

# Cisco and Ansible Solutions

## Accelerate DevOps with Cisco UCS and Ansible

Cisco UCS Manager and Ansible provide a software-defined approach to the management of the entire hardware and software stack. All Cisco Unified Computing System™ (Cisco UCS®) and Cisco HyperFlex™ systems are fully programmable infrastructure. The unified API enables you to treat the physical infrastructure as code. Instead of using multiple scripts to automate physical infrastructure. With the integration of Cisco UCS Manager with Ansible, IT administrators and DevOps teams can orchestrate all the steps needed to set up a physical infrastructure.

The unified API also provides a consistent interface for discovering, inventorying, configuring, provisioning, updating, and diagnosing the infrastructure resources, eliminating the need for multiple, time-consuming, low-level programming interfaces.

## Benefits

- Use Ansible to deploy your Cisco Unified Computing System™ (Cisco UCS®) servers, storage, fabric, hyperconverged infrastructure, and converged infrastructure.
- Achieve faster build times, because your entire application stacks can be provisioned automatically, from bare metal through applications, in minutes.
- Automate policy, resource pool, and resource profile configuration and ongoing management.

## Ansible works with Cisco UCS and Cisco HyperFlex Systems

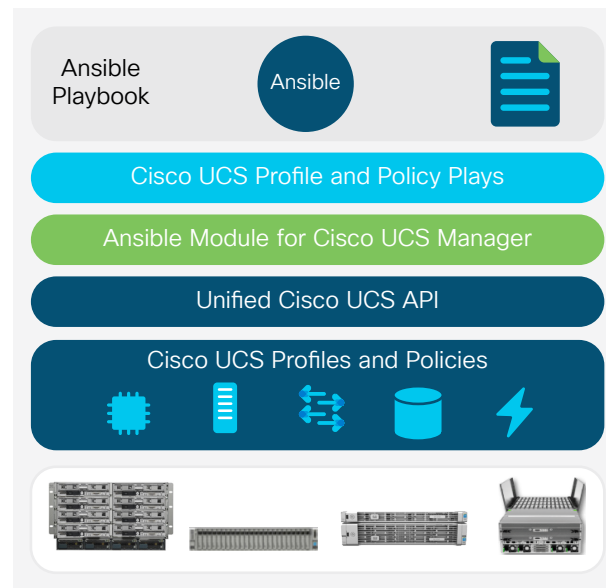
Through the integration of Cisco UCS Manager with Ansible, you can provision all your Cisco UCS servers and the related storage and fabric resources, Cisco HyperFlex hyperconverged infrastructure, and Cisco converged infrastructure. This provisioning includes Cisco UCS B-Series Blade Servers, C-Series Rack Servers, and S-Series Storage Servers and all models of Cisco HyperFlex Systems.

Cisco UCS Manager allows you to create reusable profiles that consist of policies established by subject-matter experts. A service profile is a software definition of a server and its LAN and SAN. Service profiles allow you to define infrastructure configurations and settings across servers, storage, and networking resources. The service profiles and policies created in Cisco UCS Manager allow you to create logical infrastructure from available resource pools.

## Benefits of Ansible and Cisco UCS

Ansible allows users to define the desired state and settings for infrastructure without worrying about the specific programming steps needed to reach that state. You can simply describe what you want the infrastructure to look like, and Ansible will determine how to implement your wishes. And Ansible then maintains the desired state, handling all the time-consuming work of checking the current configuration and making changes when needed. This feature provides a big advantage over traditional scripting, in which the programmer must handle the process of maintaining the system in a certain state.

Figure 1. Ansible uses playbooks to automate and orchestrate IT environments



## How Ansible works

Ansible also provides an excellent framework for organizing the data used in infrastructure configuration management. The endpoints managed and the roles for which those endpoints should be configured are specified in a straightforward and human readable markup language: YAML.

Ansible automates and orchestrates IT environments through playbooks (see Figure 1). Playbooks provide a YAML definition of a series of operations, or plays, that define automation across a set of hosts. Each 'play' consists of multiple tasks, which can target one, many, or all of the hosts in the inventory. Each task is a call to an Ansible module. A module is a piece of code for performing a specific task.

Ansible is an agentless tool that runs in a 'push' model, so it doesn't require a software agent to be installed on the target node (a server or switch) to automate the device. The module for the Cisco UCS servers is built on the Cisco UCS Manager Python Software Development Kit (SDK) from Cisco, which provides programmatic interfaces to any Cisco UCS infrastructure component. Ansible's role-based data organization and simple YAML definition files allow you to efficiently build out large-scale deployments without constantly reorganizing the data used in configuring the infrastructure.

## For more information

- [Cisco UCS Manager Ansible integration on GitHub](#)
- [Cisco UCS Communities page for Ansible](#)
- [Cisco UCS Platform Emulator](#) (program with Ansible with physical hardware)

## Ansible for standalone servers and Cisco Nexus switches

You can also use Ansible to support all your Cisco UCS servers and Cisco Nexus® Family switches. You can use one tool to achieve greater automation and simplify daily tasks in your environment. Cisco has published an [Ansible module for managing standalone Cisco UCS C-Series](#) servers using the remote management framework in the Cisco Integrated Management Controller (IMC). (Here's a [link to a blog](#) about this topic.)

Cisco's support for [Ansible and Cisco Nexus 9000 and 3000 Series Switches](#) uses Ansible's open and extensible framework along with the Cisco NX-API. The NX-API is a Representational State Transfer (REST) API for NX-OS Software based systems. It allows network administrators and programmers to send Command-Line Interface (CLI) commands in an API call to a network device. Ansible modules make API calls on the NX-API to gather real-time state data and to make configuration changes on Cisco Nexus devices.