

EMC Connectrix NEX-5020 10 Gigabit Ethernet/Fibre Channel over Ethernet Switch



The EMC® Connectrix® model NEX-5020 supports 10 Gigabit Ethernet (10 GE), Cisco Data Center Ethernet (DCE), Fibre Channel over Ethernet (FCoE), and 8 Gb/s Fibre Channel. The NEX-5020 supports up to 56 ports in a two-rack unit (RU) chassis. The base includes 40 fixed 10 GE ports. In addition to the fixed ports, the NEX-5020 also accommodates two expansion modules. The NEX-5020 includes the Storage Services License, NX-OS, redundant fans, and power supplies. The NEX-5020 can be deployed as a 10 GE access-layer switch or as a rack-level I/O consolidation platform carrying FCoE traffic to an existing Fibre Channel SAN.

System Architecture

Fibre Channel Standards

- FC-PH; FC-PH, Amendment 1; FC-PH, Amendment 2
FC-PH-2, FC-PH-3, FC-PI, FC-PI-2, FC-PI-4, FC-FS, FC-FS-2, FC-LS, FC-SW-2, FC-SW-3, FC-GS-3, FC-GS-4, FC-BB-3, FCP, FCP-2, FCP-3, FC-MI (except for FL_ports and Class 2), FC-MI-2 (except for FL_ports and Class 2), FC-SP, FC-DA (except for FL_ports, SB_ports, and Class 2)

Fibre Channel Ports

- Up to sixteen 8/4/2/1 Gbps auto-sensing ports

Gigabit Ethernet Ports

- 40 fixed 10 Gigabit Ethernet ports; two open slots accommodate up to 12 more GE ports

Virtual SANs (VSANs)

- Up to 32 VSANs supported

Performance

- Layer 2 hardware forwarding at 1.04 Tbps or 773.8 million packets per second (Mpps)
- MAC address table entries: 16,000
- Low-latency cut-through design provides predictable, consistent traffic latency regardless of packet size, traffic pattern, or enabled-features.

Classes of Fibre Channel

- Class 3, Class F

Fibre Channel Port Types

- Fibre Channel standard port type: E
- Fibre Channel enhanced port types: SD and TE

Media Types

- Hot-pluggable 10 Gigabit Ethernet SFP+ optics, 10 Gigabit Ethernet SFP+ Copper Twinax, 8 Gigabit per Second Fibre Channel SFPs

Fabric Services

- Name Server, Registered State Change Notification (RSCN), Login Services, Name Server Zoning

Hot-Swappable Components

- Power supplies, fans, SFPs, and expansion modules

Installation Options

- 19-inch customer-supplied rack

Optional License

- Fabric Manager Server (FMS)

Availability, Reliability, and Security Features

Reliability

- Hot-swappable SFP optics
- Redundant hot-swappable power supplies
- Redundant hot-swappable fans
- Hot-swappable expansion module

Availability

- Hot-swappable field-replaceable power supplies, fan modules, and expansion modules
- N+1 power redundancy
- N+1 fan module redundancy

Serviceability

- Online diagnostics
- SNMP traps for alerts

Security

- Ingress access control lists (ACLs)—standard and extended—on Ethernet and virtual Ethernet ports
- Standard and extended Layer 2 ACLs: MAC addresses, protocol type, etc.
- Standard and extended Layer 3 to 4 ACLs: IPv4 and v6, Internet Control Message Protocol (ICMP), TCP, User Datagram Protocol (UDP), etc., VLAN-based ACLs (VACLs)
- Named ACLs, ACL logging and statistics, time-based ACLs, optimized ACL distribution

Management

Interface

- Switch management using 10/100/1000 management or console ports
- CLI-based console to provide detailed out-of-band management

Supported Management Protocols

- SSHv2, Telnet, AAA, RADIUS, TACACS+, Syslog, 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 (CHAP)
- Digital certificates for management between switch and RADIUS server
- Cisco Discovery Protocol (CDP) versions 1 and 2
- Role-based Access Control (RBAC)
- Switched Port Analyzer (SPAN) on physical, PortChannel, VLAN, and Fibre Channel interfaces, Enhanced Remote SPAN (ERSPAN)
- Ingress and egress packet counters per interface, Network Time Protocol (NTP)
- Power-on self-test (POST), Cisco GOLD: Ethernet and Fibre Channel
- Comprehensive bootup diagnostic tests

Management Applications

- CLI
- Fabric Manager and Device Manager

Fibre Channel Features

- Fibre Channel over Ethernet (FCoE), Fibre Channel Protocol, Up to 64 buffer credits per port, Virtual SANs (VSANs), Fibre Channel (SAN) PortChannel, Native Interop Mode 2
- Native Interop Mode 3, VSAN Trunking, Fabric Device Management Interface (FDMI)
- Fibre Channel ID (FCID) persistence, distributed device alias services, in-order delivery, port tracking, Diffie-Hellman Challenge Handshake Authentication Protocol (DHCHAP), and Fibre Channel Security Protocol (FC-SP), distributing device alias services, host-to-switch and switch-to-switch FC-SP authentication
- Fabric Shortest Path First (FSPF), fabric binding for Fibre Channel
- Standard zoning, port security, domain and port, enhanced zoning
- SAN PortChannels, Cisco Fabric Analyzer
- Automatic failure detection and restart of applications, Fibre Channel traceroute
- Fibre Channel ping, Fibre Channel debugging

Layer 2 Features

- Layer 2 switch ports and VLAN trunks
- IEEE 802.1Q VLAN encapsulation
- Support for up to 1000 VLANs
- Rapid Per-VLAN Spanning Tree Plus (PVRST+)
- Multiple Spanning Tree Protocol (MSTP) (IEEE 802.1s): 64 instances
- Spanning Tree PortFast and PortFast Guard
- Spanning Tree UplinkFast and BackboneFast
- Spanning Tree, Tree Root Guard
- NIC teaming
- Internet Group Management Protocol (IGMP) Versions 1, 2, and 3 snooping
- IGMP snooping querier
- Cisco EtherChannel technology
- Link Aggregation Control Protocol (LACP): IEEE 802.3ad
- Advanced PortChannel hashing based on Layer 2, 3, and 4 information
- Jumbo frames on all ports (up to 9216 bytes)
- Pause frames (IEEE 802.3x)
- Storm control (unicast, multicast, and broadcast)
- Address Resolution Protocol (ARP)
- Private VLANs
- Private VLAN over trunks

Quality of Service

- Layer 2 IEEE 802.1p (CoS), 8 hardware queues per port, per-port QoS configuration
- CoS trust, Modular QoS CLI (MQC) compliance, color-aware aggregate policing
- Policed drop, per-port Virtual Output Queuing, CoS-based egress queuing
- Egress strict-priority queuing, Egress port-based scheduling: Weighted Round-Robin (WRR), ingress policing on physical Ethernet and virtual Ethernet interfaces

Cisco Data Center Ethernet

- Priority flow control (per-priority pause frame support)
- Data Center Bridging Exchange (DCBX) protocol
- IEEE 802.1Qaz: Bandwidth management

Power Specifications

Description	Specification
AC-input Voltage	110–240 VAC Rated = 200 to 240 Vrms
AC-input Frequency (VinFrequency)	Minimum = 47 Hz Rated = 50 to 60 Hz Maximum = 63 Hz
Maximum Power	750 W
Typical Power	480 W
Power Supply Output Capacity	1,200 W
Power Supply Output Voltage	12 V
Efficiency	90% or better at full load, and maintain efficiency down to 25% load
Heat Dissipation	2,566 BTU/hr
RoHS Compliant	Yes
Hot Swappable	Yes
Power Supply Dimensions	1.57 in (0.039 m) x 4.0 in (0.101 m) x 13.0 in (.330 m)

Environmental Specifications

Description	Specification
Temperature, Operating	32 to 104° F (0 to 40° C)
Temperature, Non-operating	-40 to 158° F (-40 to 70° C)
Humidity (RH), Non-condensing	5 to 95%
Altitude	0 to 10,000 ft (0 to 3,000 m)

Cooling

Airflow
Front to back

Physical Characteristics

Dimensions (H x W x D)
3.47 in. x 17.3 in. x 30.0 in. (8.8 x 43.9 x 76.2 cm)—2 RU

Weight:

Description	Specification
NEX-5020 with 1 power supply and 5 fan modules	44 lbs (20 Kg)
NEX-5020 AC power supply	4 lbs (2 Kg)
NEX-5020 expansion module	1 lb (0.5 Kg)
NEX-5020 fully loaded (2 power supplies/2 expansion modules)	50 lbs (23 Kg)

Industry 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 802.3: Ethernet
- IEEE 802.3ad: LACP
- IEEE 802.3ae: 10 Gigabit Ethernet
- SFF-8431 including optical and direct-attach (Twinax copper with 1, 3, and 5 meter cable lengths)
- RMON

Regulatory Compliance

Specification	Description
Regulatory Compliance	Products should comply with CE Markings according to directives 2004/108/EC and 2006/95/EC.
Safety	<ul style="list-style-type: none">• UL 60950-1• CAN/CSA-C22.2 No. 60950-1• EN 60950-1• IEC 60950-1• AS/NZS 60950-1• GB4943
EMC: Emissions	<ul style="list-style-type: none">• 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	<ul style="list-style-type: none">• EN55082-1• EN61000-6-1• EN55024• CISPR24• EN300386• KN 61000-4 series
RoHS	The product is RoHS 5 compliant with exceptions for leaded ball grid array (BGA) balls and lead press-fit connectors.

Regulatory Specifications

Product Ecology

Restriction of Hazardous Substances in Electric and Electronic Equipment (ROHS) 5 compliant with the exception for leaded ball grid array (BGA) balls and lead press-fit connectors



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