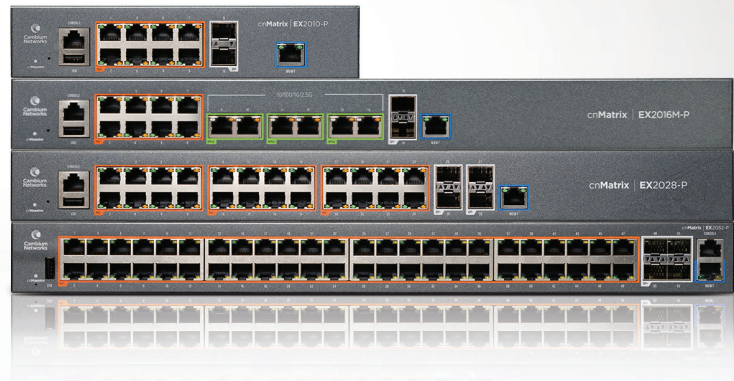


cnMatrix Switches



Cambium Networks' next generation switching platform offers a cloud managed, high performance, feature rich enterprise grade ethernet switching solution. The cnMatrix™ platform of switches provides:

- Easy and simple, free cloud (or on premise) management with cnMaestro™
- Zero touch deployment of switches makes installation easy
- Zero touch policy based configuration enables automation, reduces errors and network downtime
- Device profiling, automatic port configuration and network segmentation improves security posture of the network
- Wireless Aware: Together with Cambium Networks cnPilot Wi-Fi solution, enables a simple, easy-to-use cloud managed Unified Wired-Wireless access solution
- Affordable, high quality and enterprise grade Layer 2, Layer 3 feature set



The cnMatrix series of fully managed switches delivers full Layer2 and Layer 3 capabilities with enhanced access security. cnMatrix switches deliver power savings with several models offering fanless operation. Depending on the model, the cnMatrix EX2K series offers flexibility with SFP+ (10Gbps) or SFP (1Gbps) uplink ports.

* Feature to be included in a future release.

SPECIFICATIONS

FEATURES	EX2052	EX2052-P	EX2052R-P	EX2016M-P	EX2028-P	EX2028	EX2010-P	EX2010
Throughput	176 Gbps	176 Gbps	176 Gbps	86 Gbps	128 Gbps	128 Gbps	20 Gbps	20 Gbps
Non-Blocking Throughput	✓	✓	✓	✓	✓	✓	✓	✓
Forwarding Rate in Mpps (64 Byte Packets)	120	120	120	120	120	120	120	120
10/100/1000 Ports	48	48	48	8	24	24	8	8
2.5G Ports	NA	NA	NA	6	NA	NA	NA	NA
Uplink Ports	4 SFP+	4 SFP+	4 SFP+	2 SFP+	4 SFP+	4 SFP+	2 SFP	2 SFP
PoE+ Enabled Ports (802.3af/at)	NA	48	48	14	24	NA	8	NA
Serial Console	✓	✓	✓	✓	✓	✓	✓	✓
USB	✓	✓	✓	✓	✓	✓	✓	✓
Out-of-Band Management Port	✓	✓	✓	✓	✓	✓	✓	✓
Rack Mount Kit	✓	✓	✓	✓	✓	✓	Optional	Optional
Internal Fans	2	2	2	2	2	Fanless	Fanless	Fanless
Reset Button	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
MAC Address Table Size	16K	16K	16K	16K	16K	16K	16K	16K
Flash Storage	128MB	128MB	128MB	128MB	128MB	128MB	128MB	128MB
DRAM	512MB	512MB	512MB	512MB	512MB	512MB	512MB	512MB
VLANs	4K	4K	4K	4K	4K	4K	4K	4K
Port Based VLANs	4K	4K	4K	4K	4K	4K	4K	4K
LACP/Trunking	8 LAGs/ 8 links per LAG	8 LAGs/ 8 links per LAG	8 LAGs/ 8 links per LAG	8 LAGs/ 8 links per LAG	8 LAGs/ 8 links per LAG	8 LAGs/ 8 links per LAG	8 LAGs/ 8 links per LAG	8 LAGs/ 8 links per LAG
QoS Priority Queues	8	8	8	8	8	8	8	8
PVRST	32	32	32	32	32	32	32	32
Ingress/Egress ACL	128	128	128	128	128	128	128	128
Static Arp Entries	512	512	512	512	512	512	512	512
ARP Entries	512	512	512	512	512	512	512	512
Static Routes	64	64	64	64	64	64	64	64
Dynamic Routing	512	512	512	512	512	512	512	512
IGMP Multicast Groups	256	256	256	256	256	256	256	256
Policy Based Automation	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

cnMatrix

ALL MODELS

Quality of Service	<ul style="list-style-type: none"> • ACL mapping and marking of ToS/DSCP (COS) • ACL mapping to priority queue • Honoring DSCP and 802.1p(CoS) • Priority queue management using Weighted Round Robin (WRR), Strict Priority (SP) and a combination of WRR and SP 	<ul style="list-style-type: none"> • ACL mapping marking of 802.1p • DiffServ support • Traffic shaping/metering
Traffic Management	<ul style="list-style-type: none"> • ACL-based inbound rate limiting policies • Inbound rate limiting per port 	<ul style="list-style-type: none"> • Broadcast, multicast and unknown unicast rate limiting • Outbound rate limiting per port/queue
Security	<ul style="list-style-type: none"> • 802.1x authentication • DHCP snooping • Radius/Tacacs/Tacacs+ • Secure shell • Local username/password 	<ul style="list-style-type: none"> • MAC authentication* • RADIUS authentication/authorization • Authentication, Authorization, and Accounting (AAA) • Secure copy (SCP)*
Layer 2 Feature Set	<ul style="list-style-type: none"> • 802.1s multiple spanning tree • 802.1d • Auto MDI/MDIX • IGMP Snooping v1/v2/v3*, Fast Leave • IGMP Proxy • Flow Control per port • Port Mirroring: port based, ACL based, VLAN based • Link Aggregation Groups (Static/LACP) • Jumbo frame (9k) • BPDU filtering • DoS Protection 	<ul style="list-style-type: none"> • VLAN, Port, Protocol, 802.1q • 802.1x authentication • Bpdu Guard, Root Guard • LLDP/LLDP Med • Static MAC • Per VLAN STP (PVST/PVRST) • Port Isolation/Private VLAN Edge • Rate Limiting/Storm Control • DHCP Snooping • Broadcast/Multicast/Unlearned Unicast (Storm Control) • Ping/TraceRoute/ICMPv6

IEEE STANDARDS

SWITCHING

Core Switching Features	<ul style="list-style-type: none"> IEEE 802.1AB—Link Layer Discovery Protocol (LLDP) IEEE 802.1D—Spanning tree compatibility IEEE 802.1p—Ethernet priority with user provisioning and mapping 	<ul style="list-style-type: none"> IEEE 802.1s—Multiple spanning tree compatibility IEEE 802.1Q—Virtual LANs with port-based VLANs IEEE 802.1X—Port-based authentication 	
VLAN Support	<ul style="list-style-type: none"> IEEE 802.1W—Rapid spanning tree compatibility IEEE 802.3—10BASE-T IEEE 802.3u—100BASE-T IEEE 802.3ab—1000BASE-T Bridged Local Area Networks - Amendment 07: Multiple Registration Protocol 	<ul style="list-style-type: none"> IEEE 802.3ac—VLAN tagging IEEE 802.3ad—Link aggregation IEEE 802.3x —Flow control Static Routing 	
IEEE 802.1Q-2003	<ul style="list-style-type: none"> RFC 4541—Considerations for Internet Group Management Protocol (IGMP) Snooping Switches 	<ul style="list-style-type: none"> ANSI/TIA-1057—LLDP-Media Endpoint Discovery (MED) 	
Advanced Layer-2 Features	<ul style="list-style-type: none"> Authentication, Authorization, and Accounting (AAA) Broadcast/Multicast/Unknown unicast storm recovery DHCP Snooping IGMP Snooping Querier Independent VLAN Learning (IVL) support 	<ul style="list-style-type: none"> Jumbo Ethernet frame support Port MAC locking Port mirroring Protected ports Static MAC filtering 	
Layer-3 Features	<ul style="list-style-type: none"> RFC 2131 – DHCP Relay 	<ul style="list-style-type: none"> RFC 2328 – OSPF Version 2 	<ul style="list-style-type: none"> RFC 2453 – RIP Version 2

SYSTEM FACILITIES

- Event and error logging facility
- Run-time and configuration download capability
- PING utility
- FTP Transfers via IPv4/IPv6
- RFC 768—UDP
- RFC 783—TFTP
- RFC 791—IP
- RFC 792—ICMP
- RFC 793—TCP
- RFC 826—ARP
- RFC 894—Transmission of IP datagrams over Ethernet networks
- RFC 896—Congestion control in IP/TCP networks
- RFC 951—BOOTP
- RFC 1034—Domain names - concepts and facilities
- RFC 1035—Domain names - implementation and specification
- RFC 1321—Message digest algorithm
- RFC 1534—Interoperability between BOOTP and DHCP
- RFC 2021—Remote network monitoring management information base version 2
- RFC 2030—Simple Network Time Protocol (SNTP)
- RFC 2132—DHCP options and BOOTP vendor extensions
- RFC 2819—Remote Network Monitoring Management Information Base
- RFC 2865—RADIUS client
- RFC 2869—RADIUS Extensions
- RFC 3579—RADIUS support for EAP
- RFC 3580—IEEE 802.1X RADIUS usage guidelines
- RFC 3164—The BSD syslog protocol
- RFC 3580—802.1X RADIUS Usage Guidelines

MANAGEMENT

- SNMP v1, v2, and v3
- SSH 1.5 and 2.0
- RFC 4252: SSH authentication protocol
- RFC 4253: SSH transport layer protocol
- RFC 4254: SSH connection protocol
- RFC 4251: SSH protocol architecture
- RFC 4716: SECSH public key file format
- RFC 4419: Diffie-Hellman group exchange for the SSH transport layer protocol
- SSL 3.0 and TLS 1.0
- RFC 2246: The TLS protocol, version 1.0
- RFC 2818: HTTP over TLS
- RFC 3268: AES cipher suites for transport layer security
- Telnet
- Web GUI

SNMP MIBs

FASTPATH Enterprise MIBs for Full Configuration Support of Switching Features	<ul style="list-style-type: none"> RFC 1213—MIB II RFC 1493—Bridge MIB RFC 1612—DNS resolver MIB extensions RFC 1643—Definitions of managed objects for the Ethernet-like interface types RFC 2233—Interfaces group MIB using SMI v2 RFC 2613—SMON MIB RFC 2618—RADIUS authentication client MIB RFC 2674—VLAN MIB RFC 2737—Entity MIB version 2* 	<ul style="list-style-type: none"> RFC 2819—RMON groups 1, 2, 3, and 9 RFC 2863—IF-MIB RFC 2925—Definitions of Managed Objects for Remote Ping, Traceroute, and Lookup Operations RFC 3273—RMON Groups 1, 2, and 3 RFC 3291—Textual conventions for Internet network addresses RFC 3434—RMON Groups 1, 2, and 3 RFC 4022—TCP-MIB RFC 4113—UDP-MIB
Quality of Service MIBs	<ul style="list-style-type: none"> MIBs for full configuration support of DiffServ, ACL, and CoS functionality 	<ul style="list-style-type: none"> RFC 3289—Management information base for the DiffServ architecture (read-only)

IEEE STANDARDS

SECURITY

Permit/Deny Actions for Inbound IP and Layer-2 Traffic Classification	<ul style="list-style-type: none"> Source/Destination IP address TCP/UDP Source/Destination port IP Protocol Type Type of Service (ToS) or differentiated services (DSCP) field 	<ul style="list-style-type: none"> Source/Destination MAC address EtherType IEEE 802.1p user priority VLAN ID RFC 1858—Security Considerations for IP Fragment Filtering
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QUALITY OF SERVICE

Classify Traffic Based on Same Criteria as ACLs and Optionally:	<ul style="list-style-type: none"> Mark the IP DSCP or Precedence header fields Police the flow to a specific rate with two-color aware support RFC 2474—Definition of the differentiated services field (DS field) in the IPv4 and IPv6 headers 	<ul style="list-style-type: none"> RFC 2475—An architecture for differentiated services RFC 2597—Assured forwarding Per-Hop Behavior
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Discover more information on cnMatrix at: <http://community.cambiumnetworks.com/>