licenses from a PAK or Token**.
- Step 4** In the **Enter a Single PAK or TOKEN to Fulfill** field, enter the PAK number.
- Step 5** Click **Fulfill Single PAK/TOKEN**.
- Step 6** Complete the additional fields in **License Information** to register your PAK:

| Name | Description |
|--------------------|---|
| Organization Name | The organization name. |
| Site Contact Name | The site contact name. |
| Street Address | The street address of the organization. |
| City or Town | The city or town. |
| State or Province | The state or province. |
| Zip or Postal Code | The zip code or postal code. |
| Country | The country name. |

- Step 7** Click **Issue Key**.

The features for your license appear, and you receive an email with the Digital License Agreement and a zipped license file.

Upgrading a Single Node

For more information on upgrading see [Cisco UCS Director Upgrade Guide, Release 5.5](#).



Installing Cisco UCS Director

This chapter contains the following sections:

- [Installing Cisco UCS Director on Microsoft Hyper-V, page 11](#)
- [Configuring the Network Interface using Shelladmin, page 12](#)
- [Changing the Default Password, page 13](#)
- [Updating the License, page 14](#)
- [Changing the Maximum Packet Size, page 14](#)

Installing Cisco UCS Director on Microsoft Hyper-V

Before You Begin

- System administrator privileges for Hyper-V are required.
- Win2k12 & Win2k12r2 are required to deploy Cisco UCS Director, Release 5.5

-
- | | |
|---------------|---|
| Step 1 | Log into the Hyper-V host. |
| Step 2 | Choose Start > Administrative Tools to open Hyper-V Manager . |
| Step 3 | In the Hyper-V Manager dialog box, choose Action > New Virtual Machine . |
| Step 4 | In the Before You Begin pane, click Next . |
| Step 5 | In the Name and Location pane, in the Name field, edit the VM name. |
| Step 6 | In the Name and Location pane, check the Store the virtual machine in a different location checkbox and specify the alternate location. |
| Step 7 | Click Next . |
| Step 8 | In the Select Generation pane, choose Generation1 . With Generation1 , this virtual machine provides the same virtual hardware to the virtual machine as in previous versions of Hyper-V. |

- Step 9** In the **Assign Memory** pane, enter the amount of memory to allocate to this VM (12 GB minimum) and click **Next**.
- Step 10** In the **Configure Networking** pane, in the **Connection** field, accept the default option **Not Connected** by clicking **Next**.
- Step 11** In the **Connect Virtual Hard Disk** pane, choose **Attach a virtual disk later** and click **Next**.
- Step 12** In the **Completing the New Virtual Machine Wizard** pane, verify the settings and click **Finish**.
- Step 13** In the **Navigation** pane, right-click the new VM and choose **Settings**.
- Step 14** In the **Navigation** pane, choose **IDE Controller 0**.
- Step 15** In the **IDE Controller** pane, choose **Hard Drive** and click **Add**.
- Step 16** In the **Hard Drive** pane, choose the downloaded Cisco UCS Director .vhd file and click **OK**.
- Step 17** Inspect the virtual hard drive properties.
- Step 18** In the **Navigation** pane, choose **Memory**.
- Step 19** In the **Memory** pane, enter the recommended value (minimum 12 GB).
- Step 20** In the **Navigation** pane, choose **Processor**.
- Step 21** In the **Processor** pane, enter the recommended value (4 vCPU).
- Step 22** Remove the network adapter that was created when you created the new VM.
- Step 23** In the **Navigation** pane, choose **Add Hardware**.
- Step 24** In the **Add Hardware** pane, choose **Network Adapter** and click **OK**.
- Step 25** In the **Navigation** pane, choose the network adapter.
- Step 26** In the **Network Adapter** pane, in the **Network** field, choose your network and click **OK**.
- Step 27** Verify that you have sufficient vCPU and Memory resources allocated. For the minimum resource requirements, see [Minimum System Requirements for a Single Node Setup](#), on page 6.
- Step 28** Power on the VM.
Optionally you can configure network properties from the shelladmin.

By default, this version of Microsoft Hyper-V uses DHCP by default. If you want to use a static IP address instead of DHCP, you can change this configuration through the shelladmin.
- Step 29** After the appliance has booted up, copy and paste the Cisco UCS Director IP address that is displayed into a supported web browser to access the **Login** page.
- Step 30** At the login prompt, enter `admin` for username and `admin` for the password to log into Cisco UCS Director.
- Note** Change your administrator password after this initial login.

What to Do Next

Update your license.

Configuring the Network Interface using Shelladmin

This procedure is optional.

-
- Step 1** Log in to 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 DHCP/STATIC IP [D/S]` prompt, enter one of the following choices:

- If DHCP is enabled, enter D (IP addresses are assigned automatically)
- To configure static IP, enter S, and then choose the interface you want to configure at the next prompt followed by the option to select IPv4 or IPv6. This is followed by the confirmation of the interface selected and the version of IP for which you select **Y** to continue. Then enter the following details:
 - IP address
 - Netmask
 - Gateway
 - DNS Server 1
 - DNS Server 2

Step 4 Confirm when prompted.

Changing the Default Password

Change the default password for administration after initial logging.

Step 1 On the menu bar, choose **Administration > Users and Groups**.

Step 2 Click the **Users** tab.

Step 3 Choose the administration user for which you want to change the default password.

Step 4 Click **Change Password**.

Step 5 In the **Change Password** dialog box, enter the new password and confirm it.

Step 6 Click **Save**.

Updating the License

Before You Begin

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

-
- Step 1** Choose **Administration > License**.
- Step 2** Click the **License Keys** tab.
- Step 3** Click **Update License**.
- Step 4** In the **Update License** dialog box, do the following:
- To upload a .lic file, click **Browse** to the base license's .lic file and select the .lic file, then click **Upload**.
- Step 5** Click **Submit**.
The license file is processed, and a message appears confirming the successful update.
-

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.

**Note**

For a multi-node setup, perform this configuration on the inventory database and monitoring database nodes.

-
- 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 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`.
-



Restarting Cisco UCS Director

This chapter contains the following sections:

- [Restarting Cisco UCS Director, page 15](#)

Restarting Cisco UCS Director

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

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. Websock
8. Tomcat
9. Flashpolicyd

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`.
-



Ports

This appendix contains the following sections:

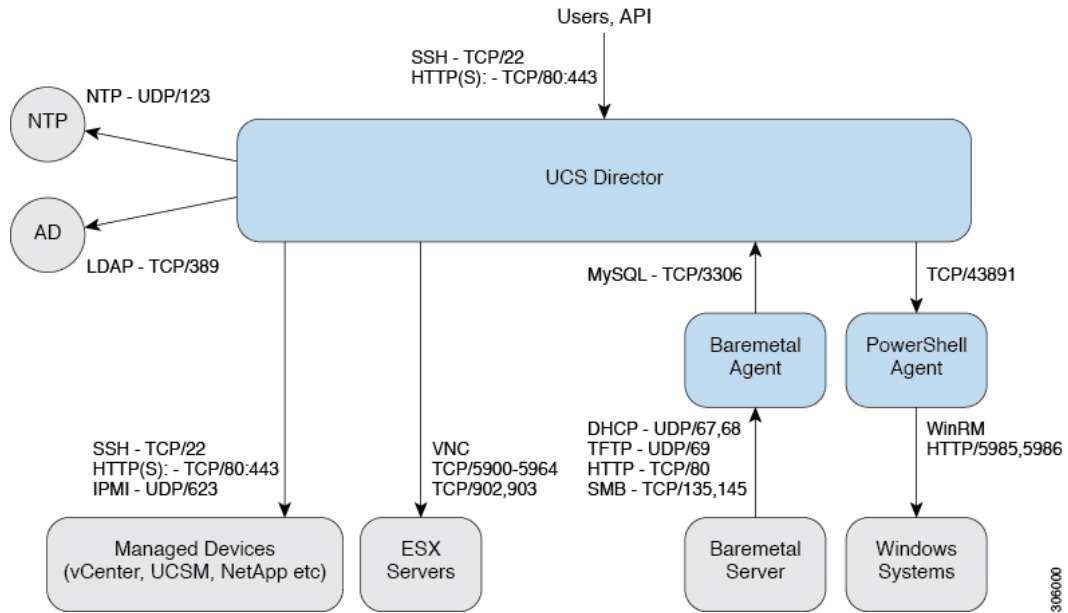
- [Cisco UCS Director TCP and UDP Port Usage, page 17](#)
- [Port List, page 18](#)
- [Multi-Node Port Requirements, page 20](#)

Cisco UCS Director TCP and UDP Port Usage

This section provides a list of the TCP and UDP ports that Cisco UCS Director uses for connections and communications with external applications or devices.

The following figure shows the network ports used for communication between the Cisco UCS Director appliance and managed devices, ESX servers, Bare Metal Agent, PowerShell Agent, NTP, and Active Directory.

Figure 1: Cisco UCS Director TCP and UDP Port Usage



Port List

| Default Port | Protocol | Description |
|------------------------|----------------|------------------------------------|
| 22 | TCP | SSH |
| 80 | TCP/UDP | HTTP |
| 443 | UDP | HTTPS |
| 27000/7279/8082 (Mgmt) | TCP | Citrix licensing |
| 2598/1494/2112/2513 | TCP | Virtual Desktop Agent for Desktops |
| 67/68 | UDP | DHCP |
| 389/636 3268/3269 | TCP/UDP TCP | Active Directory |
| 53 | TCP/UDP | DNS |
| 123 | TCP/UDP | NTP |
| 3306 | TCP/UDP | MySQL |

| Default Port | Protocol | Description |
|------------------------|----------|---|
| 8787/5900-5964 | TCP | Cisco UCS Director + VNC Connectivity |
| 3389 | TCP/UDP | Cisco UCS Director + RDP Connectivity |
| 80/443/8080 | TCP/UDP | Cisco UCS Director + NetApp Connectivity |
| 80/443 | UDP | Cisco UCS Director + Cisco UCS Manager Connectivity |
| 80/443 | UDP | Cisco UCS Director + vCenter Connectivity |
| 3389 | TCP/UDP | RDP |
| 135/445 | TCP | SMB/RPC |
| 88 | TCP/UDP | Kerberos |
| 137 | TCP/UDP | NetBIOS Name (nbname) |
| 138 | TCP/UDP | NetBIOS datagram (nbdatagram) |
| 139 | TCP | NetBIOS session (nbsession) |
| 80/443 | UDP | Desktop Delivery Controller <--> vCenter |
| 8080 through ICA | TCP | Desktop Delivery Controller <--> Virtual Desktops |
| 1494/2598/2512/2513 | TCP | Users (Citrix Recvr) <--> Virtual Desktops |
| 389/636 (LDAP Ports) | TCP/UDP | Desktop Delivery Controller <--> Active Directory |
| 389/636, 3268/3269, 53 | TCP/UDP | Virtual Desktops <--> Active Directory + DNS |
| 5985/5986 | TCP | PowerShell Agent <--> XenDesktop through WinRM |
| 43891 | TCP/UDP | Cisco UCS Director <--> PowerShell Agent |
| 80/8081 | TCP | XenApp |
| 902 | TCP | VMwareESXi host management and VM customization and to execute VIX tasks |
| 903 | TCP | VMwareESXi host management and VM customization and to execute VIX tasks (for VMware vCenter releases prior to 5.0) |

Multi-Node Port Requirements

The ports listed in [Cisco UCS Director TCP and UDP Port Usage, on page 17](#) are applicable for both single and multi-node setups.

For a multi-node setup, the following ports need to be opened between the nodes:

- From the primary and service node(s) to database nodes: port 3306
- From the primary node to service node(s): ports 80 and 443