Cisco NX-OS Software Release 5.2(1)N1(1) for Cisco Nexus 5000 Series Switches and 2000 Series Fabric Extenders

PB712076

Cisco® NX-OS Software is a data-center-class operating system built with modularity, resiliency, and serviceability at its foundation. Based on the industry-proven Cisco MDS 9000 SAN-OS Software, Cisco NX-OS helps ensure continuous availability and sets the standard for mission-critical data center environments. The self-healing and highly modular design of Cisco NX-OS makes zero-effect operations a reality and enables exceptional operational flexibility.

Cisco NX-OS Software Release 5.2(1)N1(1) introduces the Cisco Nexus® 2232TM-E Fabric Extender providing enhanced 10GBASE-T connectivity. This release will be the first Long-Lived Release for the Cisco Nexus 5000 Series Switches and Cisco Nexus 2000 Series Fabric Extenders. In addition, this release introduces several new software features such as IPv6 routing. Cisco NX-OS 5.2(1)N1(1) supports all hardware and software supported in previous Cisco NX-OS Software releases.

The combination of the Cisco Nexus 2000 Series Fabric Extenders and Cisco Nexus 5000 Series Switches offers flexible connectivity options, highly cost-effective access-layer architecture for 100 Megabit Ethernet, Gigabit Ethernet, 10 Gigabit Ethernet, mixed Gigabit Ethernet unified fabric, and virtualized server environments.

Hardware Support

Cisco Nexus 2232TM-E Fabric Extender

The Cisco Nexus 2232TM-E 1/10GBASE-T Fabric Extender supports scalable 1/10GBASE-T environments, ease of migration from 1GBASE-T to 10GBASE-T, and effective reuse of existing structured cabling. It comes with an uplink module that supports eight 10 Gigabit Ethernet fabric interfaces.

Software Support

Cisco NX-OS 5.2(1)N1(1) supports all the software features previously supported on the Cisco Nexus 5000 Series up through Cisco NX-OS 5.1(3). Cisco NX-OS 5.2(1)N1(1) is compatible with In-Service Software Upgrade (ISSU) with a Release 5.0 train and later, with the exception of Layer 3 features. In addition, Cisco NX-OS 5.2(1)N1(1) supports the new software features described in Table 1.

For more detailed information about features and ISSU, refer to the Cisco NX-OS 5.2(1)N1(1) release notes (listed in the “For More Information” section at the end of this document).

Table 1. New Features in Cisco NX-OS Release 5.2(1)N1(1)

Software Feature	Description
IPv6 Routing Support	Cisco Nexus 5500 Series Switches with an installed Layer 3 module will add routing support for IPv6 beginning in NX-OS release 5.2(1)N1(1). This includes support for the following: **Interfaces:** • Routed IPv6 interfaces • Switch virtual interface (SVI) • Port-channeling of IPv6 interfaces **Routing Protocols:** • Unicast IPv6 static routes • Open Shortest Path First Version 3 (OSPFv3) • Border Gateway Protocol version 6 (BGPv6) • Enhanced Interior Gateway Routing Protocol GRP Version 6 (EIGRPv6) • Hot Standby Routing Protocol Version 6 (HSRPv6) • Access control list (ACL) route filtering **VRF:** • VRF-Lite **Quality of Service:** • Modular Quality of Service CLI (MQC) packet remarking • MQC packet classification • IPv6 Receive ACL (RACL) • IPv6 Port ACL (PACL) • IPv6 VLAN ACL (VACL) • IPv6 Control Plane Policing (CoPP) **Service and Manageability:** • Internet Control Message Protocol Version 6 (ICMPv6) • Simple Network Management Protocol (SNMP) v1/v2/v3 (RFC 4293) • Traceroute6 • Network Time Protocol (NTP)
Cisco FabricPath Multi-Topology Support	Cisco FabricPath is a Cisco NX-OS innovation that brings the stability and scalability of Layer 3 routing to Layer 2 switching. Cisco FabricPath offers a simplified network operation with significant reduction in operating expenses (OpEx). Cisco FabricPath eliminates the need for configuration of Spanning Tree Protocol. FabricPath Multi-Topology support allows the creation of two distinct topologies on the same FabricPath infrastructure with each VLAN being mapped to a unique topology. This enables traffic engineering in the FabricPath network and also creates a distinct and segregated network with its own set of VLANs and the security associated with such designs. Cisco FabricPath is supported only on the Cisco Nexus 5500 Series Switch platform.
Multicast Enhancements	• Increased Multicast Routes (up to 8000 routes) • Increased Internet Group Management Protocol (IGMP) groups on the Cisco Nexus 5500 Series (up to 8000 groups) • Increased number of entries in the IGMP snooping table of up to 8000 (applicable only to 5500 Series)
Reserved VLAN Remapping Capability	Cisco NX-OS 5.2(1)N1(1) supports redefinition of the reserved VLAN range of the Nexus 5000 series switch in order to avoid conflicts with VLANs already in use in the network.
Increased Host Route support	For the Generation 2 Layer 3 module, Cisco NX-OS 5.2(1)N1(1) will: • Increase IPv4 host routes to 16,000 • Increase IPv6 host routes to 8000
IEEE 1588 Precision Time Protocol	Precision Time Protocol (PTP; IEEE 1588) provides accurate clock synchronization and improved data correlation with network captures and system events. Using this standard multiple network connections can be used to accurately bridge the synchronization information from one network to another (referred to as Boundary Clock function). Cisco NX-OS Release 5.2(1)N1(1) will add this Boundary Clock support for IEEE 1588 PTP to the Cisco Nexus 5500 Series Switches.
ACL Logging on Management Interfaces	ACL log feature allows the user to monitor flows that hit specific ACLs. User can configure specific Access Control Entries (ACEs) with logging option. When such an option is configured, statistics for each flow that matches the permit or deny conditions of the ACL entry are logged in software. Cisco NX-OS Release 5.2(1)N1(1) will add this support to management interfaces on the Cisco Nexus 5000 Series.

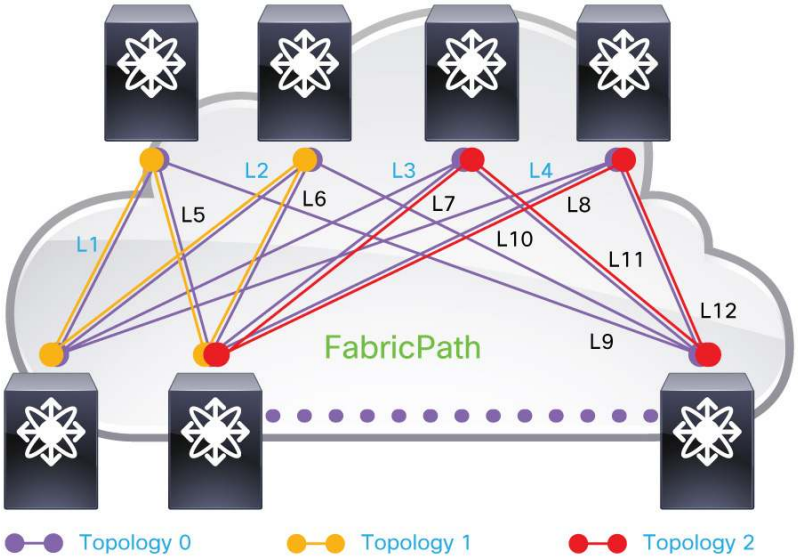
Software Feature	Description
Fibre Channel over Ethernet (FCoE) Enhancements	The following FCoE-related enhancements have been added in this software release: • Predefined SAN administrator role
Python Scripting	• Support for Python scripting APIs • Python support for Power-on Auto Provisioning (PoAP)
Virtual Port-Channel Enhancements	• vPC peer switch support: Drastically improves vPC convergence in case of the primary switch failure • vPC object tracking: Allows for tracking state of uplinks and vPC peer link for better failure detection Cisco NX-OS Release 5.2(1)N1(1) will add vPC peer switch and object tracking support on the 5000 Series.
Optics	NX-OS release 5.2(1)N1(1adds support for GLC-ZX-SM optics. This optic is a 1000Base-ZX SFP fiber optic transceiver, which works with single mode optical fiber at 1550nm working wavelength and can reach a maximum 100 km working distance over single mode fiber.

Cisco FabricPath Multi-Topology Support

Cisco FabricPath is a set of multipath Ethernet technologies that combine the reliability and scalability benefits of Layer 3 routing with the flexibility of Layer 2 networks, enabling IT to build massively scalable data centers. Cisco FabricPath offers a topology-based Layer 2 routing mechanism that provides an equal-cost multipath (ECMP) forwarding model. Cisco FabricPath implements an enhancement that solves the MAC address table scalability problem, which is characteristic of switched Layer 2 networks. Furthermore, Cisco FabricPath supports vPC+, a technology similar to vPC that allows redundant interconnection of the existing Ethernet infrastructure to Cisco FabricPath without using Spanning Tree Protocol.

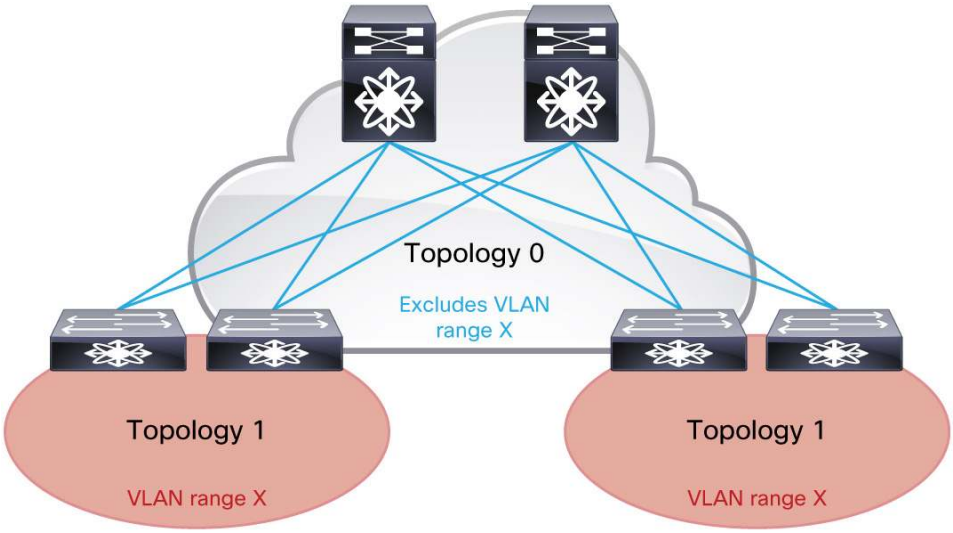
Beginning with Cisco NX-OS 5.2(1)N1(1), the Cisco Nexus 5500 Series Switches will also provide support for two topologies within a given physical FabricPath network. A topology represents a group of FabricPath links in the fabric where a given link can belong to multiple topologies. In a FabricPath Multi-Topology environment, a certain VLAN is mapped to a unique topology allowing the user to limit the scope of a VLAN in their network and create segregated networks on top of the FabricPath infrastructure (Figure 1).

Figure 1. Supporting Multiple Topologies in a FabricPath Network



FabricPath Multi-Topology support gives users the tools to prohibit the local “pod-specific” VLANs from being exposed to the data-center -ide network. It creates VLAN localization and VLAN reuse in other parts of the network. FabricPath allows network designers to extend FabricPath to the edge switches without having to redesign the local pod topology, creating a smoother transition toward FabricPath (Figure 2).

Figure 2. VLAN Reuse and Localization Using FabricPath Multi-Topologies



Predefined Storage Area Network (SAN) Administration Role

Convergence of storage and network traffic on to the same physical infrastructure is a topic on top of many data center architects’ minds as they look into designing expandable and yet cost-effective data centers. Fibre Channel over Ethernet (FCoE) is one such technology that allows the traditional Fibre Channel Storage Area Network (SAN) to be merged with an Ethernet Local Area Network (LAN) and yet still keep the original network characteristics with regard to latency and the in-order delivery of packets.

As this convergence occurs in the data center, the operational models evolve as well. Fewer and fewer data center switches are now being shared for different functions by different groups of people with different responsibilities. In this converged environment, it is of paramount importance that we help ensure the functional integrity of the network as these disparate groups administer the network.

Role-based access control (RBAC) is a popular access admission technology, which limits access to a certain shared resource on the switch. For example, it can be utilized to limit access to storage functions of a switch to only storage administrators. It can also prohibit the storage team from having access to traditional networking command line interface.

Beginning with Cisco NX-OS 5.2(1)N1(1), Cisco Nexus 5500 Series Switches provide support for a predefined SAN administrator role. This creates a RBAC template of user interface commands that are limited for use by the storage administrators. Users who are authorized will be able to perform only the storage-networking-specific functions on a given switch.

Licensing Information

There are no new licenses being introduced in this software release.

Cisco Services and Support

Cisco offers a wide range of services to help accelerate your success in deploying and optimizing Cisco Nexus 5000 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 operation efficiency and improve your data center network. Cisco Advanced Services use 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 5000 Series Switches. 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 Nexus switches, please visit http://www.cisco.com/go/nexus5000 and http://www.cisco.com/go/nexus2000.

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