Cisco Nexus 3064-X, 3064-T, and 3064-32T Switches

Product Overview

The Cisco Nexus® 3064-X, 3064-T, and 3064-32T Switches are high-performance, high-density Ethernet switches that are part of the Cisco Nexus 3000 Series Switches portfolio. These compact one-rack-unit (1RU) form-factor 10 Gigabit Ethernet switches provide line-rate Layer 2 and 3 switching. They run the industry-leading Cisco® NX-OS Software operating system, providing customers with comprehensive features and functions that are widely deployed globally. They support both forward and reverse airflow schemes with AC and DC power inputs. The Cisco Nexus 3064 switches are well suited for data centers that require cost-effective, power-efficient, line-rate Layer 2 and 3 top-of-rack (ToR) switches.

Three Cisco Nexus 3064 switches are available:

- Cisco Nexus 3064-X (Figure 1): This 10-Gbps Enhanced Small Form-Factor Pluggable (SFP+)-based top-of-rack switch has 48 SFP+ ports and 4 Quad SFP+ (QSFP+) ports. Each SFP+ port can operate in 100-Mbps, 1-Gbps, or 10-Gbps mode, and each QSFP+ port can operate in native 40-Gbps or 4 x 10-Gbps mode. This switch is a true phy-less switch that is optimized for low latency and low power consumption.
- Cisco Nexus 3064-T (Figure 2): This 10GBASE-T switch has 48 10GBASE-T RJ-45 ports and 4 QSFP+ ports. This switch is well suited for customers who want to reuse existing copper cabling while migrating from 1-Gbps to 10-Gbps servers.
- Cisco Nexus 3064-32T (Figure 2): This switch is the Cisco Nexus 3064-T with 32 10GBASE-T ports and 4 QSFP+ ports enabled. The ports are enabled through software licensing. This switch provides a cost-effective solution for customers who require up to 32 10GBASE-T ports per rack. This switch comes with a 32-10GBASE-T port license preinstalled. To enable the remaining 16 10GBASE-T ports, the customer installs the 16-port upgrade license.

Figure 1. Cisco Nexus 3064-X Switch

Figure 2. Cisco Nexus 3064-T and 3064-32T Switch

Main Benefits

The Cisco Nexus 3064 switches provide the following main benefits:

- Wire-rate Layer 2 and 3 switching on all ports
  - The Cisco Nexus 3064 switches provide Layer 2 and 3 switching of up to 1.2 terabits per second (Tbps) and more than 950 million packets per second (mpps) in a compact 1RU form factor.
- Ultra-low latency
  - The Cisco Nexus 3064 switches deliver ultra-low nominal latency that allows customers to implement high-performance infrastructure for high-frequency trading (HFT) workloads.
- Purpose-built on Cisco NX-OS operating system with comprehensive, proven innovations
  - Virtual PortChannel (vPC) provides Layer 2 multipathing through the elimination of Spanning Tree Protocol and enables fully utilized bisectional bandwidth and simplified Layer 2 logical topologies without the need to change the existing management and deployment models.
  - PowerOn 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.
  - Advanced buffer monitoring reports real-time buffer use per port and per queue, which allows organizations to monitor traffic bursts and application traffic patterns.
  - The 64-way equal-cost multipath (ECMP) routing enables Layer 3 fat tree designs and allows organizations to prevent network bottlenecks, increase resiliency, and add capacity with little network disruption.
  - EtherAnalyzer is a built-in packet analyzer for monitoring and troubleshooting control-plane traffic and is based on the popular Wireshark open source network protocol analyzer.
  - Precision Time Protocol (PTP; IEEE 1588) provides accurate clock synchronization and improved data correlation with network captures and system events.
  - Full 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).

Configuration

- Cisco Nexus 3064-X
  - 48 fixed 10 Gigabit Ethernet SFP+ ports (can operate at 100-Mbps, 1-Gbps, and 10-Gbps speeds)
  - Four fixed QSFP+ ports (each QSFP+ port can support 4 x 10 Gigabit Ethernet or 40 Gigabit Ethernet)
- Cisco Nexus 3064-T
  - 48 fixed 10GBASE-T ports (can operate at 100-Mbps, 1-Gbps, and 10-Gbps speeds)
  - Four fixed QSFP+ ports (each QSFP+ port can support 4 x 10 Gigabit Ethernet or 40 Gigabit Ethernet)

- Cisco Nexus 3064-32T
  - 32 fixed 10GBASE-T ports (can operate at 100-Mbps, 1-Gbps, and 10-Gbps speeds)
  - Four fixed QSFP+ ports (each QSFP+ port can support 4 x 10 Gigabit Ethernet or 40 Gigabit Ethernet)
  - Upgrade to 48 fixed 10GBASE-T and 4 QSFP+ ports by installing a 16-port upgrade license
- Locator LED
- Dual redundant[1] power supplies
- Fan tray with redundant fans
- Two 10/100/1000-Mbps management ports
- One RS-232 serial console port
- One USB port
- Locator LED button

Support for both forward (port-side exhaust) and reversed (port-side intake) airflow schemes is available.

Transceiver and Cabling Options

The Cisco Nexus 3064 switches support a wide variety of 1, 10, and 40 Gigabit Ethernet connectivity options. 1 and 10 Gigabit Ethernet connectivity is achieved in the first 48 ports, and 40 Gigabit Ethernet connectivity is achieved using QSFP+ transceivers in the last 4 ports.

QSFP+ technology allows smooth transition from 10 to 40 Gigabit Ethernet infrastructures in data centers. The Cisco Nexus 3064 switches support connectivity over copper and fiber cables, providing excellent physical-layer flexibility. For low-cost cabling, copper-based 40-Gbps Twinax cables can be used, and for longer cable reaches, short-reach optical transceivers are excellent.

Connectivity can be established from the QSFP ports to an upstream 10 Gigabit Ethernet switch using a splitter cable that has a QSFP transceiver on one end and four SFP+ transceivers on the other end. Similar capability can be achieved using optical transceivers by procuring third-party fiber splitters. Table 1 lists the QSFP transceiver types supported.

Table 1. Cisco Nexus 3064 QSFP Transceiver Support Matrix

Part Number	Description
QSFP-4X10G-AC10M	Cisco 40GBASE-CR4 QSFP+ to 4 10GBASE-CU SFP+ direct-attach breakout cable, 10m, active
QSFP-4X10G-AC7M	Cisco 40GBASE-CR4 QSFP+ to 4 10GBASE-CU SFP+ direct-attach breakout cable, 7m, active
QSFP-4SFP10G-CU5M	QSFP to 4xSFP10G passive copper splitter cable, 5m
QSFP-4SFP10G-CU3M	QSFP to 4xSFP10G passive copper splitter cable, 3m
QSFP-4SFP10G-CU1M	QSFP to 4xSFP10G passive copper splitter cable, 1m
QSFP-H40G-ACU10M	Cisco 40GBASE-CR4 QSFP+ direct-attach copper cable, 10m, active
QSFP-H40G-ACU7M	Cisco 40GBASE-CR4 QSFP+ direct-attach copper cable, 7m, active
QSFP-H40G-CU5M	40GBASE-CR4 passive copper cable, 5m
QSFP-H40G-CU3M	40GBASE-CR4 passive copper cable, 3m
QSFP-H40G-CU1M	40GBASE-CR4 passive copper cable, 1m
QSFP-40G-SR4	40GBASE-SR4 QSFP transceiver module with MPO connector

[1] Cisco Nexus 3064-T and 3064-32T DC power supplies operate in combined mode only.

Part Number	Description
QSFP-40G-CSR4	Cisco 40GBASE-CSR4 transceiver module, MPO, 300m
QSFP-40GE-LR4	QSFP 40GBASE-LR4 QSFP+ module for SMF

For in-rack or adjacent-rack cabling, the Cisco Nexus 3064-X supports SFP+ direct-attach 10 Gigabit Ethernet copper, an innovative solution that integrates transceivers with Twinax cables into an energy-efficient and low-cost solution. For longer cable runs, multimode and single-mode optical SFP+ transceivers are supported. Table 2 lists the supported 10 Gigabit Ethernet transceiver options.

Table 2. Cisco Nexus 3064-X 10 Gigabit Ethernet Transceiver Support Matrix

Part Number	Description
SFP-10G-SR	10GBASE-SR SFP+ module (multimode fiber [MMF])
SFP-10G-LR	10GBASE-LR SFP+ module (single-mode fiber [SMF])
SFP-10G-ER	Cisco 10GBASE-ER SFP+ module for SMF
SFP-10G-ZR	Cisco 10GBASE-ZR SFP+ module for SMF*
DWDM-SFP10G-*	10GBASE-DWDM Modules (multiple varieties)
SFP-H10GB-CU1M	10GBASE-CU SFP+ cable 1m (Twinax cable)
SFP-H10GB-CU3M	10GBASE-CU SFP+ cable 3m (Twinax cable)
SFP-H10GB-CU5M	10GBASE-CU SFP+ cable 5m (Twinax cable)
SFP-H10GB-ACU7M	Active Twinax cable assembly, 7m
SFP-H10GB-ACU10M	Active Twinax cable assembly, 10m
SFP-10G-AOC1M	10GBASE-AOC SFP+ cable 1m
SFP-10G-AOC2M	10GBASE-AOC SFP+ cable 2m
SFP-10G-AOC3M	10GBASE-AOC SFP+ cable 3m
SFP-10G-AOC5M	10GBASE-AOC SFP+ cable 5m
SFP-10G-AOC7M	10GBASE-AOC SFP+ cable 7m
SFP-10G-AOC10M	10GBASE-AOC SFP+ cable 10m

The Cisco Nexus 3064-X is compatible with existing Gigabit Ethernet infrastructures. The 10 Gigabit Ethernet interfaces can operate in either Gigabit Ethernet or 100-Mbps mode. Table 3 lists the Gigabit Ethernet SFP transceivers that are supported. 100-Mbps connectivity can be achieved by using copper-based SFP transceivers (SFP-GE-T and GLC-T).

Table 3. Cisco Nexus 3064 Gigabit Ethernet Transceiver Support Matrix

Part Number	Description
SFP-GE-T	1000BASE-T NEBS 3 ESD
GLC-T	1000BASE-T SFP
GLC-SX-MM	GE SFP, LC connector SX transceiver (MMF)
GLC-LH-SM	GE SFP, LC connector LX/LH transceiver (SMF)
GLC-SX-MMD	1000BASE-SX short wavelength; with DOM
GLC-LH-SMD	1000BASE-LX/LH long-wavelength; with DOM
GLC-EX-SMD	1000BASE-EX long-wavelength; with DOM
GLC-ZX-SMD	1000BASE-ZX extended distance; with DOM
GLC-BX-U	1000BASE-BX10-U upstream bidirectional single fiber; with DOM
GLC-BX-D	1000BASE-BX10-D downstream bidirectional single fiber; with DOM

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

The Cisco Nexus 3064-T and 3064-32T support IEEE 802.3an standard cables and transceivers to provide 10-Gbps connections over unshielded or shielded twisted-pair cables, over distances of up to 330 feet (100 meters). It provides a cost-effective and highly scalable 10 Gigabit Ethernet implementation over structured copper cabling infrastructure that is widely used in data centers.

Cisco NX-OS Software Overview

Cisco NX-OS is a data center-class operating system built with modularity, resiliency, and serviceability at its foundation. 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-impact operations a reality and provides exceptional operation flexibility.

Focused on the requirements of the data center, Cisco 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 (CLI) like that of Cisco IOS® Software, Cisco NX-OS provides state-of-the-art implementations of relevant networking standards as well as a variety of true data center-class Cisco innovations.

Cisco NX-OS Software Benefits

Table 4 summarizes the benefits that Cisco NX-OS Software offers.

Table 4. Benefits of Cisco NX-OS Software

Feature	Benefit
Common software throughout the data center: Cisco NX-OS runs on all Cisco data center switch platforms (Cisco Nexus 7000, 5000, 4000, 2000, and 1000V Series).	• Simplification of data center operating environment • End-to-end Cisco Nexus and Cisco NX-OS fabric • No retraining necessary for data center engineering and operations teams
Software compatibility: Cisco 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: Cisco NX-OS is designed to support distributed multithreaded processing. Cisco NX-OS 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. The modular processes are governed by a real-time preemptive scheduler that helps ensure timely processing of critical functions.	• Robust software • Fault tolerance • Increased scalability • Increased network availability
Troubleshooting and diagnostics: Cisco NX-OS is built with unique serviceability functions to allow 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. Cisco Smart Call Home and Cisco Online Health Management System (OHMS) are some of the features that enhance the serviceability of Cisco NX-OS.	• Quick problem isolation and resolution • Continuous system monitoring and proactive notifications • Improved productivity of operations teams
Ease of management: Cisco NX-OS provides a programmatic XML interface based on the NETCONF industry standard. The Cisco NX-OS XML interface provides a consistent API for devices. Cisco NX-OS also provides support for Simple Network Management Protocol (SNMP) Versions 1, 2, and 3 MIBs.	• Rapid development and creation of tools for enhanced management • Comprehensive SNMP MIB support for efficient remote monitoring
Role-based access control (RBAC): With RBAC, Cisco 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.	• Effective access control mechanism based on user roles • Improved network device security • Reduction in network problems arising from human error

Cisco NX-OS Software Packages for Cisco Nexus 3064 Switches

The software packages for the Cisco Nexus 3064 switches offer flexibility and comprehensive features while being consistent with the Cisco Nexus access switches. The default system software has a comprehensive Layer 2 feature set with extensive security and management features and a basic Layer 3 feature set. To enable advanced Layer 3 IP routing functions, an additional license must be installed, as described in Table 5. See Table 7 later in this document for a complete list of software features.

Table 5. Software Licensing for Cisco Nexus 3064 Switches

Software Package	Features Supported
System default: Base license (N3K-BAS1K9); included, with no additional purchase necessary)	• Comprehensive Layer 2 feature set: VLAN, IEEE 802.1Q Trunking, vPC, LACP, Unidirectional Link Detection UDLD (standard and aggressive), MSTP, RSTP, Spanning Tree guards, and Transparent VLAN Trunk Protocol (VTP) • Security: Authentication, authorization, and accounting (AAA); access control lists (ACLs), Dynamic Host Configuration Protocol (DHCP) snooping, storm control, private VLAN (PVLAN), and configurable Control-Plane Policing (CoPP) • Management features: Cisco Data Center Network Manager (DCNM) support, console, Secure Shell Version 2 (SSHv2) access, Cisco Discovery Protocol, SNMP, and syslog • Layer 3 IP routing: inter-VLAN routing (IVR), static routes, RIPv2, ACLs, OSPFv2 (limited to 256 routes), EIGRP stub, Hot Standby Router Protocol (HSRP), Virtual Router Redundancy Protocol (VRRP), and Unicast Reverse-Path Forwarding (uRPF) • Multicast: PIM SM, SSM, and MSDP
LAN Enterprise license (N3K-LAN1K9); requires Base license	• Advanced Layer 3 IP routing: OSPFv2, EIGRP, BGP, and Virtual Route Forwarding lite (VRF-lite)

Cisco Data Center Network Manager

The Cisco Nexus 3064 switches are supported in Cisco DCNM. Cisco DCNM is designed for the Cisco Nexus hardware platforms, which are enabled for Cisco NX-OS. Cisco DCNM is a Cisco management solution that increases overall data center infrastructure uptime and reliability, improving business continuity. Focused on the management requirements of the data center network, Cisco DCNM provides a robust framework and comprehensive feature set that can meet the routing, switching, and storage administration needs of present and future data centers. Cisco DCNM automates the provisioning process, proactively monitors the LAN by detecting performance degradation, secures the network, and simplifies the diagnosis of dysfunctional network elements.

Product Specifications

Table 6 lists the specifications for the Cisco Nexus 3064 switches, Table 7 lists software features, and Table 8 lists management standards and support.

Table 6. Specifications

Description	Specification

Physical	• 1RU fixed form factor
	• Cisco Nexus 3064-X: 64 10 Gigabit Ethernet ports (48 SFP+ and 4 QSFP+)
	  ◦ 48 SFP ports support 1 and 10 Gigabit Ethernet
	  ◦ 4 QSFP ports support 4 x 10 Gigabit Ethernet or 40 Gigabit Ethernet each
	• Cisco Nexus 3064-T: 64 x 10 Gigabit Ethernet ports (48 10GBASE-T and 4 QSFP+)
	  ◦ 48 RJ-45 ports support 100 Mbps and 1 and 10 Gigabit Ethernet
	  ◦ 4 QSFP ports support 4 x 10 Gigabit Ethernet or 40 Gigabit Ethernet each
	• Cisco Nexus 3064-32T: 48 x 10 Gigabit Ethernet ports (32 10GBASE-T and 4 QSFP+)
	  ◦ 32 RJ-45 ports support 100 Mbps and 1 and 10 Gigabit Ethernet
	  ◦ 4 QSFP ports support 4 x 10 Gigabit Ethernet or 40 Gigabit Ethernet each
	• 2 redundant power supplies
	• 1 fan tray with redundant fans

Description	Specification	
	• 1 I/O module with management, console, and USB flash memory ports	
Performance	• 1.28-Tbps switching capacity • Forwarding rate of 950 mpps • Line-rate traffic throughput (both Layer 2 and 3) on all ports • Configurable maximum transmission units (MTUs) of up to 9216 bytes (jumbo frames)	
Hardware tables and scalability	MAC addresses	128,000
	Number of VLANS	4096
	Spanning-tree instances	• Rapid Spanning Tree Protocol (RSTP): 512 • Multiple Spanning Tree (MST) Protocol: 64
	ACL entries	• 2000 ingress • 1000 egress
	Routing table	• 16,000 prefixes and 16,000 host entries* • 8000 multicast routes*
	Number of EtherChannels	64 (with vPC)
	Number of ports per EtherChannel	32
	Buffers	9 MB shared
	Boot flash memory	2 GB
Power	Number of power supplies	2 • Cisco Nexus 3064-X: Redundant for AC and DC power • Cisco 3064-T and 3064-32T: Redundant for AC power
	Power supply types	• AC (forward and reversed airflow) • DC (forward and reversed airflow)
	Typical operating power	• Cisco Nexus 3064-X ◦ 143 watts (W; 64p with Twinax at 100% load; 2 power supply units [PSUs]) ◦ 177W (64p with SR optics at 100% load; 2 PSUs) • Cisco Nexus 3064-T ◦ 362W (48p with 3m cables; 4 SR4 at 100% load)
	Maximum power	• Cisco Nexus 3064-X: 199W • Cisco Nexus 3064-T
	AC PSUs • Input voltage • Frequency • Efficiency	 • 100 to 240 VAC • 50 to 60 Hz • 89 to 91% at 220V
	DC PSUs • Input voltage • Maximum current • Efficiency	 • –40 to –72 VDC • 33A • 85 to 88%
	Typical heat dissipation	• Cisco Nexus 3064-X ◦ 488 BTU/hr (64p with Twinax at 100% load; 2 PSUs) ◦ 605 BTU/hr (64p with SR optics at 100% load; 2 PSUs) • Cisco Nexus 3064-T ◦ 1235 BTU/hr (48p with 3m cables; 4 SR4 at 100% load)
	Maximum heat dissipation	• Cisco Nexus 3064-X: 683 BTU/hr • Cisco Nexus 3064-T: 1553 BTU/hr
Cooling	Forward and reversed airflow schemes: • Forward airflow: Port-side exhaust (air enters through fan-tray and power supplies and exits through ports) • Reversed airflow: Port-side intake (air enters through ports and exits through fan-tray and power supplies) Single fan tray with redundant fans	

Description	Specification	
	Hot swappable (must swap within 1 min)	
Sound	Measured sound power (maximum) • Fan speed: 40% duty cycle • Fan speed: 60% duty cycle • Fan speed: 100% duty cycle	 • 59.7 dBA • 66.4 dBA • 71.0 dBA
Environment	Dimensions (height x width x depth)	• Cisco Nexus 3064-X: 1.72 x 17.3 x 19.7 in. (4.4 x 43.9 x 50.5 cm) • Cisco Nexus 3064-T and 3064-32T: 1.72 x 17.3 x 22.45 in.(4.4 x 43.9 x 57.0 cm)
	Weight	• Cisco Nexus 3064-X: 20.5 lb (9.3 kg) • Cisco Nexus 3064-T and 3064-32T: 20.8 lb (9.5 kg)
	Operating temperature	32 to 104℉ (0 to 40℃)
	Storage temperature	–40 to 158℉ (–40 to 70℃)
	Operating relative humidity	• 10 to 85% noncondensing • Up to 5 days at maximum (85%) humidity • Recommend ASHRAE data center environment
	Storage relative humidity	5 to 95% noncondensing
	Altitude	0 to 10,000 ft (0 to 3000m)

* Please refer to the Cisco Nexus 3000 Series Verified Scalability Guide for scalability numbers validated on specific software releases: http://www.cisco.com/en/US/products/ps11541/products_installation_and_configuration_guides_list.html.

Table 7. Software Features

Description	Specification
Layer 2	• Layer 2 switch ports and VLAN trunks • IEEE 802.1Q VLAN encapsulation • Support for up to 4096 VLANs • Rapid Per-VLAN Spanning Tree Plus (PVRST+) (IEEE 802.1w compatible) • Multiple Spanning Tree Protocol (MSTP) (IEEE 802.1s): 64 instances • Spanning Tree PortFast • Spanning Tree Root Guard • Spanning Tree Bridge Assurance • Cisco EtherChannel technology (up to 32 ports per EtherChannel) • Link Aggregation Control Protocol (LACP): IEEE 802.3ad • Advanced PortChannel hashing based on Layer 2, 3, and 4 information • vPC • Jumbo frames on all ports (up to 9216 bytes) • Storm control (unicast, multicast, and broadcast) • Private VLANs
Layer 3	• Layer 3 interfaces: Routed ports on interfaces, switch virtual interfaces (SVIs), PortChannels, and subinterfaces (total: 1024) • 64-way ECMP • 2000 ingress and 1000 egress ACL entries • IPv6 routing: Static, OSPFv3, and BGPv6 • Routing protocols: Static, RIPv2, EIGRP, OSPF, and BGP • Bidirectional Flow Detection (BFD) for BGP, OSPF and ipv4 Static routes • HSRP and VRRP • ACL: Routed ACL with Layer 3 and 4 options to match ingress and egress ACLs • VRF: VRF-lite (IP VPN), VRF-aware unicast (BGP, OSPF, and RIP), and VRF-aware multicast • Unicast Reverse-Path Forwarding (uRPF) with ACL; strict and loose modes • Jumbo frame support (up to 9216 bytes) • Generic Routing Encapsulation (GRE) tunneling

Description	Specification
Multicast	Multicast: PIMv2, PIM-SM, and SSM Bootstrap router (BSR), Auto-RP, and Static RP Multicast Source Discovery Protocol (MSDP) and Anycast RP Internet Group Management Protocol (IGMP) Versions 2 and 3
Quality of Service (QoS)	Layer 2 IEEE 802.1p (class of service [CoS]) 8 hardware queues per port Per-port QoS configuration CoS trust Port-based CoS assignment Modular QoS CLI (MQC) compliance ACL-based QoS classification (Layers 2, 3, and 4) MQC CoS marking Differentiated services code point (DSCP) marking Weighted Random Early Detection (WRED) CoS-based egress queuing Egress strict-priority queuing Egress port-based scheduling: Weighted Round-Robin (WRR) Explicit Congestion Notification (ECN) Configurable ECN (Marking) per port
Security	• Ingress ACLs (standard and extended) on Ethernet • Standard and extended Layer 3 to 4 ACLs include IPv4, Internet Control Message Protocol (ICMP), TCP, and User Datagram Protocol (UDP) • VLAN-based ACLs (VACLs) • Port-based ACLs (PACLs) • Named ACLs • ACLs on virtual terminals (vtys) • DHCP snooping with Option 82 • Port number in DHCP Option 82 • DHCP relay • Dynamic Address Resolution Protocol (ARP) inspection • Configurable CoPP
Management	• POAP • Python scripting • Cisco EEM • Switch management using 10/100/1000-Mbps management or console ports • CLI-based console to provide detailed out-of-band management • In-band switch management • Locator and beacon LEDs • Configuration rollback • SSHv2 • Secure Copy (SCP) server • Telnet • AAA • AAA with RBAC • RADIUS • TACACS+ • Syslog • Syslog generation on system resources (for example, FIB tables) • Embedded packet analyzer • SNMP v1, v2, and v3 • Enhanced SNMP MIB support • XML (NETCONF) support • Remote monitoring (RMON) • Advanced Encryption Standard (AES) for management traffic • Unified username and passwords across CLI and SNMP

Description	Specification
	• Microsoft Challenge Handshake Authentication Protocol (MS-CHAP) • Digital certificates for management between switch and RADIUS server • Cisco Discovery Protocol Versions 1 and 2 • RBAC • Switched Port Analyzer (SPAN) on physical layer, PortChannel, and VLAN • Tunable Buffer Allocation for SPAN • Encapsulated Remote SPAN (ERSPAN) • Ingress and egress packet counters per interface • PTP (IEEE 1588) boundary clock • Network Time Protocol (NTP) • Cisco OHMS • Comprehensive bootup diagnostic tests • Cisco Call Home • Cisco DCNM • Advanced buffer utilization monitoring • sFlow

Table 8. Management and Standards Support

Description	Specification	
MIB Support	Generic MIBs • SNMPv2-SMI • CISCO-SMI • SNMPv2-TM • SNMPv2-TC • IANA-ADDRESS-FAMILY-NUMBERS-MIB • IANAifType-MIB • IANAiprouteprotocol-MIB • HCNUM-TC • CISCO-TC • SNMPv2-MIB • 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 • MAU-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-VTP-MIB • CISCO-IMAGE-MIB • CISCO-IMAGE-UPGRADE-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 • 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

Description	Specification
Standards	• IEEE 802.1D: Spanning Tree Protocol • IEEE 802.1p: 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 (Cisco Nexus 3064-X) • IEEE 802.3ba: 40 Gigabit Ethernet • IEEE 802.3an:10GBASE-T (Cisco Nexus 3064-T and 3064-32T • IEEE 802.1ab: LLDP • IEEE 1588-2008: Precision Time Protocol (Boundary Clock)
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 • 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 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: Internet Control Message Protocol (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

Description	Specification
	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

Software Requirements

Cisco Nexus 3000 Series Switches are supported by Cisco NX-OS Software Release 5.0 and later. Cisco NX-OS interoperates with any networking OS, including Cisco IOS Software, that conforms to the networking standards mentioned in this data sheet.

Regulatory Standards Compliance

Table 9 summarizes regulatory standards compliance for the Cisco Nexus 3000 Series.

Table 9. Regulatory Standards Compliance: Safety and EMC

Specification	Description
Regulatory compliance	• Products should comply with CE Markings per directives 2004/108/EC and 2006/95/EC
Safety	• UL 60950-1 Second Edition • CAN/CSA-C22.2 No. 60950-1 Second Edition • EN 60950-1 Second Edition • IEC 60950-1 Second Edition • AS/NZS 60950-1 • GB4943
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	• EN55024 • CISPR24 • EN300386 • KN24
RoHS	RoHS 5 compliant except for lead press-fit connectors

Ordering Information

Table 10 provides ordering information for the Cisco Nexus 3064 switches.

Table 10. Ordering Information

Part Number	Description
Chassis	
N3K-C3064PQ-10GX	Nexus 3064-X, 48 SFP+ and 4 QSFP+ ports, with enhanced scale, low latency
N3K-C3064TQ-10GT	Nexus 3064-T, 48 10GBase-T and 4 QSFP+ ports
N3K-C3064TQ-32T	Nexus 3064-32T, 32 10GBase-T and 4 QSFP+ ports
N3K-C3064-FAN	Nexus 3064 Fan Module, Forward airflow (port side exhaust)
N3K-C3064-FAN-B	Nexus 3064 Fan Module, Reversed airflow (port side intake)
N2200-PAC-400W	N2K/3K 400W AC Power Supply, Forward airflow (port side exhaust)
N2200-PAC-400W-B	N2K/3K 400W AC Power Supply, Reversed airflow (port side intake)
NXA-PAC-500W	Nexus 3064-T 500W AC PSU, Forward airflow (port side exhaust)
NXA-PAC-500W-B	Nexus 3064-T 500W AC PSU, Reverse airflow (port side intake)
N2200-PDC-400W	N2K/3K 400W DC Power Supply, Forward airflow (port side exhaust)
N3K-PDC-350W-B	N3K Series 350W DC Power Supply, Reversed airflow (port side intake)
Software Licenses	
N3K-BAS1K9	Nexus 3000 Layer 3 Base License
N3K-LAN1K9	Nexus 3000 Layer 3 LAN Enterprise License (Requires N3K-BAS1K9 License)
N3064T-32T-LIC	Factory installed 32 Port license for N3064-32T
N3064T-16T-UPG=	16 Port Upgrade License for N3064-32T
Spares	
N3K-C3064-FAN=	Nexus 3064 Fan Module, Forward airflow (port side exhaust), Spare
N3K-C3064-FAN-B=	Nexus 3064 Fan Module, Reversed airflow (port side intake), Spare
N2000-PAC-400W=	N2K/3K 400W AC Power Supply, Forward airflow (port side exhaust), Spare
N2000-PAC-400W-B=	N2K/3K 400W AC Power Supply, Reversed airflow (port side intake), Spare
NXA-PAC-500W=	Nexus 3064-T 500W AC PSU, Forward airflow (port side exhaust), Spare
NXA-PAC-500W-B=	Nexus 3064-T 500W AC PSU, Reverse airflow (port side intake), Spare
N2200-PDC-400W=	N2K/3K 400W DC Power Supply, Forward airflow (port side exhaust), Spare
N3K-PDC-350W-B=	N3K Series 350W DC Power Supply, Reversed airflow (port side intake), Spare
N3K-C3064-ACC-KIT=	Nexus 3064PQ Accessory Kit
Bundles	
N3K-C3064-X-FA-L3	Nexus 3064-X, Forward Airflow (port side exhaust), AC P/S, Base and LAN Enterprise License Bundle
N3K-C3064-X-BA-L3	Nexus 3064-X, Reversed Airflow (port side intake), AC P/S, Base and LAN Enterprise License Bundle
N3K-C3064-X-FD-L3	Nexus 3064-X, Forward Airflow (port side exhaust), DC P/S, Base and LAN Enterprise License Bundle
N3K-C3064-X-BD-L3	Nexus 3064-X, Reversed Airflow (port side intake), DC P/S, Base and LAN Enterprise License Bundle
N3K-C3064-T-FA-L3	Nexus 3064-T, Forward Airflow (port side exhaust), AC P/S, Base and LAN Enterprise License Bundle
N3K-C3064-T-BA-L3	Nexus 3064-T, Reversed Airflow (port side intake), AC P/S, Base and LAN Enterprise License Bundle

Part Number	Description
Cables and Optics	
QSFP-40G-SR4(=)	40GBASE-SR4 QSFP Transceiver Module with MPO Connector
QSFP-40G-CSR4(=)	QSFP 4x10GBASE-SR Transceiver Module, MPO, 300M
QSFP-H40G-CU1M(=)	40GBASE-CR4 Passive Copper Cable, 1m
QSFP-H40G-CU3M(=)	40GBASE-CR4 Passive Copper Cable, 3m
QSFP-H40G-CU5M(=)	40GBASE-CR4 Passive Copper Cable, 5m
QSFP-4SFP10G-CU1M(=)	QSFP to 4xSFP10G Passive Copper Splitter Cable, 1m
QSFP-4SFP10G-CU3M(=)	QSFP to 4xSFP10G Passive Copper Splitter Cable, 3m
QSFP-4SFP10G-CU5M(=)	QSFP to 4xSFP10G Passive Copper Splitter Cable, 5m
SFP-10G-SR(=)	10GBASE-SR SFP+ Module
SFP-10G-LR(=)	10GBASE-LR SFP+ Module
SFP-10G-ER(=)	Cisco 10GBASE-ER SFP+ Module for SMF
SFP-10G-ZR(=)	Cisco 10GBASE-ZR SFP+ Module for SMF
SFP-H10GB-CU1M(=)	10GBASE-CU SFP+ Cable 1 Meter
SFP-H10GB-CU3M(=)	10GBASE-CU SFP+ Cable 3 Meter
SFP-H10GB-CU5M(=)	10GBASE-CU SFP+ Cable 5 Meter
SFP-H10GB-ACU7M(=)	Active Twinax Cable Assembly, 7m
SFP-H10GB-ACU10M(=)	Active Twinax Cable Assembly, 10m
SFP-GE-T(=)	1000BASE-T NEBS 3 ESD
GLC-T(=)	1000BASE-T SFP
GLC-SX-MM(=)	GE SFP, LC Connector SX Transceiver
GLC-LH-SM(=)	GE SFP, LC Connector LX/LH Transceiver

Warranty

The Cisco Nexus 3000 Series Switches have a 1-year limited hardware warranty. The warranty includes hardware replacement with a 10-day turnaround from receipt of a return materials authorization (RMA).

Service and Support

Cisco offers a wide range of services to help accelerate your success in deploying and optimizing the Cisco Nexus 3000 Series in your data center. The innovative Cisco Services offerings 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 uses 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 3000 Series Switches. Spanning the entire network lifecycle, Cisco Services helps increase investment protection, optimize network operations, support migration operations, and strengthen your IT expertise.

For More Information

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

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