



Second-Generation Cisco Nexus 7000 Series Supervisor Modules

Product Overview

The second-generation Cisco Nexus[®] 7000 Series Supervisor Modules scale the control-plane and data-plane services for the Cisco Nexus 7000 Series Switches in scalable data center networks. The second-generation Cisco Nexus 7000 Series Supervisor Modules come in two versions: Supervisor2 (Sup2) and Supervisor2 Enhanced (Sup2E) (see Figure 1).

The Cisco Nexus 7000 Series Switches comprise a modular data center-class product line designed for highly scalable 10 Gigabit Ethernet networks with a fabric architecture that scales beyond 15 terabits per second (Tbps). Designed to meet the requirements of the most mission-critical data centers, it delivers continuous system operation and virtualized, pervasive services. The Cisco Nexus 7000 Series is based on a proven operating system, with enhanced features to deliver real-time system upgrades with exceptional manageability and serviceability. Its innovative unified fabric design is specifically built to support consolidation of IP and storage networks on a single lossless Ethernet fabric.

The Cisco Nexus 7000 Series Supervisor Modules are designed to deliver scalable control-plane and management functions for the Cisco Nexus 7000 Series chassis. The supervisor controls the Layer 2 and 3 services, redundancy capabilities, configuration management, status monitoring, power and environmental management, and more. It provides centralized arbitration to the system fabric for all line cards. The fully distributed forwarding architecture allows the supervisor to support transparent upgrades to I/O and fabric modules with greater forwarding capacity. Two supervisors are required for a fully redundant system, with one supervisor module running as the active device and the other in hot-standby mode, providing exceptional high-availability features in data center-class products.

Figure 1. Second-Generation Cisco Nexus 7000 Series Supervisor Modules



Features and Benefits

The second-generation Cisco Nexus 7000 Series Supervisor Modules deliver a comprehensive set of features to address the needs of the most demanding data center deployments:

- Continuous system operation
 - Active and standby supervisors
 - Segmented and redundant out-of-band provisioning and management paths

- Virtualization of the management plane
- Integrated diagnostics and protocol decoding with an embedded control-plane packet analyzer
- Upgradeable architecture
 - No hardware or software forwarding
 - Independent supervisor and fabric modules in a distributed architecture, enabling independent upgrades of supervisor and fabric modules
 - Transparent upgrade capacity and capability; designed to support high-density 10, 40 and 100 Gigabit Ethernet
- Superior operating efficiency
 - System locator and beacon LEDs for simplified operations
 - On-board failure logging (OBFL) flash memory
- Control-plane and virtualization features such as:
 - Virtual device contexts (VDCs)
 - Fabric extender control plane
 - Cisco® Overlay Transport Virtualization (OTV) control plane
 - Layer 3 protocol learning
 - Spanning Tree Protocol processing
 - Internet Group Management Protocol (IGMP) processing for multicast, etc.
 - CPU shares to allocate and guarantee CPU for the highest-priority VDCs

Cisco Nexus 7000 Series Supervisor2 Enhanced Module

The Cisco Nexus 7000 Series Sup2E Module (Figure 2) is based on a two-quad-core Intel Xeon processor with 32 GB of memory that scales the control plane by harnessing the flexibility and power of the two quad cores. With four times the CPU and memory power of the first-generation Cisco Nexus 7000 Series Supervisor1 (Sup1) Module, the Sup2E module offers the highest control-plane performance and scalability of the modules: for example, supporting more VDCs¹ and fabric extenders.

Figure 2. Cisco Nexus 7000 Series Supervisor2 Enhanced Module



¹ Software License is required to enable additional VDCs on the Sup2E

Cisco Nexus 7000 Series Supervisor2 Module

The Cisco Nexus 7000 Series Supervisor2 (Sup2) Module (Figure 3) is based on a quad-core Intel Xeon processor with 12 GB of memory and scales the control plane by harnessing the flexibility and power of the quad cores. A faster CPU and expanded memory compared to the first-generation Sup1 module enable better control-plane performance and an enhanced user experience.

Figure 3. Cisco Nexus 7000 Series Supervisor2 Module

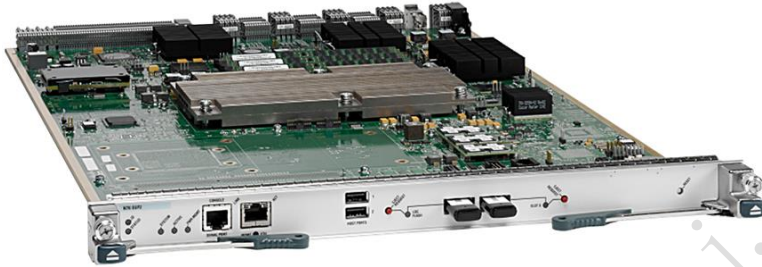


Figure 4 shows the connectivity and indicators for the Sup2 and Sup2E modules.

Figure 4. Cisco Nexus 7000 Series Supervisor2 and Supervisor2 Enhanced Module Connectivity and Indicators

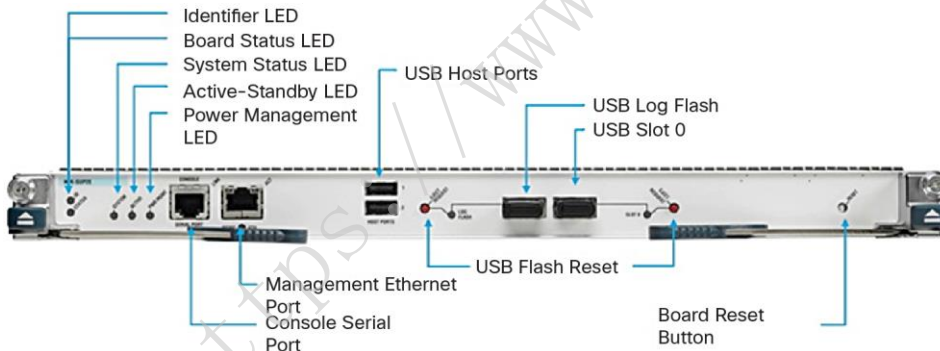


Table 1 summarizes the features and benefits of the Cisco Nexus 7000 Series Supervisor Modules.

Table 1. Features and Benefits

Feature	Benefit
High availability	Two supervisor modules operate in active and standby modes with stateful supervisor failover to enhance total system availability.
Resilient dedicated connectivity to each fabric and I/O module slot	Dual redundant Ethernet out-of-band channels to each module and fabric provide resilience for communication between the control plane and line-card processors.
Centralized arbiter	Active-active control of the flow of traffic through the switch fabric helps ensure transparent switchover with no losses.
Virtual output queuing	A quality-of-service (QoS)-aware lossless fabric avoids the problems associated with head-of-line blocking.
Embedded packet analyzer	An advanced integrated troubleshooting tool reduces the need for dedicated protocol analyzers and provides faster resolution of control-plane problems.
Front-panel LEDs	LEDs provide visible indication of the supervisor ID, active or standby status, power management, and activity on the compact flash drive.
Identification (ID) LED	Using the beacon feature, the administrator can clearly identify the chassis and supervisor module.
USB ports	Ports enable access to USB flash memory devices for software image loading and recovery.

Feature	Benefit
Log and expansion flash memory	Removable devices can be used for logging and software images.
CPU shares	CPU shares enable you to allocate specific amounts of the switch's CPU to a specific VDC. This feature enables you to prioritize VDCs and help ensure that critical VDCs have access to the CPU, and it prevents lower-priority VDCs from negatively affecting higher-priority VDCs.

Supervisor Redundancy

Two supervisor modules are required in a Cisco Nexus 7000 Series system for high availability with active-standby redundancy, with one supervisor module operationally active, and the standby device serving as a hot backup. Both supervisors in the redundancy configuration must be of the same type.

Advanced Diagnostics and Troubleshooting Tools

Management of large-scale data center networks requires proactive management tools to verify connectivity and mechanisms for capturing and analyzing traffic. The Cisco Nexus 7000 Series Supervisor Modules incorporate highly advanced analysis and debugging capabilities. The Power-On Self-Test (POST) and Cisco Generic Online Diagnostics (GOLD) provide proactive health monitoring both at startup and during system operation. The supervisor module uniquely provides a built-in packet capture and protocol decoding tool that allows analysis of control-plane traffic to improve network planning, provide faster operation response times to events, and reduce operating costs.

Product Specifications

Table 2 lists the specifications and comparisons for all the Cisco Nexus 7000 Series Supervisor Modules.

Table 2. Technical Specifications by Module

Item	Sup2	Sup2E
Processor	Xeon	Xeon
Number of cores	Quad core	2 quad cores
Speed	2.13 GHz	2.13 GHz
Kernel	64-bit	64-bit
Cisco NX-OS version	Cisco NX-OS Software Release 6.1	Cisco NX-OS Software Release 6.1
Memory	12 GB (DDR3) NVRAM 2-MB battery backup	32 GB (DDR3) NVRAM 2-MB battery backup
Connectivity Management Processor (CMP)	Not supported	Not supported
Flash memory	USB flash memory	USB flash memory
Removable storage	2 external USB memory slots: <ul style="list-style-type: none"> • Log (8 GB) • Expansion (2 GB) 	2 external USB memory slots: <ul style="list-style-type: none"> • Log (8 GB) • Expansion (2 GB)
Power	Typical: 109W Maximum: 300W	Typical: 147W Maximum: 300W
Dimensions	<ul style="list-style-type: none"> • H x W x D: 1.18 x 15.35 x 21.85 in. (3.0 x 38.9 x 55.6 cm) • Weight 10.34 lb (4.7 kg) 	<ul style="list-style-type: none"> • H x W x D: 1.18 x 15.35 x 21.85 in. (3.0 x 38.9 x 55.6 cm) • Weight 11.55 lb (5.25 kg)

Table 3 provides additional technical specifications that are common to all Cisco Nexus 7000 Series Supervisor Modules.

Table 3. Technical Specifications Common Across Modules

Item	Specifications
Product compatibility	Cisco Nexus 7000 Series Switches
Cards, ports, and slots	2 supervisor modules (must be of same type) required per system for high availability
Interfaces	<ul style="list-style-type: none"> • Supervisor management port: 10/100/1000-Mbps Ethernet port • Console serial port: RJ45 connector • Auxiliary serial port: RJ45 connector • 3 USB ports: 2 host and 1 device port for peripheral devices
MIBs	Simple Network Management Protocol (SNMP) supported; see Cisco NX-OS Software release notes for details of specific MIB support
Network management	<ul style="list-style-type: none"> • Cisco Data Center Network Manager (DCNM)
Programming interfaces	<ul style="list-style-type: none"> • XML • Scriptable command-line interface (CLI) • Cisco DCNM web services
Environmental conditions	<ul style="list-style-type: none"> • Operating temperature: 32 to 104°F (0 to 40°C) • Relative humidity (operational): 5 to 90%, noncondensing • Storage temperature: -40 to 158°F (-40 to 70°C) • Relative humidity (nonoperational): 5 to 95%, noncondensing
Regulatory compliance	<ul style="list-style-type: none"> • EMC compliance • FCC Part 15 (CFR 47) (USA) Class A • ICES-003 (Canada) Class A • EN55022 (Europe) Class A • CISPR22 (International) Class A • AS/NZS CISPR22 (Australia and New Zealand) Class A • VCCI (Japan) Class A • KN22 (Korea) Class A • CNS13438 (Taiwan) Class A • CISPR24 • EN55024 • EN50082-1 • EN61000-3-2 • EN61000-3-3 • EN61000-6-1 • EN300 386
Environmental standards	<ul style="list-style-type: none"> • NEBS criteria levels • SR-3580 NEBS Level 3 (GR-63-CORE, issue 3; and GR-1089-CORE, issue 4) • Verizon NEBS compliance • Telecommunications Carrier Group (TCG) Checklist • Qwest NEBS requirements • Telecommunications Carrier Group (TCG) Checklist • ATT NEBS requirements • ATT TP76200 level 3 and TCG Checklist • ETSI • ETSI 300 019-1-1, Class 1.2 Storage • ETSI 300 019-1-2, Class 2.3 Transportation • ETSI 300 019-1-3, Class 3.2 Stationary Use
Safety	<ul style="list-style-type: none"> • UL/CSA/IEC/EN 60950-1 • AS/NZS 60950

Warranty

Cisco Nexus 7000 Series Switches come with the standard Cisco 1-year limited hardware warranty.

Ordering Information

To place an order, visit the [Cisco ordering homepage](#). To download software, visit the [Cisco Software Center](#).

Table 4 provides ordering information.

Table 4. Ordering Information

Product Name	Part Number
Cisco Nexus 7000 Series Supervisor2 Module, Includes External 8Gb USB Flash	N7K-SUP2
Cisco Nexus 7000 Series Supervisor2 Module, Includes External 8Gb USB Flash Spare	N7K-SUP2=
Cisco Nexus 7000 Series Supervisor2 Enhanced Module, Includes External 8Gb USB Flash	N7K-SUP2E
Cisco Nexus 7000 Series Supervisor2 Enhanced Module, Includes External 8Gb USB Flash Spare	N7K-SUP2E=
Cisco Nexus 7000 - USB Flash Memory - 2 GB (Expansion Flash)	N7K-USB-2GB
Cisco Nexus 7000 - USB Flash Memory - 2 GB (Expansion Flash) Spare	N7K-USB-2GB=
Cisco Nexus 7000 - USB Flash Memory - 8 GB (Log Flash) Spare	N7K-USB-8GB=

Service and Support

Cisco offers a wide range of services to help accelerate your success deploying and optimizing Cisco Nexus 7000 Series Switches in your data center. Our innovative services are delivered through a unique combination of people, processes, tools, and partners, and are focused on helping you increase operation efficiency and improve your data center network. Cisco Advanced Services uses an architecture-led approach to help you align your data center infrastructure with your business goals and provide long-term value. Cisco Smart Net Total Care™ Service helps you resolve mission-critical problems with direct access at any time to Cisco network experts and award-winning resources. With this service, you can take advantage of the Cisco Smart Call Home service, which offers proactive diagnostics and real-time alerts on your Cisco Nexus 7000 Series Switches. Spanning the entire network lifecycle, Cisco Services helps increase investment protection, optimize network operations, support migration, and strengthen your IT expertise. For more information about Cisco Data Center Services, visit <http://www.cisco.com/go/dcservices>.

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For More Information

For more information about the Cisco Nexus 7000 Series, visit the product homepage at <http://www.cisco.com/go/nexus> or contact your local account representative.

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