Cisco Nexus 3132C-Z Switches

Cisco Nexus 3000 Series Switches overview

The Cisco Nexus® 3000 Series Switches are a comprehensive portfolio of 1, 10, 40, and 100 Gigabit Ethernet switches built from a Switch-on-a-Chip (SoC) architecture. Introduced in April 2011, this series of switches provides line-rate Layer 2 and 3 performance and is suitable for Top-of-the-Rack (ToR) architecture.

Cisco Nexus 3132C-Z product overview

The Cisco Nexus 3132C-Z is the 32-port 100-Gbps programmable architecture switch, enabled with major data center features designed for software-defined data centers. This 1-Rack-Unit (1RU) model offers wire-rate Layer 2 and 3 switching.

The Cisco Nexus 3132C-Z (Figure 1) is a Quad Small Form-Factor Pluggable (QSFP) switch with 32 QSFP28 ports. Each QSFP28 port can operate at 10, 25, 40, 50, and 100 Gbps, up to a maximum of 128 x 25-Gbps ports.

It is a member of the Cisco Nexus 3100 platform and runs the industry-leading Cisco® NX-OS Software operating system, providing customers with comprehensive features and functions that are widely deployed. The Cisco Nexus 3132C-Z supports both forward and reverse (port-side exhaust and port-side intake) airflow schemes with AC and DC power inputs.

The Cisco Nexus 3132C-Z has the following hardware configuration:

- 32 fixed 100-Gigabit Ethernet QSFP28 ports
- Beacon LED
- Environment LED
- Status LED
- Four lane-selected LEDs
- Dual redundant power supplies
- Redundant (3+1) fans
- Two 10-Gbps SFP ports
- One RJ45 console port
- One RJ45 and SFP management port
- One USB port

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 operational 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.

Main benefits

The Cisco Nexus 3132C-Z provides the following:

- **Data center feature richness** that supports full IPv4 and IPv6 routing; Virtual Extensible LAN (VxLAN); and hardware-based encapsulation, including Multiprotocol Label Switching (MPLS), Virtual Private LAN Service (VPLS), Generic Routing Encapsulation (GRE), and Q-in-Q tunneling
- **Wire-rate Layer 2 and 3 switching on all ports**,[2] with up to 6.4 Terabits per second (Tbps) and up to 2 billion packets per second (bpps)
- **Robust programmability**, with support for 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 a four-core CPU, 16 GB of DRAM, and 32 Mb of dynamic buffer allocation, making the switch excellent for massively scalable data centers and big data application
- **Flexibility**
  - The QSFP28 port can be configured to work as 4 x 25-Gbps ports, offering deployment flexibility, with up to a maximum of 128 x 25-Gbps ports.
  - Both fiber and copper cabling solutions are available for 10-, 25-, 40-, 50-, and 100-Gbps connectivity, including Active Optical Cable (AOC) and Direct-Attached Cable (DAC).
- **High availability**
  - Virtual Port Channel (vPC) technology provides Layer 2 multipath through the elimination of Spanning Tree Protocol. It also enables fully utilized bisectional bandwidth and simplified Layer 2 logical topologies without the need to change the existing management and deployment models.
  - The 64-way Equal-Cost Multipath (ECMP) routing enables the use of Layer 3 fat-tree designs. This feature allows organizations to prevent network bottlenecks, increase resiliency, and add capacity with little network disruption.
  - Advanced reboot capabilities include hot and cold patching and fast reboot capabilities.
  - The switch uses hot-swappable Power-Supply Units (PSUs) and fans.

- **Purpose-built NX-OS operating system with comprehensive, proven innovations**
  - Power-on Autoprovisioning (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 utilization per port and per queue, which allows organizations to monitor traffic bursts and application traffic patterns.
  - 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.
  - 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).

Table 1. Software licensing for Cisco Nexus 3132C-Z

Software package	Features supported
System default (no license required)	• Comprehensive Layer 2 feature set: VLAN, IEEE 802.1Q trunking, Link Aggregation Control Protocol (LACP), Unidirectional Link Detection (UDLD; Standard and Aggressive), Multiple Spanning Tree Protocol (MSTP), Rapid Spanning Tree Protocol (RSTP), and Spanning Tree Protocol guard • Security: Authentication, Authorization, and Accounting (AAA); Access Control Lists (ACLs); storm control; and configurable Control-Plane Policing (CoPP) • Management features: Cisco Data Center Network Manager (DCNM) support, Secure Shell Version 2 (SSHv2) access, Cisco Discovery Protocol, SNMP, syslog, and IEEE 1588 PTP • Monitoring features: advanced buffer monitoring, SPAN, and ERSPAN
Base license	• Layer 3 IP routing: Inter-VLAN Routing (IVR), static routes, RIPv2, ACLs, OSPFv2 (limited to 256 routes), EIGRP stub, Hot Standby Router Protocol (HSRP), and Virtual Router Redundancy Protocol (VRRP) • Multicast: PIM-SM, SSM, and MSDP
LAN Enterprise license (N3K-LAN1K9); requires Base license	• Advanced Layer 3 IP routing: OSPFv2, EIGRP, BGP, and Virtual Routing and Forwarding Lite (VRF-Lite)
Cisco Nexus Data Broker license (NDB-FX-SWT-K9)	• License for using the tap and SPAN aggregation functions with Cisco Nexus Data Broker; only the Base license is needed for this feature

Transceiver and cabling options

The Cisco Nexus 3132C-Z has 32 QSFP28 ports. QSFP28 technology allows a smooth transition from 40 to 100 Gigabit Ethernet infrastructure in data centers. Each of the Cisco Nexus 3132C-Z switch's QSFP28 ports can operate in native 100, 4 x 25, 4 x 10, or 2 x 50 Gigabit Ethernet mode. In addition to the QSFP28 technology, the Cisco Nexus 3132C-Z also supports 40/100G Bidi to help customers run 40G and 100G at the same time in their Data Centers.

This switch supports both fiber and copper cabling solutions for these two modes. 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 QSFP28 ports to 10 Gigabit Ethernet switches or hosts using a splitter cable that has an Enhanced QSFP (QSFP+) transceiver on one end and four SFP+ transceivers on the other end. Similar capability can be achieved on the fiber solution by using QSFP+ SR4 transceivers on both ends and procuring third-party fiber splitter MPO-to-LC cables. Table 2 lists the transceiver types supported.

Table 2. Cisco Nexus 3132C-Z QSFP28 transceiver support matrix

Part number	Description
QSFP-100G-AOC (1m–30m)	QSFP 100-Gbps to QSFP 100-Gbps AOC: 1, 2, 3, 5, 7, 10, 15, and 30m
QSFP-100G-CU (1m–5m)	QSFP 100-Gbps to QSFP 100-Gbps copper DAC: 1, 2, 3, and 5m
QSFP-100G-SR4-S	100GBASE SR4 transceiver module with MPO-12 connector, multimode fiber up to 100m
QSFP-100G-LR4-S	100GBASE LR4 transceiver module for Single-Mode Fiber (SMF) with LC connector, 10km
QSFP-100G-CWDM4-S	100GBASE CWDM4 transceiver module for SMF with LC connector, 2km
QSFP-100G-PSM4-S	100GBASE PSM4 transceiver module with MPO-12 connector, SMF up to 500m

Product specifications

Table 3 lists the product specifications for the Cisco Nexus 3132C-Z.

Table 3. Product specifications

Specification	Cisco Nexus 3132C-Z
Physical	• 32 fixed 100 Gigabit Ethernet QSFP28 ports • Beacon LED • Environment LED • Status LED • Lane-selected LED • Dual redundant power supplies • Redundant (3+1) fans • Two 1/10-Gbps SFP ports (port 33 and port 34 in front • One RJ-45 console port • One RJ45 and one SFP management port • One USB port
Performance	6.4Tbps switching capacity
Typical operating power	200W
Maximum power	493W
Typical heat dissipation	1064 BTUs/hr
Maximum heat dissipation	1682 BTUs/hr

[1] PPS output will be enabled in a future software revision.

Table 4. Hardware specifications common to all switches

	Mode	Normal mode
Hardware tables and scalability[1]	Number of MAC addresses	32,000 min 288,000 max
	Number of IPv4 unicast routes	24,000
	Number of IPv4 hosts	16K min/168K max
	Number of IPv4 multicast routes	8000
	Number of VLANs	4096
	Number of ACL entries	4096
	Number of spanning-tree instances	RSTP: 512 MSTP: 64
	Number of EtherChannels	24
	Number of ports per EtherChannel	24
	Buffer size	32 MB
	Boot flash memory	128 GB

	Mode	Normal mode
Power	Number of power supplies	2 (redundant)
	Power supply types	AC (forward and reversed airflow)
	Input voltage	100 to 240 VAC
	Frequency	50 to 60Hz
	Power supply efficiency	89 to 91% at 220V
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) Four individual, hot-swappable fans (3+1 redundant)	
Environment	Dimensions (height x width x depth)	17.3W x 1.72H x 18.5D" (43.9 x 4.36 x 46.99cm)
	Weight	19.2 lb. with PSU and fan 13.8 lb. without PSU and fan
	Operating temperature	32 to 104°F (0 to 40°C)
	Storage temperature	–40 to 158°F (–40 to 70°C)
	Relative humidity: storage	5 to 95% noncondensing
	Relative humidity: operating	• 10 to 85% noncondensing • Up to 5 days at maximum (85%) humidity • Recommend ASHRAE data center environment
	Altitude (operating and nonoperating	0 ft. to 10,000 ft.

[1.] Refer to the scalability guide for numbers supported by software.

Table 5. Software features common to all switches

Description	Specifications
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) • MSTP (IEEE 802.1s): 64 instances • Spanning Tree PortFast • Spanning Tree Root Guard • Spanning Tree Bridge Assurance • Cisco EtherChannel technology (up to 24 ports per EtherChannel) • LACP: IEEE 802.3ad, IEEE 802.1ax • Advanced port-channel hashing based on Layer 2, 3, and 4 information • Jumbo frames on all ports (up to 9216 bytes) • Link-level flow control (IEEE 802.3x) • vPC[1]
Layer 3	• Layer 3 interfaces: routed ports on interfaces, switch virtual interfaces (SVIs), port channels, and subinterfaces (total: 1024) • 24-way ECMP • 4096 ACL entries • Routing protocols: static, RIPv2, EIGRP, OSPF, and BGP • 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 • VRF route leaking • Jumbo frame support (up to 9216 bytes)

Description	Specifications
Multicast	• Multicast: PIMv2, PIM-SM, SSM, and BiDir • Bootstrap router (BSR), Auto-RP, and Static RP • Internet Group Management Protocol (IGMP) Versions 2 and 3
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) • ACLs on virtual terminals (VTYs) • Dynamic Host Configuration Protocol (DHCP) relay • CoPP
Cisco Nexus Data Broker	• Topology support for tap and SPAN aggregation • Traffic load balancing to multiple monitoring tools • Packet truncation • Traffic filtering based on Layer 1 through Layer 4 header information • Traffic replication and forwarding to multiple monitoring tools • Robust RBAC • Northbound Representational State Transfer (REST) API for all programmability support
Management	• POAP • Python scripting • 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 • Telnet • AAA • AAA with RBAC • RADIUS • TACACS+ • Syslog • 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 • Microsoft Challenge Handshake Authentication Protocol (MS-CHAP) • Digital certificates for management between switch and RADIUS server • Cisco Discovery Protocol Versions 1 and 2 • RBAC • SPAN on physical, port channel, and VLAN • ERSPAN Versions 2 and 3 • Ingress and egress packet counters per interface • Network Time Protocol (NTP) • Cisco OHMS • Comprehensive bootup diagnostic tests • Cisco Call Home • Cisco DCNM • Active buffer monitoring

Table 6. 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 Ethernet MIBs • CISCO-VLAN-MEMBERSHIP-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	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 • OSPF-TRAP-MIB • BGP4-MIB • CISCO-HSRP-MIB • PIM-MIB
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: LACP • IEEE 802.1ax: LACP • IEEE 802.3ae: 10 Gigabit Ethernet • IEEE 802.3ba: 40 Gigabit Ethernet • IEEE 802.1ab: 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	

Description	Specification
	• 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: 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: PIM-SM: Protocol Specification (Revised) • RFC 4607: Source-Specific Multicast for IP • RFC 4610: Anycast-RP using PIM • RFC 5015: PIM BiDir • RFC 5132: IP Multicast MIB

Regulatory standards compliance

Table 7 summarizes regulatory standards compliance for the Cisco Nexus 3000 Series.

Table 7. 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 8 provides ordering information for the Cisco Nexus 3132C-Z.

Table 8. Ordering information

Part number	Description
Chassis	
N3K-C3132C-Z	Cisco Nexus 3132C-Z switch with 32 QSFP28
NXA-FAN-30CFM-F	Cisco Nexus fan, forward airflow (port-side exhaust)
NXA-FAN-30CFM-B	Cisco Nexus fan, reversed airflow (port-side intake)
NXA-PAC-650W-PE	Cisco Nexus 650W AC power supply, forward airflow (port-side exhaust)
NXA-PAC-650W-PI	Cisco Nexus 650W AC power supply, reversed airflow (port-side intake)
N9K-PUV-1200W	Cisco Nexus 1200W DC power supply
Software licenses	
N3K-LAN1K9	Cisco Nexus 3264 Layer 3 LAN Enterprise license
Spares	
N3K-C3132C-Z=	Cisco Nexus 3132C-Z switch with 32 QSFP28 spare
NXA-FAN-30CFM-F=	Cisco Nexus fan, forward airflow (port-side exhaust) spare
NXA-FAN-30CFM-B=	Cisco Nexus fan, reversed airflow (port-side intake) spare

Part number	Description
NXA-PAC-650W-PE=	Cisco Nexus 650W AC power supply, forward -airflow (port-side exhaust) spare
NXA-PAC-650W-PI=	Cisco Nexus 650W AC power supply, reversed airflow (port-side intake) spare
N9K-PUV-1200W=	Cisco Nexus 1200W DC power supply spare
930W DC power supply	
NXA-PDC-930W-PI	Nexus 9K 930W DC PS, Port-side Intake
NXA-PDC-930W-PE	Nexus 9K DC PS, Port-side Exhaust

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 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 3000 Series Switches. Spanning the entire network lifecycle, Cisco Services help increase investment protection, optimize network operations, support migration operations, and strengthen your IT expertise.

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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

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