Cisco NX-OS Software Release 7.3(0)N1(1) for the Cisco Nexus 5500 Series, Nexus 5600 Series and Nexus 6000 Series Switches

PB736958
This product bulletin introduces Cisco® NX-OS Software Release 7.3(0)N1(1) for the Cisco Nexus® 5500 Series, Nexus 5600 Series and Nexus 6000 Series Switches (Figure 1). This document summarizes the new features that this new release supports.

Figure 1. Cisco Nexus 5500 Series, Nexus 5600 Series & Nexus 6000 Series Switches

New Features
Cisco NX-OS 7.3(0)N1(1) for the Cisco Nexus 5500 Series, Nexus 5600 Series and Nexus 6000 Series Switches provide a robust and comprehensive feature set to address the high demands of mission-critical data centers.

NX-OS 7.3(0)N1(1) supports all hardware and software supported in prior NX-OS releases. In addition, NX-OS 7.3(0)N1(1) delivers the new Cisco Nexus 5672UP-16G switch that introduces 16-Gbps Fibre Channel on Cisco Nexus fixed switches and new innovative solutions for Cisco Programmable Fabric, Cisco Unified Fabric, Cisco Fabric Extenders(FEX), and Programmability. The Cisco Nexus 5600 switches are now integrated into Virtual Extensible LAN (VXLAN) Ethernet VPN (EVPN)–based Programmable Fabric. They include Chef and Puppet agent support for automation and extend the proven Cisco FEX architecture with support for 16-Gbps Fibre Channel over the Cisco Nexus 2348UPQ 10GE FEX. The following list summarizes the main new software features in this release:

- Programmable Fabric enhancements:
  - VXLAN EVPN control-plane support with the Cisco Nexus 5600 series switch acting as a leaf switch (Distributed IP Anycast Gateway), border-leaf switch, and spine switch with support for Bidirectional Protocol-Independent Multicast (Bidir-PIM) in the underlay
  - VXLAN EVPN hand-off, which includes classical Ethernet L2 and L3 hand-off
  - Auto-configuration for VXLAN EVPN networks, including Virtual Machine Tracker auto-configuration
  - VXLAN operations, administration and management (OAM) support
● Programmability enhancements:
  ◦ Support for Chef and Puppet agents

● Fibre Channel over Cisco Nexus 2348UPQ with Cisco Nexus 5600 switch as the parent switch

● FEX enhancements:
  ◦ Slow Drain for Fibre Channel over Ethernet (FCoE)/Slow Port Recovery

● Enhancements to Class-Based quality-of-service (cbQoS) MIB

● Link Aggregation Control Protocol (LACP) Fast Hello

● Graceful insertion and removal (GIR) enhancements:
  ◦ Protocol isolation
  ◦ FEX Group GIR Functionality

● Security enhancements:
  ◦ Product Security Baseline enhancements
  ◦ Conceptual Schema Definition Language (CSDL): No-Execute

● Layer 3 enhancements:
  ◦ Layer 3 over virtual-port-channel (vPC) unicast
  ◦ PIM Source-Specific Multicast (PIM-SSM) over vPC
  ◦ Virtual Router Redundancy Protocol Version 3 (VRRPv3)
  ◦ Lightweight Dynamic Host Configuration Protocol Version 6 (DHCPv6) Relay (LDRA)

Hardware Support

NX-OS 7.3(0)N1(1) supports the following new hardware:

● Cisco Nexus 5672UP-16G switch (N5K-C5672UP-16G)
● Cisco Nexus 2348TQ-E FEX (N2K-C2348TQ-E)

Cisco Nexus 5672UP-16G

The Cisco Nexus 5672UP-16G is a VXLAN and 16-Gbps Fibre Channel–capable 1-rack-unit (1RU) 10-Gbps top-of-rack (ToR) switch (Figure 2).

Figure 2. Cisco Nexus 5672UP-16G
Main features include:

- 24 Unified Ports that support 16-, 8-, 4-, and 2-Gbps Fibre Channel or 1/10/40 Gigabit Ethernet or 10/40Gbps FCoE
- 128 buffer-to-buffer credits, providing SAN extension of up to 16 kilometers at 16-Gbps Fibre Channel speeds

**Cisco Nexus 2348TQ-E**

The Cisco Nexus 2348TQ-E is a 10BASE-T FEX with 40-Gbps uplinks and support for 100 Megabit Ethernet (Figure 3).

**Figure 3.** Cisco Nexus 2348TQ-E

Table 1 lists all the new hardware supported in this release.

**Table 1. New Hardware in Cisco NX-OS Release 7.3(0)N1(1)**

<table>
<thead>
<tr>
<th>Category</th>
<th>Hardware</th>
<th>Part Number</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Cisco Nexus 5600 Series</strong></td>
<td>Cisco Nexus 5672UP-16G</td>
<td>N5K-C5672UP-16G</td>
</tr>
<tr>
<td></td>
<td>Cisco Nexus 5672UP-16G=</td>
<td></td>
</tr>
<tr>
<td><strong>Cisco Nexus 2300 Series</strong></td>
<td>Cisco Nexus 2348TQ-E</td>
<td>N2K-C2348TQ-E</td>
</tr>
<tr>
<td></td>
<td>Cisco Nexus 2348TQ4F-E</td>
<td>N2K-C2348TQ4F-E</td>
</tr>
<tr>
<td></td>
<td>Cisco Nexus 2348TQ8F-E</td>
<td>N2K-C2348TQ8F-E</td>
</tr>
<tr>
<td></td>
<td>Cisco Nexus 2348TQ12F-E</td>
<td>N2K-C2348TQ12F-E</td>
</tr>
<tr>
<td></td>
<td>Cisco Nexus 2348TQ-10G-E</td>
<td>N2K-C2348TQ-10G-E</td>
</tr>
<tr>
<td><strong>Optics</strong></td>
<td>Cisco Nexus 2248PQ support for Quad Small Form-Factor Pluggable (QSFP)–to–SFP or Enhanced SFP (SFP+) adapter (QSA)</td>
<td>CVR-QSFP-SFP10G</td>
</tr>
<tr>
<td></td>
<td></td>
<td>CVR-QSFP-SFP10G=</td>
</tr>
</tbody>
</table>

NX-OS 7.3(0)N1(1) supports all other hardware supported in prior NX-OS software releases.

**Software Support**

NX-OS 7.3(0)N1(1) supports all the software features previously supported on the Cisco Nexus 5500 Series Nexus 5600 Series & Nexus 6000 Series Switches up through Cisco NX-OS 7.2(0)N1(1).

NX-OS 7.3(0)N1(1) is compatible with Cisco In-Service Software Upgrade (ISSU) with NX-OS Release 7.2(1)N1(1). In addition, NX-OS 7.3(0)N1(1) supports the new software features described in Table 2.

For more detailed information about supported features and ISSU, refer to the NX-OS 7.3(0)N1(1) release notes (see “For More Information” at the end of this document).
Table 2. New Software Features in Cisco NX-OS Release 7.3(0)N1(1)

<table>
<thead>
<tr>
<th>Category</th>
<th>New Feature</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Programmable Fabric</td>
<td>VXLAN (L2/L3 gateway and Border Gateway Protocol [BGP] EVPN)</td>
<td>VXLAN with the Multiprotocol BGP (MP-BGP) EVPN control plane is supported with the Cisco Nexus 5600 series switch acting as a leaf switch (L2/L3 Gateway with Distributed Anycast Gateway and vPC), border-leaf switch (L2/L3 Gateway, Virtual Routing and Forwarding lite [VRF-lite], and Classic Ethernet Layer 2 with and without vPC), and spine switch with and without a route reflector. For VXLAN multi-destination traffic, Bidir-PIM is required.</td>
</tr>
<tr>
<td></td>
<td>VXLAN EVPN Auto-configuration</td>
<td>Virtual Machine Tracker auto-configuration automatically configures a tenant for provisioning. The Virtual Machine Tracker auto-configuration retrieves information about a tenant from the database (Lightweight Directory Access Protocol [LDAP]) and sends the necessary configuration commands for the provisioning process.</td>
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<td>VXLAN OAM</td>
<td>Ethernet OAM is a protocol for installing, monitoring, and troubleshooting Ethernet networks to enhance management in VXLAN-based overlay networks.</td>
</tr>
<tr>
<td>Programmability</td>
<td>Support for Chef and Puppet agents</td>
<td>Open agents such as Chef and Puppet provide automated network configuration and management capabilities. These agents cannot be directly installed on the Cisco Nexus switches. Instead, they run in a special environment; a decoupled execution space within a Linux Container (LXC) called the Open Agent Container (OAC).</td>
</tr>
<tr>
<td></td>
<td>Network Configuration Protocol (NETCONF) RFC 47471 compliance</td>
<td>NETCONF (RFC 4741) is an IETF network management protocol that provides mechanisms for installing, manipulating, and deleting network device configurations.</td>
</tr>
<tr>
<td>Storage</td>
<td>Fibre Channel over Cisco Nexus 2348UPQ (with Cisco Nexus 5600 platform switch as parent)</td>
<td>The host interface (HIF) ports, which are unified ports on the Cisco Nexus 2348UPQ Fabric Extender (FEX) can now be configured and used as Fibre Channel ports to run 2-, 4-, 8-, or 16-Gbps Fibre Channel.</td>
</tr>
<tr>
<td></td>
<td>Implicit bind for virtual Fibre Channel (vFC)</td>
<td>You can now create a vFC and implicitly bind it to an Ethernet interface or a port channel using a single command. You must make sure that the vFC identifier matches the Ethernet interface or port-channel identifier. The Ethernet interface can be a module (slot or port) or a Fabric Extender (FEX) interface (chassis, slot, or port).</td>
</tr>
<tr>
<td>Application Experience and IT Simplicity</td>
<td>Graceful Insertion Removal–Protocol Isolate</td>
<td>The default mode for GIR is now isolate. By using the <code>isolate</code> command to isolate the protocols, the switch can be isolated from the network but not shut down. This approach retains neighborship and prevents loss of data traffic.</td>
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<tr>
<td></td>
<td>FEX Group GIR Functionality</td>
<td>GIR can be used to perform maintenance and software upgrades of the switches and the connected FEXs. A FEX group is added to optimize the procedure to bring up or take down the FEX.</td>
</tr>
<tr>
<td></td>
<td>LACP Fast Hello</td>
<td>This feature is enhanced to change the LACP short timeout value for the <code>lACP fast rate</code> command to modify the duration of the LACP Fast Rate timeout. Prior to this enhancement, even when the rate was set to fast (1 second), the timeout was still 15 seconds. This enhancement introduces a configurable short timeout with a range of 3 to 15 seconds.</td>
</tr>
</tbody>
</table>
|                           | Enhancements to cbQoS MIB                                                   | The following cbQoS MIB tables now are also supported by QoS policies:  
  - cbQoSClassMapStats  
  - cbQosMatchStmtStats  
  - cbQosQueueingStats  

Cisco IOS® Software parity features:  
- 63-character host name  
- Exec Banner  
- 128-character VLAN name  
- 32-character Network Time Protocol (NTP) authentication key

- The character limit for a switch name and a host name is increased from 32 to 63 alphanumeric characters.  
- The Exec banner is displayed after a user logs in to a switch. This banner can be used to post reminders to your network administrators.  
- The size of VLAN long names that you can configure has now been increased from 32 to 128 characters.  
- You can now use up to 32 alphanumeric characters for the MD5 message digest string.
Category | New Feature | Description
--- | --- | ---
Security | CSDL (No Execute) | Runtime protections provide increased resiliency to a product while it is running. They typically allow the software to detect and correct certain types of undesirable behavior, or allow the product to terminate or restart to regain its integrity. These technologies help prevent malicious software from gaining a foothold in a system. With the enhancement in this release, certain areas of memory can now be marked as “no execute” that is, the areas cannot be run on the CPU. This feature normally is enabled for areas of memory that are writable, thus preventing an attacker from writing memory during exploitation of a vulnerability and then subsequently running the written data.
SHA-512 Algorithm Support to verify OS | With this enhancement, the `show file <filename>` command displays an option to calculate the SHA-512 sum, and the `show file bootflash: file sha512sum` command displays the SHA-512 checksum for the input file.
Login Block Per User | The Login Block Per User feature helps detect suspected Denial of Service (DoS) attacks and slow down dictionary attacks. You can configure login parameters to block logins per user (applicable only for local users).

Fabric Extender
Cisco Nexus 2300 FEX enhancements:
Slow Port Recovery/Slow Drain for FCoE | During slow-drain detection, the driver checks for the pause condition for each No-Drop class per port at an interval of 100 milliseconds.

Layer 3 Leadership
Layer 3 over vPC unicast | A Layer 3 device can form peering adjacency between both the vPC peers in a vPC domain. Traffic sent over the peer link will not have the time-to-live (TTL) value decremented. The Layer 3 device can form peering adjacency with both vPC peers.
Layer 3 FEX Scale for Cisco Nexus 5696Q Switch: 32 FEX nodes | Layer 3 FEX support for the Cisco Nexus 5696Q is now increased from 24 to 32 nodes.
PIM-SSM over vPC | PIM-SSM traffic is supported.
IPv6 enhancements:
LDRA
VRPPv3 | LDRA forwards DHCPv6 messages between clients and servers when they are not on the same IPv6 link, allowing relay agent information to be inserted by an access node that performs a link-layer bridging (non-routing) function.
VRPPv3 enables a group of switches to form a single virtual switch to provide redundancy and reduce the possibility of a single point of failure in a network. The LAN clients can then be configured with the virtual switch as the default gateway.

Licensing Information
NX-OS 7.3(0)N1(1) also supports a new license for the 16-Gbps Fibre Channel capability on the 24 unified ports of the Cisco Nexus 5672UP-16G (Table 3).

Table 3. New Software License in Cisco NX-OS Release 7.3(0)N1(1)

<table>
<thead>
<tr>
<th>License Part number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>N56-12P-SSK9</td>
<td>Cisco Nexus 5672UP-16G 12-port storage license</td>
</tr>
</tbody>
</table>

Service and Support
Cisco offers a wide range of services to help accelerate your success in deploying and optimizing Cisco Nexus 5500 Series, Nexus 5600 Series and Nexus 6000 Series Switches in your data center. Our innovative services are delivered through a unique combination of people, processes, tools, and partners and focus 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 provide 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 diagnostic information and real-time alerts for your Cisco Nexus 5500 Series, Nexus 5600 Series and Nexus 6000 Series Switches.
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For More Information
For more information about the Cisco Nexus 5500 Series, Nexus 5600 Series and Nexus 6000 Series Switches, visit the product homepage at http://www.cisco.com/go/nexus or contact your local account representative.