

# Achieve Continuous Integration and Delivery of Applications

With DevOps Tools Integrated with Cisco UCS



## Modern approach

- Programmable IT infrastructure
- Support for DevOps methodologies



## Rapid deployment

- Automation of DevOps tool chains
- Simplified configuration
- Orchestration of IT resources



## Proven and supported solutions

- Integration with Ansible, Chef, and Puppet
- Access to Cisco Developer Network (DevNet)

**Familiar tools and the Cisco Unified Computing System™ (Cisco UCS®) platform make it easy for your development and operations (DevOps) teams to continuously deliver applications.**

Application updates are needed in production systems in minutes rather than months. That's why organizations continue to shift away from monolithic applications to three-tier, microservices-based, and cloud-hosted applications using a DevOps methodology and Cisco UCS. With this powerful platform, you can integrate, automate, and orchestrate applications and IT infrastructure—and bridge the gap between your development, testing, operations, and production teams to innovate faster and reduce deployment delays.

## Automating your DevOps tool chain

DevOps is a cultural, collaborative shift that requires the use of multiple tools to code, build, test, package, release, configure, monitor, and update applications. Integrating each tool with IT systems takes time, particularly when different mechanisms are used to interact with hardware.

Cisco UCS is IT infrastructure that can be programmed as code to automate system configuration and resource allocation. Your teams can use a variety of DevOps management tools and align your IT infrastructure with applications, improving IT and developer productivity and reducing the risk associated with human error.

## A unified API makes it possible

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

## Configuration management

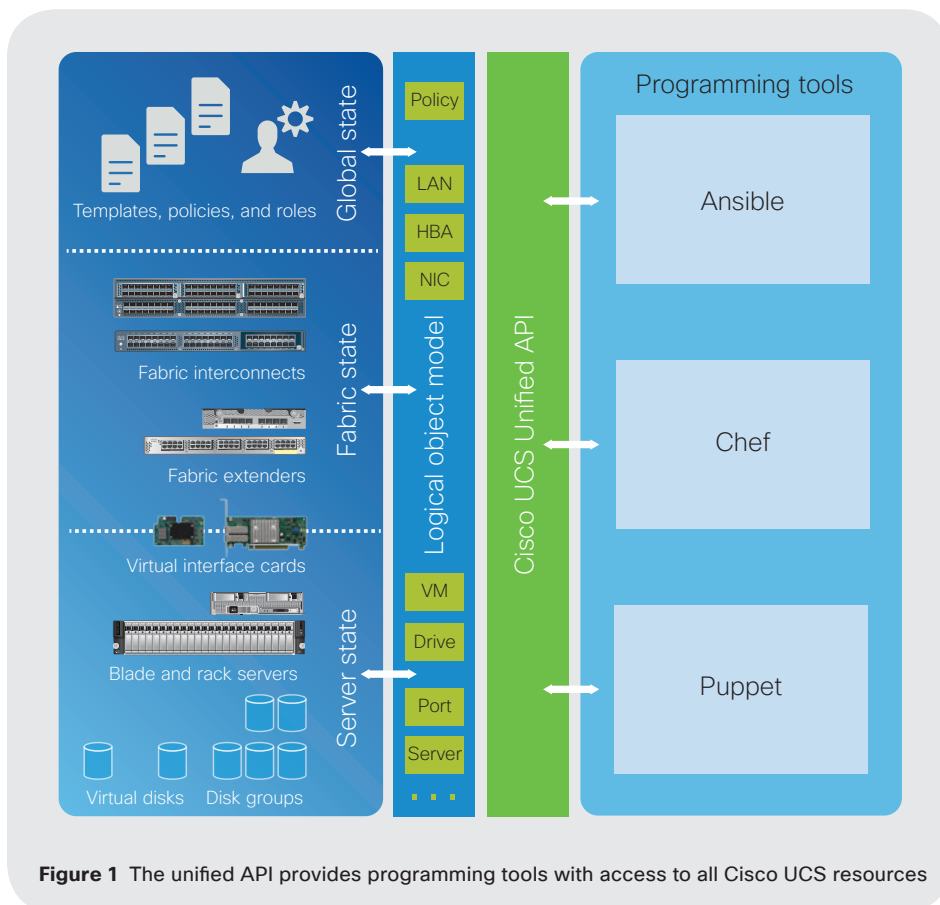
The Cisco UCS Unified API is also used by Cisco's large group of management solution partners. Your DevOps teams can use the tools with which they are already familiar, such as Puppet, Chef, and Ansible, to deploy, orchestrate, and manage individual Cisco UCS servers, Cisco Nexus® switches, storage systems, and fabric interconnects, as well as entire Cisco® converged and hyperconverged systems (Figure 1).

The capability to provision entire application stacks in minutes—from automating Cisco UCS policies, service profile configurations, and resource pools to ongoing management and the detection and remediation of unintended changes—improves productivity, reduces the likelihood of errors, and accelerates time to deployment.

### Puppet

Puppet Enterprise, a leading tool for DevOps configuration management, is rapidly becoming essentially a standard for IT automation and management. With an extensible plug-in architecture and powerful declarative language, Puppet provides a flexible, easy-to-use platform that seamlessly integrates the unique capabilities of Cisco UCS and Cisco Nexus solutions. You can:

- Manage your infrastructure and application workloads from end to end
- Use Puppet modules for Cisco UCS to perform initial infrastructure configuration and server role assignment
- Perform rapid day-one provisioning with the Puppet Razor module, which provides a robust set of programmatic interfaces for provisioning the operating system and workload
- Use Cisco UCS service profiles to create flexible definitions of server roles and pass that information to Puppet Razor



**Figure 1** The unified API provides programming tools with access to all Cisco UCS resources

## Puppet resources

- [Puppet Force hosted modules for Cisco UCS](#)
- [Puppet module for Cisco UCS Manager](#)
- [Integrate Puppet Enterprise and Razor and Cisco Unified Computing System](#) white paper
- [Programmatic Provisioning with Puppet Enterprise, Razor, and Cisco UCS](#) [document](#) and [blog](#)

## Chef resources

- Ruby SDK [download site](#)
- [Configuring Cisco Integrated Management Controller \(IMC\) for standalone servers](#) [cookbook](#)
- [Video demo](#) and [hands-on guide](#)

## Ansible resources

- [Ansible and Cisco UCS management integration](#) [blog](#)
- [Managing Cisco UCS C-Series Servers with Ansible](#) [community site](#) and [documents](#)
- [Ansible modules for Cisco UCS Manager](#) [community and documents](#)
- [Ansible modules for Cisco UCS](#) [download site](#)

- Perform day-two and beyond management and monitoring of applications using open-source Puppet or Puppet Enterprise
- Deploy a wide range of managed workloads across major operating systems, virtual machines, and containerized environments

### Chef

Chef is an open-source systems and cloud infrastructure automation framework. Using a Chef cookbook, your DevOps teams can configure your Cisco UCS platforms and distribute policies. Everything required to support your deployment is defined, including libraries, recipes, files, and more.

Each cookbook and recipe—a collection of property definitions for setting device states—instruct the Chef client on how to configure each node in the system. Because the details for checking and setting property states are abstracted, recipes can be used for multiple operating systems and platforms. Recipe can also be used to install software packages, copy files, start services, and more.

Cisco has developed a cookbook for standalone Cisco UCS C-Series Rack Servers and the Cisco Integrated Management Controller (IMC). Built on the Cisco IMC Ruby software development kit (SDK), the cookbook simplifies the deployment of servers and applications to any physical, virtual, or cloud location. The Ruby SDK is also available as a [Ruby Gem](#).

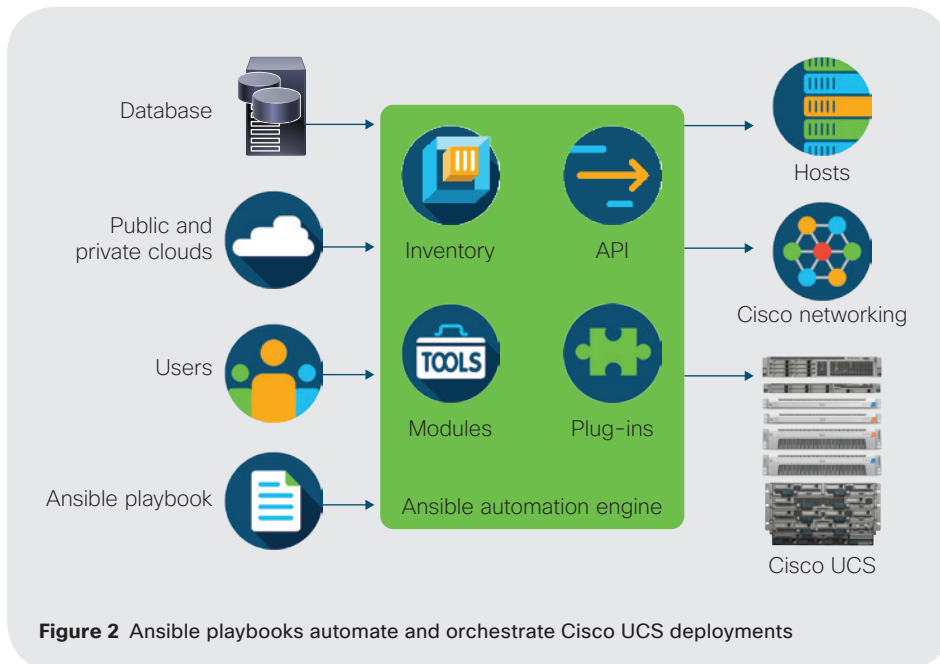
### Ansible

Using Ansible playbooks, your DevOps teams can automate and orchestrate your IT environments simply by describing the infrastructure configuration that's needed. A human-readable markup language (YAML) defines a series of "plays" that define automation across an inventory of hosts. Each play consists of multiple tasks that target one or more hosts and call an Ansible module that performs configuration operations.

Cisco UCS Manager, the Cisco UCS Unified API, and standalone rack servers integrate with Ansible (Figure 2). This integration allows your DevOps teams to use Ansible to configure, deploy, and orchestrate your Cisco UCS infrastructure.

Using the Ansible open and extensible framework along with the Cisco NX-API, you can use a single tool to manage your servers and Cisco Nexus 9000 and 3000 Series Switches, increasing automation and simplifying daily IT tasks. The NX-API is a REST-like API for Cisco NX-OS Software-based systems. Ansible modules call NX-API functions to gather real-time state data and configure or reconfigure switches.

Ansible modules for Cisco UCS are based on the Cisco UCS Python SDK. A hands-on lab and guide are also available.



**Figure 2** Ansible playbooks automate and orchestrate Cisco UCS deployments

- **Code samples:** Examples give developers a starting point and accelerate the learning process.
- **DevNet Express:** This train-the-trainer program helps systems engineers position APIs with their peers, partners, and customers.
- **Cisco Live training events:** These developer-focused presentations and hands-on workshops are delivered at Cisco Live events.

## Cisco Demo Cloud

The [Cisco Demo Cloud](#) (dCloud) allows your DevOps teams to see Cisco UCS and other Cisco products in action. Using preconfigured environments, your DevOps teams get hands-on experience with simulated and physical infrastructure and comprehensive user guides to understand demo workflows.

Detailed labs are available to help you use Cisco UCS PowerTool software and the Python SDK with Cisco UCS infrastructure. The programmability lab can also be used with Puppet and Ansible. Search the dCloud catalog to find demos, training, and sandboxes for every Cisco architecture.

## Hands-on programming

The [Cisco UCS Platform Emulator](#) lets you use Cisco UCS Manager and the Cisco UCS Unified API without requiring physical hardware. This approach thus also lets you use any tool integrated with the API, including Ansible, Chef, and Puppet. This innovative tool can help you shorten development cycles and create and test programs using the software installed on a laptop. Nearly all Cisco UCS Manager features are available, including access to the Cisco UCS Unified API. Access to this robust, simulated environment is provided at no additional cost

## Developer resources: Cisco DevNet

The Cisco Developer Network (DevNet) helps you get your questions answered so that you can keep your project moving. DevNet serves as an aggregation point for developers, giving you free and quick access to the tools, information, and resources you need to [automate with Cisco UCS](#) and other programmable Cisco products.

DevNet offers:

- **Learning Labs:** These hands-on labs introduce developers to Cisco product APIs.
- **Sandbox environments:** Physical and virtual sandbox testing areas allow developers to use Cisco product APIs, including the Cisco UCS Unified API.

## For more information

For more information about Cisco UCS and tool integration, visit:

- [Cisco UCS management](#)
- [Cisco UCS integrations](#)