



Introduction to Cisco Platforms

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Understanding the Cisco API Platform



Cisco has a long history as a networking gear company and hardware supplier. Those offerings are now available as automation opportunities. The Cisco portfolio spans customer service centers, phone management, mobile and wireless networking, the Internet of Things (IoT), and even security, as Cisco continues to improve data center and cloud-based solutions. In this module, we'll look at some of these platforms and how they can be used.

Exploring the categories of Cisco technology

To help with sorting through all of the Cisco developer offerings, DevNet creates Dev Centers for each technology group, and those Dev Centers are a convenient way of grouping technologies together. On the landing pages that represent those Dev Centers, you can find all the related resources for that technology, such as links to relevant documentation, Sandboxes, and Learning Labs. Below is a list of the Cisco Dev Centers:

- Cloud
- Collaboration
- Data center
- Internet of Things(IoT) and edge computing
- Networking
- Security
- Wireless and mobile
- Application developers

Cloud

Cisco works on solutions with major cloud providers such as AWS and Google Cloud, as well as offering a container management program running on Cisco hardware. Cisco provides many models for cloud deployments, including public, private, or hybrid. Cisco also has container management solutions based on Docker and Kubernetes.

Cisco knows that most companies do not use a single cloud-based deployment or storage or networking solution but instead, use combinations of hosting, including cloud and on-premises, as well as using

solutions from various partners. With that in mind, DevNet provides a Cloud Dev Center with links to the APIs, tools, and explanations of container networking and hybrid connectivity.

Collaboration

Modern collaboration tools connect the world and Cisco has many capabilities in the collaboration category. The Webex product line has both device and cloud-based API access for video teleconferencing, enterprise-level instant messaging, and meeting scheduling and management. Use cases include integrated customer care through Finesse, as well as call control for customer service centers using Cisco Unified Communications Manager (CUCM). Additional use cases include voice messaging and presence statuses, chatbots for customer support or notifications when monitoring systems, calling, and messaging.

Cisco Unified Communications Manager (CUCM) provides API access to data management, call management, and voicemail integration. Developers can create custom web applications for voice and video calls, or interact with a Cisco desk phone. Use cases, integration points, and many more developer tools for collaboration solutions, can be found in the Cisco DevNet Collaboration Dev Center.

Data Center

The data center provides networking, compute power, storage solutions, and access for powerful solutions for operations, business networks, and applications. Cisco provides multiple data center platforms, including Nexus and Cisco Unified Computing System (UCS). Data center use cases address both the NX-OS and IOS XE operating systems.

With programmable infrastructure, developers and engineers are integrating network deployment with monitoring and policy management to deploy their workloads programmatically. Many components of a data center may be accessed programmatically to manage everything from a single server with a standalone network, to complex multi-layered architectures with thousands of devices in orchestration. We call this Application Centric Infrastructure or ACI.

Cisco provides platforms that integrate with automation, orchestration, and configuration management tooling while also offering monitoring, detection, alerts, and telemetry data. This wide range of Cisco platforms and infrastructure form the basis for solutions that scale to large service provider platforms.

You can use Python SDKs for data center automation solutions for ACI, Nexus platform, and Cisco Unified Computing System (UCS). The Python Automation Test Systems (pyATS) may also be used as a basis for reusable tests, represented by linked objects. pyATS tests range from simple connectivity tests all the way to profiling and verifying the target network with automated tests. DevNet provides the Data Center Dev Center that serves as a starting point for compute and networking APIs, day 0 provisioning use cases, testing and automating with Python, and links to management tools and technologies.

Internet of Things (IoT) and Edge Computing

Sometimes you need networks with built-in capabilities for lots of sensors and data on the IoT. These sensors may even be needed in harsh or remote environments. Cisco provides different types of tools for IoT, including rugged industrial-strength networking gear, IoT gateways, low-power solutions, and embedded networking for highly secure IoT data delivery as needed. All are configurable with Cisco access points and routers.

With Cisco IOx, you can host applications on Cisco hardware, including container-based deployments. IOx applications integrated with Kinetic can publish data using a message protocol, MQTT, acting as a Kinetic data connector.

Edge computing refers to providing computing capability as close to the actual data as possible. There are many reasons to have an application deployed at the edge, such as to avoid high levels of data transfer for performance or security purposes. Or, maybe there are a large number of sensors with a high level of streaming data. With Cisco edge computing support, you can build, deploy, monitor applications on network devices.

These use cases are explained in greater detail and references to resources in the IoT Dev Center.

Networking

Cisco doesn't just provide network device hardware such as switches, wireless endpoints, routers. The operating system software for these devices is purpose-built for specific needs. Cisco IOS is used for network infrastructure, with different specialty versions. Cisco IOS XR focuses on service provider use cases. Cisco IOS XE separates the data plane and control plane for network creation and maintenance. Cisco NX-OS works across both physical and virtual data center deployments.

Nearly all of the major product lines from Cisco have APIs and programmability built-in. As a result, it is now possible to write shared code to manage varied network devices, even if the devices are from different vendors. For example, Meraki offers monitoring, configuration, and data access such as floor plans, plus security and teleworker appliances, with APIs available to build custom solutions built on the Meraki platform. And Cisco DNA Center enables automation for network-wide changes, plus monitoring with events and notifications, and integration points for third-party tools, all through APIs.

DevOps engineers now have powerful tools to quickly get visibility into the status of the network and to reduce time to solution and repair. The Networking Dev Center is a place to learn about methods and approaches for enhancing network fault-finding and correction.

Security

In today's threat landscape, there can be an overwhelming firehose of security and threat information. It is critical to triage this information by elevating key threats and relegating other items for later analysis. This can not be accomplished by a single security professional working alone. Fortunately, there are security organizations working on a much more massive scale. The Open Web Applications Security Project (OWASP) provides an updated knowledge base to help security professionals take on the challenges related to securing web sites and web applications. Similarly, the Talos project has an intelligence team that provides data about threats.

Cisco provides products that investigate threats and malware, and can quarantine endpoints as needed. These products provide programmatic access and policy-based responses to quarantine and mitigate threats.

The Security Dev Center provides information on Cisco security products that work together in multiple scenarios to keep your network and applications safe.

Wireless and mobile

Events or organizations with a lot of people mean a lot of mobile devices, along with requirements for a robust wireless network. Cisco wireless networks can be customized so that developers can create unique experiences, or better performance in their mobile apps. Location analytics offer real-time visibility into the users and devices on your networks. Take a look at the Mobility Dev Center for SDKs, technical resources, and use cases for mobile needs.

Wireless, including Wi-Fi6 access, provides capabilities for low-power IoT devices, high-density deployments, and meeting the demands of real-time applications such as Augmented Reality (AR) and Virtual Reality (VR). The Wireless Dev Center offers tools for wireless network troubleshooting and RF analysis in the field.

Application developers

All of these areas require application development. Developers might choose to embed video calls in custom web applications, provide location services and analytics on wireless and mobile networks, or create conversational chatbots for support, automation, or alerting.

Applications may need prioritized traffic capabilities, such as indicating which networks have video or real-time data needs. For example, location services might be added to an application that is serving end-users on mobile networks, such as in a retail store, where the business wants to send coupons to customers while they are shopping.

With Cisco Webex and collaboration use cases, developers might create meeting rooms customized for business needs using available devices and sensors. You can meet your application deployment needs, such as edge computing or continuous integration pipelines using Cisco offerings like IOx or Cisco Container Platform. All of these use cases are brought together in the Application Developer Center.



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