Managing a Scalable and Cohesive System

The Cisco Unified Computing System™ (Cisco UCS®) provides unified, embedded management of all software and hardware components with Cisco UCS Manager, which can control up to 160 servers in multiple chassis and thousands of Cisco UCS components. Every instance of Cisco UCS Manager and all the Cisco UCS components managed by it form a domain. Cisco UCS Central is a software product for scaling the management of multiple, globally distributed Cisco UCS domains from a single pane. The two Cisco UCS management products described here provide integration with industry-leading systems management solutions to ease adoption of Cisco UCS in IT departments.

Cisco UCS Manager

Cisco UCS Manager provides unified, embedded management of all software and hardware components of Cisco UCS across multiple chassis, Cisco UCS B-Series Blade Servers, Cisco UCS C-Series Rack Servers, and thousands of virtual machines. By enabling automation, Cisco UCS Manager delivers greater agility, integration, and scale for server operations, while reducing complexity and risk. It provides flexible role- and policy-based management, with service profiles and templates. An extensive XML API with a software development kit (SDK) that includes an emulator facilitates custom development to achieve new levels of system visibility and control. Through its simplified, ecosystem-friendly approach, Cisco UCS Manager helps reduce management and administration expenses, which are among the biggest expenses in most IT budgets.

Cisco UCS Central

Cisco UCS Central manages multiple, globally distributed domains from a single pane. Tightly integrated with Cisco UCS Manager for individual domains, it provides global configuration capabilities for service profiles, pools, policies, and firmware. It also aggregates inventory, fault, and audit information across multiple domains to facilitate service assurance for the Cisco UCS infrastructure. Like Cisco UCS Manager, Cisco UCS Central exposes an XML API for integration with customer and partner management solutions. Unlike Cisco UCS Manager, which is embedded in the Fabric Interconnects, Cisco UCS Central is a virtual machine image that can be run on a hypervisor. Cisco UCS Central uses Cisco UCS Manager as the engine that effects changes in individual domains. It builds on the capabilities provided by Cisco UCS Manager and facilitates large-scale standardized deployments of Cisco UCS in multiple globally distributed data centers.

Cisco UCS Management Concepts

Flexible, Role-Based Management

Cisco UCS management products offer role-based access that helps organizations make efficient use of their limited administrator resources. Server, network, and storage administrators maintain responsibility and accountability for their domain policies within an integrated management environment. Roles and privileges in the system can easily be modified and new roles quickly created.

Figure 1. Service Profiles Provide Automatic, End-to-End Configuration of the Entire Hardware Stack
Policy-Based Provisioning of Server, Network, and Storage Access Resources

Cisco UCS management products use service profiles to provision and manage Cisco UCS blade servers and rack servers and their I/O properties within management domains. Infrastructure policies needed to deploy applications are encapsulated in the service profile. The policies coordinate and automate element management at every layer of the hardware stack (Figure 1), including RAID levels, BIOS settings, firmware revisions and settings, adapter identities and settings, VLAN and VSAN network settings, network quality of service (QoS), and data center connectivity. This approach simplifies configuration and deployment of one server or hundreds of servers with potentially thousands of virtual machines.

Workload Portability

Virtualized and nonvirtualized environments benefit from service profiles. Workloads may need to be moved from server to server to change the hardware resources assigned to a workload or take a server offline for service or upgrade. They also can be used in conjunction with virtualization clusters to bring new resources online easily, complementing existing virtual machine mobility. With Cisco UCS Manager, service profiles can be applied, enabling faster provisioning and consistency of configuration policies for new servers and applications. Cisco UCS Central allows the use of global templates and thus helps enable workload mobility across data centers and geographies.

Multiple Interface Options

Cisco UCS management products offer multiple interface options. Cisco UCS Manager has a GUI and a command-line interface (CLI) for use by server, network, and storage administrators. Some examples of additional management interfaces are the Intelligent Platform Management Interface (IPMI); keyboard, video, and mouse (KVM); serial-over-LAN (SoL); and Simple Network Management Protocol (SNMP). Cisco UCS Manager and Cisco UCS Central both provide an XML API for integration with existing data center systems management tools from Cisco’s management ecosystem partners. The Cisco UCS Central GUI aggregates Cisco UCS inventory and fault information. Figure 2 shows the Cisco UCS Manager GUI with a view of the Cisco UCS 5108 Server Chassis equipment.

Enhanced Virtualization Support

The Cisco UCS Manager implementation of Cisco® Data Center Virtual Machine Fabric Extender (VM-FEX) technology consolidates virtual and physical networking into a single infrastructure. Data center administrators can use it to provision, configure, manage, monitor, and diagnose virtual machine network traffic and bare-metal network traffic in a unified infrastructure.

Resource Pooling

Server resources can be placed in pools based on various criteria, such as memory or CPU type. Service profiles and templates may require the use of servers from specific pools, and discovery policies can be created so that servers are automatically placed in an appropriate pool the moment they are inserted into a chassis. With Cisco UCS Central, the pools and IDs can be defined at an enterprise level, crossing geographic and data center boundaries.

Cisco UCS Manager in Operation

Cisco UCS Manager resides on a pair of Cisco UCS 6200 or 6100 Series Fabric Interconnects using a clustered, active-standby configuration for high availability. Cisco UCS Manager participates not only in server provisioning, but also in device discovery, inventory, configuration, diagnostics, monitoring, fault detection, auditing, and statistics collection. Cisco UCS Manager can export the system’s configuration information, if needed, for use in configuration management databases (CMDBs).
Cisco UCS Central in Operation
Cisco UCS Central is packaged and distributed as a virtual machine image in an OVF or VDH file, depending on the hypervisor in use. Cisco UCS Central can export the system’s configuration backup file through standard Secure FTP (SFTP) and Secure Copy (SCP) protocols. The configuration can also be extracted through the XML API. Cisco UCS Central allows the definition of global policies that can be applied in any of the registered domains.

Why Cisco?
Enhancing Cisco’s ability to deliver standards-based solutions is a broad ecosystem of industry-leading partners that provide end-to-end customer solutions and services that can accelerate the transition to a unified computing architecture. Unified computing elevates the traditional product classification of network, server, storage, operating systems, and applications to a data center–wide vision. Cisco Unified Computing Services helps our customers quickly deploy data center resources, simplify ongoing operations, and optimize infrastructure to better meet business needs. For more information about these and other Cisco Data Center Services offerings, visit http://www.cisco.com/go/unifiedcomputingservices.

Summary
Cisco UCS Manager Benefits and Features
• Service profiles and templates provide fast, consistent, compliant, and accurate configuration of the system.
• Policy-based management shifts the focus of IT from maintenance to strategic initiatives.
• Autodiscovery allows Cisco UCS Manager to detect and inventory any system components added or changed.
• Dynamic pooling enables policy-based, automatic grouping of servers into dynamic pools based on capacity, scale, or performance as the servers are discovered.
• The XML API facilitates integration with third-party systems management tools from a robust ecosystem of leading providers and developers to further support transparent deployments.
• A centralized management interface integrates the entire set of Cisco UCS components across multiple chassis.
• Role-based administration builds on existing skills and best practices and supports collaboration across disciplines.
• A high-availability configuration is provided with the use of two fabric interconnects.

Cisco UCS Central Benefits and Features
• Complements Cisco UCS Manager
• Enables management of multiple domains across data centers and geographies
• Provides model-based management and an XML API for large-scale automation
• Simplifies global operations with a centralized view of inventory, faults and logs
• Facilitates the use of global policies, service profiles, ID pools, and templates
• Provides the foundation for high availability, disaster recovery, and workload mobility

For More Information