



Ethernet Switching

Enterprise Switching Architectures and Best Practices - Access

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Today's Topics

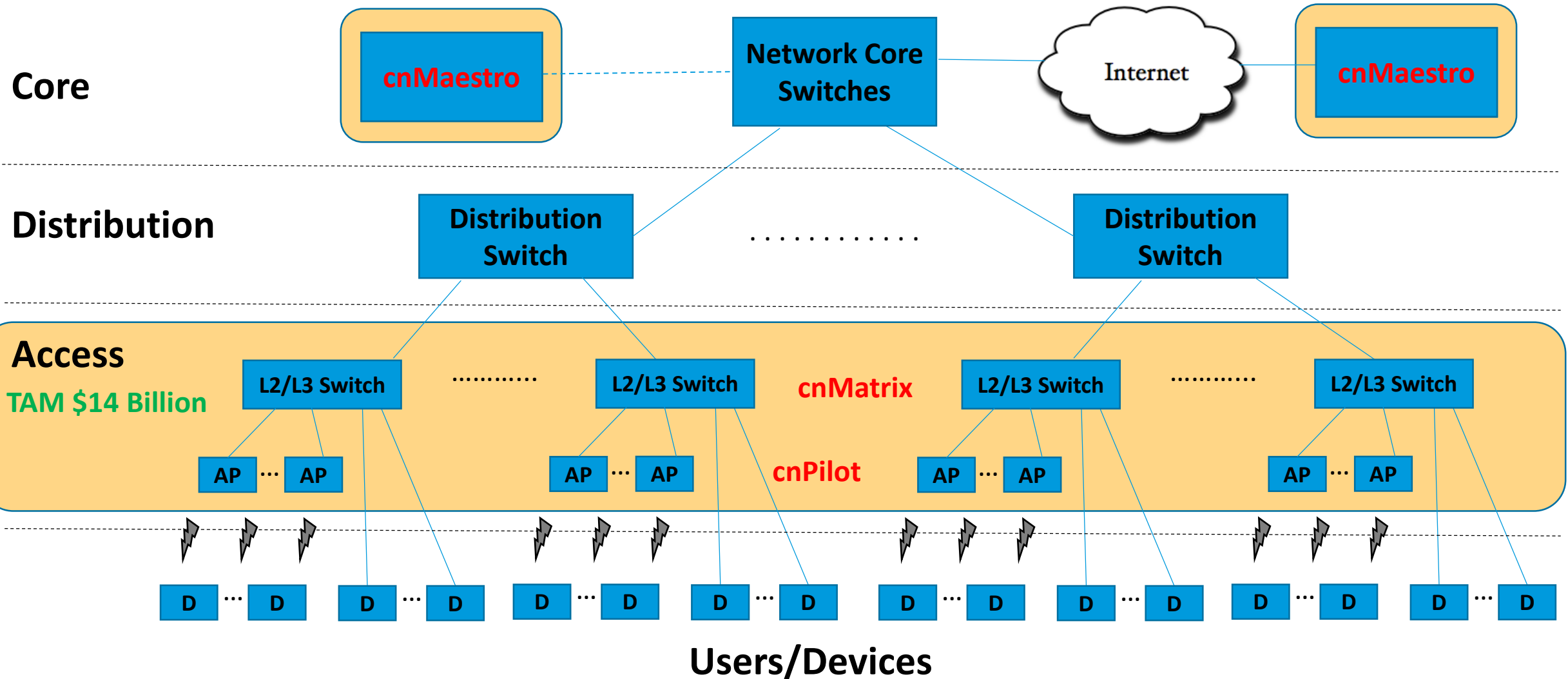
- Deployment Use Cases
- General Considerations
- Critical Factors
- HW Requirements
- Feature Highlight – Zero Touch/Automation
- cnMatrix Overview

Deployment Use Cases

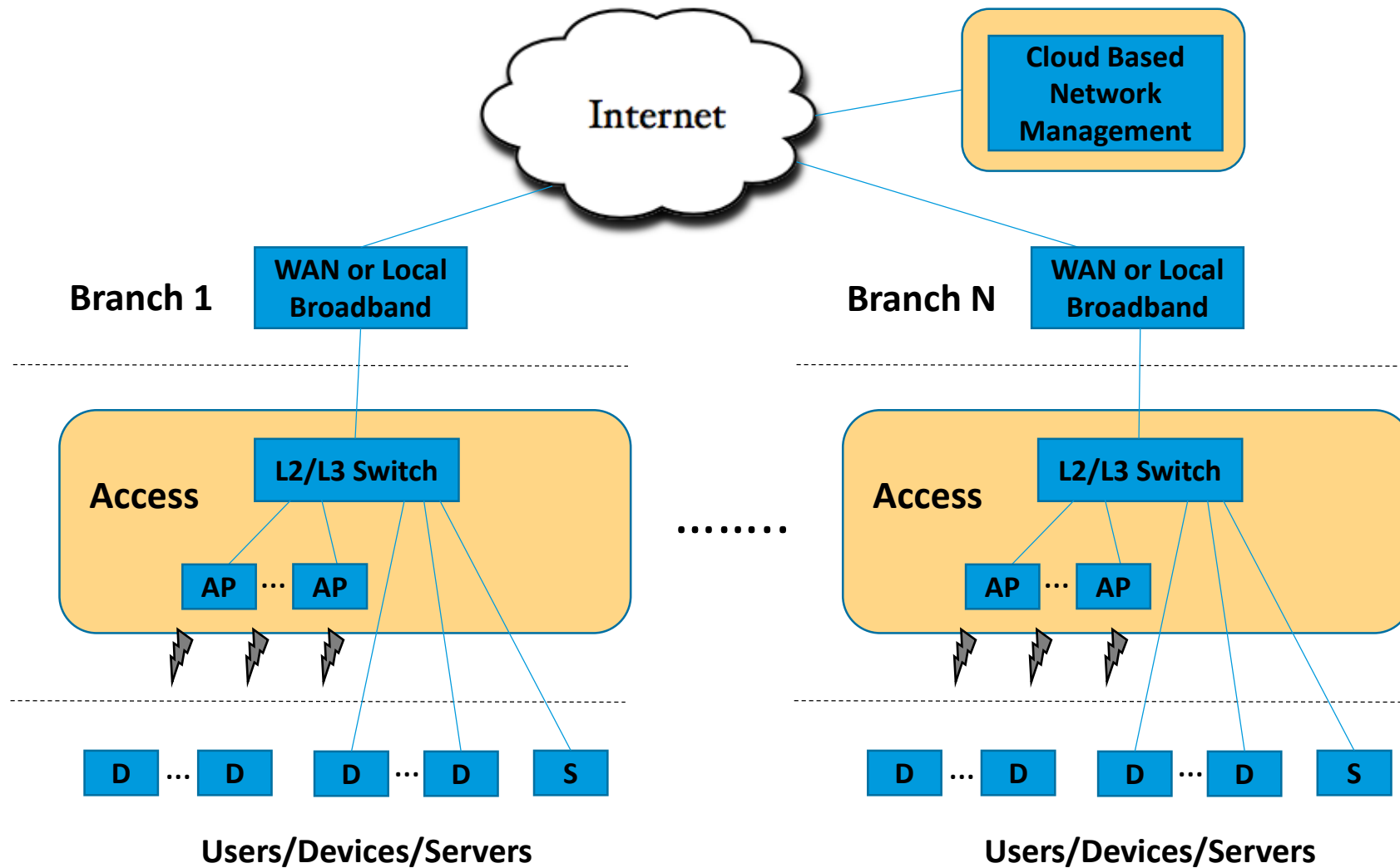
A background image showing a dense network of blue nodes connected by lines, creating a mesh-like structure that recedes into the distance.

Enterprise Switching

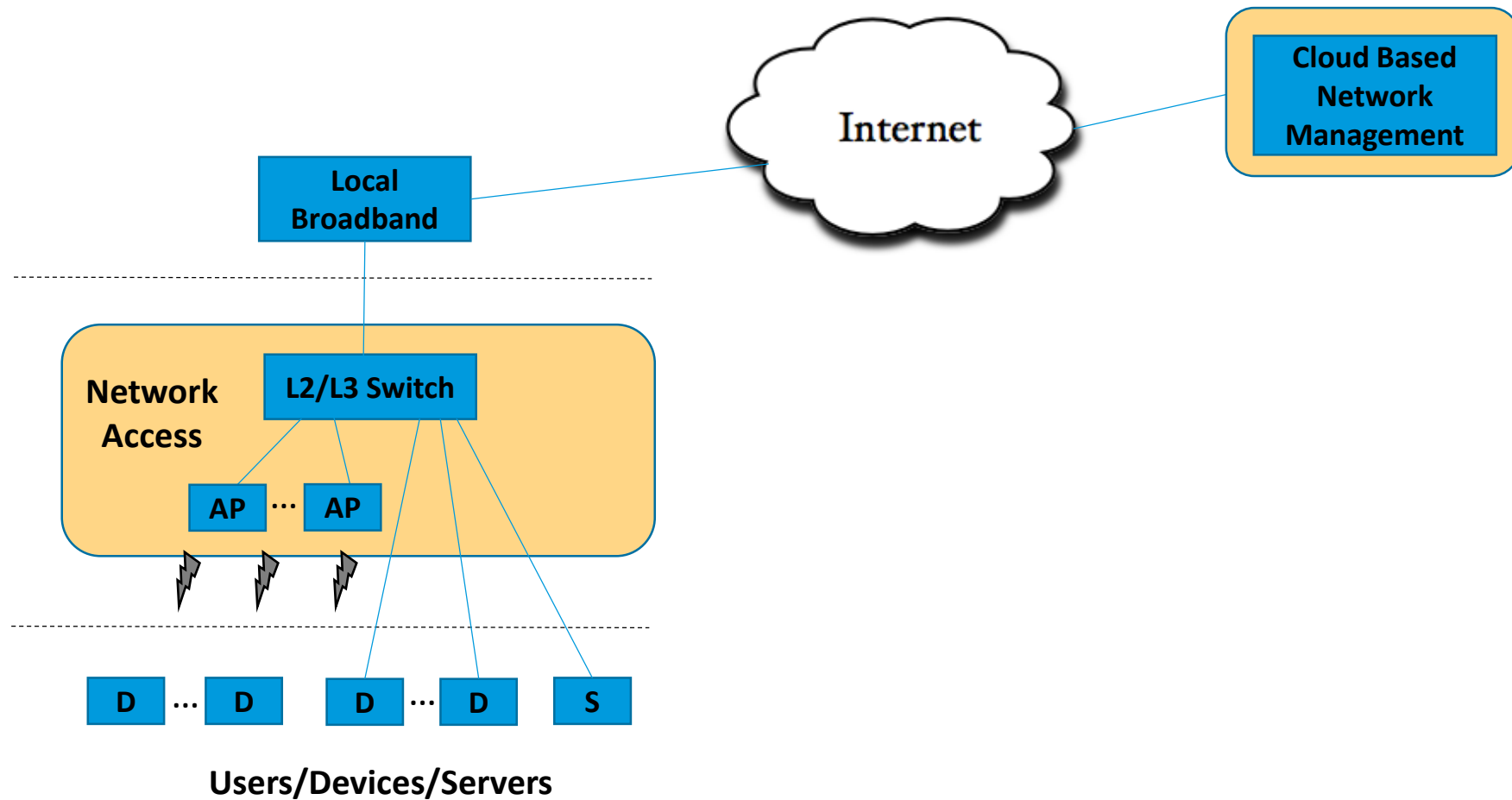
Enterprise Campus – 3 Tier Network Architecture



cnMatrix - Enterprise Branch Office, Retail



cnMatrix - Home Office, Retail, Small Business



Enterprise Edge - Access Layer - General Considerations

- Edge – Ongoing changes – Adds, Moves, & Changes
 - Core – Stable – fewer changes
- Wired & Wireless – One solution, not two
- Single Vendor across Access Layer - Strongly Recommended
 - Wired, Wireless, Management
 - Seamless integration
 - Support across wired and wireless devices
 - Extra features – 1+1=3
 - Single/consistent user interface
- Access Switching Capabilities
 - Layer 2
 - Layer 3
 - Security
 - QOS, ACLs, Filtering
 - Fully Managed – CLI, Web GUI, SNMP, NMS (Cloud or on-Premise)
- TCO – CapEx, Support, On-going operations
- Support – Reliable, Dependable, Responsive & Proactive
 - Active Roadmap – SW & HW
- Warranty – Standard 1 year or Limited Lifetime Warranty (LLW)



Enterprise Switches – What to look for - 4 Critical Factors

- Quality
 - Dependable, Reliable, and Robust
- Ease of use
 - Simplicity
 - Easy to Configure – Automation
 - Easy to Deploy – Zero Touch
 - Easy to Maintain
 - Easy to trouble shoot
- Meets Use Case Requirements
 - HW Requirements
 - SW Requirements
- Innovation & Differentiation
 - Advanced Applications
 - Added Simplicity
 - Plug & Play, True Zero Touch
 - Enhanced Security



Enterprise Access Switches – HW Requirements

- Switch Architecture
 - Silicon Based – High Performance, Feature Rich
 - SW based – Doesn't scale
- Ports
 - # of Ports – Access & Uplink
 - Type of ports – Fiber & Copper
 - Port Speed
 - Fast Ethernet – 10/100 Mbps
 - Today's standard – 10/100/1000 Mbps
 - 2.5G/5G – 802.3bz
 - 10 GE (copper)
 - SFP – 1Gbps, SFP+ - 10Gbps, QSFP+ - 40 Gbps, 25 Gbps
- Uplink Requirements – Non Blocking???
- PoE
 - Standard – 802.3af/at/bt
 - Passive – non standard
 - PoE Power Budget
 - Control – enable/disable, stats, priority, status
- USB – File transfers
- OOB Management port – Backup access to the switch
- Local RJ45 Console port
- LEDs – System Status & Port Specific Status
- Kensington Lock



- 24 Ports 10/100/1000 Mbps
- 4 Ports 10 Gbps



Feature Highlight

Zero Touch - Automation

A background image showing a dense network of blue nodes connected by lines, representing a complex data or communication network.

Enterprise Switching

cnMatrix – A True Zero Touch Experience

'Zero Touch' Automating Configuration

Examples

- Static VLANs
- Uplink Ports
- Link Aggregation
- IP address
- Static Routes
- QoS, ACLs
- Radius Server
- 802.1x
- etc

**Configuration
for Initial
Deployment**

**Solution:
Vendor Specific**

**Configuration
required for
ongoing
Network
changes**

**Solution:
Very Few Vendors
support this**

Examples

- Connecting APs
- Connecting Cameras
- Connecting Printers
- Connecting IoT devices
- Removing devices
- Moving devices

cnMatrix Overview



cnMatrix



cnMatrix EX 2K

Cambium Networks cnMatrix – Overview

- **Enterprise Grade Layer 2 & Layer 3 Functionality**
- **Cloud Management with cnMaestro**
- **Ease of Use – Zero Touch Provisioning**
 - **Initial Deployment** – On boarding with cnMaestro
 - **Policy Based Automation** – Automation of device dependent configuration
- **Enhanced Security** – Device profiling and segmentation
- **Complete Access Layer** – cnMatrix+cnPilot+cnMaestro
- **Limited Lifetime Warranty & Best in Class Support**
- **Best in Class TCO**



Q&A

cnMatrix Overview



cnMatrix



Cambium NetworksTM

Feature Summary

Technical Knowledge Transfer



cnMatrix

cnMatrix Features

L2 Switching Features

- 802.1Q VLAN and Trunking Support
- 802.1d STP, 802.1w RSTP, 802.1s MST
- PVRST (Per VLAN RSTP)
- STP Enhancements: BPDU guard, BPDU Edge, Root Guard
- ACL QoS: Mapping/Marking ToS/DSCP, 802.1p, Priority Queue
- Inbound Traffic Policing, and Outbound Traffic Shaping
- Storm Control
- Flow Control Per Port
- 802.1ab Link Layer Discovery Protocol (LLDP, LLDP-MED)
- 802.3ad Link Aggregation

L2 Switching Features

- Policy Based Automation
- IGMP Snooping v1/v2/v3 (v3*)
- IGMP Proxy
- Private Vlan Edge
- 802.3af/at
- Mirroring: Port-based, ACL-based
- SNTP
- Port Statistics
- RMON
- Dynamic Voice VLAN assignment*
- RSPAN**
- sFlow**

* Available in 2.1 Release

** Available in Future Release

L3 Switching Features

- Routing Between Directly Connected Subnets
 - Routed Interfaces
 - IPv4 and IPv6* static routes
 - Host routes
 - DHCP Relay
 - RIP v1/v2*
 - OSPF v2*
 - Route Policy and Redistribution*
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- ECMP**
 - VRRP**
 - Policy Based Routing**
 - Layer 3/Layer 4 ACLs**

* Available in 2.1 Release

** Available in Future Release

cnMatrix Features

Management Features

- CnMaestro Cloud-based Management
- Industry-standard Command Line Interface (CLI)
- Web Management
- IPv6 Host
- Zero Touch
 - Initial Deployment with cnMaestro
 - Dynamic configuration w/ Policy Based Automation
- SNMPv1/v2c/v3
- Telnet Client/Server
- Out-of-band Ethernet Management
- SSH/SSH v2
- DHCP Client, Server
- USB File Management and Storage*
- Local/Remote Syslog
- System Resource Monitoring

Security Features

- 802.1x Authentication
- Radius/TACACS+
- DHCP Snooping
- MAC-Based and IP-Based ACLs
- Static MAC
- IGMP Filtering
- Local Management User Name Password
- Dynamic ARP Inspection*
- Protection against Denial of Service (DoS) Attacks**
- Black-hole Routing**
- Neighbor Discovery (ND) Inspection**

* Available in 2.1 Release

** Available in Future Release

Enterprise Campus – 3 Tier Network Architecture

