N3K-C3064Q-40GT Datasheet

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Overview

Product overview

The Cisco Nexus® 3016 Switch (Figure 1) is a 40 Gigabit Ethernet switch platform. It is a high-performance, ultra-low-latency Ethernet switch providing line-rate Layer 2 and 3 switching in a compact one-Rack-Unit (1RU) form factor. The switch runs the industry-leading Cisco® NX-OS Software operating system, providing customers with robust features and functions that are widely deployed globally.

The line-rate Layer 2 and 3 switching at ultra-low latencies along with the serialization benefits of 40 Gigabit Ethernet switching make the Cisco Nexus 3016 an ideal switch platform for financial co-locations. This switch supports both forward and reversed airflow schemes with AC and DC power inputs.

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

Table 2. Specifications

Description	Specification
Physical	• 1RU fixed form-factor switch • 16 QSFP ports; each supports native 40 Gigabit Ethernet and 4 x 10 Gigabit Ethernet modes • 2 redundant power supplies • 1 fan tray with redundant fans • 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	• RSTP: 512 • MSTP: 64
	Access Control List (ACL) entries	2000 ingress 1000 egress
	Routing table	16,000 prefixes and 16000 host entries* 8000 multicast routes*
	Number of EtherChannels	64 (with vPC)
	Number of ports per EtherChannel	16
	Buffers	9 MB shared
	Boot flash memory	2 GB
Power	Frequency	50 to 60 Hz
	Power supply types	AC (forward and reversed airflow) DC (forward and reversed airflow)
	Typical operating power	172 watts (W; with Twinax at 100% load; 2 Power Supply Units [PSUs]) 174W (with short-reach optics at 100% load; 2 PSUs)
	Maximum power	227W

Description	Specification	
	AC PSUs • Input voltage • Frequency • Efficiency	 100 to 240 VAC 50 to 60 Hz 89 to 91% at 220V
	DC PSUs • Input voltage • Max current • Efficiency	 –40 to –72 VDC 33A 85 to 88%
	Power supply efficiency	89 to 91% at 220V
	Typical heat dissipation	587 BTU/hr (16p with Twinax at 100% load; 2 PSUs) 594 BTU/hr (16p with SR4 optics at 100% load; 2 PSUs)
	Maximum heat dissipation	775 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); supported with AC and DC power supplies Reversed airflow: Port-side intake (air enters through ports and exits through fan tray and power supplies); supported with AC power supply only Single fan tray with redundant fans Hot swappable (must swap within 1 minute)	
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)	1.72 x 17.3 x 19.7 in. (4.4 x 43.9 x 50.5 cm)
	Weight	20.5 lb (9.3 kg)
	Operating temperature	32 to 104°F (0 to 40°C)
	Storage temperature	-40 to 158°F (-40 to 70°C)
	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)

Table 3. 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) • MSTP (IEEE 802.1s): 64 instances • Spanning Tree PortFast • Spanning Tree Root Guard • Spanning Tree Bridge Assurance • Cisco EtherChannel technology (up to 16 ports per EtherChannel) • LACP: IEEE 802.3ad • vPC • Advanced PortChannel hashing based on Layer 2, 3, and 4 information • 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 Equal-Cost Multipath (ECMP) • 2000 ingress and 1000 egress ACL entries • Routing protocols: Static, RIPv2, EIGRP, OSPFv2, and BGP • Bidirectional Flow Detection (BFD) for 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 • uRPF with ACL; strict and loose modes • Jumbo frame support (up to 9216 bytes)
Multicast	Multicast: PIM Version 2 Sparse Mode (PIM-SM) and SSM Bootstrap router (BSR), Automatic Rendezvous Point (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 unicast and 4 multicast 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)

Description	Specification
	CoS-based egress queuing Egress strict-priority queuing Egress port-based scheduling: Weighted Round-Robin (WRR) Explicit Congestion Notification (ECN)
Security	• Ingress ACLs (standard and extended) on Ethernet • Standard and extended Layer 3 to 4 ACLs: IPv4, Internet Control Message Protocol (ICMP), TCP, User Datagram Protocol (UDP), etc. • VLAN-based ACLs (VACLs) • Port-based ACLs (PACLs) • Named ACLs • ACLs on virtual terminals (vtys) • DHCP snooping with Option 82 • Port number in DHCP Option82 • DHCP relay • Dynamic Address Resolution Protocol (ARP) inspection • Configurable CoPP
Cisco Nexus Data Broker	• Topology support for tap and SPAN aggregation • Support for QinQ to tag input source tap and SPAN ports • Traffic load balancing to multiple monitoring tools • 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	• 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 • Port-based locator and beacon LEDs • Configurable CoPP • Configuration rollback • SSHv2 • 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

Description	Specification
	• 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 • Cisco SPAN on physical, PortChannel, VLAN, and Fibre Channel interfaces • 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 monitoring

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 • 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 • LLDP-MIB • IP-MULTICAST-MIB Configuration MIBs • ENTITY-MIB • IF-MIB • CISCO-ENTITY-EXT-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
	• 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
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 • 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

Description	Specification
	• 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

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.

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As a leadouter-switch.com focuses on original new ICT equipment of Cisco, Huawei,H3C, A10, Juniper, Fortinet,F5

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