Cisco Nexus 3636C-R Switch

Contents

Product overview

The Cisco Nexus® 3636C-R switch is a high-speed, high-density 10-, 25-, 40-, or 100-Gigabit Ethernet (GE) switch designed for the data center spine. The large buffers and routing table sizes of the 3636C-R also make this switch an alternative for a wide range of applications, such as IP storage, demilitarized zone (DMZ), big data, and edge routing. The switch comes in a compact 1-Rack-Unit (1RU) form factor and provides extensive Layer 2 and Layer 3 functions. It is part of the R-Series family and runs industry-leading Cisco® NX-OS Software.

The comprehensive programmability features enable organizations to run today's applications while also preparing them for demanding and changing application needs. The Cisco Nexus 3636C-R switch supports both forward and reverse (port-side exhaust and port-side intake) airflow schemes with AC and DC power inputs.

The 3636C-R (Figure 1) is a Quad Small Form-Factor Pluggable (QSFP) switch with 36 QSFP28 ports. Each QSFP28 can operate at 100 or 40 Gigabit Ethernet or in a breakout cable configuration.

Figure 1.
Cisco Nexus 3636C-R switch

Main benefits

The Cisco Nexus 3636C-R switch provides:

- **Wire-rate Layer 2 and 3 switching on all ports**[*] with up to 7.2 Terabits per second (Tbps) and up to 3.34 billion packets per second (bpps).

- **Programmability** with support for the Cisco NX-API, Linux containers, XML, and JavaScript Object Notation (JSON) APIs, the OpenStack plug-in, Python, and Puppet and Chef configuration and automation tools.

- **High performance and scalability** with an 8-core CPU, 32 GB of DRAM, and 16 GB of dynamic buffer allocation, making the switch excellent for massively scalable data centers and big-data applications.

- **MACSec capability***

- **Higher TCAM capability**

- **Flexibility:**
  - Fiber cabling solutions are available for 10-, 25-, 40-, 50-, and 100-Gbps connectivity, including Active Optical Cable (AOC) and Direct-Attached Cable (DAC).
  - Configurable QSFP28 Uplinks to work as 4 x 25-Gbps or 4 x 10-Gbps port.

- **High availability:**
  - Virtual Port Channel (VPC) technology provides Layer 2 multipathing by eliminating the Spanning Tree Protocol. It also enables fully used bisectional bandwidth and simplified Layer 2 logical topologies without the need to change the existing management and deployment models.
  - Advanced maintenance capabilities include hot and cold patching and Graceful Insertion and Removal (GIR) mode.
  - The switch uses hot-swappable Power-Supply Units (PSUs) and fans.
- **NX-OS operating system with comprehensive, proven innovations:**
  - Power-On Auto Provisioning (POAP) enables touchless bootup and configuration of the switch, drastically reducing provisioning time.
  - Cisco Embedded Event Manager (EEM) and Python scripting enable automation and remote operations in the data center.
  - Ethanalyzer is a built-in packet analyzer for monitoring and troubleshooting control-plane traffic that is based on the popular Wireshark open-source network protocol analyzer.
  - Complete Layer 3 unicast and multicast routing protocol suites are supported, including Border Gateway Protocol (BGP), Open Shortest Path First (OSPF), Enhanced Interior Gateway Routing Protocol (EIGRP), Routing Information Protocol Version 2 (RIPv2), Protocol Independent Multicast Sparse Mode (PIM-SM), Source-Specific Multicast (SSM), and Multicast Source Discovery Protocol (MSDP).

* Please check release notes for NX-OS support

Configuration

The Cisco Nexus 3636C-R has the following configuration:

- 36 QSFP28 ports operating at 40 or 100 Gigabit Ethernet
- 8 ports that can be used for MACSec
- Locator LED
- Environment LED
- Status LED
- Dual redundant power supplies
- 3 redundant fans
- One 10-, 100-, or 1000-Mbps management port (copper or fiber)
- One RS-232 serial console port
- One USB port

Transceiver and cabling options

The Cisco Nexus 3636C-R has 36 QSFP28 ports that support a wide range of speed, from 10- or 25- Gbps with breakout cable.

The Cisco Nexus 3636C-R QSFP28 technology allows a smooth transition from 40- to 100-Gigabit Ethernet infrastructure in data centers. Each of the switch's QSFP28 ports can operate in native 100- or 40-Gigabit Ethernet mode or 4 x 10 or 4 x 25 Gigabit Ethernet mode.

Please refer to the latest compatibility matrix for information on all supported optics:

- **100-Gigabit Ethernet compatibility matrix:**
  https://www.cisco.com/c/en/us/td/docs/interfaces_modules/transceiver_modules/compatibility/matrix/100GE_Tx_Matrix.html.

- **40-Gigabit Ethernet compatibility matrix:**
  https://www.cisco.com/c/en/us/td/docs/interfaces_modules/transceiver_modules/compatibility/matrix/40GE_Tx_Matrix.html.

- **25-Gigabit Ethernet compatibility matrix:**
  https://www.cisco.com/c/en/us/td/docs/interfaces_modules/transceiver_modules/compatibility/matrix/25GE_Tx_Matrix.html.

- **10-Gigabit Ethernet compatibility matrix:**
  https://www.cisco.com/c/en/us/td/docs/interfaces_modules/transceiver_modules/compatibility/matrix/10GE_Tx_Matrix.html.

For more information about the transceiver types, visit:
https://www.cisco.com/en/US/products/hw/modules/ps5455/prod_module_series_home.html.

Cisco NX-OS software benefits

Cisco NX-OS Software is a data center-class operating system built with modularity, resiliency, and serviceability at its foundation. It helps ensure continuous availability and sets the standard for mission-critical data center environments. The self-healing and highly modular design of NX-OS makes zero-impact operations a reality and enables exceptional operation flexibility.

Focused on the requirements of the data center, NX-OS provides a robust and comprehensive feature set that meets the networking requirements of present and future data centers. With an XML interface and a command-line interface like that of the Cisco IOS® Software solution, NX-OS provides state-of-the-art implementations of relevant networking standards as well as a variety of true data center-class Cisco innovations.

Table 1 summarizes the benefits that NX-OS offers, and Table 2 lists the NX-OS packages available for the Cisco Nexus 3636C-R switch.

Table 1.   Benefits of Cisco NX-OS Software

Feature	Benefit
Software compatibility: NX-OS interoperates with Cisco products running any variant of Cisco IOS Software and also with any networking OS that conforms to the networking standards listed as supported in this data sheet.	• Transparent operation with existing network infrastructure • Open standards • No compatibility concerns
Modular software design: NX-OS is designed to support distributed multithreaded processing. Its modular processes are instantiated on demand, each in a separate protected memory space. Thus processes are started and system resources allocated only when a feature is enabled. A real-time preemptive scheduler that helps ensure timely processing of critical functions governs the modular processes.	• Robust software • Fault tolerance • Increased scalability • Increased network availability

Feature	Benefit
Troubleshooting and diagnostics: NX-OS is built with innovative serviceability functions to enable network operators to take early action based on network trends and events, enhancing network planning and improving Network-Operations-Center (NOC) and vendor response times.	• Quick problem isolation and resolution • Continuous system monitoring and proactive notifications • Improved productivity of operations teams
Ease of management: NX-OS provides a programmatic XML interface based on the NETCONF industry standard. The NX-OS XML interface provides a consistent API for devices. NX-OS also supports Simple Network Management Protocol (SNMP) Versions 1, 2, and 3 MIBs. In addition, NX-API and Linux Bash are now supported.	• Rapid development and creation of tools for enhanced management • Comprehensive SNMP MIB support for efficient remote monitoring
Role-Based Access Control (RBAC): With RBAC, NX-OS enables administrators to limit access to switch operations by assigning roles to users. Administrators can customize access and restrict it to the users who require it.	• Tight access control mechanism based on user roles • Improved network device security • Reduction in network problems arising from human errors

Table 2. Cisco NX-OS Software packages available for Cisco Nexus 3636C-R[*]

Packaging	Chassis Based	Part Number	Supported Features
Cisco Nexus 3636C-R Enhanced Layer 3 license	Chassis	N3K-LAN1K9	Layer 3 including full OSPF, EIGRP, BGP

[*] Cisco Nexus 3636C-R uses the Cisco Nexus 9000 licensing scheme. For more information please refer to https://www.cisco.com/c/en/us/td/docs/switches/datacenter/sw/nx-os/licensing/guide/b_Cisco_NX-OS_Licensing_Guide/b_Cisco_NX-OS_Licensing_Guide_chapter_01.html.

Product specifications

Table 3 lists the specifications for the Cisco Nexus 3636C-R.

Table 3. Specifications

Description	Specification
Physical	• 1RU fixed-form-factor switch • 36 QSFP28 ports; each supports native 100-GE and 40-GE mode • 2 redundant power supplies • 3 redundant fans • Lane select LED button • Management, console, and USB flash-memory ports
Performance	• 7.2-Tbps switching capacity • Forwarding rate of up to 3.34 bpps • Line-rate traffic throughput (both Layer 2 and 3) on all ports for packet size larger than 115 bytes • Configurable Maximum Transmission Unit (MTU) of up to 9216 bytes (jumbo frames)

Description	Specification	
Hardware tables and scalability*	Number of MAC addresses	750,000
	Number of Virtual LANs (VLANs)	4096
	Number of spanning-tree instances	• Rapid Spanning Tree Protocol (RSTP): 512 • Multiple Spanning Tree Protocol (MSTP): 64
	Number of Access Control List (ACL) entries	• 7000 ingress
	Routing table*	• Maximum number of Longest-Prefix-Match (LPM) routes: 128,000 • Maximum number of IP host entries:750,000 • Maximum number of MAC address entries: 192,000 • Maximum number of Layer 3 multicast entries: 64,000
	Number of EtherChannels	256 (with VPC)
	Number of ports per EtherChannel	32
	Buffer size	16 GB
	System memory	32 GB
	Boot-flash memory	128 GB
	Frequency	50 to 60 Hz
Power	Power-supply types	AC (forward and reverse airflow) DC (port-side exhaust)
	Typical operating power	921 Watt (W)
	Maximum power	1,341W
	AC Power-Supply Units (PSUs) • Input voltage • Frequency • Power-supply efficiency	• 100 to 240 VAC • 50 to 60 Hz • 89-91% at 220V
Cooling	Maximum heat dissipation	2,631 MBtuTU

	• Forward and reverse airflow schemes
	  ○ Forward airflow: Port-side exhaust (air enters through fan tray and power supplies and exits through ports)
	  ○ Reverse airflow: Port-side intake (air enters through ports and exits through fan tray and power supplies)
	• Redundant fans
	Hot-swappable (must swap within 31 minutes)	

Sound	Measured sound power (maximum) • Fan speed (PE): 50% duty cycle • Fan speed (PE): 90% duty cycle • Fan speed (PI) 50% duty cycle • Fan speed (PI) 90% duty cycle Fan speed: 100% duty cycle	• 74.6 dBA • 87.5 dBA • 76.2 dBA • 90.0 dBA

Description	Specification	
Dimensions (height x width x depth)	1.65 x 17.3 x 31.22 in. (4.2 x 44 x 79.3 cm)	
Weight	• 35.627.1 lb (12.316.1 kg)	
Environment	Temperature: Operating	32 to 104°F (0 to 40°C)
	Temperature: Storage	−40 to 158°F (−40 to 70°C)
	Relative humidity: Operating	• 10- to 85% noncondensing • Up to 5 days at maximum (85%) humidity Recommend American Society of Heating, Refrigeration, and Air-Conditioning Engineers (ASHRAE) data center environment
	Relative humidity: Storage	5 –to 95% noncondensing
	Altitude (Operating)	• Up to 13,123 ft.
	Altitude (Non-Operating)	• Up to 16,000 ft.
	Mean Time Between Failures (MTBF)	194,870 hours

* Denotes Application-Specific Integrated Circuit (ASIC) capabilities; please refer to Cisco Nexus 3000 Series Verified Scalability Guide documentation for exact scalability numbers validated for specific software releases: https://www.cisco.com/en/US/products/ps11541/products_installation_and_configuration_guides_list.html.

Software features

Please refer to the latest release notes for a list of software features supported by the Cisco Nexus 3000 platform: https://www.cisco.com/c/en/us/support/switches/nexus-3000-series-switches/products-release-notes-list.html.

Standards

Table 4 lists management standards supported by the Cisco Nexus 3000 platform.

Table 4. Management and standards support

Description	Specification	
MIB support	**Generic MIBs** • SNMPv2-SMI • CISCO-SMI • SNMPv2-TM • SNMPv2-TC • IANA-ADDRESS-FAMILY-NUMBERS-MIB • IANA-Type-MIB • IANA iprouteprotocol-MIB • HCNUM-TC • CISCO-TC • SNMPv2-MIB	**Monitoring MIBs** • NOTIFICATION-LOG-MIB • CISCO-SYSLOG-EXT-MIB • CISCO-PROCESS-MIB • RMON-MIB • CISCO-RMON-CONFIG-MIB • CISCO-HC-ALARM-MIB **Security MIBs** • CISCO-AAA-SERVER-MIB • CISCO-AAA-SERVER-EXT-MIB • CISCO-COMMON-ROLES-MIB

Description	Specification	
	• SNMP-COMMUNITY-MIB • SNMP-FRAMEWORK-MIB • SNMP-NOTIFICATION-MIB • SNMP-TARGET-MIB • SNMP-USER-BASED-SM-MIB • SNMP-VIEW-BASED-ACM-MIB • CISCO-SNMP-VACM-EXT-MIB • CISCO-CLASS-BASED-QOS-MIB **Ethernet MIBs** • CISCO-VLAN-MEMBERSHIP-MIB • LLDP-MIB • IP-MULTICAST-MIB **Configuration MIBs** • ENTITY-MIB • IF-MIB • CISCO-ENTITY-EXT-MIB • CISCO-ENTITY-FRU-CONTROL-MIB • CISCO-ENTITY-SENSOR-MIB • CISCO-SYSTEM-MIB • CISCO-SYSTEM-EXT-MIB • CISCO-IP-IF-MIB • CISCO-IF-EXTENSION-MIB • CISCO-NTP-MIB • CISCO-IMAGE-MIB • CISCO-IMAGE-UPGRADE-MIB	• CISCO-COMMON-MGMT-MIB • CISCO-SECURE-SHELL-MIB **Miscellaneous MIBs** • CISCO-LICENSE-MGR-MIB • CISCO-FEATURE-CONTROL-MIB • CISCO-CDP-MIB • CISCO-RF-MIB **Layer 3 and Routing MIBs** • UDP-MIB • TCP-MIB • OSPF-MIB • BGP4-MIB • CISCO-HSRP-MIB
Standards	• IEEE 802.1D: Spanning Tree Protocol • IEEE 802.1p: Class-of-Service (CoS) Prioritization • IEEE 802.1Q: VLAN Tagging • IEEE 802.1s: Multiple VLAN Instances of Spanning Tree Protocol • IEEE 802.1w: Rapid Reconfiguration of Spanning Tree Protocol • IEEE 802.3z: Gigabit Ethernet • IEEE 802.3ad: Link Aggregation Control Protocol (LACP) • IEEE 802.3ae: 10 Gigabit Ethernet • IEEE 802.1ab: Link Layer Discovery Protocol (LLDP)	
RFC	**BGP** • RFC 1997: BGP Communities Attribute • RFC 2385: Protection of BGP Sessions with the TCP MD5 Signature Option • RFC 2439: BGP Route Flap Damping • RFC 2519: A Framework for Inter-Domain Route Aggregation • RFC 2545: Use of BGPv4 Multiprotocol Extensions • RFC 2858: Multiprotocol Extensions for BGPv4 • RFC 3065: Autonomous System Confederations for BGP • RFC 3392: Capabilities Advertisement with BGPv4 • RFC 4271: BGPv4	

Description	Specification
	• RFC 4273: BGPv4 MIB: Definitions of Managed Objects for BGPv4
	• RFC 4456: BGP Route Reflection
	• RFC 4486: Subcodes for BGP Cease Notification Message
	• RFC 4724: Graceful Restart Mechanism for BGP
	• RFC 4893: BGP Support for Four-Octet AS Number Space
	• RFC 5549: BGP IPv4 NLRIs with an IPv6 next hop
	OSPF
	• RFC 2328: OSPF Version 2
	• 8431RFC 3101: OSPF Not-So-Stubby-Area (NSSA) Option
	• RFC 3137: OSPF Stub Router Advertisement
	• RFC 3509: Alternative Implementations of OSPF Area Border Routers
	• RFC 3623: Graceful OSPF Restart
	• RFC 4750: OSPF Version 2 MIB
	RIP
	• RFC 1724: RIPv2 MIB Extension
	• RFC 2082: RIPv2 MD5 Authentication
	• RFC 2453: RIP Version 2
	IP services
	• RFC 768: User Datagram Protocol (UDP)
	• RFC 783: Trivial File Transfer Protocol (TFTP)
	• RFC 791: IP
	• RFC 792: ICMP
	• RFC 793: TCP
	• RFC 826: ARP
	• RFC 854: Telnet
	• RFC 959: FTP
	• RFC 1027: Proxy ARP
	• RFC 1305: Network Time Protocol (NTP) Version 3
	• RFC 1519: Classless Interdomain Routing (CIDR)
	• RFC 1542: BOOTP Relay
	• RFC 1591: Domain Name System (DNS) Client
	• RFC 1812: IPv4 Routers
	• RFC 2131: DHCP Helper
	• RFC 2338: VRRP
	IP Multicast
	• RFC 2236: Internet Group Management Protocol, Version 2
	• RFC 3376: Internet Group Management Protocol, Version 3
	• RFC 3446: Anycast Rendezvous Point Mechanism Using PIM and MSDP
	• RFC 3569: An Overview of SSM
	• RFC 3618: Multicast Source Discovery Protocol (MSDP)
	• RFC 4601: Protocol Independent Multicast - Sparse Mode (PIM-SM): Protocol Specification (Revised)
	• RFC 4607: Source-Specific Multicast for IP
	• RFC 4610: Anycast-RP using PIM
	• RFC 5132: IP Multicast MIB

Regulatory standards compliance

Table 5 summarizes regulatory standards compliance for the Cisco Nexus 3000 platform.

Table 5.　Regulatory standards compliance: Safety and electromagnetic compatibility (EMC)

Specification	Description
Regulatory compliance	Products should comply with CE markings according to directives 2004/108/EC and 2006/95/EC.
Safety	- UL 60950-1 - CAN/CSA-C22.2 No. 60950-1EN 60950-1 - IEC 60950-1AS/NZS 60950-1GB4943
EMC: Emissions	47CFR Part 15 (CFR 47) Class A - AS/NZS CISPR22 Class A - CISPR22 Class A - EN55022 Class A - ICES003 Class A - VCCI Class A - EN61000-3-2 - EN61000-3-3 - KN22 Class A - CNS13438 Class A
EMC: Immunity	- EN50082-1 - EN61000-6-1 - EN55024 - CISPR24 - EN300386 - KN 61000-4 series

Ordering information

Table 6 provides ordering information for the Cisco Nexus 3636C-R.

Table 6.　Ordering information

Part Number	Description
Chassis	
N3K-C3636C-R	Nexus 3636C-R switch, 36p QSFP28 MACSEC
NXA-FAN-65CFM-PI	Nexus Fan, 65CFM, port side intake airflow
NXA-FAN-65CFM-PE	Nexus Fan, 65CFM, port side exhaust airflow
NXA-PAC-2KW-PI	Nexus 9000 2KW AC Power Supply, Port-side Intake
NXA-PAC-2KW-PE	Nexus 9000 2KW AC Power Supply, Port-side Exhaust

Part Number	Description
NXA-PDC-2KW-PI	Nexus 9000 2KW DC Power Supply, Port-side Intake
NXA-PDC-2KW-PE	Nexus 9000 2KW DC Power Supply, Port-side Exhaust
Software Licenses	
N3K-LAN1K9XL	Nexus 3000 Layer 3 LAN Enterprise License
Spares	
N3K-C3636C-R=	Nexus 36180YC-R, 48p 10/25G and 6p QSFP28, Spare
NXA-FAN-65CFM-PI=	Nexus Fan, 65CFM, port side intake airflow
NXA-FAN-65CFM-PE=	Nexus Fan, 65CFM, port side exhaust airflow
NXA-PAC-2KW-PI=	Nexus 9000 2KW AC Power Supply, Port-side Intake
NXA-PAC-2KW-PE=	Nexus 9000 2KW AC Power Supply, Port-side Exhaust
NXA-PDC-2KW-PI=	Nexus 9000 2KW DC Power Supply, Port-side Intake
NXA-PDC-2KW-PE=	Nexus 9000 2KW DC Power Supply, Port-side Exhaust

Services and support

Cisco offers a wide range of services to help accelerate your success in deploying and optimizing the Cisco Nexus 3600 platform switches in your data center. The innovative Cisco Services offerings are delivered through a unique combination of people, processes, tools, and partners, and they 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 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 3600 platform switches. Spanning the entire network lifecycle, Cisco Services help increase investment protection, optimize network operations, support migration operations, and strengthen your IT expertise.

Cisco Capital

Flexible payment solutions to help you achieve your objectives

Cisco Capital makes it easier to get the right technology to achieve your objectives, enable business transformation and help you stay competitive. We can help you reduce the total cost of ownership, conserve capital, and accelerate growth. In more than 100 countries, our flexible payment solutions can help you acquire hardware, software, services and complementary third-party equipment in easy, predictable payments. Learn more.

For more information

For more information, please visit https://www.cisco.com/go/nexus3000.

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