Overview

This chapter contains the following sections:

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	• 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
Self-service catalog	• Allows end users to order and deploy new infrastructure instances following IT-prescribed policies and governance

Feature	Benefit
Adaptive provisioning	• Provides a real-time available capability, internal policies, and application workload requirements to optimize the availability of your resources
Dynamic capacity management	• Provides continuous monitoring that indicates real-time infrastructure consumption to improve capacity planning and management • Identifies underutilized and overutilized resources
Multiple hypervisor support	• Supports VMware ESX, ESXi, 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 life-cycle management and business continuance through snapshots • Allows administrators to access server utilization trending analysis
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.

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 life cycle • Perform server use trending and capacity analysis • Perform bare metal 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 life cycle 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 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 • 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

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
• Add tenants • Migrate or add applications • Integrate with enterprise systems • Use end user portal	• Monitor performance • Start metering and billing • Manage tenant changes • Self-service IaaS	• 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.
- 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.

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 6.0.