

cnMatrix



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 management with cnMaestro
- Zero touch deployment of switches makes deployment 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. The cnMatrix switch series offers flexibility with 4 - 10 Gbps (SFP+) uplinks on the 28 port models while offering 2 - 1Gbps (SFP) uplink ports on the 10 port models.

** Feature to be included in release 2*

SPECIFICATIONS

FEATURES	EX2028P	EX2028	EX2010P	EX2010
Throughput	128 Gbps	128 Gbps	20 Gbps	20 Gbps
Non-Blocking	✓	✓	✓	✓
PoE enabled ports	24	n/a	8	n/a
PoE power budget units (watts)	400	n/a	100	n/a
10/100/1000 ports	24	24	8	8
Uplink ports	4 SFP+	4 SFP+	2 SFP	2 SFP
Serial console	✓	✓	✓	✓
USB*	✓	✓	✓	✓
OoB port	✓	✓	✓	✓
Rack mount kit	✓	✓	Optional	Optional
Internal fans	2	Fanless	Fanless	Fanless
Maximum routes (Static)	64	64	64	64
Dynamic routing*	512	512	512	512
LACP/trunking	8 LAGs / 8 links per 9216	8 LAGs / 8 links per 9216	8 LAGs / 8 links per 9216	8 LAGs / 8 links per 9216
QoS priority queues	8	8	8	8
Maximum IGMP multicast groups	256	256	256	256
Max PVRST	32	32	32	32

cnMATRIX	ALL MODELS	
Quality of Service	• 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	• ACL mapping marking of 802.1p • DiffServ support • Traffic shaping/metering
Traffic Management	• ACL-based inbound rate limiting policies • Inbound rate limiting per port	• Broadcast, multicast and unknown unicast rate limiting • Outbound rate limiting per port/queue
Security	• 802.1x authentication • DHCP snooping • Neighbor Discovery (ND) inspection • Radius/Tacacs+/Tacacs+ • Secure shell	• MAC authentication • RADIUS authentication/authorization • Authentication, Authorization, and Accounting (AAA) • Secure copy (SCP) • Local username/password
Layer 2 feature set	• 802.1s multiple spanning tree • 802.1d • Auto MDI/MDIX • IGMP Snooping V1v2 • IGMP Proxy • Flow Control per port/per queue • Per VLAN STP (PVST/PVRST) • Private VLAN edge/port isolation • Rate limiting/Storm Control • DHCP snooping • Broadcast/Multicast/Unlearned Unicast (Storm Control) • Ping/TraceRoute/ICMPv6	• VLAN, Port, Protocol, 802.1q • 802.1x authentication • Bpdu guard, Root Guard • LLDP/LLDP Med • Static MAC • IGMP v2v3 fast leave • Port Mirroring: port based, ACL based, VLAN based • Link Aggregation Groups (Static/LACP) • Jumbo frame support • BPDU filtering • DoS Protection (Port, CPU)
Management	• cnMaestro (cloud management) • DHCP autoconfiguration • Embedded DHCP server • Out of band Ethernet management client/server • SNMP v1v2 • System Network Time Protocol (SNTP) • Auto Edge / Auto Attach • TFTP	• Industry standard Command Line Interface (CLI) • Embedded web management (HTTP/HTTPS) • USB file management and storage • SSH /SSH v2 • DHCP relay • Local/remote system logging • Display log messages multiple terminals • Telnet client/server

SPECIFICATIONS

cnMATRIX MODELS	EX2028P	EX2028	EX2010P	EX2010
Cambium Auto Edge	Yes	Yes	Yes	Yes
MTBF (hours)	285,350.90	432,283.26	338,917.20	806,354.10
Power budget	400W	n/a	100W	n/a
Power supply	AC/Internal	AC/Internal	AC/Internal	AC/Internal
Weight	3.96 kg (8.75 lb)	2.77 kg (6.1 lb)	1.99 kg (4.375 lb)	1.6 kg (3.5375 lb)
Dimensions	44 x 4.4 x 25 cm (17.3 x 1.75 x 9.85 in)	44 x 4.4 x 20.9 cm (17.3 x 1.75 x 8.22 in)	21 x 4.4 x 25 cm (8.26 x 1.75 x 9.85 in)	21 x 4.4 x 25 cm (8.26 x 1.75 x 9.85 in)
LEDs per port	Link/activity Poe	Link/activity	Link/activity Poe	Link/activity
Rack mountable	Yes 1U	Yes 1U	Yes 1U	Yes 1U
Temperature ranges	-0°C to +50°C (+32°F to +122°F)	-0°C to +50°C (+32°F to +122°F)	-0°C to +50°C (+32°F to +122°F)	-0°C to +50°C (+32°F to +122°F)
Operating humidity	+55° at 95% RH	+55° at 95% RH	+55° at 95% RH	+55° at 95% RH
Storage temperature	-40°C to +70°C (-40°F to +158°F)	-40°C to +70°C (-40°F to +158°F)	-40°C to +70°C (-40°F to +158°F)	-40°C to +70°C (-40°F to +158°F)

IEEE STANDARDS

SWITCHING

Core Switching Features	- IEEE 802.1AB—Link Layer Discovery Protocol (LLDP) - IEEE 802.1D—Spanning tree compatibility - IEEE 802.1p—Ethernet priority with user provisioning and mapping	- IEEE 802.1s—Multiple spanning tree compatibility - IEEE 802.1Q—Virtual LANs with port-based VLANs - IEEE 802.1X—Port-based authentication with Guest
VLAN support	- IEEE 802.1W—Rapid spanning tree compatibility - IEEE 802.3—10BASE-T - IEEE 802.3u—100BASE-T - IEEE 802.3ab—1000BASE-T - IEEE 802.1ak—Virtual Bridged Local Area Networks - Amendment 07: Multiple Registration Protocol	- IEEE 802.3ac—VLAN tagging - IEEE 802.3ad—Link aggregation - IEEE 802.3x —Flow control - Static Routing
IEEE 802.1Q-2003	RFC 4541—Considerations for Internet Group Management Protocol (IGMP) Snooping Switches	- ANSI/TIA-1057—LLDP-Media Endpoint Discovery (MED) - RFC 5171—Unidirectional Link Detection (UDLD) Protocol
Advanced Layer-2 Features	- Authentication, Authorization, and Accounting (AAA) - Broadcast Storm Recovery - Broadcast/Multicast/Unknown unicast storm recovery - DHCP Snooping - IGMP Snooping Querier - Multicast VLAN Registration (MVR) - Independent VLAN Learning (IVL) support	- IPv6 Classification APIs - Jumbo Ethernet frame support - Port MAC locking - Port mirroring - Protected ports - Static MAC filtering
TACACS+	- Voice VLANs - Unauthenticated VLAN - Internal 802.1X Authentication Server	- CLI Filtering - Switchport mode configuration - Link Dependency

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 2131—DHCP relay - RFC 2132—DHCP options and BOOTP vendor extensions - RFC 2819—Remote Network Monitoring Management Information Base - RFC 2865—RADIUS client - RFC 2866—RADIUS accounting - RFC 2868—RADIUS attributes for tunnel protocol support - 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 - RFC 5176—Dynamic Authorization Server (Disconnect-Request processing only)
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IEEE STANDARDS

MANAGEMENT

- cnMaestro
- Industry-standard CLI
- IPv6 management
- Password management
- Autoinstall support for firmware images and config files
- 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
- Secure
- Telnet
- Web

SNMP MIBs

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| <p>FASTPATH Enterprise MIBs for full configuration support of switching features</p> | <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 2620—RADIUS accounting 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 |
| <p>Quality of Service MIBs</p> | <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) |

SECURITY

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| <p>Permit/deny actions for inbound IP and Layer-2 traffic classification based on:</p> | <ul style="list-style-type: none"> • Time-Based ACL • 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 (outer and/or inner VLAN tag) • VLAN ID (outer and/or inner VLAN tag) • RFC 1858—Security Considerations for IP Fragment Filtering |
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Permit/deny actions for inbound IP and Layer-2

QUALITY OF SERVICE

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|--|---|--|
| <p>Classify traffic based on same criteria as ACLs and optionally:</p> | <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/>