Achieve Consistent IT Management At Any Scale

Solution Brief
September 2016

With the Cisco UCS Unified API

Highlights

Program Your Infrastructure

- Manage your IT infrastructure resources as code at every level to achieve consistency, visibility, and control.

Learn It Once, Use It Everywhere

- Use a consistent object model that lets you learn the API once and apply it as the scope of what you are managing changes.

Use the Tools You Want to Use

- Write your own scripts or use Cisco Unified Computing System™ (Cisco UCS®) management or third-party tools, or a combination, to help you implement DevOps methodologies.

Manage Everything the Same Way

- Manage standalone servers, fabric interconnects, logical servers, chassis, and entire data centers with an API that expands to include more capabilities to match your management domain.

Cisco's unified API delivers the foundation for consistent, predictable automation for your Cisco Unified Computing System™ (Cisco UCS®) environments.

For many reasons—IT efficiency, consistency, productivity, and compliance—your IT staff uses automation capabilities to deliver infrastructure and services in less time and with increased oversight. Obtaining the most from automation means managing your IT infrastructure as code, giving you control over underlying infrastructure and access to APIs and scripting mechanisms. Unlike vendors that deliver a fraction of the tools and interfaces you need, forcing you to use multiple APIs, Cisco provides an object-based model and unified API that lets you easily and consistently manage your Cisco UCS infrastructure at any level.

Why a Well-Structured API Matters

Your developers want to treat physical infrastructure the way they treat other application services, using processes that automatically provision or change IT resources. Similarly, your IT staff needs to provision, configure, and monitor physical and virtual resources; automate routine activities;; and rapidly isolate and resolve problems. The right API provides complete control, integrates with management tools and processes, and enables you to easily adopt DevOps methodologies.

So Many Standards

IT standards are offered for every layer of infrastructure—from servers, storage systems and power supplies to networking interfaces and software—each with multiple revisions and varying levels of market adoption. Recently, the Distributed Management Task Force (DMTF) released Redfish, a new standard that specifies many aspects of infrastructure management, including the following:

- A relational object model that describes each type of resource
- Secure data transfer mechanisms using the HTTPS protocol
- Scalability that extends from single servers to large pools of computing resources, with extensions for additional components such as chassis, storage systems, and networking adapters and interfaces

The combination of existing standards and Redfish creates complexity for your developers and administrations, who need to gain easy access to and control over IT resources. Today, your experts are forced to use device controls and APIs that are hardware specific or vendor specific, requiring your staff to spend time learning every interface, modifying scripts and programs for each new or upgraded infrastructure component, and complying with revised standards. What's needed is an API that abstracts this complexity and interfaces with every managed IT resource.

Cisco UCS Unified API

Understanding the complexity and believing that management should not be an afterthought, Cisco changed the management landscape when it introduced Cisco UCS. All Cisco® platforms are built from the foundation with a unified API that gives you programmatic access to every system component. The Cisco UCS unified API is uniquely positioned to adopt evolving standards while continuing to provide a premier framework for automation. You can use the API on its own or to supplement industry-standard APIs such as Redfish to get the most from your IT infrastructure (Figure 1).

Object Model

The Cisco UCS unified API is a well-structured interface that provides

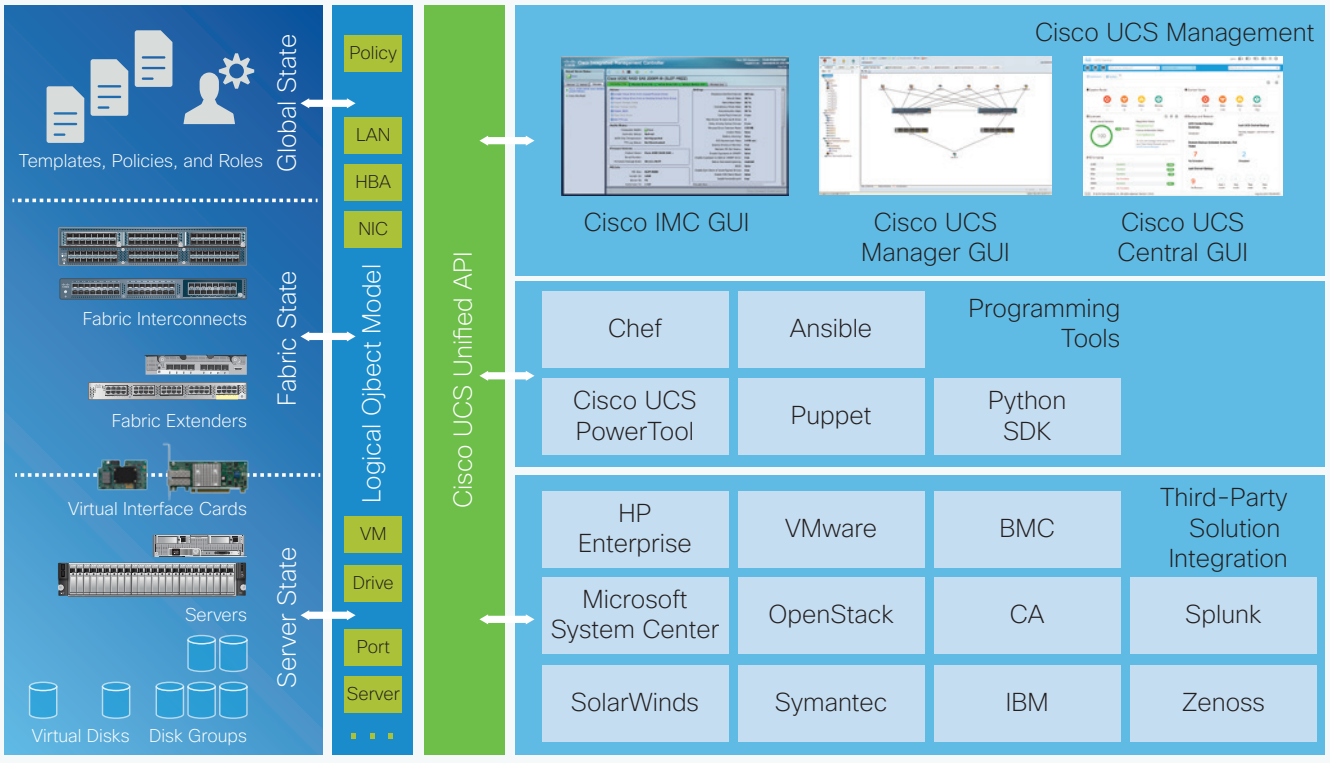

Figure 1. The Cisco UCS API Object Model Is Unified Across Components

modern automation capabilities from the top of your IT infrastructure to the bottom. At its foundation is a consistent object model that defines every type of resource in the system: from individual CPUs, memory chips, ports, and networking interfaces to entire servers, chassis, storage systems, and virtual machines. You can manage your infrastructure at any level you choose with fine-grained control.

Learn It Once, Use It Everywhere

The use of a consistent object model and unified API results in simplicity for your administrators writing scripts, your programmers developing tools, and your budget. Because the object model is consistent throughout your Cisco UCS deployment, your staff can learn the API once and apply it as the scope of what they are managing changes.

For example, they can program at the drive or chassis or a higher level, and they can apply the investment they've made in learning the API as they move to other areas of infrastructure management. They simply add new objects at each level of infrastructure and scale—without the need to change the data model or software architecture.

Consistency at Scale

Whether your IT staff needs to manage a server, chassis, local data center, or geographically dispersed deployments, they can use the same framework, data format, and object model. That's because all Cisco UCS management interfaces, including the command-line interface (CLI) and GUI, use the Cisco UCS unified API to control the infrastructure. Your staff manages everything in a similar way no matter what it is or where it is located (Figure 2).

Manage Standalone Servers

Embedded in Cisco UCS servers, the Cisco Integrated Management Controller (IMC) provides an easy way to provision and deploy a standalone server. Your IT administrators can control and manage servers, including network configuration; remote keyboard, video, and mouse (KVM) devices; power states; and firmware revisions. Out-of-band management is accessible through standard protocols, CLIs, and web-based interfaces.

Manage Fabrics and Logical Servers

The API that supports standalone server management allows a Cisco UCS chassis and its components to be programmed as code. That's because every component is incorporated into an object model that maintains a single source of truth regarding system inventory and configuration.

At this scope and level, the API adds connectivity controls and introduces logical server concepts with service profiles. Cisco UCS Manager, which runs in the system's fabric interconnects, uses this expanded API to control all parts of the system. Your IT staff can create a model of a desired server configuration and then configure the server simply by associating the model with the physical resources. The system helps guarantee consistent, error-free policy-based alignment of server personalities with workloads, increasing standards compliance.

Manage the Data Center at Scale

If you need to manage growth within a single data center, support multiple sites, or both, your IT staff can use Cisco UCS Central Software. At this management scope, the software adds multidomain and global policy

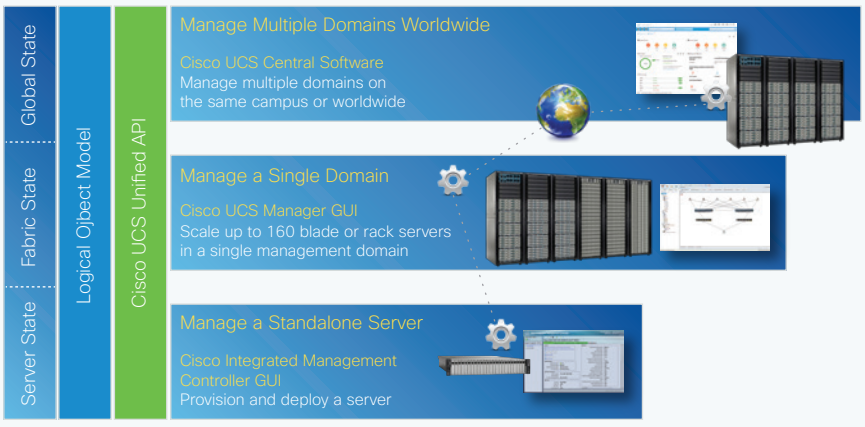

Figure 2. The Cisco UCS Unified API Delivers Scalability Across the Data Center

management to the Cisco UCS unified API. Your IT staff can manage multiple Cisco UCS domains using the same concepts that Cisco UCS Manager uses to support a single domain. No changes in the object model or protocols are needed, enabling you to easily scale your management strategy to match the growth of your managed domain.

Orchestrate and Automate

Cisco UCS Director supports your business acceleration efforts by simplifying the consumption, management, and lifecycle of your IT infrastructure resources. Adding another layer of capabilities, Cisco UCS Director delivers self-service access to infrastructure and hybrid cloud services to multiple types of users. It also provides orchestration and management across Cisco and third-party storage systems, servers, networks, and converged and hyperconverged infrastructure. Your IT staff can automate the delivery and management of physical and virtual infrastructure, perform lifecycle tasks, and maintain security policies across shared IT infrastructure resources.

Integration with Familiar Development Environments

Your administrators and developers don't have a lot of time to waste on learning new interfaces, protocols, and tools. Cisco's approach includes easy-to-use programming environments that abstract the underlying unified API. These abstractions provide a robust set of functions for the Cisco UCS product line and are integrated with familiar programming tools, giving your staff access to the same development environment regardless of the scale or scope of your management domain.

- **Third-party tool integration:** The Cisco UCS unified API is also used by Cisco's large group of management solution partners, including BMC, CA, Compuware, ExtraHop Networks, Hewlett Packard Enterprise (HPE), IBM, InfoVista, Microsoft, OpenStack, Puppet, ScienceLogic, SevOne, SolarWinds, Splunk, Symantec, Turbonomic, VMware, and Zenoss.
- **Microsoft Windows PowerShell:** The Cisco UCS PowerTool 2.0 suite supports Microsoft Windows PowerShell Desired State Configuration (DSC). With a unified installer and support for all levels of Cisco UCS management, the software provides consolidation of PowerShell cmdlets across all platforms. For example, Cisco UCS Central Software and Cisco UCS Manager configuration capabilities are combined with PowerTool's Set-UcsPowerToolConfiguration cmdlet. In addition, the innovative and remarkable ConvertTo-Ucs cmdlet creates code based on GUI actions.
- **Python:** Cisco supports Python software development kits (SDKs) for Cisco IMC, Cisco UCS Manager, and Cisco UCS Central Software. These SDKs are hosted under the CiscoUcs account on GitHub. Built to support Python 2 and 3, the SDKs are PEP8 compliant and can be installed and updated using the PIP package management system. Similar to PowerTool, the built-in convert_to_ucs_python function lets you generate code from actions in the GUI. Although the Python SDK is developed and supported by Cisco, it also has an active development community, and a growing library of Cisco UCS Python SDK samples is available.
- **Cisco UCS Platform Emulator:** The Cisco UCS Platform Emulator lets you use Cisco UCS Manager and the Cisco UCS unified API without requiring physical hardware. This innovative tool can help you shorten development cycles and create and test programs using the software installed on a laptop.

For More Information

For more information about the Cisco UCS unified API, visit https://developer.cisco.com/site/ucs-dev-center.

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