Cisco Nexus 7700 F4-Series 30-Port 100-Gigabit Ethernet Module

Product overview

The Cisco Nexus® 7700 F4-Series 30-Port 100-Gigabit Ethernet Module (referred to as the Cisco Nexus 7700 F4-Series module in this document) offers outstanding feature flexibility and wire-rate performance on each port. The module enables the deployment of high-density, low-latency, scalable data center architecture. The Cisco Nexus 7700 F4-Series 30-Port 100-Gigabit Ethernet Module provides flexibility to use each port with either a 100- or 40-Gigabit Ethernet link. Each port also provides the flexibility to use as many as four 10-Gigabit Ethernet links.

The Cisco Nexus 7700 Switches are an extension of the Cisco Nexus 7000 Series modular switches. With more than 83 Terabits per second (Tbps) of overall switching capacity, the Cisco Nexus 7700 Switches deliver the highest-capacity 10-, 40-, and 100-Gigabit Ethernet ports in the industry, with up to 768 native 10-Gbps ports, 480 40-Gbps ports, or 480 100-Gbps ports. This high system capacity is designed to meet the scalability requirements of the largest cloud environments.

The Cisco Nexus 7700 platform switches have 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 F4-Series module (Figure 1) is a low-latency, high-performance, high-density 100-Gigabit Ethernet module designed for mission-critical data center networks. This module delivers 1.44 billion packets per second (bpps) of distributed Layer 2 and Layer 3 forwarding and up to 3Tbps of data throughput. A Cisco Nexus 7700 18-Slot Switch fully populated with the Cisco Nexus 7700 F4-Series module can support up to 480 wire-rate 100-Gigabit Ethernet ports (Table 1) and deliver nearly 90 Tbps of switching performance.

Figure 1. Cisco Nexus 7700 F4-Series module

Table 1. Cisco Nexus 7700 Platform 100 Gigabit Ethernet maximum port density

Cisco Nexus 7700 Chassis	Maximum wire-rate port density
Cisco Nexus 7700 18-Slot Switch	480
Cisco Nexus 7700 10-Slot Switch	240
Cisco Nexus 7700 6-Slot Switch	120
Cisco Nexus 7700 2-Slot Switch	30

The Cisco Nexus 7700 F4-Series module is based on the Cisco Nexus F4-Series Switch-on-Chip (SoC) ASIC. This type of design increases performance, reduces latency while lowering the power and cooling requirements of the module. The Cisco Nexus F4-Series SoC is an innovative Cisco® ASIC powered by a flexible packet engine, which makes it excellent for building network infrastructure for public and private cloud environments. The Cisco Nexus F4-Series engine supports all the foundational networking protocols needed to build Layer 2 and Layer 3 networks. It also provides hardware support for Cisco Virtual Extensible LAN (VXLAN) and Locator/ID Separation Protocol (LISP), which enable building scalable virtual overlay networks. The Cisco Nexus 7700 F4-Series module enables customers to transparently interconnect their data centers with protocols such as Overlay Transport Virtualization (OTV), Multiprotocol Label Switching (MPLS), and Virtual Private LAN Services (VPLS).

Features and benefits

The Cisco Nexus 7700 F4-Series modules are powered by the proven and widely deployed Cisco NX-OS Software. The Cisco Nexus 7700 F4-Series modules integrate a broad set of data center switching technologies, including both industry standards and Cisco's own innovations, such as the following:

- GPRS (General Packet Radio Service) Tunneling Protocol (GTP) Hashing: This feature leverages the advanced packet-parsing capabilities of the F4-Series modules to provide enhanced port-channel and equal-cost multipathing (ECMP) load balancing for GTP packets.
- Virtual Extensible LAN (VXLAN): VXLAN enables organizations to build highly scalable virtual overlay networks for virtualized environments. It also provides the architectural flexibility and agility required to scale cloud deployments with repeatable pods in different Layer 2 domains and to migrate virtual machines between servers across Layer 3 networks.
- Advanced Data Center Interconnect (DCI) protocols: Advanced protocols such as Overlay Transport Virtualization (OTV), Locator/ID Separation Protocol (LISP), Multiprotocol Label Switching (MPLS), and Virtual Private LAN Service (VPLS) offer customers a broad choice of technologies to transparently interconnect their data centers and extend applications across geographically dispersed data center sites.
- Virtual Device Context (VDC): This feature enables the virtualization of a single physical device as multiple logical devices. Each provisioned logical device is configured and managed as if it were a separate physical device.
- Exceptional integrated hardware security capabilities:
  - Control-Plane Policing (CoPP), which protects the supervisor CPU from excessive traffic
  - Access Control List (ACL) counters and logging capability to provide deeper packet visibility
  - Layer 2-to-Layer-4 ACL for both IPv4 and IPv6 traffic
- Onboard Fabric Services Accelerator (FSA): The accelerator provides higher performance and greater scalability for distributed fabric services such as Bidirectional Forwarding Detection (BFD) and Cisco NetFlow.
- Cisco FabricPath: This technology enables organizations to build resilient, flexible, and massively scalable Layer 2 networks. FabricPath provides investment protection by allowing existing spanning-tree–based deployments to be connected to a FabricPath network.
- Cisco Nexus 2000 Series Fabric Extenders: The Cisco Nexus 7700 F4-Series modules can be used with the Cisco Nexus 2000 Series Fabric Extenders. These fabric extenders are designed to simplify data center architecture and operations by dramatically reducing the number of points of management.

- Port breakout capability: This feature allows the 100-Gigabit Ethernet ports on the module to be split into 4 logical and independent 10 Gigabit Ethernet ports. Any port that is not configured for breakout remains available for establishing either 100- or 40-Gigabit Ethernet links. The capability to configure the breakout mode on each port independently of any other port without the need to reload the module enhances operational simplicity. Copper or fiber breakout assemblies are required to enable the physical separation of 10-Gigabit Ethernet channels. In a Cisco Nexus 7700 F4-Series 30-port 100-Gigabit Ethernet module, you can break out 20 ports of the available 30 ports. Breakout is not supported on the following ports: 3,6,9,12,15,18,21,24,27 and 30.
- Port speed flexibility: Each of the ports in the Cisco Nexus 7700 F4-Series module can be used at either 100- or 40-Gigabit Ethernet speed.

This broad set of foundational and advanced features along with higher scale available on the Cisco Nexus 7700 F4-Series 30-Port module provides flexible deployment options and investment protection for organizations that are consolidating their data centers and migrating to high-density 100-Gigabit Ethernet networks.

Note: This data sheet describes the hardware capabilities of the Cisco Nexus 7700 F4-Series 30-Port 100-Gigabit Ethernet module. Please refer to the Cisco NX-OS Software release notes (https://www.cisco.com/c/en/us/support/switches/nexus-7000-series-switches/products-release-notes-list.html) or consult your Cisco representative to confirm the current or future NX-OS release required for any of these features.

Product specifications

Table 2 summarizes the specifications for the Cisco Nexus 7700 F4-Series 30-Port 100-Gigabit Ethernet module.

Table 2. Product specifications

Item	Specifications
System	
Product compatibility	• Supported on Cisco Nexus 7700 2-, 6-, and 10-slot Switch chassis • Recommended to use with Supervisor3E and Fabric-3 modules • Supported with Fabric-2 and Fabric-3 modules • Supported with Supervisor2E and Supervisor3E modules
Software compatibility	Cisco NX-OS Software Release 8.3.1 or later
Memory	8 GB of Dynamic RAM (DRAM)
Front-panel LEDs	• Status ◦ Green (operational) ◦ Orange (module booting) ◦ Red (fault) • Link ◦ Green (port enabled and connected) ◦ Orange (port disabled) ◦ Off (port enabled and not connected) ◦ Blinking green and orange in conjunction with blue ID LED (port flagged for identification; beacon) • ID ◦ Blue (operator has flagged this card for identification; beacon) • Off (module not flagged)
Programming interfaces	• Cisco NX-API • XML • Scriptable Command-Line Interface (CLI) • Cisco Data Center Network Manager (DCNM) web services • Python and TCL • Puppet and Chef

Item	Specifications
	• Cisco Embedded Event Manager (EEM)
Physical interfaces	
Connectivity	30 ports of 100/40-Gigabit Ethernet (Quad Enhanced Small Form-Factor Pluggable [QSFP+])
Port density	• 480 x 100-Gigabit Ethernet ports in Cisco Nexus 7700 18-Slot chassis • 240 x 100-Gigabit Ethernet ports in Cisco Nexus 7700 10-Slot chassis • 120 x 100-Gigabit Ethernet ports in Cisco Nexus 7700 6-Slot chassis • 30 x 100-Gigabit Ethernet ports in Cisco Nexus 7700 2-Slot chassis
Queues per port	4 ingress and 8 egress
Virtual Output Queuing (VOQ) buffer	3 GB
Jumbo frames	Up to 9216 bytes for bridged and routed packets
Forwarding engine	
Forwarding performance	1.44 bpps of Layer 2 and Layer 3 forwarding capacity for both IPv4 and IPv6 packets
MAC address entries	384,000
VLANs	4096 per VDC
IPv4 entries	128,000
IPv6 entries	64,000
ACLs	32,000
Policers	8000
Environmental	
Physical dimensions	• Occupies one I/O module slot in a Cisco Nexus 7700 platform chassis • Dimensions: 1.75 x 15.9 x 21.8 in. (4.4 x 40.39 x 55.37 cm) • Weight: 23 lb (10.6 kg)
Power utilization	• Typical Power: 730 Watts • Maximum Power: 1000 Watts
MTBF	• 168,150 Hours
Environmental conditions	• Operating temperature: 32 to 104°F (0 to 40°C) • Operational relative humidity: 5 to 90%, noncondensing • Storage temperature: –40 to 158°F (–40 to 70°C) • Storage relative humidity: 5 to 95%, noncondensing
Regulatory compliance	• 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 • KN32 (South Korea) Class A • KN35 (South Korea) Class A • CNS13438 (Taiwan) Class A • TCVN 7189 (Vietnam) • CISPR24 • EN55024 • EN50082-1 • EN61000-3-2 • EN61000-3-3 • EN61000-6-1 • EN300 386

Item	Specifications
Environmental standards	Designed to meet: • GR-1089-CORE* • GR-63-CORE* • ETSI* ◦ ETSI 300 019-2-1, Class 1.2 Storage ◦ ETSI 300 019-2-2, Class 2.3 Transportation** ◦ ETSI 300 019-2-3, Class 3.2 Stationary Use * Validation in progress ** Some exceptions apply
Safety	• UL/CSA/IEC/EN 60950-1 • AS/NZS 60950
Warranty	The Cisco Nexus 7700 platform switches come with the standard Cisco 1-year limited hardware warranty.

Ordering information

Table 3 provides ordering information for the Cisco Nexus 7700 30-Port 100-Gigabit Ethernet Module.

Table 3. Ordering information

Part number	Product description
N77-F430CQ-36 **N77-F430CQ-36=**	Cisco Nexus 7700 F4-Series 30-Port 100G Ethernet Module (req. QSFP+ modules)

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For more information

For more information about the Cisco Nexus 7700 platform, visit the product homepage at https://www.cisco.com/go/nexus or contact your local account representative.

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