Cisco Nexus 9000 Series Switches

Cisco Nexus 9000 Series Switches Portfolio

The Cisco Nexus® Family, Cisco's flagship switching product line in the data center, has been the benchmark for innovation in the networking industry. Complementing the existing Cisco Nexus Family switches, the Cisco Nexus 9000 Series Switches are the foundation for Cisco® application centric infrastructure (ACI). The Cisco Nexus 9000 Series includes a set of both modular and fixed switches that offer scalability, performance, low power consumption, and full Virtual Extensible LAN (VXLAN) and Network Virtualization Using Generic Routing Encapsulation (NVGRE) functions. Customers can use the Cisco Nexus 9000 Series with the Cisco NX-OS Software operating system or manage the switches with a policy controller in ACI mode.

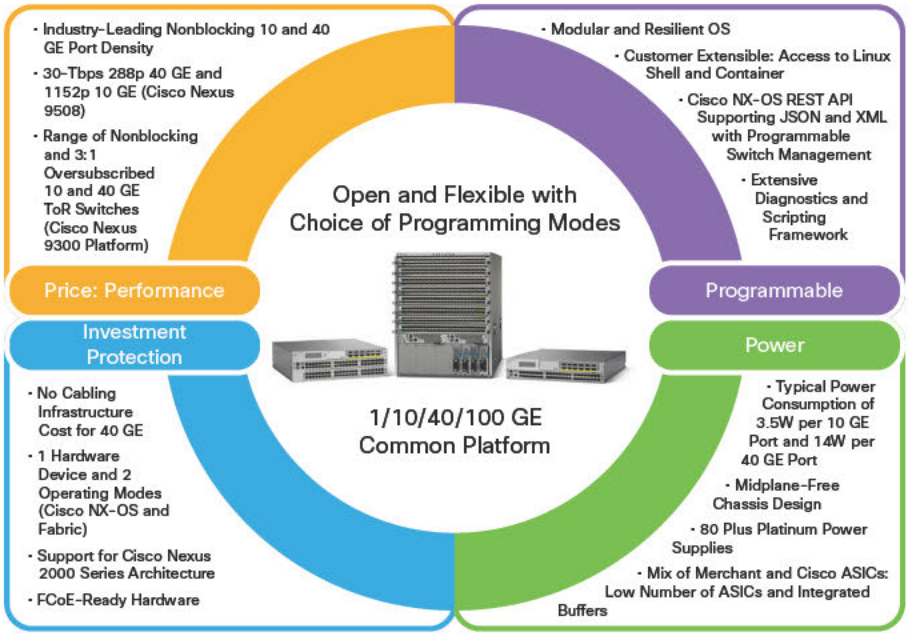
Cisco NX-OS Operating System for Cisco Nexus 9000 Series Switches

The Cisco Nexus 9000 Series uses an enhanced version of Cisco NX-OS Software with a single binary image that supports every switch in the series, simplifying image management. The operating system is modular and supports in-service software upgrade (ISSU), hot and cold patching, stateful process restart, and extensive online diagnostics and scripting. Customers have access to the Linux shell on the switch, can install their own scripts and agents in secure containers, and can use a Cisco NX-OS RESTful API (JavaScript Object Notation [JSON] or XML) to manage switches programmatically.

ACI Operating Mode with Cisco Application Policy Infrastructure Controller (APIC)

ACI offers a holistic architecture, bringing together the network, security, and application teams through the delivery of the next-generation data center fabric and an application centric policy management framework with the scalability of hardware and the flexibility of software (Figure 1).

Figure 1. Cisco ACI



Challenges

Organizations everywhere recognize that changing application environments are creating new demands for the IT infrastructure that supports them. Application workloads are deployed across a mix of virtualized and nonvirtualized server and storage infrastructure, requiring a network infrastructure that provides consistent connectivity, security, and visibility:

- Application instances are created dynamically. As a result, the provisioning, modification, and removal of application network connectivity needs to be dynamic as well.

- Business units demand accelerated application deployments. IT departments have to provide shared IT infrastructure to address time-to-market needs and to increase their return on investment (ROI).
- With organizations deploying a mix of custom, open source, and off-the-shelf commercial applications, IT departments must manage both security and quality of service (QoS) for environments that support multitenancy.
- Applications have been transitioning over time to a less monolithic, scale-out, multinode model. IT infrastructure that supports this model must scale with the speed of business and support both 10 and 40 Gigabit Ethernet connectivity.

The Cisco Nexus 9000 Series provides small and midsized business (SMB), enterprise, and service provider customers with the foundation for ACI, delivering savings in capital expenditures (CapEx) and operating expenses (OpEx) and an increasingly agile IT environment.

Cisco Nexus 9300 and 9500 Platforms

Figure 2. Cisco 9000 Series Switches

The Cisco Nexus 9508 Switch (Figure 2 middle) is a 13-rack unit (13RU) 1, 10, and 40 Gigabit Ethernet modular switch with eight line cards and six fabric module slots. It provides 30 terabits per second (Tbps) Layer 2 and 3 switching performance and up to 288 nonblocking 40 Gigabit Ethernet ports or 1152 nonblocking 10 Gigabit Ethernet ports per fully populated system. The switch has no midplane and hence offers superior airflow and cooling within the chassis and a simple upgrade path for future 100 Gigabit Ethernet modules. The Cisco Nexus 9500 platform is fully redundant, with two supervisors, two system controllers, three fan trays, and up to four power supplies.

The Cisco Nexus 9396PX Switch (Figure 2 right) is a 2RU 1, 10, and 40 Gigabit Ethernet fixed switch with 960-Gbps Layer 2 and 3 forwarding capacity. It has forty-eight 10 Gigabit Ethernet Enhanced Small Form-Factor Pluggable (SFP+) ports and twelve 40 Gigabit Ethernet Enhanced Quad SFP (QSFP+) ports. The Cisco Nexus 93128TX Switch (Figure 2 left) is a 3RU 1, 10, and 40 Gigabit Ethernet fixed switch with 1280-Gbps Layer 2 and 3 forwarding capacity. It has ninety-six 10GBASE-T ports and eight 40 Gigabit Ethernet QSFP+ ports. Each 10GBASE-T port can run at 100 Megabit Ethernet or 1 Gigabit Ethernet speed as well for backward compatibility.

Both the Cisco Nexus 9500 and 9300 platforms support VXLAN and NVGRE bridging and routing functions in hardware.

The main characteristics of the platforms include:

- Predictable high performance: Nonblocking 10 and 40 Gigabit Ethernet switch infrastructure with latency of 1 to 5 microseconds
- Reuse of existing copper and fiber cabling: Easy upgrade path from 1 Gigabit Ethernet to 10GBASE-T server access and from 10 to 40 Gigabit Ethernet network connectivity
- Advanced optics: Pluggable 40 Gigabit Ethernet QSFP bidirectional transceiver that enables customers to reuse existing 10 Gigabit Ethernet data center fiber cabling when deploying Cisco Nexus 9000 Series switches
- Power efficiency: First switch chassis designed without a midplane (Cisco Nexus 9500 platform); typical power consumption in a fully loaded configuration is less than 3.5W per 10 Gigabit Ethernet port, and typical power consumption per 40 Gigabit Ethernet port is less than 14W

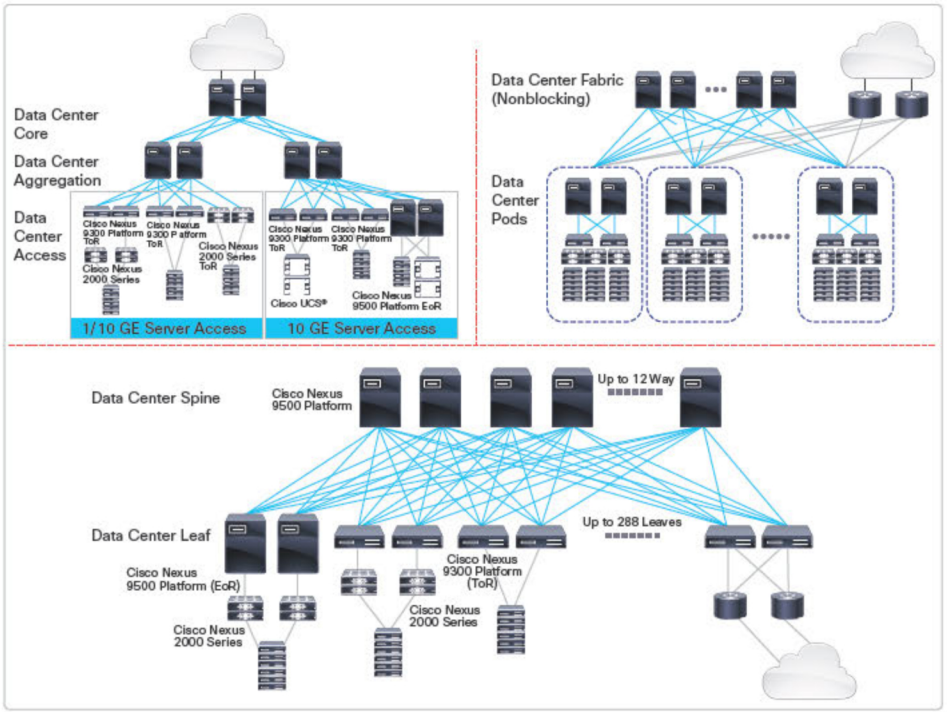
Deployment Scenarios

Customers can use the Cisco Nexus 9500 platform as a 1/10GBASE-T end-of-row (EoR) switch, Cisco Nexus 2000 Series Fabric Extenders aggregator, hybrid 10 and 40 Gigabit Ethernet aggregation switch, or high-density 40 Gigabit Ethernet spine switch for clos-fabric topologies.

The Cisco Nexus 9300 platform switches are optimized for top-of-rack (ToR) use cases, Cisco Nexus 2000 Series Switch aggregation, and small collapsed access- and aggregation-layer deployments. They can also be used as leaf switches for clos-fabric topologies.

The Cisco Nexus 9000 Series Switches enable deployments as small as a few hundred 10 Gigabit Ethernet servers, scaling up to 200,000 10 Gigabit Ethernet servers or more (Figure 3).

Figure 3. Sample Deployment



Benefits

In today's data centers, IT is tasked with delivering business agility while lowering total cost of ownership (TCO). The Cisco Nexus 9000 Series can adapt to increasing bandwidth demands with low power use, industry-leading price:performance ratios, and two modes of operation, providing customers with the flexibility required to implement data center architecture changes that align with their business needs.

The Cisco Nexus 9000 Series comes with a Cisco 90-day hardware warranty. Adding a contract for a technical service offering such as Cisco SMARTnet® Service to your device coverage provides access to the Cisco Technical Assistance Center (TAC) and can provide hardware replacement options to meet critical business needs, updates for licensed OS software, and registered access to the extensive Cisco.com knowledge base and support tools.

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