Extension of Cisco Nexus 7000 Series Switches and Cisco NX-OS Software Release 6.2

The Cisco Nexus® 7000 Series Switches are the foundation of the Cisco® Unified Fabric solution. Designed to meet the requirements of mission-critical data centers, these switches deliver exceptional availability and scalability and the proven and comprehensive Cisco NX-OS Software data center switching feature set.

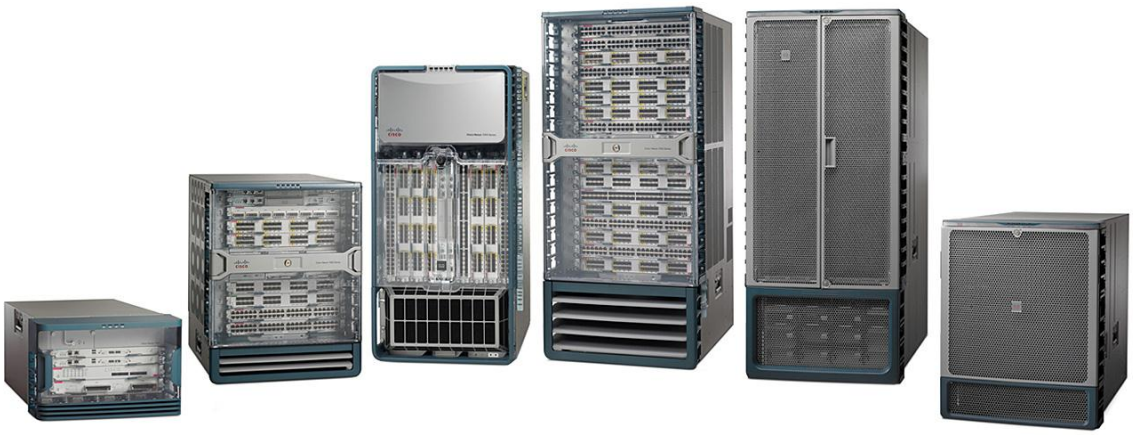
What Is New

The Cisco Nexus 7700 switches are the latest extension to the Cisco Nexus 7000 Series modular switches. With more than 83 terabits per second (Tbps) of overall switching capacity, the Cisco Nexus 7700 platform delivers the highest-capacity 10, 40, and 100 Gigabit Ethernet ports in the industry, with up to 768 native 10-Gbps ports, 384 40-Gbps ports, or up to 192 100-Gbps ports. This high system capacity is designed to meet the scalability requirements of the largest cloud environments.

The Cisco Nexus 7700 switches offer operational and feature consistency with the existing Cisco Nexus 7000 Series Switches, using a common system architecture, the same application-specific integrated circuit (ASIC) technology, and the same proven Cisco NX-OS Software releases. The Cisco Nexus 7700 platform is supported by Cisco NX-OS Software Release 6.2 and later.

This product bulletin introduces the Cisco Nexus 7700 10-Slot and 18-Slot Switches, the Cisco Nexus 7700 Supervisor 2 Enhanced (Sup2E) Module, the Cisco Nexus 7700 Enhanced F2-Series 48-Port Fiber 1/10 Gigabit Ethernet Module (referred to as the Cisco Nexus 7700 F2E-Series module in this document), the Cisco Nexus 7000 Network Analysis Module (NAM-NX1), and Cisco NX-OS Software Release 6.2 for Cisco Nexus 7000 Series Switches (Figure 1).

Figure 1. Cisco Nexus 7000 Series Switches



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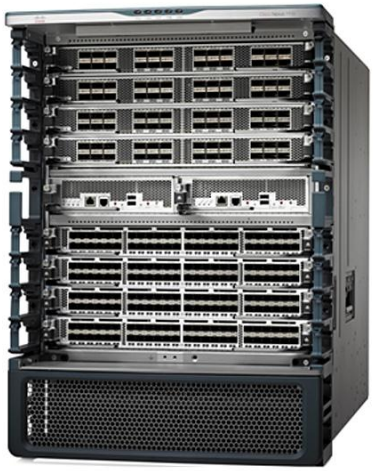
Cisco Nexus 7700 10-Slot and 18-Slot Switches

Powered by Cisco NX-OS, the Cisco Nexus 7700 platform delivers a comprehensive set of features with nonstop operations in two chassis form factors:

- Cisco Nexus 7700 10-Slot Switch with 10 front-accessible module slots with front-to-back airflow and an integrated cable management system: The Cisco Nexus 7700 10-Slot Switch consists of up to eight I/O module slots that support up to 384 x 1 and 10 Gigabit Ethernet ports, 192 x 40 Gigabit Ethernet ports, and 96 x 100 Gigabit Ethernet ports, meeting the demands of large data center deployments (Figure 2).

Figure 2. Cisco Nexus 7700 10-Slot Switch



The features of the Cisco Nexus 7700 10-Slot Switch include:

- 21-Tbps forwarding capacity with 384 x 1 and 10 Gigabit Ethernet port, 192 x 40 Gigabit Ethernet ports, or 96 x 100 Gigabit Ethernet ports
- True front-to-back airflow for hot-aisle and cold-aisle deployments and efficient cooling
- Three redundant hot-swappable fan trays with independent, variable-speed fans
- Two supervisor slots to provide full redundancy and high availability
- Smaller 3-kilowatt (kW) power supplies for more flexibility and control in power provisioning

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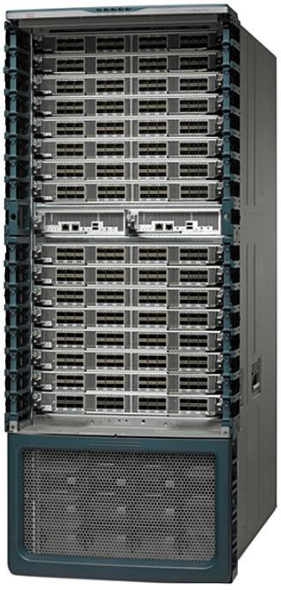
- Cisco Nexus 7700 18-Slot Switch with 18 front-accessible module slots and front-to-back airflow with integrated cable management: The Cisco Nexus 7700 18-Slot Switch consists of up to 16 I/O module slots that support up to 768 x 1 and 10 Gigabit Ethernet ports, 384 x 40 Gigabit Ethernet ports, and 192 x 100 Gigabit Ethernet ports, meeting the demands of the largest data center deployments (Figure 3).

Figure 3. Cisco Nexus 7700 18-Slot Switch



The features of the Cisco Nexus 7700 18-Slot Switch include:

- 42-Tbps forwarding capacity with 768 x 1 and 10 Gigabit Ethernet ports, 384 x 40 Gigabit Ethernet ports, or 192 x 100 Gigabit Ethernet ports
- True front-to-back airflow for hot-aisle and cold-aisle deployments and efficient cooling
- Three redundant hot-swappable fan trays with independent, variable-speed fans
- Two supervisor slots to provide full redundancy and high availability
- Smaller 3kW power supplies for more flexibility and control in power provisioning

Cisco Nexus 7700 Supervisor 2 Enhanced Module

The Cisco Nexus 7700 Sup2E Module (Figure 4) scales the control-plane and data-plane services for the Cisco Nexus 7700 platform in scalable data center networks. The enhanced supervisor module is designed to deliver control-plane and management functions. The supervisor controls 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 such as stateful switchover and In-Service Software Upgrade (ISSU) on mission-critical data center-class products.

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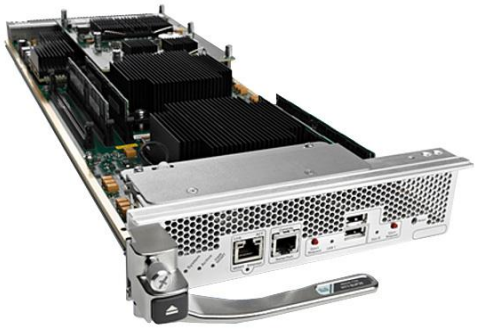
Figure 4. Cisco Nexus 7700 Supervisor 2 Enhanced Module



The features of the Cisco Nexus 7700 Sup2E Module include:

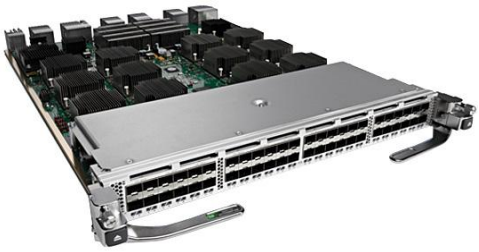
- Administrative virtual device context (VDC), providing a pure administrative context on the Cisco Nexus 7700 platform switches
- Scalability of up to eight VDCs and up to 64 Cisco Nexus 2000 Series Fabric Extenders on the Cisco Nexus 7700 Sup2E Module
- CPU shares feature enabling per-VDC CPU access and prioritization, helping guarantee CPU cycles for higher-priority VDCs

Cisco Nexus 7700 Enhanced F2-Series Module

The Cisco Nexus 7700 F2E-Series module (Figure 5) is a low-latency, high-performance, high-density 1/10 Gigabit Ethernet module designed for the Cisco Nexus 7700 platform.

The Cisco Nexus 7700 F2E-Series module is built on a switch-on-chip (SoC) architecture, in which a single ASIC implements all the module functions, including ingress buffering, forwarding of lookup operations, management of access control lists (ACLs) and quality-of-service (QoS) tables, establishment of lossless links to fabric interfaces, and traffic load balancing through virtual output queues (VOQs). This type of design increases performance while reducing the power and cooling requirements for the module. The module delivers 720 million packets per second (mpps) of distributed Layer 2 and Layer 3 forwarding and up to 480 Gbps of data throughput.

Figure 5. Cisco Nexus 7700 Enhanced F2-Series Module



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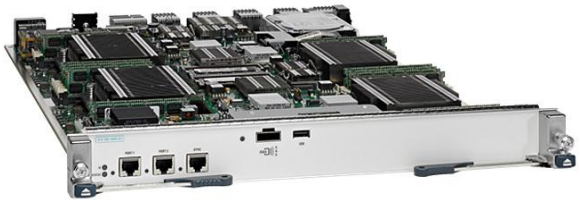
Features include:

- Dual-speed 1 and 10 Gigabit Ethernet ports, allowing smooth migration to 10 Gigabit Ethernet
- Comprehensive set of Layer 2 and Layer 3 functions, excellent for data center networks
- Support for Cisco FabricPath technology, allowing organizations to build resilient, flexible, and if needed, massively scalable Layer 2 networks
- Capability to be used in conjunction with the Cisco Nexus 2000 Series Fabric Extenders, which are designed to simplify data center architecture and operations by dramatically reducing the number of points of management
- Integrated Fibre Channel over Ethernet (FCoE), greatly simplifying the network infrastructure and reducing costs by enabling the deployment of unified data center fabrics to consolidate data center traffic onto a single, general-purpose, high-performance, highly available network
- Exceptional security with integrated hardware support for features such as configurable control-plane policing (CoPP), ACL counters and logging capability to allow administrators to see what traffic is policed, Layer 2 to Layer 4 ACL for both IPv4 and IPv6 traffic, Cisco TrustSec® technology, including line-rate data confidentiality, data integrity, and ACL processing for security group tags (SGTs)

Cisco Nexus 7000 Series Network Analysis Module (NAM-NX1)

The Cisco Nexus 7000 switches Network Analysis Module (NAM-NX1) is a high-performance services module (Figure 6) that offers comprehensive application awareness, comprehensive performance analytics, and deep network visibility to simplify data center operations. It empowers network administrators with actionable details to characterize application experience, optimize use of network resources, and troubleshoot performance problems, improving service delivery in today's dynamic IT environment. The Cisco NAM-NX1 module is not supported on the Cisco Nexus 7700 platform.

Figure 6. Cisco Nexus 7000 Series Network Analysis Module (NAM-NX1)



Cisco NAM-NX1 features include:

- Advanced application performance analytics
- Application traffic analysis
- IEEE 1588-based time synchronization
- Visibility into Cisco Overlay Transport Virtualization (OTV)
- Cisco TrustSec policy validation
- Insight into data center protocols such as Cisco OTV, Cisco Locator/ID Separation Protocol (LISP), Multiprotocol Label Switching (MPLS), and Virtual Extensible (VXLAN)
- Advanced hardware and software filters

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Software Support

Cisco NX-OS Release 6.2 supports all the software features previously supported on the Cisco Nexus 7000 Series Switches up through Cisco NX-OS Release 6.1. Cisco NX-OS Release 6.2 is compatible using ISSU with Cisco NX-OS Release 5.2(4) or higher. Note that because of some infrastructure changes in Cisco NX-OS Release 6.2, that release does not support In-Service Software Downgrade (ISSD). In addition, Cisco NX-OS Release 6.2 supports the new software features described in Table 1.

For more detailed information about new features and ISSU, refer to the Cisco NX-OS Release 6.2 release notes (see “For More Information” at the end of this document).

Table 1. New Software Features in Cisco NX-OS Release 6.2

Software Features	Description
MPLS Phase 2: Virtual Private LAN Services(VPLS) and Ethernet over MPLS (EoMPLS)	Completes the Cisco NX-OS MPLS feature set with VPLS and EoMPLS support
Cisco FabricPath Anycast Hot Standby Router Protocol (HSRP)	Allows more than 2 active default gateways for additional bandwidth at the Layer 2 and Layer 3 boundary in a Cisco FabricPath network
Layer 2 proxy learning for Cisco FabricPath	Allows a switch virtual interface (SVI) handled by a Cisco Nexus 7000 M-series I/O module to address 128,000 hosts in a Cisco FabricPath network
Cisco FabricPath overload bit support	Provides faster convergence in a Cisco FabricPath network
Administrative VDC on Sup1	Provides the capability to run an administrative VDC with a Supervisor 1 module, a capability reserved for Supervisor 2 modules until now
Cisco OTV enhancements	Provides improved Cisco OTV performance and scalability for more flexible deployments
2 bidirectional and 11 unidirectional SPAN) sessions (Cisco Nexus 7000 M2-Series, F1-Series, and F2-Series)	Provides more SPAN sessions, improving visibility for scalable designs
Cisco Nexus 7700 F2E-Series interoperability	Allows a Cisco Nexus 7000 F2E-Series I/O module to be part of the same VDC as a Cisco 7000 M-Series I/O module
Support for NAM service modules	Integrates the infrastructure to support the Cisco Nexus 7000 Series NAM
32-way equal-cost multipath (ECMP) for Cisco Nexus 7000 F2-Series I/O modules	Provides additional bandwidth in a routed environment, using up to 32 paths to a particular destination at Layer 3
New fabric extender models	Supports Cisco Nexus 2232TM-E 10GE and 2248PQ 10GE Fabric Extenders and Cisco Nexus B22 Fabric Extender
Differentiated services code point (DSCP) for queue mapping Layer 3 protocol adjacencies on fabric extender host interfaces (HIFs)	Allows attachment of devices running a Layer 3 control protocol on fabric extender HIFs
Private VLAN (PVLAN) on virtual PortChannel vPC and PortChannel	Allows configuration on vPCs and PortChannels
Domain Host Configuration Protocol (DHCP) relay IPv6 **Bidirectional Forwarding Detection (BFD) client for Intermediate System-to-Intermediate System Version 5 (ISISv6), Protocol-Independent Multicast Version 6 (PIMv6), Border Gateway Protocol Version 6 (BGPv6), and Open Shortest Path First Version 3 (OSPFv3)** **IPv6 logo phase 2 certification** **BGP enhancements (flexible distance manipulation and injection map)** **Virtual Router Redundancy Protocol Version 3 (VRRPv3)** **Virtual Routing and Forwarding lite (VRF-lite) scalability enhancements**	Strengthens the Cisco NX-OS Layer 3 protocol portfolio

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Ordering Information

To place an order, visit the Cisco Ordering homepage. To download software, visit the Cisco Software Center. Table 2 provides ordering information.

Table 2. Cisco Nexus 7000 Series Next-Generation Hardware

Description	Part Number
Cisco Nexus 7700 Switches 10-Slot chassis including Fan Trays, No Power Supply	N77-C7710
Cisco Nexus 7700 Switches 18-Slot chassis including Fan Trays, No Power Supply	N77-C7718
Cisco Nexus 7700 Switches Supervisor2 Enhanced Module, Includes External 8Gb USB Flash	N77-SUP2E
Nexus 7700 F2E-Series 48-Port 1 and 10G Ethernet Module (req. SFP/SFP+ modules	N77-F248XP-23E
Cisco Nexus 7000 Series Network Analysis Module (NAM-NX1)	N7K-SM-NAM-9G-K9

Support for Cisco Nexus 2000 Series Fabric Extenders

Table 3 lists ordering information for the Cisco fabric extenders now supported on the Cisco Nexus 7000 F2-Series and F2E-Series 48-Port 1 and 10 Gigabit Ethernet Module, Cisco Nexus 7700 F2E-Series 48-Port 1/10 Gigabit Ethernet Module, Cisco Nexus 7000 M2-Series 24-Port 10 Gigabit Ethernet Module, and Cisco Nexus 7000 M1-Series 32-Port 10 Gigabit Ethernet Module.

Table 3. New Cisco Fabric Extenders Supported in Cisco NX-OS Release 6.2

Cisco Fabric Extenders	Part Number
Cisco Nexus 2232TM-E Series 10GBASE-T Fabric Extender, 32x1/10GBase-T + 8x10GE Module	N2K-C2232TM-E
Cisco Nexus 2248PQ 10GE Fabric Extender, 48x1/10GE (SFP/SFP+) + 4x40G QSFP+	N2K-C2248PQ
Cisco Nexus B22HP blade Fabric Extender for HP blade servers	Refer to HP website

Support for Cisco Transceiver Modules

Table 4 lists ordering information for the new optics supported in Cisco NX-OS Release 6.2.

Table 4. New Optics Supported in Cisco NX-OS Release 6.2

Optics	Part Number
For Cisco Nexus 7700 F2-Series Enhanced (F2E) 48-Port 1/10GbE Module (N77-F248XP-23E)	
FET-10G Fabric Extender Transceiver (up to 100m)	FET-10G
SFP 10GBASE-SR (up to 300m)	SFP-10G-SR
SFP 10GBASE-LR (up to 10km)	SFP-10G-LR
SFP 10GBASE-ER (up to 40km)	SFP-10G-ER
10GBASE-LRM (up to 300m)	SFP-10G-LRM
10GBASE-ZR SFP+	SFP-10G-ZR
10GBASE-AOC (Active Optical Cable) SFP+ Cable (1m, 2m, 3m, 5m, 7m, 10m)	SFP-10G-AOCxM
SFP-H10GB-CUxM Twinax Cable Passive (1m, 3m, 5m)	SFP-H10GB-CUxM
SFP-H10GC-CUxM Twinax Cable Passive (1.5m, 2m, 2.5m)	SFP-H10GB-CUxM
SFP-H10GB-ACUxM Twinax Cable Active (7m, 10m)	SFP-H10GB-ACUxM
1000BASE-T SFP	SFP-GE-T
1000BASE-SX SFP (DOM)	SFP-GE-S
1000BASE-LX/LH SFP (DOM)	SFP-GE-L
1000BASE-ZX SFP (DOM)	SFP-GE-Z

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Optics	Part Number
1000BASE-LX/LH SFP	GLC-LH-SM
1000BASE-LX/LH SFP	GLC-LH-SMD
1000BASE-SX SFP	GLC-SX-MM
1000BASE-SX SFP	GLC-SX-MMD
1000BASE-ZX SFP	GLC-ZX-SM
1000BASE-ZX SFP	GLC-ZX-SMD
1000BASE-T SFP	GLC-T
1000BASE-BX10-D	GLC-BX-D
1000BASE-BX10-U	GLC-BX-U
1000BASE-EX SFP	GLC-EX-SMD
1000BASE-CWDM	CWDM-SFP-xxxx
10GBASE-DWDM SFP+	DWDM-SFP10G-xx.xx
1000BASE-DWDM	DWDM-SFP-xxxx
For Cisco Nexus 7000 F2-Series (F2) 48-Port 1/10GbE Module (N7K-F248XP-25)	
10GBASE-AOC (Active Optical Cable) SFP+ Cable (1m, 2m, 3m, 5m, 7m, 10m)	SFP-10G-AOCxM
SFP-H10GC-CUxM Twinax Cable Passive (1.5m, 2m, 2.5m)	SFP-H10GB-CUxM
1000BASE-ZX SFP	GLC-ZX-SMD
For Cisco Nexus 7000 F2-Series Enhanced (F2E) 48-Port 1/10GbE Module (N7K-F248XP-25E)	
10GBASE-AOC (Active Optical Cable) SFP+ Cable (1m, 2m, 3m, 5m, 7m, 10m)	SFP-10G-AOCxM
SFP-H10GC-CUxM Twinax Cable Passive (1.5m, 2m, 2.5m)	SFP-H10GB-CUxM
1000BASE-ZX SFP	GLC-ZX-SMD
For Cisco Nexus F1-Series 32-Port 10GbE Module (N7K-F132XP-15)	
10GBASE-AOC (Active Optical Cable) SFP+ Cable (1m, 2m, 3m, 5m, 7m, 10m)	SFP-10G-AOCxM
SFP-H10GC-CUxM Twinax Cable Passive (1.5m, 2m, 2.5m)	SFP-H10GB-CUxM
1000BASE-ZX SFP	GLC-ZX-SMD
For Cisco Nexus 7000 Series 48-Port Gigabit Ethernet Module (SFP) (N7K-M148GS-11) and For Cisco Nexus 7000 Series 48-Port Gigabit Ethernet Module (SFP) with XL Option (N7K-M148GS-11L)	
1000BASE-EX SFP	GLC-EX-SMD
1000BASE-ZX SFP	GLC-ZX-SMD
For Cisco Nexus M1-Series 32-Port 10GbE Module with XL Option (N7K-M132XP-12L)	
10GBASE-AOC (Active Optical Cable) SFP+ Cable (1m, 2m, 3m, 5m, 7m, 10m)	SFP-10G-AOCxM
SFP-H10GC-CUxM Twinax Cable Passive (1.5m, 2m, 2.5m)	SFP-H10GB-CUxM
Cisco Nexus 7000 M2-Series 24 Port 10 GbE with XL Option (N7K-M224XP-23L)	
10GBASE-AOC (Active Optical Cable) SFP+ Cable (1m, 2m, 3m, 5m, 7m, 10m)	SFP-10G-AOCxM
SFP-H10GC-CUxM Twinax Cable Passive (1.5m, 2m, 2.5m)	SFP-H10GB-CUxM
Cisco Nexus 7000 M2-Series 6 Port 40 GbE with XL Option (req. QSFP+) (N7K-M206FQ-23L)	
40GBASE-CSR4 QSFP+	QSFP-40G-CSR4
40GBASE-CR4 QSFP+ Direct Attach Copper Cable Active (7m, 10m)	QSFP-H40G-ACUxM

More information about the transceivers is available at http://www.cisco.com/en/US/docs/interfaces_modules/transceiver_modules/installation/note/78_15160.html.

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Cisco NX-OS is available with the following software licenses:

- Base license: A comprehensive feature set is provided with the Base license, which is bundled with the hardware at no additional cost. Cisco TrustSec is included in this license for Cisco NX-OS Release 6.1 and later.
- Enterprise license: The Enterprise license enables incremental functions that are applicable to many enterprise deployments.
- VDC license: The VDC license enables the use of the following functions in Cisco NX-OS:
  - 4 VDCs and +1 Admin VDC: Four VDC licenses for Cisco Nexus 7000 Series Supervisor 1, Supervisor 2, and Supervisor 2E Modules
  - +4 VDCs: Increments VDC licenses by four, allowing the Cisco Nexus 7000 Series Supervisor 2E Module to scale up to eight VDCs
- Scalable Feature license: The Scalable Feature license enables XL capabilities on the line cards. The Scalable Feature license is applied on a per-chassis basis.
- Transport Services license: The Transport Services license enables Cisco OTV functions. The license to enable Cisco LISP is included in this license for Cisco NX-OS Release 6.0 and later.
- Enhanced Layer 2 license: The Enhanced Layer 2 license enables the Cisco FabricPath feature. The license to enable Pong is included in this license for Cisco NX-OS Release 6.0 and later.
- MPLS license: The MPLS license enables all MPLS features, including MPLS forwarding; QoS; Layer 3 VPN (L3VPN); IPv6 VPN Provider Edge (6PE/VPE); and operations, administration, and maintenance (OAM). Starting with Cisco NX-OS Release 6.2(2), the MPLS feature license (N7K-MPLS1K9) includes support for VPLS and EoMPLS.
- FCoE license: The FCoE license enables all FCoE features on the Cisco Nexus 7000 Series Switches.
- Storage license: The Storage license enables VSAN routing and access control.

Starting with Cisco NX-OS Release 6.2(2), the following new licenses are available for the Cisco Nexus 7700 18-Slot chassis (N77-C7718) and Cisco Nexus 7700 10-Slot chassis (N77-C7710):

- LAN_ENTERPRISE_SERVICES (N77-LAN1K9)
- VDC_LICENSES (N77-VDC1K9)
- ENHANCED_LAYER2_PKG (N77-EL21K9)
- STORAGE_ENT (N77-SAN1K9)

Additional information about the license packages can be found on the Cisco website at http://www.cisco.com/en/US/prod/collateral/iosswrel/ps9494/ps9372/data_sheet_c78-437306.html.

Cisco Services and Support

Cisco offers a wide range of services to help accelerate your success in deploying and optimizing Cisco Nexus 7000 Series Switches in your data center. Cisco's innovative services are delivered through a unique combination of people, processes, tools, and partners and are focused on helping you increase your 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 achieve long-term value. Cisco SMARTnet® 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 capability, which offers proactive diagnostics and real-time alerts on your Cisco Nexus 7000 Series Switches.

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Spanning the entire network lifecycle, Cisco Services helps protect your investment, 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.

For More Information

For more information about Cisco NX-OS, visit the product homepage at http://www.cisco.com/go/nxos or contact your local account representative.

For more information about the Cisco Nexus 7000 Series, visit the product homepage at http://www.cisco.com/go/nexus7000 or contact your local account representative.

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