

Solution Overview

Enable Local and Global Infrastructure Scale with Cisco UCS Central Software



Contents

What You Will Learn..... 3

The Challenge: Disaggregated Computing Resources 3

The Solution: Cisco UCS Central Software 4

Global Awareness of Inventory..... 5

Automated Standards Compliance..... 6

Increased Business Agility..... 6

Increased Asset Utilization 7

Meeting and Exceeding Service-Level Agreements 7

Helping Business Organizations Manage 8

Cisco UCS Central Architecture..... 9

Built on Foundational Cisco UCS Manager Concepts 9

Cisco UCS Central Software Extends Unified Management to Multiple Domains . 10

Deployment Architecture..... 15

Conclusion 17

For More Information 18

Enable Local and Global Infrastructure Scale with Cisco UCS Central Software

Solution Overview
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What You Will Learn

Cisco UCS® Central Software helps business organizations manage growth within data centers and across the world by enabling the management of multiple Cisco Unified Computing System™ (Cisco UCS) instances. The software provides global awareness of inventory and operations statistics, automated standards compliance, increased asset utilization, increased business agility, and improved capability to meet service-level agreements (SLAs). Written for technical decision makers, this document presents an overview of Cisco UCS Central Software, which helps provide these business benefits by extending the capabilities of Cisco UCS Manager to support data centers worldwide.

The Challenge: Disaggregated Computing Resources

Meeting the challenge of staying ahead in a crowded marketplace demands the deployment of increasing numbers of servers in individual data centers and across every geographic region that a business organization serves. Today's scalability challenges are the outcome of three universal trends:

- **Mobile applications are everywhere:** To an increasing degree, both business and personal processes are automated by a collection of applications that run on hundreds of millions of consumer devices worldwide. For all kinds of tasks, including booking airline flights, making restaurant reservations, navigating to the restaurant, and maintaining medical records in a health provider's office, there's a mobile application that runs on smartphones and tablets. Nearly all mobile applications need back-end servers to support them, and they need massive amounts of computing power and immense amounts of storage. These requirements result in increased growth in individual data centers and also the demand to position multiple data centers close to customers and their mobile devices.
- **Growth in online services:** Classic e-commerce characterized by transactional interfaces in desktop environments is thriving, with an increasing number of business-to-consumer (B2C) transactions also demanding back-end

infrastructure. While traditional B2C continues to experience steady growth, a new class of services including social networking, video processing, photo sharing, and salesforce automation propels even more growth.

- **Rise of hosted services:** For every mobile application or online service, there are business-to-business (B2B) services that support it on the back end. Applications using maps obtain them from a hosted service. Airline reservation applications interoperate with B2B booking agencies. Salesforce automation tools are hosted in public clouds. Virtual desktops are hosted in enterprise environments and for public consumption. Personal and business telephony has increasingly become an Internet protocol-based service that is hosted in enterprise and service provider data centers.

These three trends increase the overall demand for servers and the extent to which computing power is distributed around the world. Indeed, virtualization helps maintain high levels of server utilization in the midst of growth, but the fact is that more servers are needed to support the growing number and sophistication of B2C and B2B applications. To an increasing degree, computing power is disaggregated from client devices, making it imperative to locate the computing power for applications as close to clients as possible to reduce latency and accelerate application response time.

Business organizations need to manage the growth and change that is occurring within individual data centers and also on a global scale, but they also must not lose sight of traditional management concerns:

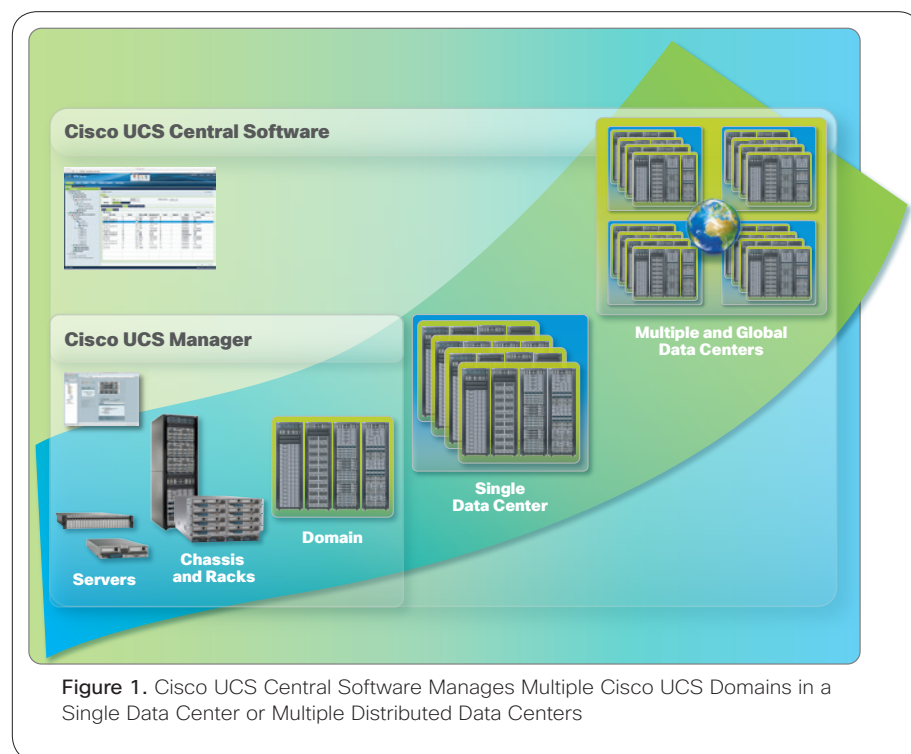
- Standards compliance becomes more important as large amounts of user data must be kept secure and within the political boundaries of host nations.
- Cost containment is more important than ever as tens of thousands of servers can easily be deployed to support a single application.
- Business agility is diminished if traditional data center management approaches are simply replicated in each data center distributed around the world, because of the manual coordination required and the need to communicate across languages and time zones.
- The capability to meet service-level agreements (SLAs) with high performance and availability 24 hours a day, 7 days a week (24/7), requires multisite distribution that is challenging to manage.
- Massive scalability is needed to support the dramatic growth that can take place as new applications are accepted into new markets. The capability to scale down, reallocate, and power off resources is also a necessity for efficient resource utilization.

The Solution: Cisco UCS Central Software

The Cisco Unified Computing System™ (Cisco UCS®) has made business organizations not just more efficient but more effective in their missions because it automates IT in a way that no other product has accomplished. Cisco UCS was designed from the beginning so that every aspect of server personality, configuration, and connectivity can be managed through software. Embedded Cisco UCS Manager software integrates every system component into a single unified

system, referred to in this document as a domain. Cisco UCS is self-aware and self-integrating, allowing software—rather than time-consuming, error-prone, manual processes—to configure every aspect of a server's configuration.

For Cisco UCS customers managing growth within a single data center, growth across multiple sites, or both, Cisco UCS Central Software centrally manages multiple Cisco UCS domains using the same concepts that Cisco UCS Manager uses to support a single domain (Figure 1). Cisco UCS Central Software manages global resources (including identifiers and policies) that can be consumed within individual Cisco UCS Manager instances. It can delegate the application of policies (embodied in global service profiles) to individual domains, where Cisco UCS Manager puts the policies into effect. In its first release, Cisco UCS Central Software can support up to 10,000 servers in a single data center or distributed around the world in as many domains as are used for the servers.

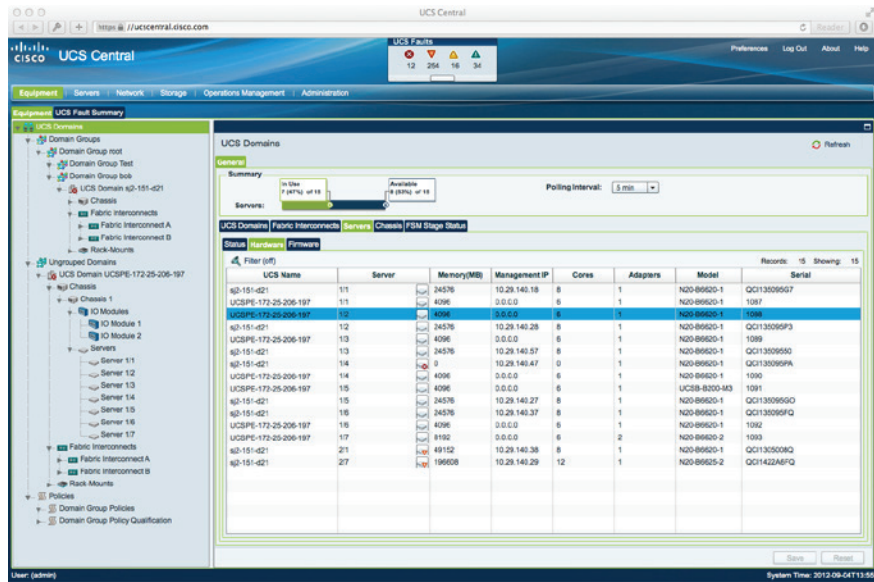


Cisco UCS Central Software enables the local and global scalability that business organizations need to be more effective in a future that includes mobile applications with large amounts of back-end processing power, growth in traditional B2C electronic commerce, and transactions between businesses that support both.

Global Awareness of Inventory

Cisco UCS Manager automatically discovers and integrates any component installed in a domain, and Cisco UCS Central Software uses the self-awareness of each individual domain to establish a global inventory of every component in the systems that it manages (Figure 2).

For the first time, business organizations can experience the benefits of an automated, accurate, and up-to-date inventory of every device that is plugged into a Cisco UCS domain. Cisco UCS Central Software takes the guesswork out of tracking every server, memory module, internal disk drive, I/O interface, and firmware revisions and settings by hand. What used to be a tedious and error-prone process is now automated, giving administrators more time to focus on strategic initiatives and giving organizations implementing ITIL processes a boost over their competitors.



The screenshot displays the Cisco UCS Central Software interface. On the left, a navigation pane shows a hierarchical tree of UCS domains, including 'UCS Domain k2-151-421' and 'UCS Domain UCSPE-172-25-206-197'. The main panel shows the 'UCS Domains' summary, with a table listing various servers and their attributes. The table includes columns for UCS Name, Server, Memory (MB), Management IP, Cores, Adapters, Model, and Serial. The data is filtered to show 15 records.

UCS Name	Server	Memory (MB)	Management IP	Cores	Adapters	Model	Serial
k2-151-421	1/1	24576	10.29.140.15	8	1	N20-89520-1	QC113009057
UCSPE-172-25-206-197	1/1	4096	0.0.0.0	8	1	N20-89520-1	1081
UCSPE-172-25-206-197	1/2	4096	0.0.0.0	8	1	N20-89520-1	1086
k2-151-421	1/2	24576	10.29.140.26	8	1	N20-89520-1	QC113009053
UCSPE-172-25-206-197	1/3	4096	0.0.0.0	8	1	N20-89520-1	1089
k2-151-421	1/3	24576	10.29.140.57	8	1	N20-89520-1	QC113009050
k2-151-421	1/4	0	10.29.140.47	0	1	N20-89520-1	QC11300905A
UCSPE-172-25-206-197	1/4	4096	0.0.0.0	8	1	N20-89520-1	1090
UCSPE-172-25-206-197	1/5	4096	0.0.0.0	8	1	UCSPE-8200-403	1091
k2-151-421	1/5	24576	10.29.140.27	8	1	N20-89520-1	QC11300905G
k2-151-421	1/6	24576	10.29.140.37	8	1	N20-89520-1	QC11300905Q
UCSPE-172-25-206-197	1/6	4096	0.0.0.0	8	1	N20-89520-1	1092
UCSPE-172-25-206-197	1/7	4096	0.0.0.0	8	2	N20-89520-2	1093
k2-151-421	2/1	49152	10.29.140.36	8	1	N20-89520-1	QC11300906Q
k2-151-421	2/7	196608	10.29.140.29	12	1	N20-89525-2	QC11422A6Q

Figure 2. Cisco UCS Central Software Establishes an Accurate, Up-to-Date Global Inventory

Automated Standards Compliance

Cisco UCS Central Software makes global policy and compliance easier. When Cisco UCS domains are registered with Cisco UCS Central Software, they can be configured to automatically inherit global identifiers and policies that are centrally defined and managed. Making identifiers such as universal user IDs (UUIDs), MAC addresses, and worldwide names (WWNs) global resources allows every server worldwide to be configured uniquely so that identifier conflicts are automatically avoided. Globally defined policies take this concept significantly further: by defining and enforcing server identity, configuration, and connectivity policies centrally, standards compliance is essentially ensured. The system simply will not configure a server in why that is inconsistent with standards, and configuration drift and an entire class of errors that can cause downtime are avoided.

Increased Business Agility

Central control over a global pool of resources increases business agility through workload mobility. Server configurations can be dynamically adjusted to meet changing business requirements within minutes. For example, if the back-end software supporting a mobile application is experiencing heavy use, the private

cloud supporting it can be scaled up by recruiting available servers from other Cisco UCS domains in the same data center or from other data centers in other regions. Similarly, Cisco UCS Central Software accelerates the provisioning of new servers to support new applications by defining server configuration policies centrally and making them available for use in every Cisco UCS domain worldwide. Now every server supporting the new application is provisioned identically.

The capability of Cisco UCS Manager and Cisco UCS Central Software to manage both rack and blade servers gives organizations more flexibility in their use of resources. Some IT departments prefer a rack-mount form factor for the enhanced storage, I/O, and PCI Express (PCIe) device support that it can offer. Some organizations prefer the density and uniformity of blade servers. No matter what business factors are a priority, Cisco UCS Central Software offers the same management capabilities for each form factor.

Increased Asset Utilization

Cost containment is an essential focus of nearly every IT department, and increasing the utilization of both software and hardware assets avoids expenditures that would otherwise be necessary if it were not for Cisco UCS and Cisco UCS Central Software.

The operation statistics that Cisco UCS Central Software provides makes it straightforward to assess server utilization on a global scale. This information can be used to make centralized resource allocation decisions: for instance, powering down servers that are underutilized, and rightsizing applications by changing the mapping of workloads to servers for more effective utilization.

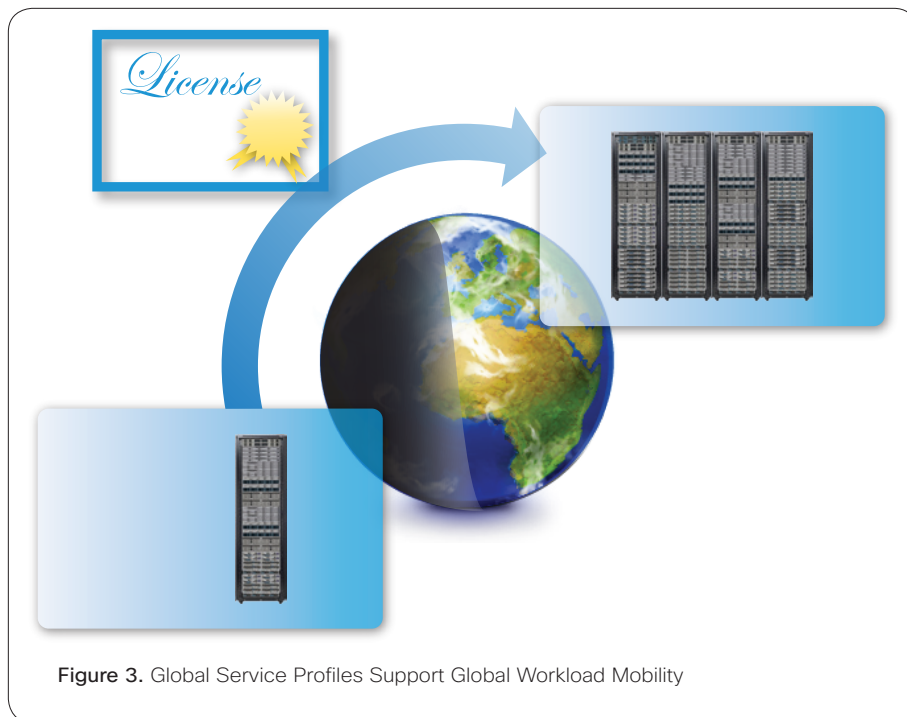
Cisco UCS Central Software also uses global workload mobility to increase capital utilization and reduce costs. Consider the licensed software that is used during working hours in Asia, Europe, and the Americas (Figure 3). Cisco UCS Central Software's global identifier pool along with global Cisco UCS service profiles can simplify the process of moving the use of that licensed software from one time zone to another. For example, if one or more instances of licensed software are idle during nighttime in the United States, the Cisco UCS service profile that defines the servers in the United States can be applied to servers to run the same software during daytime in Europe, saving the need to purchase additional software licenses.

Similarly, when servers are lightly loaded for their primary purpose during nighttime hours in one region, they can be repurposed to support other regions during daylight hours: for example, augmenting the computing power of a hybrid cloud, or performing other tasks where immediate proximity to users is not necessary.

Meeting and Exceeding Service-Level Agreements

Meeting SLAs is one of the primary concerns of IT departments, and Cisco UCS Central Software gives them greater flexibility and security that can help them to meet their agreements with ease:

- Global workload mobility enabled by Cisco UCS Central Software accelerates and simplifies the alignment of capital resources with applications.
- Global policy management and global Cisco UCS service profiles help reduce the possibility of configuration errors and drift can cause downtime. Even the most



difficult-to-manage aspects of firmware administration are handled with ease through the application of global firmware policies.

- Centralized fault logging combined with a global dashboard makes it easy for operations staff to recognize a fault and quickly look into the Cisco UCS domain in which the fault is occurring. Combining Cisco UCS Central Software's XML API with higher-level enterprise management software can automate problem remediation by taking prescriptive actions in the event of a fault. For example, a server failure could be remediated by automatically recruiting a spare server from an appropriate pool, applying the correct Cisco UCS service profile, and putting the spare server into operation.
- Centralized audit logging can be used to detect operations that could lead to configuration drift, and it can be coordinated with higher-level software to automatically remediate changes that were not authorized.

Helping Business Organizations Manage

Cisco UCS Central Software helps business organizations manage the transitions they are experiencing: growth in local data centers, expanded geography, and the need to continually adjust resources so that they are as close as possible to client systems. Cisco UCS Central Software is implemented using a phased approach, and the specific features discussed in this document are planned for implementation according to the phased implementation described in the section "Phased Implementation" on page 15.

Cisco UCS Central Architecture

Cisco UCS Central Software enables organizations to manage multiple Cisco UCS domains using the same mechanisms with which they manage a single Cisco UCS domain.

Built on Foundational Cisco UCS Manager Concepts

Cisco UCS is the only system that has been built from the beginning to allow every aspect of system identity, configuration, and connectivity to be manipulated through software. Cisco UCS provides “knobs” with which to configure everything, including UUIDs, MAC addresses, WWNs, firmware revisions, network interface card (NIC) and host bus adapter (HBA) settings, the number and type of I/O devices, quality-of-service (QoS) settings, VLAN membership, and bandwidth settings. Cisco UCS Manager uses the knobs provided by the system to automatically discover, integrate, and configure every device that is connected to the system’s fabric interconnects. The distinctive features of Cisco UCS Manager are summarized in the following sections.

Role- and Policy-Based Management

Subject-matter experts define the way that different types of systems are to be configured by creating policies that cover their specific domains of expertise: for example, network administrators can create policies that determine every aspect of the way that a Microsoft Exchange Server should connect to the network. These policies may indicate that certain aspects of identity should be drawn from a specific pool of resources: for example, a pool of MAC addresses dedicated to Microsoft Exchange Server NICs.

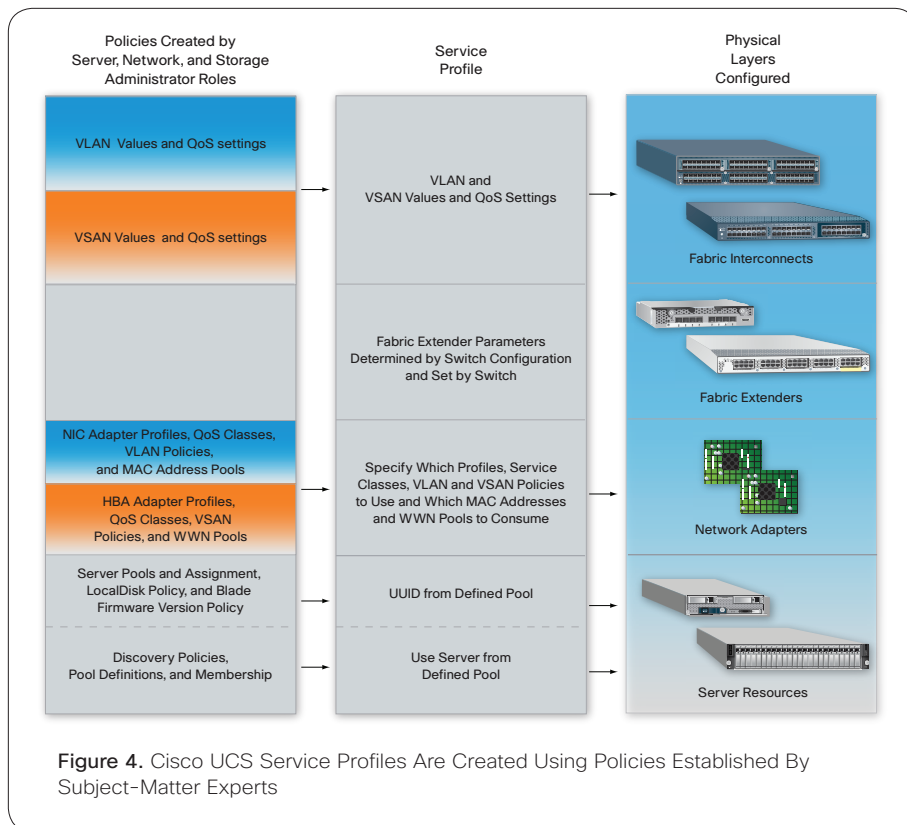
Cisco UCS Manager supports typical divisions of responsibility in IT departments while giving one role visibility into the actions taken by other roles, enhancing communication and simplifying coordination between roles. Role- and policy-based management makes organizations more effective because administrators can configure policies once, and then any level of administrator can use these policies to configure a server.

Cisco UCS Service Profiles and Templates

Administrators can select among policies to create a Cisco UCS service profile, which is the complete specification detailing how a system should be identified, configured, and connected to IP and storage networks (Figure 4). For example, an administrator might select server, network, and storage access policies designed to support Oracle database servers to configure a server to support the software. While a Cisco UCS service profile dictates how to configure a single server, Cisco UCS service profile templates dictate how to create a service profile, and can be used to create service profiles to configure hundreds of servers as easily as it is to configure one. Cisco UCS service profiles and templates allow a Cisco UCS domain to be treated as a flexible, malleable pool of resources that can be configured rapidly and accurately to support changing workload and business conditions.

Logging and Audit Capabilities

Cisco UCS Manager produces detailed logs of how servers are configured and deployed. Because these logs are complete and accurate and reflect all changes to any component in the entire system, they can be used to detect and automatically



remediate any unauthorized change in server configuration, eliminating the configuration drift that can make a server become noncompliant and potentially cause downtime. In the event that a hardware failure does occur, the same logs can be used to initiate an automated reboot to a server that can be recruited from a backup pool of servers.

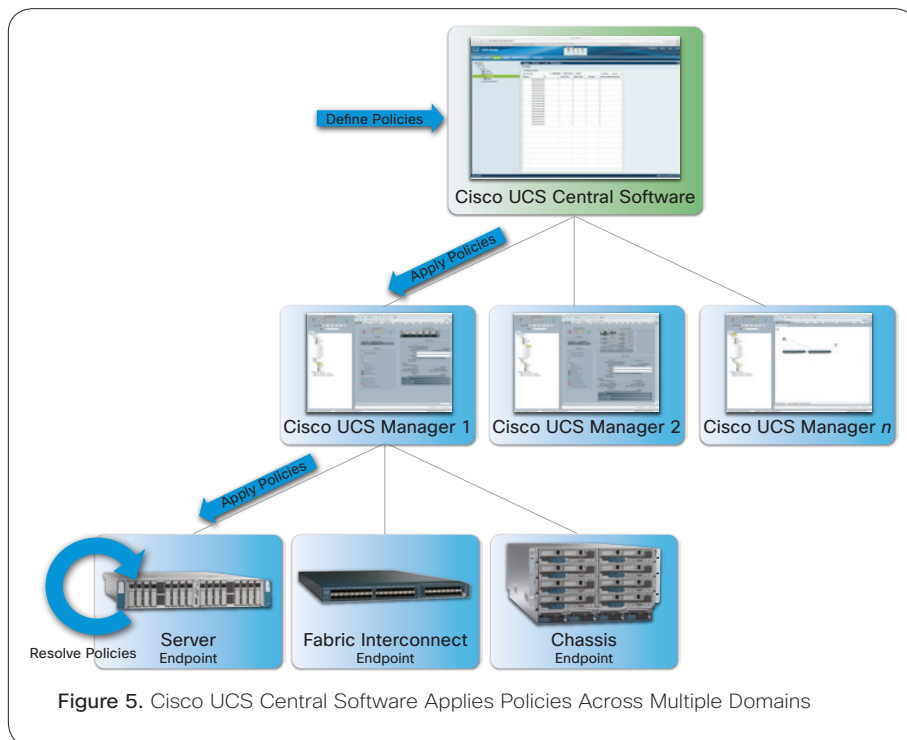
Access Through the GUI, Command-Line Interface, and XML API

Cisco UCS Manager can be used through an intuitive GUI, and its actions can be automated through its command-line interface (CLI) and its XML API. More than 22 partners in the management ecosystem use the XML API to incorporate Cisco UCS into higher-level processes. For example, orchestration tools now can set every aspect of server configuration before installing software on a server, eliminating time-consuming, manual, error-prone server provisioning processes.

Cisco UCS Central Software Extends Unified Management to Multiple Domains

Cisco UCS Central Software manages multiple Cisco UCS domains within a single data center and on a global scale using the same principles as Cisco UCS Manager. It provides role- and policy-based management; manages global server identity, configuration, and connectivity; maintains audit logs; and supports access through an intuitive GUI, CLI, and XML API. After a Cisco UCS domain is registered with Cisco UCS Central, the domain can inherit policies such as service profiles and templates. Cisco UCS Central Software can direct the policies to be applied to specific servers in specific domains, and the local Cisco UCS Manager applies them (Figure 5).

The basic capabilities of Cisco UCS Central Software are discussed in the sections that follow, and its features and their availability are summarized in the section “Phased Implementation” on page 15.



Domain Groups

Recognizing that global business organizations often have data centers supporting specific business functions, client organizations, or geographic locales, Cisco UCS Central Software supports the concept of “domain groups.” A domain group can be any arbitrary grouping of Cisco UCS domains, and the software supports up to five levels of nested subdomains. For example, a set of domain groups could include all of the company’s Cisco UCS domains grouped by geography, simplifying the application of policies that pertain to specific regions. Similarly, domain groups could be created to support specific applications or business units, helping better align policies with workloads.

Centralized Inventory

Cisco UCS Central Software automatically aggregates all the components discovered by all registered Cisco UCS domains into a single centralized inventory along with their state (powered on or off, for example). The display is organized by domain and is similar to the hardware display in Cisco UCS Manager.

A centralized, global inventory of components helps organizations increase infrastructure utilization because it allows them to easily locate resources anywhere in the world and put them to use when and where they are needed. It helps organizations integrate Cisco UCS with their ITIL processes by providing programmatic access to the global inventory through Cisco UCS Central Software’s

XML API. In contrast to manually created inventories, which are usually outdated the moment they are created, the self-aware, self-integrating nature of each Cisco UCS domain helps ensure that the Cisco UCS Central Software inventory is correct and up-to-date.

Global Identifier Pools

Cisco UCS Central Software supports global identifier pools that include UUIDs, MAC addresses, IP addresses, and WWNs. Cisco UCS Central Software can consume identifiers when creating Cisco UCS service profiles, or Cisco UCS domains can consume identifiers from the global pool when creating Cisco UCS service profiles locally. This approach helps ensure global consistency of server and network identities, eliminating the potential for conflicts, and helping with software license portability.

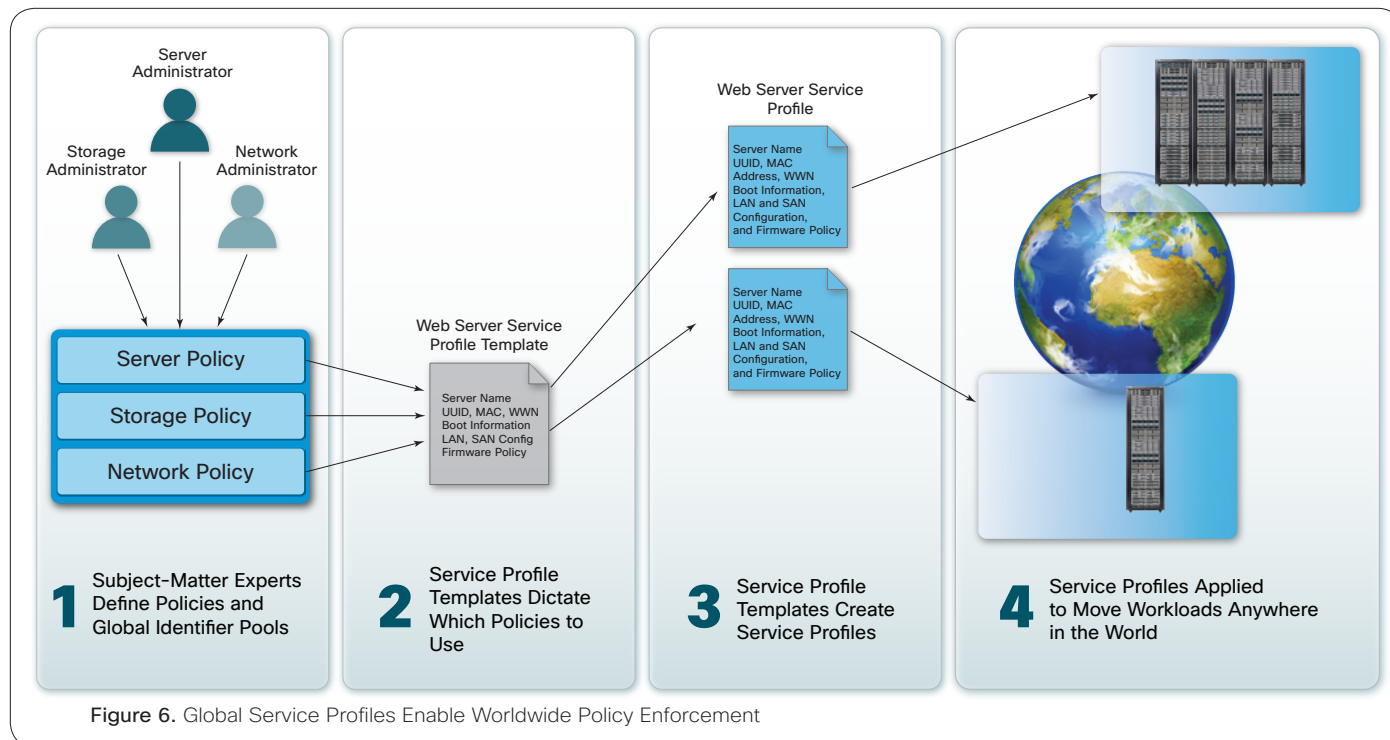
Even for identifiers and pools that are defined in individual domains, Cisco UCS Central Software aggregates information about how and where they are used. This aggregation simplifies the process of tracking identifiers and pools regardless of the context in which they are defined.

Global identifier pools support global workload mobility in much the same way that virtualized environments offer virtual machine mobility within a virtualization cluster. Global identifier pools make it straightforward, for example, to create a set of UUIDs that are tied to a set of software licenses. Licensed software can be more fully utilized by moving server definitions to locations where the software is needed most and running the licensed software on servers in that region. Cisco UCS Central Software reports on global identifier use, helping organizations track the number of identifiers from a pool that are in use, and where, from a central location.

Global Service Profiles and Templates

Cisco UCS service profiles and templates encapsulate every aspect of server identity, configuration, and connectivity so that server provisioning can be entirely automated, and the manual, time-consuming, error-prone process of putting a server into operation eliminated. When this concept is applied globally, IT departments can experience both greater efficiency and greater effectiveness.

- Subject-matter experts can create global policies for server configuration using Cisco UCS Central Software (Figure 6). These policies dictate, for example, the firmware revisions necessary to support specific software, or the network profiles needed to help ensure compliance with security requirements. Global policies are available for use in Cisco UCS Central Software and can also be used within individual Cisco UCS domains.
- Global service profile templates dictate which policies are to be used when a Cisco UCS service profile is created for a specific kind of server. For example, a global service profile that dictates how an Apache web server is to be configured might use a firmware revision policy that supports Linux servers, a network connectivity policy that requires the use of a specific VLAN and MAC address from a particular pool, and a storage access policy that dictates how the web content is to be accessed from a shared storage system.
- Global service profile templates can be used to create global service profiles that are then associated with specific servers in specific domains.



- Service profiles completely define a server configuration and can be applied to physical servers manually or automatically from Cisco UCS Central Software or through Cisco UCS Manager instances.

Cisco UCS service profiles can be applied automatically when a server is added to a specific pool, when a blade server is inserted into a specific slot, or when a specific serial number is discovered. Pools of servers can be defined in Cisco UCS Central Software and may contain servers from multiple domains. Servers are automatically added to specific pools if they meet the pool qualification criteria. For example, a pool of servers to be used in a virtualization cluster might be defined as 2-socket servers with a minimum of 512 MB of main memory and with a Cisco® virtual interface card (VIC) installed.

The concept of pools allows the process of server provisioning to be based on pool membership. The configuration process is initiated when the server is discovered by Cisco UCS Manager and added to the global pool. After it is in the pool, the server can be configured automatically by applying a Cisco UCS service profile. Through Cisco UCS Central Software's XML API, the new server can be discovered by orchestration software that then

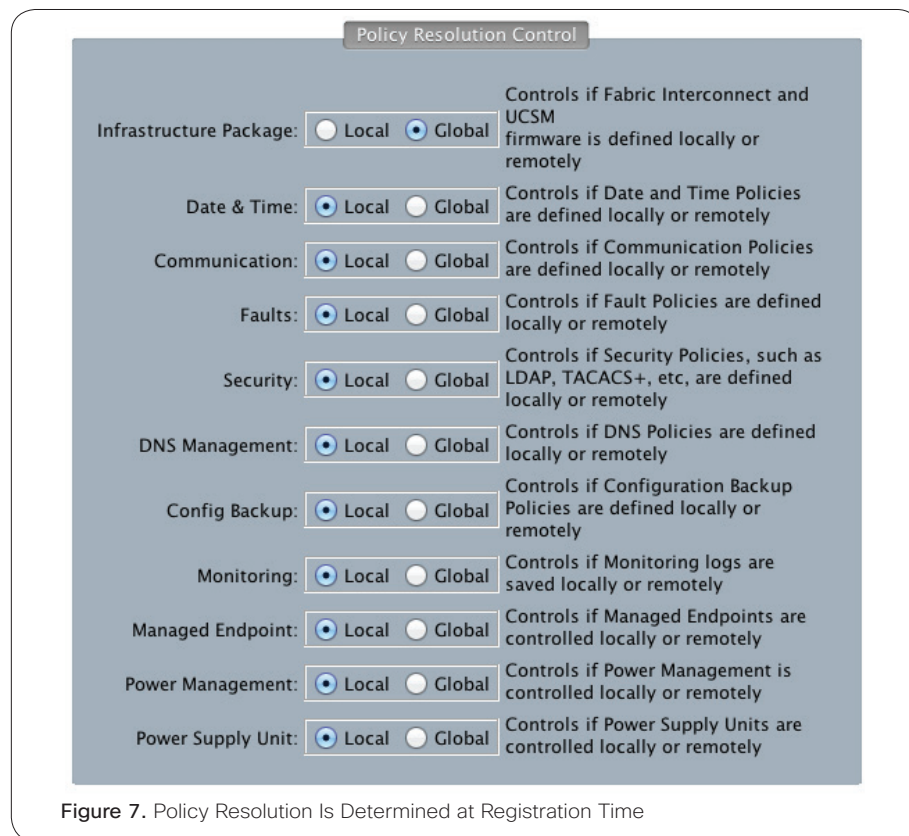
completes the software provisioning, and then the server can be put to work.

Consider the benefits of automated configuration in cloud computing environments. One of the distinctive features of cloud computing is that users have the illusion of infinite resources supported by an elastic set of physical servers. The challenge with traditional infrastructure is that to rapidly scale such an environment to meet sudden workload spikes, administrators must rapidly acquire and provision servers, a process that typically takes days to complete and is prone to error. With Cisco UCS, existing servers can be reprovisioned in minutes, and new servers can be put to use as soon as they are slid into a blade server slot or attached to a Cisco fabric extender. Automation using server pools and Cisco UCS service profiles expands the cloud computing infrastructure quickly, automatically, and without configuration errors.

Global Administration Policies

Cisco UCS Central Software defines global policies that can be enforced within each Cisco UCS domain. Global administrative policies help ensure compliance and increase staff efficiency by standardizing basic policies, including date and time settings, user authentication, fault handling, and power management. As illustrated in Figure 7, global policy

resolution can be configured when a Cisco UCS instance is registered with Cisco UCS Central Software, and it can be modified through Cisco UCS Manager. Note that Figure 7 shows global policy resolution control as implemented in the first phase of the software's deployment.



In this specific example, system firmware is defined globally, helping ensure that all Cisco UCS domains are running the same, consistent set of firmware as dictated by the global policies defined in Cisco UCS Central Software.

Fault Display and Summary

The software displays a quick-look global fault summary at the top of every screen. Faults are organized by their source domain, severity, and category, making identification and isolation of faults straightforward in a global computing environment. Access to the specific domain's Cisco UCS Manager and to individual server consoles through the Cisco Integrated Management Controller (IMC) is available through a single click of the mouse (Figure 8).

Global Statistics Gathering

Cisco UCS Central Software gathers statistics from Cisco UCS domains to provide a centralized view that reveals how a global operation is functioning. Although these statistics are not gathered in real time as they are in individual domains, Cisco UCS Central Software is designed to store statistics for the long term in a centralized database. Organizations can view statistics through the software's GUI, extract them for use by other tools through the XML API, or obtain them by direct querying of the

database. Global statistics can be used for capacity planning, trend analysis, and troubleshooting.

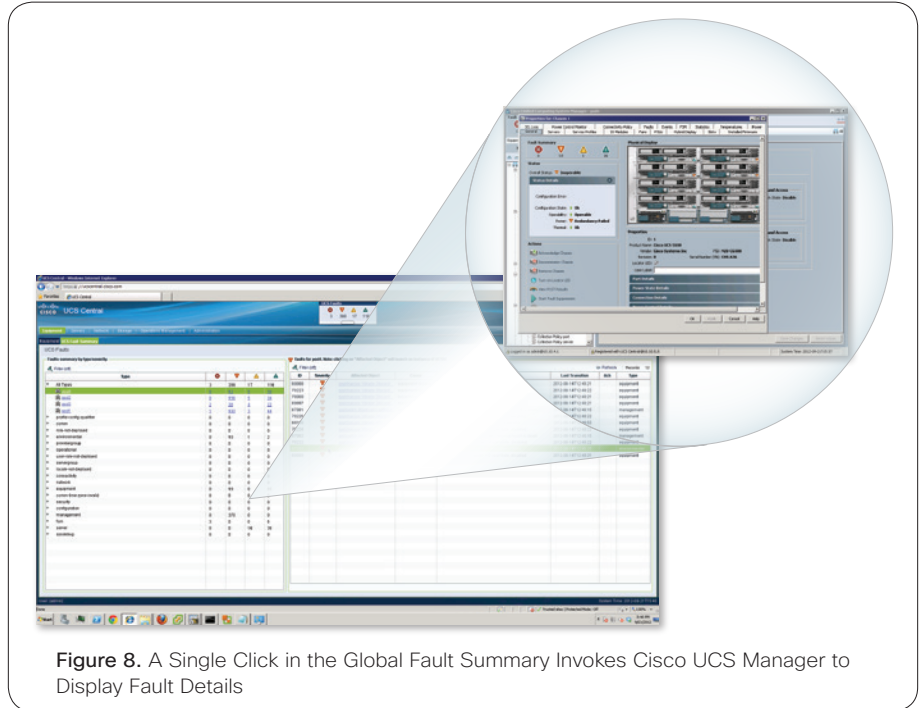


Figure 8. A Single Click in the Global Fault Summary Invokes Cisco UCS Manager to Display Fault Details

Deployment Architecture

Cisco provides Cisco UCS Central Software as a virtual appliance that is ready to run in a VMware vSphere or Microsoft Windows Server Hyper-V environment (Figure 9). Typically deployed in a redundant pair, the software operates using an active-standby model for high availability.

The software is accessible through the XML API, GUI, or CLI. It can download and retain firmware packages available from Cisco.com so that firmware versioning can be controlled centrally. The software stores firmware, operational statistics, and application-specific data (such as service profiles and global inventory) in an external relational database.

Cisco UCS domains are integrated with Cisco UCS Central Software through a registration process that uses a preshared secret key for authentication.

Phased Implementation

Cisco UCS Central Software is implemented in two phases, with specific features available according to the phase, as shown in Table 1. As of the date of this document, Phase 1 features are available.

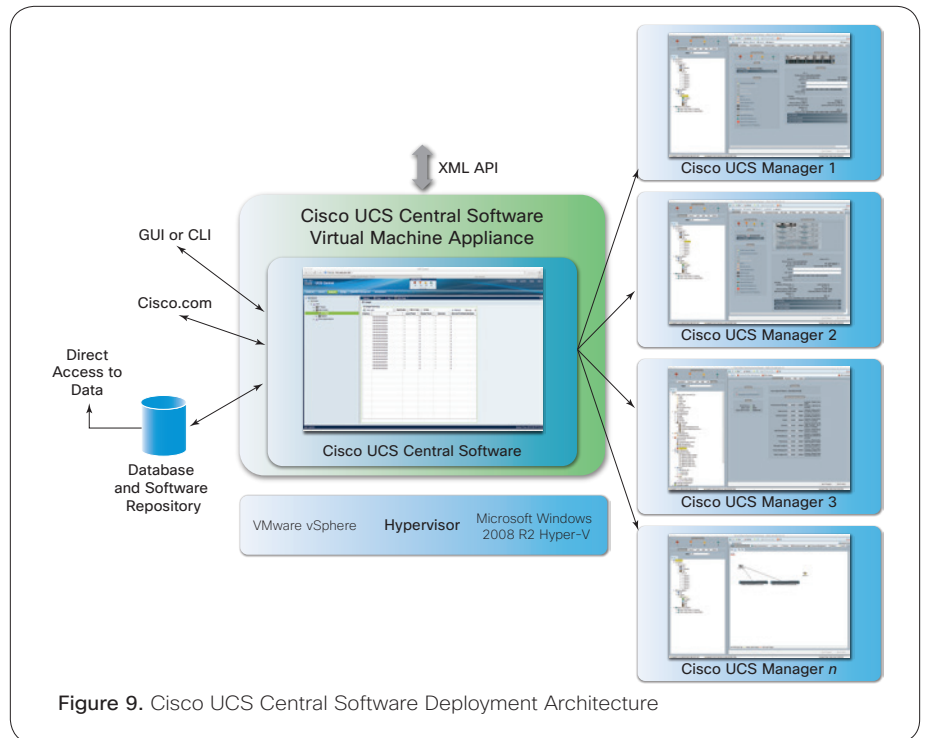


Table 1. Cisco UCS Central Software Capabilities and Availability

Global Capacity or Policy	Phase 1	Phase 2
Centralized inventory	Yes	
Global fault summary	Yes	
Centralized, policy-based firmware upgrades	Yes	
Global ID pooling	Yes	
Real-time ID use summaries	Yes	
Domain grouping and subgrouping	Yes	
Global administrative policies	Yes	
Date and time: Network Time Protocol (NTP) and time zone	Yes	

Global Capacity or Policy	Phase 1	Phase 2
Domain Name System (DNS)	Yes	
Remote access	Yes	
Simple Network Management Protocol (SNMP)	Yes	
Debug settings	Yes	
Cisco Call Home	Yes	
Authentication (Lightweight Directory Access Protocol [LDAP], RADIUS, and TACACS)	Yes	
Equipment power and system event log (SEL) policies	Yes	
Cross-launch of Cisco UCS Manager or keyboard, video, and mouse (KVM) console	Yes	
Global service profiles and templates		Yes
Statistics aggregation		Yes
GUI, CLI, and XML API	Yes	
Cisco UCS Central Software database backup	Yes	
High-availability for Cisco UCS Central Software		Yes

Conclusion

Business organizations continue to be challenged by the need to deploy increasing numbers of servers to support mobile applications, expand electronic commerce, and provide services to other businesses—and with the need to do so on a global scale.

Cisco UCS Central Software helps these organizations meet the demand for expansion with central control over Cisco UCS domains, supporting massive scalability within data centers and around the world. The software uses the fundamental concepts of Cisco UCS Manager to establish a central point from

which IT policies can be implemented and enforced, helping provide worldwide compliance while automating infrastructure configuration for greater effectiveness.

With Cisco UCS Central Software, organizations can take their business into the future, while giving their administrators and subject-matter experts the freedom to focus not on the tedious details of system identity, configuration, and connectivity, but on the strategic initiatives that can help make a business to thrive.

For More Information

For more information about Cisco UCS Central Software, please visit <http://www.cisco.com/en/US/products/ps12502/index.html>.

For more information about Cisco Unified Computing System, please visit <http://www.cisco.com/go/ucs>.

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