

A complex network of glowing blue nodes connected by thin lines, creating a mesh-like pattern that recedes into the distance.

cnMatrix

Cloud Managed Access

Policy Based Automation

John Mead - July 2019

Agenda

- Introduction to Cambium Switching Portfolio – cnMatrix
 - HW & SW Overview
- cnMatrix Roadmap – What's next
- Policy Based Automation – Intro
- Policy Based Automation – Example
- Policy Based Automation – Summary
- cnMaestro on boarding with PBA – Live Demo
- Summary

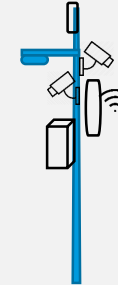
cnMatrix - Purpose Built for Target Deployment Use Cases

Q4
2018



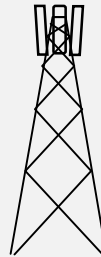
**Enterprise Indoor Access
Switch**

cnMAESTRO



In
Development

**Video Surveillance &
Smart City Deployments**



In
Development

WISP Tower

HW & SW Overview



cnMatrix

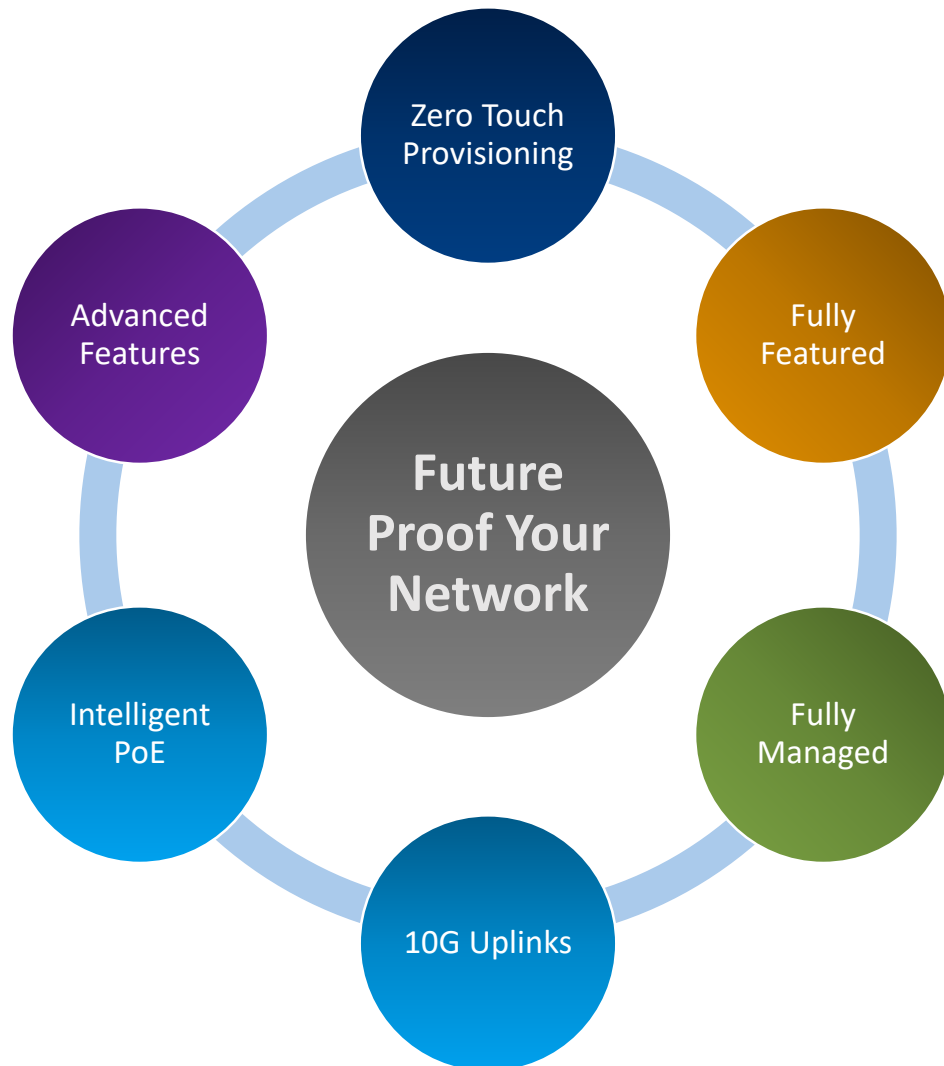
cnMatrix – Enterprise Switches (EX 2K) – HW Overview

- HW Overview

- Cambium designed switch - NOT an OEM switch
- Silicon based Switching Solution
 - Dedicated HW data plane- L2 & L3 line rate processing
 - Rich L2 & L3 functionality - Extensive QoS, ACL, & Filtering
- 4 Models Available
 - 8 Port & 24 port models with and without PoE+
 - 24 Port – 4 SFP+(10GE) Uplinks
 - 8 Port – 2 SFP(1GE) Uplinks
- USB, OOB/MGMT, & RJ45 console port
- Fan-less: All models except the 24 port PoE SKU



Future proof the network with cnMatrix



- Fully Featured Switches
 - Layer 2, Layer 3
 - Extensive ACL's, Filters, & QoS support
 - Security
- Fully Managed
 - Web GUI, CLI, & SNMP
 - NMS - cnMaestro Cloud/On-Prem
- Uplinks
 - 10G uplinks as compared to 1G
- Intelligent PoE
 - 8/24-Port PoE+
 - Healthy Power Budget
 - Complete Control – Enable, disable, monitor, prioritize, automate
- Advanced Features
 - Layer 3 – Static and Dynamic Routing
 - Automatic Device Profiling
 - Policy Based Automation
- A true Zero Touch Experience
 - Initial Deployment
 - Day to day operations with Automation

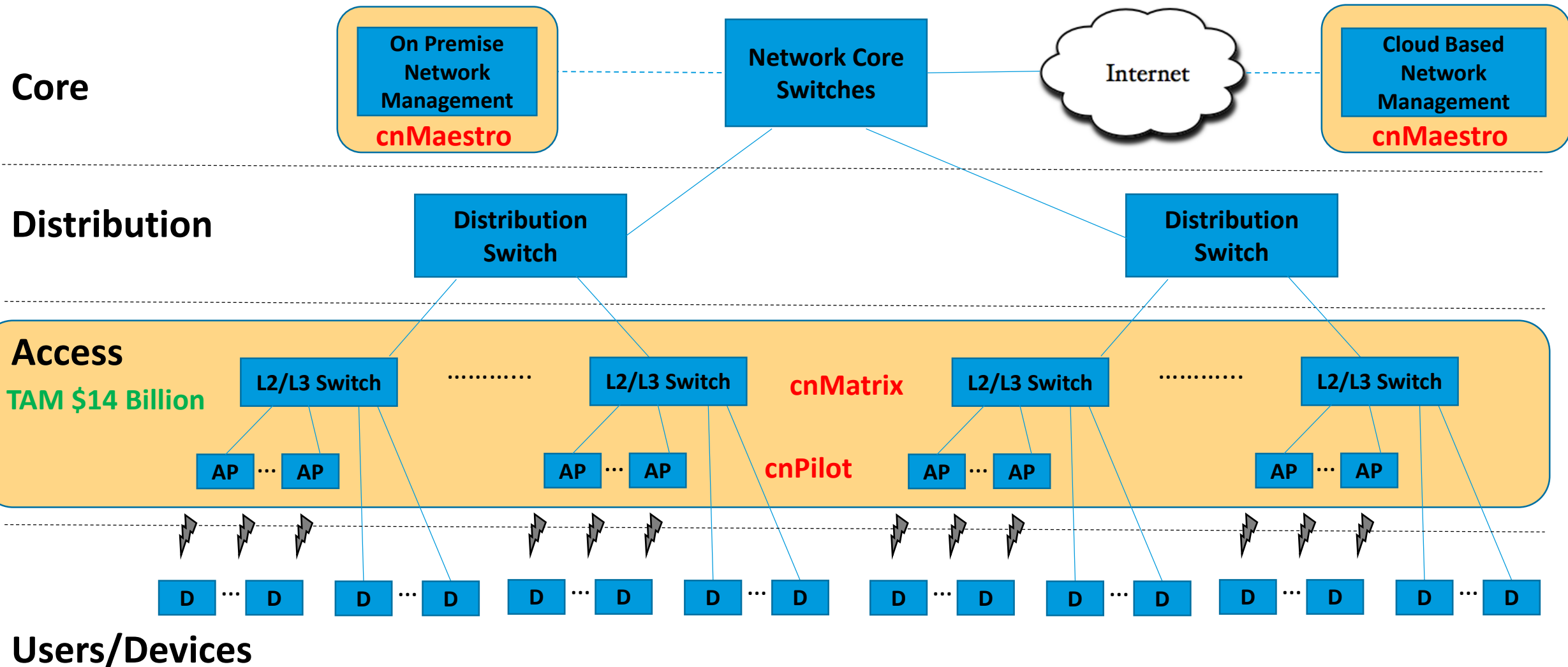
Get all for a low all-inclusive price!

Market Positioning



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cnMatrix EX 2K - Enterprise Campus – 3 Tier Network Architecture



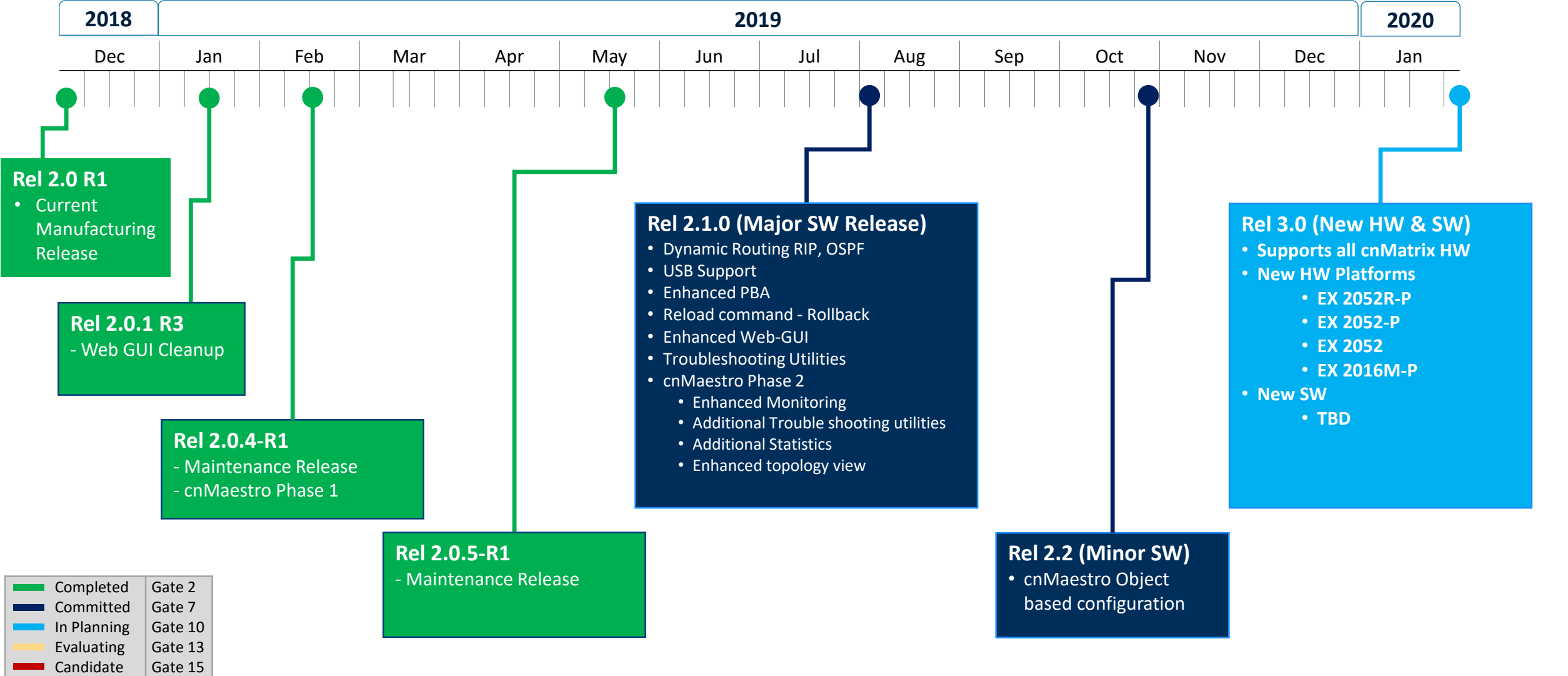
Roadmap

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

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cnMatrix Roadmap

PLAN OF INTENT
SUBJECT TO CHANGE
July 11,, 2019

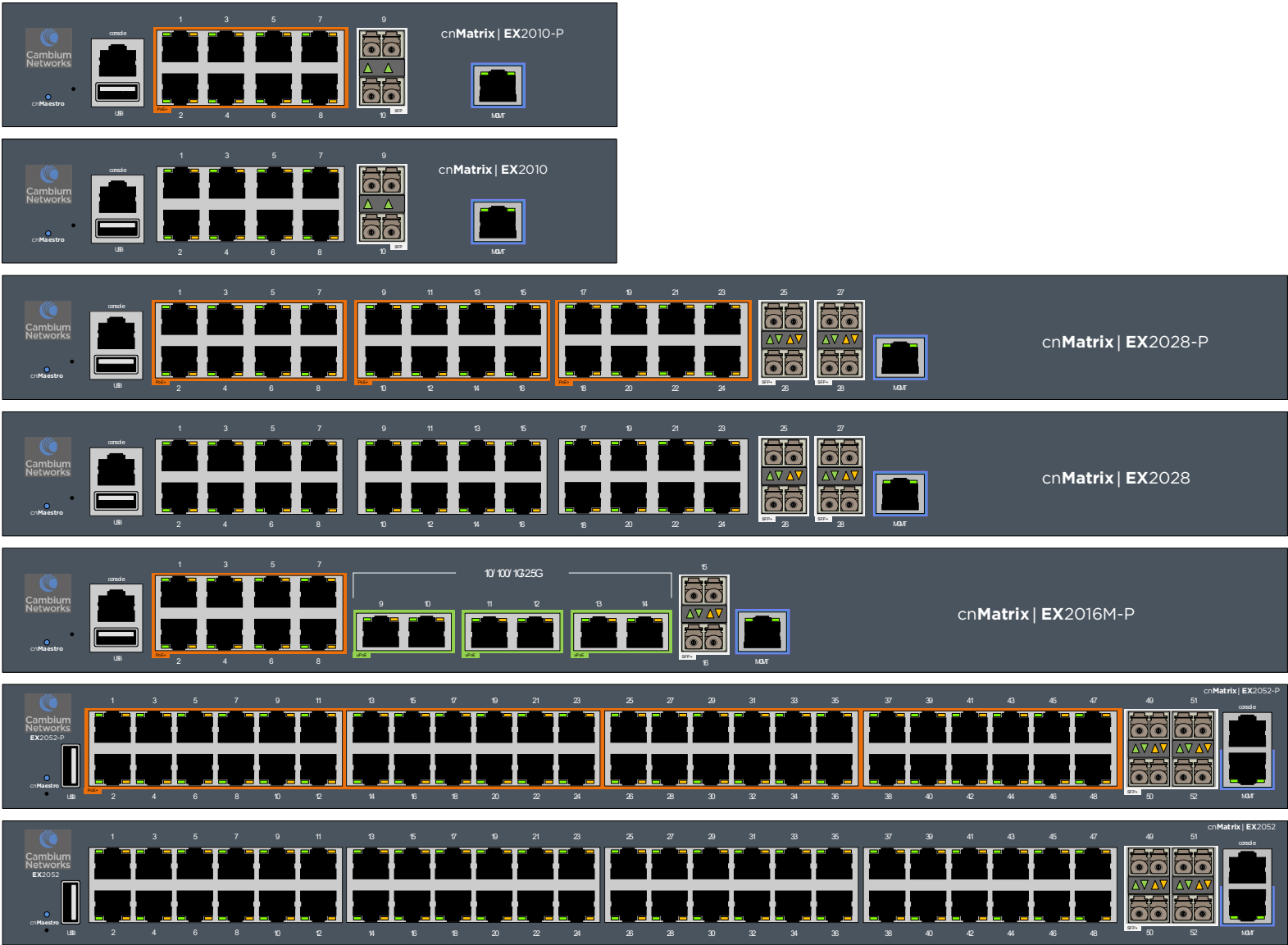


New Enterprise SKUs



cnMatrix

Enterprise Switching Portfolio – cnMatrix EX 2k





Policy Based Automation

A True Zero Touch Experience

A background image on the right side of the slide showing a dense, glowing blue network of interconnected nodes and lines, creating a sense of depth and complexity.

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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:
cnMatrix**

**Configuration
required for
ongoing
Network
changes**

**Solution:
Policy Based
Automation**

Examples

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

cnMatrix – Policy Based Automation (PBA)

- User created Policies that will automate switch and port configuration
- Policies can be created via any Management interface
 - cnMaestro configures all switches simultaneously
- Policies have 2 components
 1. Match Criteria
 - LLDP information
 - MAC information
 2. Actions
 - VLANs, QoS, ACLs, Security, PoE Priority, Port Labeling
- Configuration as a result of policies is dynamic – Auto cleaned upon:
 - Link down, Device disconnects
 - Match criteria is no longer valid
 - Policy is disabled

Example: Required Switch Configuration when connecting an AP

Example: Needed Switch Configuration - VLANs, 40, 50, 60: PVID 40: port 5 – Hybrid Mode

```
cnMatrix(config)# interface gigabitethernet 0/5
cnMatrix(config-if)# switchport mode hybrid
cnMatrix(config-if)# switchport acceptable-frame-type all
cnMatrix(config-vlan)# exit
cnMatrix(config)# vlan 50
cnMatrix(config-vlan)# port add gigabitethernet 0/5
cnMatrix(config-vlan)# exit
cnMatrix(config)# auto-attach policy E430 match LLDP-ANY 430 set vlan 40,50,60 pvid 40
cnMatrix(config)# vlan 60
cnMatrix(config-vlan)# port add gigabitethernet 0/5
cnMatrix(config-vlan)# exit
cnMatrix(config)# vlan 40
cnMatrix(config-vlan)# port add gigabitethernet 0/5
cnMatrix(config-vlan)# exit
cnMatrix(config)# interface gigabitethernet 0/5
cnMatrix(config-if)# switchport pvid 40
cnMatrix(config-if)# end
```

cnMatrix – Policy Based Automation – Key Take Aways

- Automates 'Adds', 'Moves', and 'Changes'
- Eliminates error prone manual configuration
 - Simplifies and reduces trouble-shooting
- Every port is treated equally
- Enhances security by auto segmenting devices
- Little or no IT needed for deploying new devices
- Reduce expenses required to deploy and manage





Policy Based Automation On Boarding with cnMaestro

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cnMatrix Live Demo - Zero Touch with cnMaestro and PBA

- Cambium's 'Cloud Managed Access'
 - cnMaestro – cloud based Network Management Solution
 - cnMatrix – Access layer switching (1 EX2010-P)
 - cnPilot – Access layer WiFi (2 E430s)
- A True Zero touch experience
 - Covers Initial Deployment
 - Covers Day to Day operations
- 3 Simple Steps
 1. Create Configuration file (cnMaestro)
 2. Claim Device(s) (cnMaestro)
 3. Connect devices to network
 4. Finished!!

cnMatrix – Demo details

- Step 1 – Create Configuration File/Template
 - Configuration can be as large or as small as you want
 - My example template – ‘cnMatrix – Johns Demo’
 - Create VLAN 10, All ports a member of VLAN 10
 - Create Policy for Cambium WiFi APs
- Step 2 – Claim Devices
 - Open up your cnMaestro account
 - Claim devices of purchased Cambium equipment
 - You do not need to have received the equipment
 - Claim devices by entering serial #s
 - Select configuration template and then approve device
- Step 3 – Connect devices to network
 - When ready – days, weeks, or months after Step 2
 - Power on Switch(es)
 - Connect switch to network – in default state – NO NEED TO PRE-CONFIGURE
 - Connect devices to switch
 - Switch(es) will be auto discovered and auto configured.
 - As devices (that are covered by policies) are added, switch will be auto configured

cnMatrix – cnMaestro Configuration Template

```
### begin script
### Create VLAN 10
### Add all ports as tagged to vlan 10
config terminal
vlan 10
port add gigabitethernet 0/1-8
end
### Now set up a PBA Policy
configure terminal
# set port description
auto-attach update-port-desc lldp-sys-name
# Create Rule
auto-attach rule Pilot430-rule LLDP-ANY Pilot
# Create Action
auto-attach action Pilot430-action vlan 20,30,40 poe-
priority critical uplink Gi0/8
# Create Policy
auto-attach policy Pilot430-policy match rule Pilot430-rule
set action Pilot430-action
end
```

Creates VLAN 10 and makes ports 1-8 a member of VLAN 10

Auto labels port with LLDP sys name

Creates a rule that uses LLDP to detect Cambium cnPilot APs

Creates an action that:

- 1) Makes port a member of VLANs 20,30,40
- 2) Sets the PoE priority of port to 'Critical'
- 3) Sets uplink port to port 8

Creates policy using Action and Rule

cnMatrix – Go To Demo

cnMatrix – Policy Based Automation – Key Take Aways

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cnMatrix – Summary

- **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**



Cambium Networks

cnMaestro + cnPilot + cnMatrix





Cambium NetworksTM