New Cisco Nexus XL I/O Modules

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The Cisco Nexus® 7000 Series Switches now support a new series of scalable I/O modules designed to meet the needs of customers using the full Internet routing tables. These new modules enable support for both larger IPv4 and v6 forwarding tables of up to 1 million entries and expand the capacity of tables for access control list (ACL) and quality-of-service (QoS) entries. The first two XL I/O modules available are the Cisco Nexus 8-Port 10 Gigabit Ethernet XL Module and the Cisco Nexus 48-Port Gigabit Ethernet XL Module, both of which use the Cisco Nexus 7000 Series M1-XL Forwarding Engine and support the same flexible forwarding engine architectures as the current Cisco Nexus 7000 Series M1 Series modules, providing consistent features and protecting customer investments made in the Cisco Nexus 7000 Series platform.

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 network environments, the switches delivers continuous system operation and virtualized, pervasive services.

Cisco Nexus 7000 Series XL I/O Modules Features

The 8-port 10 Gigabit Ethernet (Figure 1) and 48-port Gigabit Ethernet (Figure 2) modules are available now, and both support the M1-XL forwarding engine. The two modules have feature consistency with the Cisco Nexus 7000 Series M1 Series modules and enable specific enhanced features as described here.

Figure 1. Cisco Nexus 7000 Series 8-Port 10 Gigabit Ethernet XL Module

The Cisco Nexus 7000 Series M1-XL Ethernet modules are designed to allow flexible deployment in enterprise and service provider environments, where support for high performance, expanded forwarding table capacity, and rich features is required. The M1-XL modules can be operated in either non-XL or XL mode; without any changes to the module and through the simple addition of a new scalable feature license, the module will operate in XL mode. This mode enables the Cisco Nexus 7000 Series system to use the larger tables, essential for large-scale deployments such as in Internet peering environments. The expanded forwarding information base (FIB) table can support multiple copies of the full Internet routing table for use in Internet-facing deployments with simultaneous Virtual routing and forwarding (VRF) and virtual device context (VDC) support.

Figure 2. Cisco Nexus 7000 Series 48-Port Gigabit Ethernet XL Module

Nexus 7000 M-Series Forwarding Architectures

The 8-port module has two forwarding engines, and the 48-port module has a single forwarding engine.

All Cisco Nexus 7000 M-Series I/O modules contain integrated M-Series forwarding engines. The M1-Series forwarding engine enables up to 60 million packets per second (Mpps) of IPv4 unicast forwarding traffic and up to 30 Mpps of IPv6 unicast forwarding traffic per forwarding engine. This fully distributed forwarding architecture scales the overall system forwarding performance linearly as the number of M-Series I/O modules installed increases. The M1 forwarding engine also delivers ACL filtering, marking, rate limiting, and NetFlow with no degradation of performance.

The Cisco Nexus 7000 Series M1-XL forwarding engine on the Cisco Nexus 7000 Series 8-Port 10 Gigabit Ethernet XL Module increases the table sizes for IPv4 and v6 routes and ACL and QoS entries. Table 1 summarizes the specifications for the Cisco Nexus 7000 M1-Series modules operating in non-XL and XL modes.

Table 1. Performance Specifications for M1 Non-XL and XL Mode Operation

Item	Non-XL Mode	XL Mode
MAC entries	128K	128K
IPv4 routes	128K	Up to 1M*
IPv6 routes	64K	Up to 350K*
NetFlow entries	512K	512K
ACL entries	64K	128K

* Actual limit depends on prefix distribution

The 8-port 10 Gigabit Ethernet module, with dual M1-XL forwarding engines delivers up to 120 Mpps of Layer 2 and 3 IPv4 unicast forwarding or 60 Mpps of IPv6 unicast forwarding across all ports of a single I/O module. The 18-slot chassis with sixteen 8-port 10 Gigabit Ethernet XL Modules provides up to 1.92 billion packets per second (Bpps) of IPv4 unicast forwarding. Multicast forwarding is built into the I/O module performing egress replication.

The M1 XL forwarding engine also delivers ACL filtering, marking, rate limiting, and NetFlow with no degradation of performance. Powerful ACL processing supports up to 64K entries per module in non-XL mode or 128K entries per module in XL mode, in which entries can address Layer 2, 3, and 4 fields in addition to new Cisco® metadata fields that employ security group tags (SGTs).

Operation of a system with both M1 and M1-XL modules is supported with either the M1-XL operating in non-XL mode or the module types segregated in VDCs, with each VDC in either XL or non-XL mode.

Cisco Nexus 7000 Scalable Feature License

The Cisco Nexus 7000 Series Scalable Feature license provides the flexibility to enable the XL capabilities without requiring a hardware module change or upgrade. A single license per system enables all XL-capable I/O modules to operate in XL mode. After the single system license is added to a system, all modules that are XL capable are enabled with no additional licensing.

The software feature license reduces the operational challenges associated with having unique hardware requirements for systems that require larger forwarding tables and helps ensure that investment protection continues into the future regardless of deployment scenarios.

This license offers several advantages. It offers capital cost savings through operation in an environment in which a common hardware module can be used in all places in the network, regardless of whether the large or standard table size is appropriate. It also enables reduced operational costs through simplification of the effort associated with qualifying multiple different hardware types, software testing, and configuration management because all features not specifically increased by the feature license remain consistent. The system license can be added as needed to enable the larger tables in specific systems, and the use of common hardware simplifies sparing and maintenance.

Benefits include the following:

- **Ease of sparing:** Use of a single common hardware base reduces the need to stock multiple versions of a module in depots and in partner and customer environments.
- **Upgrade in place:** Customers can defer costs, using the flexible chassis license to upgrade an entire system when needed without a requirement to upgrade the hardware or replace the modules.
- **Simplified ordering:** Customers can purchase one module with the knowledge that should they later need to use larger forwarding tables, either because of a change in design or scaling, the hardware is ready.
- **Flexible deployment:** The same module can be deployed in all environments and configured correctly, either with or without the license to enable the incremental feature.

For More Information

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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