

## Cisco Nexus 7000 Series Supervisor Module

The Cisco® Nexus 7000 Series Supervisor Module (Figure 1) scales the control plane and data plane services for the Cisco Nexus 7000 Series system in scalable data center networks.

**Figure 1.** Cisco Nexus 7000 Series Supervisor Module



### Product Overview

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 design is purpose built to support end-to-end data center connectivity, consolidating IP, storage, and interprocess communication (IPC) networks onto a single Ethernet fabric.

The Cisco Nexus 7000 Series Supervisor Module is designed to deliver scalable control plane and management functions for the Cisco Nexus 7000 Series chassis. It is based on a dual core processor that scales the control plane by harnessing the flexibility and power of the dual cores. The supervisors control 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 higher forwarding capacity-capable I/O and fabric modules. The supervisor incorporates an innovative dedicated connectivity management processor (CMP) to support remote management and troubleshooting of the complete system. 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.

## Features and Benefits

### Supervisor Module

The Cisco Nexus 7000 Series Supervisor Module delivers a comprehensive set of features to address the needs of the most demanding data center deployments.

- Continuous system operation
  - Active and standby supervisor
  - 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
  - Fully decoupled control plane and data plane with no hardware forwarding on the module
  - Distributed forwarding architecture, allowing independent upgrades of the supervisor and fabric
  - Unified Fabric ready
  - Transparent upgrade capacity and capability; designed to support 40 Gigabit and 100 Gigabit Ethernet
- Superior operational efficiency
  - System locator and beacon LEDs for simplified operations
  - Dedicated out-of-band management processor for 'lights out' management

### Supervisor Connectivity Management Processor (CMP)

The CMP provides a complete out-of-band management and monitoring capability independent from the primary operating system. The CMP enables 'lights out' remote monitoring and management of the supervisor module, all modules and the Cisco Nexus 7000 Series system without the need for separate terminal servers with the associated additional complexity and cost. The CMP delivers the remote control through its own dedicated processor, memory, and boot flash memory and a separate Ethernet management port. The CMP can reset all system components, including power supplies; it can also reset the host supervisor module to which it is attached, allowing a complete system restart.

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

**Table 1.** Features and Benefits

Feature	Benefit
<b>Supervisor</b>	
<b>High-performance dual-core Intel Xeon processor</b>	The multithreaded operating system runs on a dedicated dual-core processor. The flexible dual-core design harnesses the maximum processing power for control plane processing with enhanced reliability.
<b>High availability</b>	Two supervisor modules operate in active and standby modes with stateful supervisor failover to enhance total system availability.
<b>Resilient dedicated connectivity to each fabric and I/O module slot</b>	Dual redundant Ethernet out-of-band channels to each module and fabric provide resilience for communication between the control and line card processors.
<b>Centralized arbiter</b>	Active-active control of the flow of traffic through the switch fabric helps ensure transparent switchover with no losses.

<b>Virtual output queuing</b>	A quality-of-service (QoS) aware lossless fabric avoids the problems associated with head-of-line blocking.
<b>Secure Cisco Media Access Control Security (IEEE 802.1AE) enabled management port</b>	Secure access to switch management is provided (not available at first customer shipment [FCS]).
<b>Embedded packet analyzer</b>	An advanced integrated troubleshooting tool reduces the need for dedicated protocol analyzers and provides faster resolution of control plane problems.
<b>Front-panel LEDs</b>	LEDs provide visible indication of the supervisor ID, active or standby status, power management, and activity on the compact flash drive.
<b>Identification (ID) LED</b>	Using the beacon feature, the administrator can clearly identify the chassis and supervisor module.
<b>USB ports</b>	Ports enable access to USB flash memory devices for software image loading and recovery.
<b>Log and expansion flash memory</b>	Removable devices can be used for logging and software images.
<b>Compact flash memory slot cover</b>	The cover protects against accidental damage or removal.
<b>CMP</b>	
<b>Dedicated operating environment</b>	An independent remote system management and monitoring capability allows 'lights out' management of the system.
<b>Monitoring of supervisor status and initiation of resets</b>	Remote monitoring removes the need for separate terminal server devices for out-of-band management.
<b>System reset while retaining out-of-band Ethernet connectivity</b>	The need for onsite support during system maintenance is reduced.
<b>Capability to view boot-time messages remotely</b>	Complete visibility during the entire boot process simplifies remote operations.
<b>Capability to initiate a complete system power shutdown and restart</b>	Local operator intervention is not needed to reset power for devices.
<b>Login authentication</b>	Authentication provides secure access to the out-of-band management environment.
<b>Access to supervisor logs</b>	Access to critical log information enables rapid detection and prevention of potential system problems.
<b>Capability to take full console control of the supervisor</b>	Complete control is delivered to the operating environment.
<b>Dedicated front-panel LEDs</b>	LEDs clearly identify the CMP status separate from that of the supervisor.

**Note:** Not all Cisco Nexus 7000 Series Supervisor Module features are enabled in the first software release. Refer to the release notes for up-to-date software version information to see what features are supported.

### Supervisor redundancy

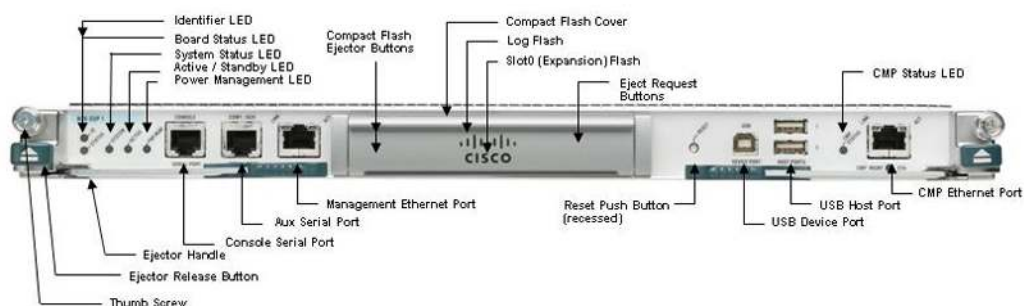
Two supervisor modules are required in a Cisco Nexus 7000 Series system for high availability with active standby redundancy, where one supervisor module is operationally active, and the standby device serves as a hot backup. Out-of-band access to both supervisors is available from either CMP.

### 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 Module incorporates 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.

Figure 2 shows supervisor module connectivity and indicators.

**Figure 2.** Cisco Nexus 7000 Series Supervisor Module Connectivity and Indicators



## Product Specifications

Table 2 lists the specifications for the Cisco Nexus 7000 Series Supervisor Module.

**Table 2.** Product Specifications

Item	Specifications
<b>Product compatibility</b>	Cisco Nexus 7000 Series Switches
<b>Software compatibility</b>	Cisco NX-OS Software Release 4.0 or later (minimum)
<b>Cards, ports and slots</b>	Two supervisor modules required per system for high availability
<b>Interfaces</b>	<ul style="list-style-type: none"> <li>Supervisor management port: 10/100/1000-Mbps Ethernet port, support for inline encryption through MAC security (IEEE 802.1AE)</li> <li>CMP management port: 10/100/1000-Mbps Ethernet port</li> <li>Console serial port: RJ45 connector</li> <li>Auxiliary serial port: RJ45 connector</li> <li>3 USB ports: 2 host and 1 device port for peripheral devices</li> </ul>
<b>Memory</b>	<ul style="list-style-type: none"> <li>DRAM: 4 GB</li> <li>Flash memory: 2 GB</li> <li>NVRAM: 2 Mb battery backup</li> </ul>
<b>Options</b>	<ul style="list-style-type: none"> <li>Removable storage; 2 external type II compact flash memory slots:</li> <li>Log (8 GB)</li> <li>Expansion (2 GB)</li> </ul>
<b>Reliability and availability</b>	<ul style="list-style-type: none"> <li>Mean time between failure (MTBF): 99,491 hours</li> <li>Online insertion and removal (OIR)</li> </ul>
<b>MIBs</b>	Simple Network Management Protocol (SNMP) Versions 3, 2c and 1 supported; see Cisco NX-OS Software release notes for details of specific MIB support
<b>Network management</b>	<ul style="list-style-type: none"> <li>Cisco Data Center Network Manager (DCNM) 4.0</li> <li>Cisco VFrame Data Center 1.2</li> </ul>
<b>Programming interfaces</b>	<ul style="list-style-type: none"> <li>Extensible Markup Language (XML)</li> <li>Scriptable command-line interface (CLI)</li> <li>Cisco DCNM 4.0 Web Services</li> </ul>
<b>Physical specifications</b>	<ul style="list-style-type: none"> <li>Occupies one supervisor slot in a Cisco Nexus 7000 Series chassis</li> <li>Dimensions (H x W x D): 1.2 x 15.3 x 21.9 in. (3.0 x 38.9 x 55.6 cm)</li> <li>Weight: 10 lb (4.5 kg)</li> </ul>
<b>Environmental conditions</b>	<ul style="list-style-type: none"> <li>Operating temperature: 32 to 104°F (0 to 40°C)</li> <li>Operational relative humidity: 5 to 90%, noncondensing</li> <li>Storage temperature: -40 to 158°F (-40 to 70°C)</li> <li>Storage relative humidity: 5 to 95%, noncondensing</li> </ul>

<b>Regulatory compliance</b>	<ul style="list-style-type: none"> <li>• EMC compliance <ul style="list-style-type: none"> <li>◦ FCC Part 15 (CFR 47) (USA) Class A</li> <li>◦ ICES-003 (Canada) Class A</li> <li>◦ EN55022 (Europe) Class A</li> <li>◦ CISPR22 (International) Class A</li> <li>◦ AS/NZS CISPR22 (Australia and New Zealand) Class A</li> <li>◦ VCCI (Japan) Class A</li> <li>◦ KN22 (Korea) Class A</li> <li>◦ CNS13438 (Taiwan) Class A</li> <li>◦ CISPR24</li> <li>◦ EN55024</li> <li>◦ EN50082-1</li> <li>◦ EN61000-3-2</li> <li>◦ EN61000-3-3</li> <li>◦ EN61000-6-1</li> <li>◦ EN300 386</li> </ul> </li> </ul>
<b>Environmental standards</b>	<ul style="list-style-type: none"> <li>• NEBS criteria levels <ul style="list-style-type: none"> <li>◦ SR-3580 NEBS Level 3 (GR-63-CORE, issue 3, and GR-1089-CORE, issue 4)</li> </ul> </li> <li>• Verizon NEBS compliance <ul style="list-style-type: none"> <li>◦ Telecommunications Carrier Group (TCG) Checklist</li> </ul> </li> <li>• Qwest NEBS requirements <ul style="list-style-type: none"> <li>◦ Telecommunications Carrier Group (TCG) Checklist</li> </ul> </li> <li>• ATT NEBS requirements <ul style="list-style-type: none"> <li>◦ ATT TP76200 level 3 and TCG Checklist</li> </ul> </li> <li>• ETSI <ul style="list-style-type: none"> <li>◦ ETSI 300 019-1-1, Class 1.2 Storage</li> <li>◦ ETSI 300 019-1-2, Class 2.3 Transportation</li> <li>◦ ETSI 300 019-1-3, Class 3.2 Stationary Use</li> </ul> </li> </ul>
<b>Safety</b>	<ul style="list-style-type: none"> <li>• UL/CSA/IEC/EN 60950-1</li> <li>• AS/NZS 60950</li> </ul>
<b>Warranty</b>	Cisco Nexus 7000 Series Switches come with the standard Cisco 1-Year Limited Hardware Warranty

### Software Requirements

The Cisco Nexus 7000 Series Supervisor Module is supported in Cisco NX-OS Software. The minimum software version is Cisco NX-OS Software Release 4.0 or later.

### Ordering Information

To place an order, visit the Cisco Ordering homepage. To download software, visit the Cisco Software Center. Table 3 provides ordering information.

**Table 3.** Ordering Information

Product Name	Part Number
Cisco Nexus 7000 Series Supervisor Module, Includes External 8Gb flash	N7K-SUP1
Cisco Nexus 7000 Series Supervisor Module, Includes External 8Gb flash Spare	N7K-SUP1=
Cisco Nexus 7000 - Compact Flash Memory – 2 GB (Expansion Flash)	N7K-CPF-2GB
Cisco Nexus 7000 - Compact Flash Memory – 2 GB (Expansion Flash) Spare	N7K-CPF-2GB=
Cisco Nexus 7000 - Compact Flash Memory – 8 GB (Log Flash) Spare	N7K-CPF-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 operational efficiency and improve your data center network. Cisco Advanced Services use an architecture-led approach to help you align your data center infrastructure to your business goals and provide long-term value. Cisco SMARTnet<sup>®</sup> Service helps you resolve mission critical problems with direct access anytime to Cisco network experts and award-winning resources. With this service, you can take advantage of the Smart Call Home service capability that offers proactive diagnostics, and real-time alerts on your Cisco Nexus 7000 switches. Spanning the entire network lifecycle, Cisco Services help maximize investment protection, optimize network operations, provide migration support, and strengthen your IT expertise. For more information about Cisco Data Center Services, visit: <http://www.cisco.com/go/dcservices>.

## 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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