Cambium Networks™

Expanded Portfolio of Multi-Gig Enterprise Network Solutions

June 2020

Agenda

Cambium Networks™

What We Are Announcing

How This Announcement Benefits You

New Wi-Fi 6 Solutions

New Switch Solutions

New Software Tools

Wrap Up / Q&A

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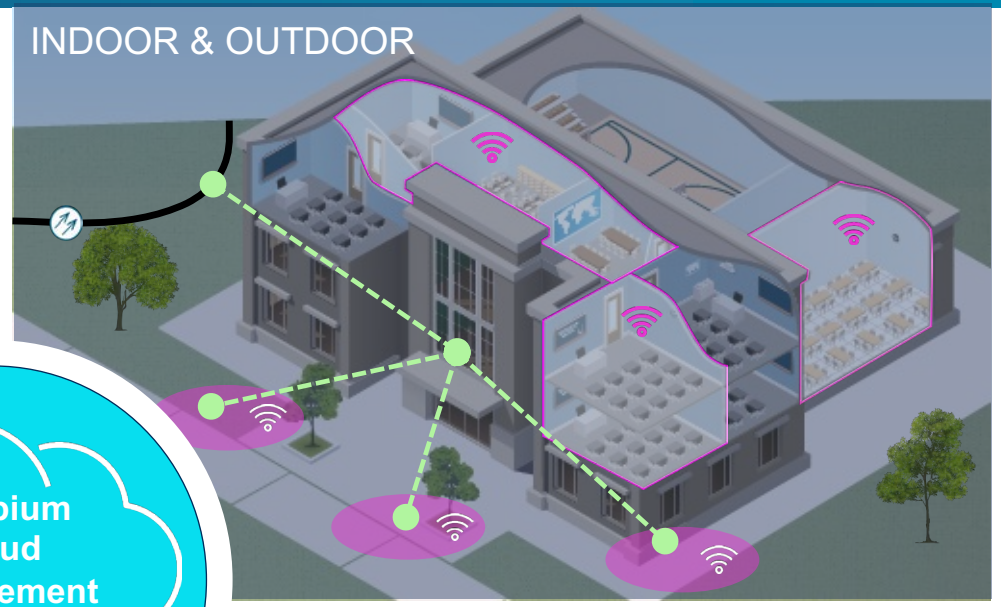
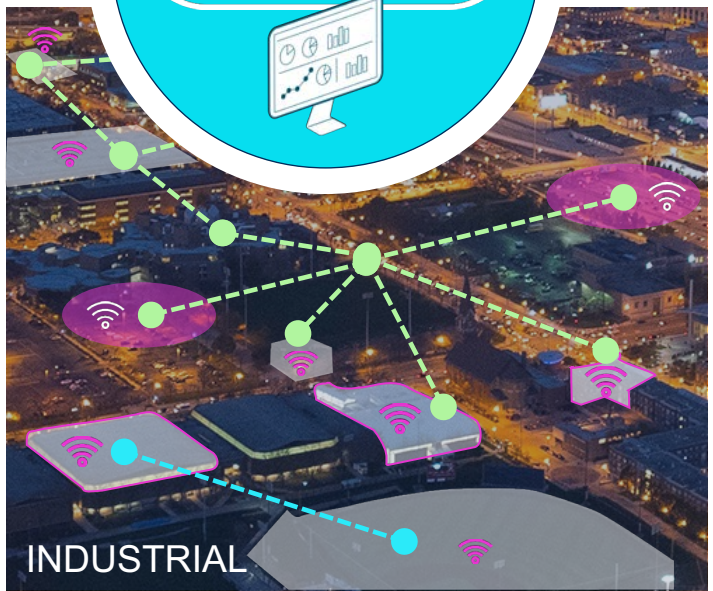
Cambium Networks Multi-Gigabit Wireless Fabric



Cambium Cloud Management



- Multi-Gig Wireless from Broadband to the Edge
- Proven Lowest Cost per Mbps
- One Dashboard for Wi-Fi, Switching and Broadband

- Fixed Wireless 60 GHz Distribution
- Fixed Wireless 60 GHz PTP
- Wi-Fi
- Fiber Ring

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Networks Are Being Asked to Do More Than Ever

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Video Conferencing

AR/VR

Cloud Everything

Location Tracking

Internet of Things

4K/8K Video

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IT Technology Transitions Are Challenging to Manage

Networks are being asked to **do more** than ever

1

Limited IT resources means **minimizing complexity**

2

Tight budgets means doing more with less

3

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How This Announcement Simplifies Tech Transitions

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Improve Your Wireless
Performance Now

1

Limited IT resources means
minimizing complexity

Tight budgets means
doing more with less

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Deliver Performance & Quality with Real-world Testing

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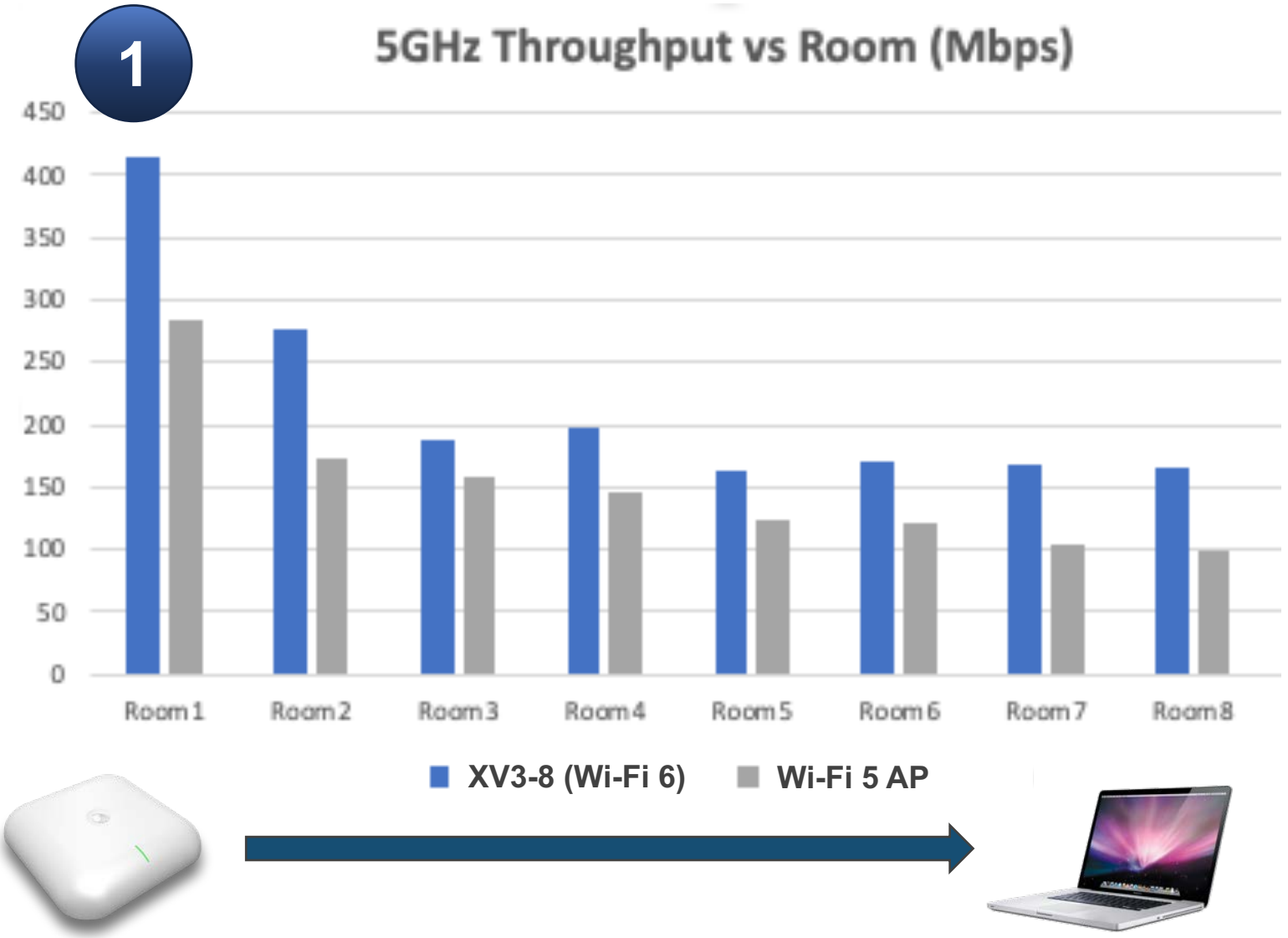
Fully Automated Testing Facility in Thousand Oaks, CA

Wi-Fi 6 Improves Wireless Performance



Wi-Fi 6 Advantage:
Up to **40%** Higher Performance vs. Wi-Fi 5

What is happening?

- 8x8 antennas provide better receive sensitivity and signal integrity
- Improved radio driver and offload
- 1024QAM is 25% more bits/Hz

Test Details
AP located outside of Room 1
Increasing distance from AP to Rooms on the right of graph
Throughput measured to single Macbook 3x3 11ac client

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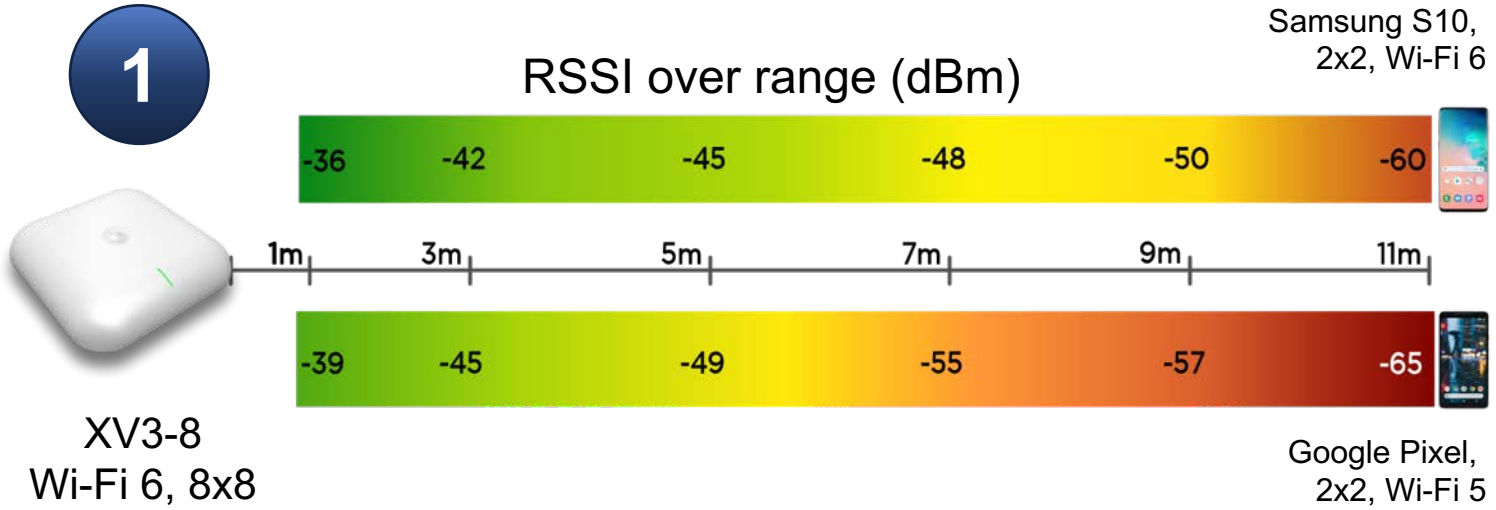
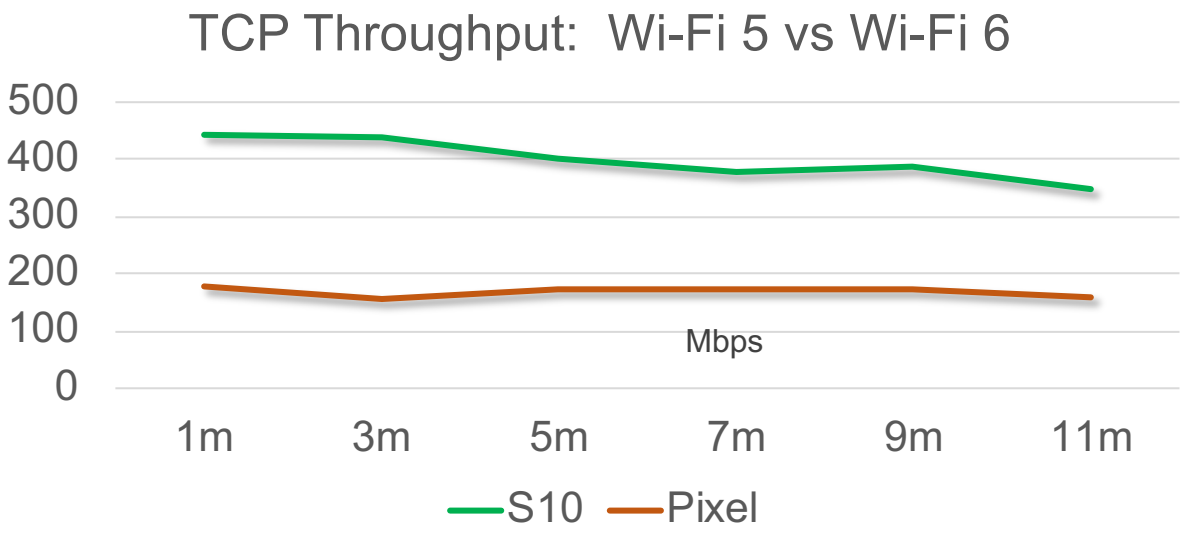
Wi-Fi 6 Improves Wireless Performance





Wi-Fi 6 Advantage:
Average **135%**
Improvement vs. Wi-Fi 5

What is happening?

- 1024QAM is 25% more bits/Hz
- More efficient signaling protocols
- Client-side CPU speed increase

Test Details
iPerf3 client on Windows 10 PC
iPerf3 server on smart phone
iperf3 –c <ip> -i 10 –t 10 –P 6
40Mhz channel, 44/48, short guard

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How This Announcement Simplifies Tech Transitions

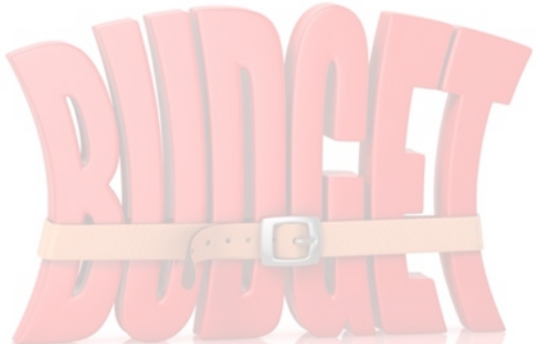
Cambium Networks™

Improve Your Wireless
Performance Now

1

Sophisticated Cloud Management
Simplifies Operations

2



Tight budgets means being
able to do more with less

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Sophisticated Cloud Management Simplifies Operations

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Zero-touch Provisioning ★ MSP Ready ★ Advanced Analytics ★ On-premises & Cloud

2

XMS

cnMaestro

Key Capabilities	Customer Profile
Advanced Services for Wi-Fi • **EasyPass** for BYOD & Guest Onboarding • Integrated **Microsoft, Google** authentication • **App Control** Profile 2000+ Apps, policy control • Built in Location Engine for location based services	• **Enterprise** customers with a BYOD policy for employee devices • **Education** customers looking easy onboarding of student devices • **Large public venues** looking to deliver a consistent user experience
Single Pane of Glass for Wi-Fi, Switching & FWB • **Simplified** experience for onboarding, visibility, monitoring & troubleshooting • Integrated flexible **guest portal** • **License Free** Option	• **SMB** networks deploying enterprise grade networks and wanting cost effective cloud • **Hospitality** and public Wi-Fi networks leveraging today's cnPilot solutions • **Service Providers** using Fixed Wireless, Wi-Fi, Switching solutions from Cambium

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How This Announcement Simplifies Tech Transitions

Cambium Networks™

Improve Your Wireless **Performance** Now

1

Sophisticated Cloud Management **Simplifies** Operations

2

Deliver Wi-Fi 6 Performance without Premium **Cost**

3

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Wi-Fi 6 TCO and Performance Competitive Comparison

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3

Cambium Advantage:

32% Lower 5 Year TCO
32% Lower Cost/Mbps

100% More
5GHz Radios

Comparison of:
100 Cambium XV3-8's + Cloud
100 Meraki MR55's + Cloud

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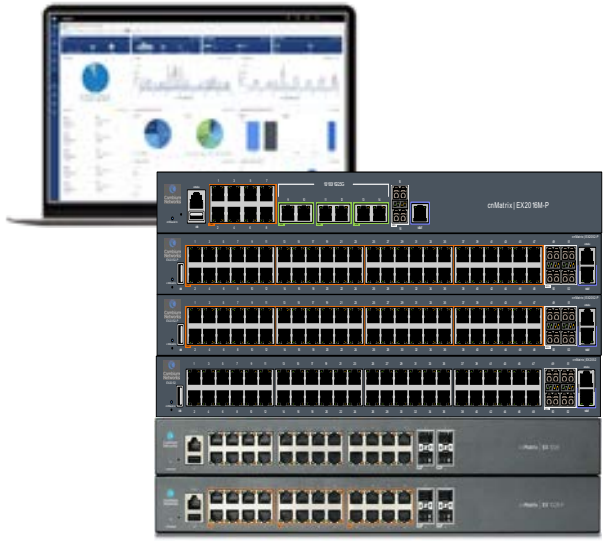
What Are We Announcing?

2 New Wi-Fi 6 APs with Software-Defined Wi-Fi

6 New Wireless Optimized Multi-Gig Switches



Wi-Fi Designer and TCO Profiler

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What Customers and Partners Are Saying

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"There is no other vendor that can offer this feature set at this **price point** and deliver Wi-Fi 6."

Chaz Hager, North River IT

3

"Wow, connecting through this more than **doubled my speed**. I went from an average throughput of 158 MB to a screaming 365 MB on my new IPhone 11 Pro. Utilizing our system as we do for monitoring others networks puts a very high demand on our internal network. Adding this device with the 802.11ax technology has provided considerable headroom allowing our services to be quicker and of higher quality."

Bruce A. Weintraub, CEO HealthSignals®, LLC

1

"We have seen **impressive performance** from the Cambium Wi-Fi 6 solutions. The **software-defined** capabilities of the Wi-Fi 6 and Xirrus solutions are key to us – it allows us to adapt the 5GHz radio count to the number of Wi-Fi devices that support 5GHz. With a compelling price point, it makes moving to Wi-Fi 6 a seamless proposition and an easy decision."

Tim Carlyle, Manager Infrastructure Services, Northwest Missouri State University

3

"**Exceptional performance** by cnMatrix. The product is easy to deploy and manage. The performance is exceptional compared to other brands which we used. Our **user productivity** has increased by 10% after deploying cnMatrix and cnPilot."

Healthcare, CIO on Gartner Peer Insights

1

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International School of Luxembourg

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Pre-K to 12th grade school with an emphasis on global consciousness

Requirements

- Upgrade from aging 11n/11ac network that was showing signs of capacity issues
- Improve security moving from PSK guest network to captive portal
- Wi-Fi performance future proofed to handle transition to 1:1 student to device ratio and beyond

Solution

- Deployed 215 high density Cambium Wi-Fi 6 APs across campus supporting 3000 devices and 1700 students/staff
- XMS-Cloud management with EasyPass access

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Delivering Business Outcomes with Ecosystem Partners

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Community | Blog | Partners | cnMaestro Login

GET QUOTE/DEMO

Products Solutions Technology About Cambium Resources Support Buy

Application partners for Cambium/Xirrus Enterprise Wi-Fi

Digitize public spaces, simplify edge applications, get insights from location analytics, deliver guest experiences & more...

Digitizing physical spaces
Delivering customer engagements

Simplifying edge applications
Wi-Fi Access Gateway

Guest, customer, student Wi-Fi & engagement
Secure guest access on your branded landing page

Location Analytics
Insights into customer behavior in a public venue

MSP
Manage & operate public and enterprise WiFi networks

Wi-Fi Network Design
Tools for designing & troubleshooting WiFi networks

Security & Identity Services
End user device & application monitoring & management

kloudspot

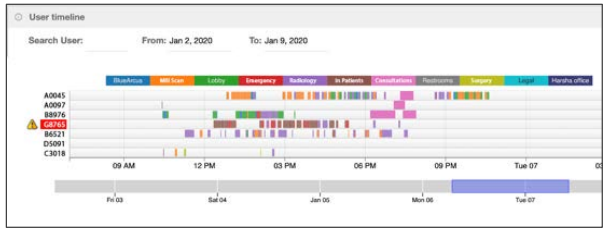
An intelligence and engagement platform created over cloud-managed wireless and sensor networks, enabling data-driven strategic decision making, improving operational efficiency, and providing business insights

KloudSpot: Historical Movement for Audit & Safety

Contact Tracing of COVID-19 cases as organizations re-open after shelter at home phase

Contact tracing of infected people

Proximity, movement tracking and analysis



Contact tracking of infected person with other people

Use Case:
If a person in the premises has been identified as infected with a communicable disease, the system can provide historical data on their movement and interactions with other staff members and guests to identify other potential infected persons and prevent the spread of the disease.

https://www.cambiumnetworks.com/wifi/

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Delivering Business Outcomes with Ecosystem Partners

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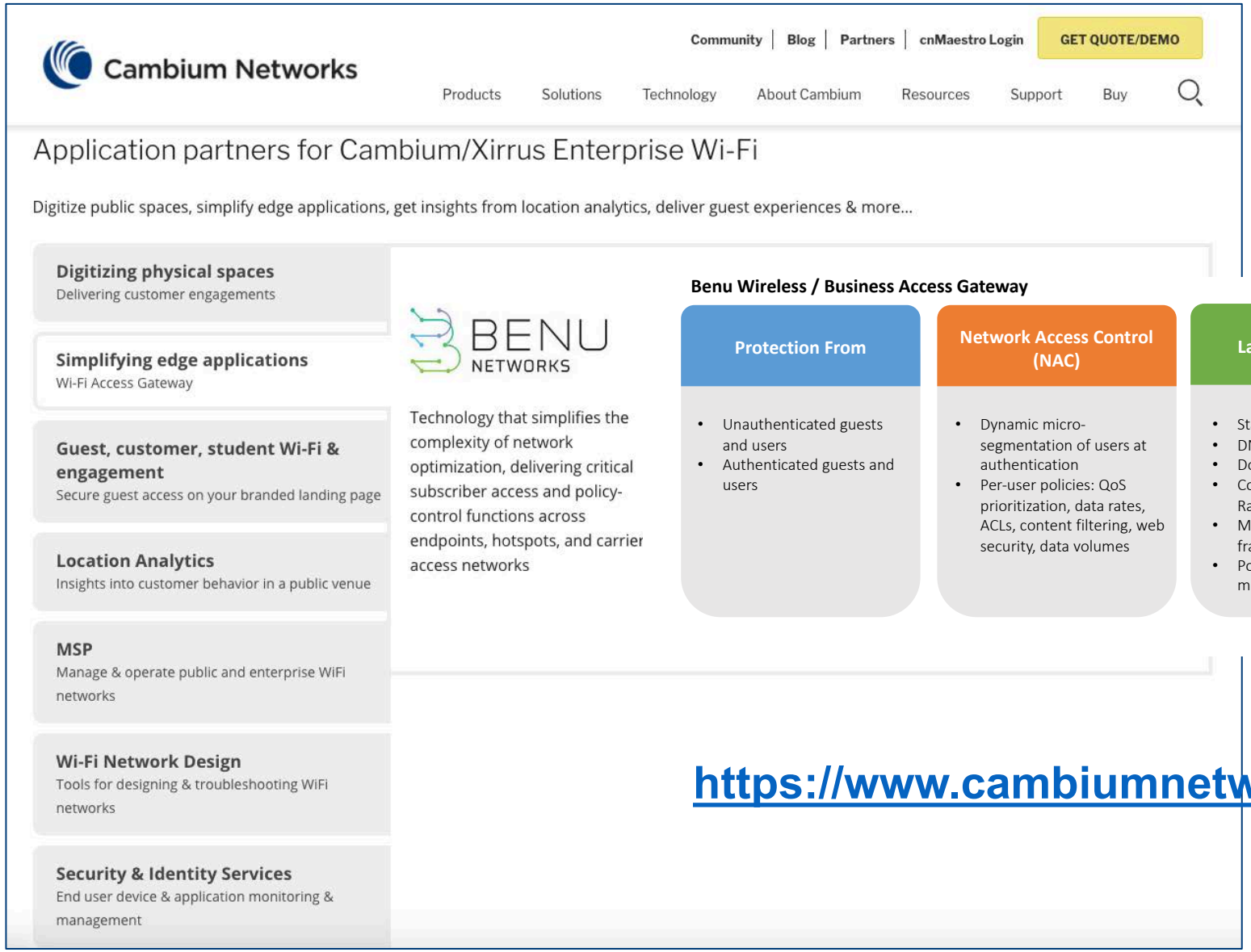

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New Wi-Fi 6 Solutions

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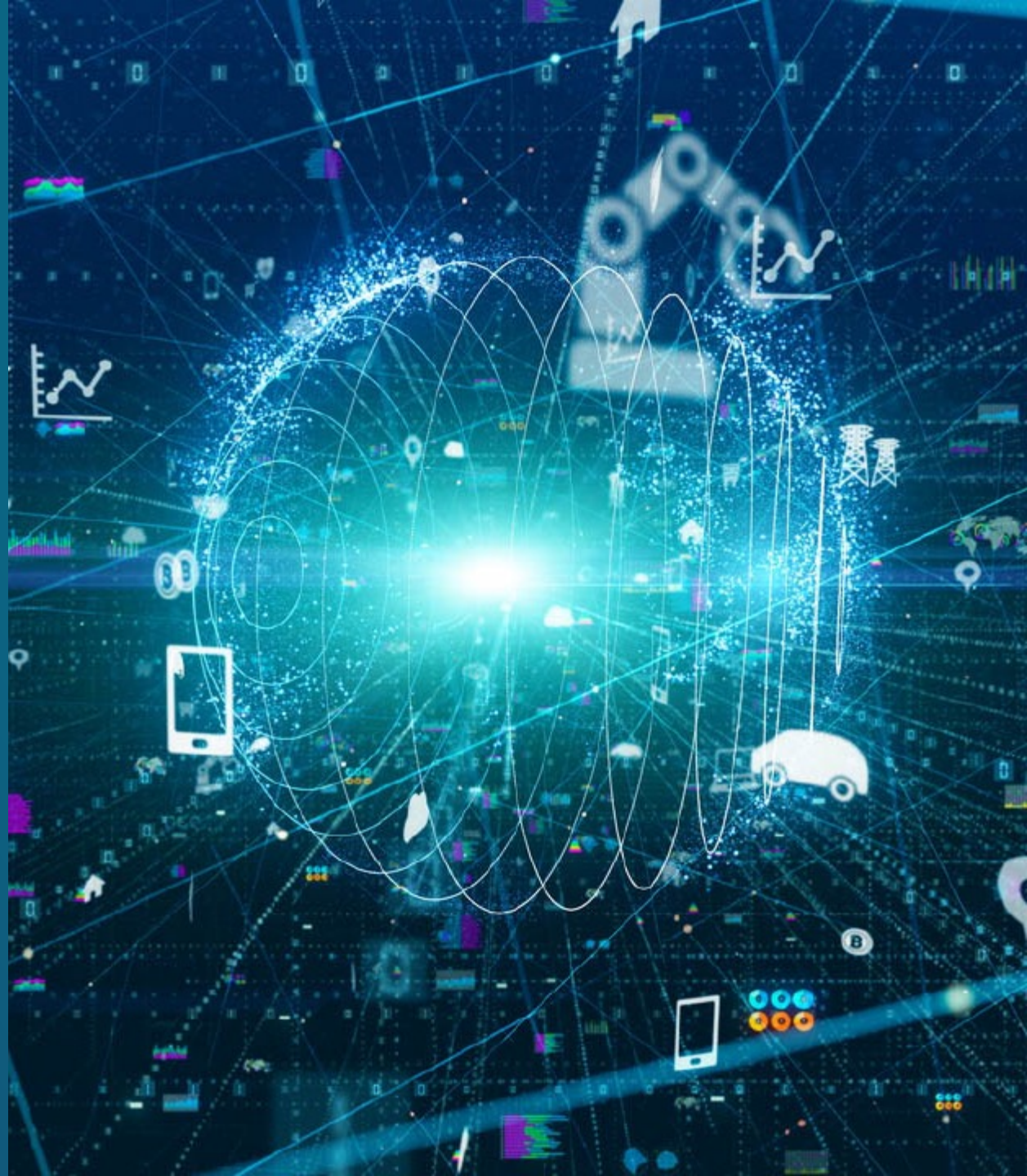

Wi-Fi 6 Real-World Performance

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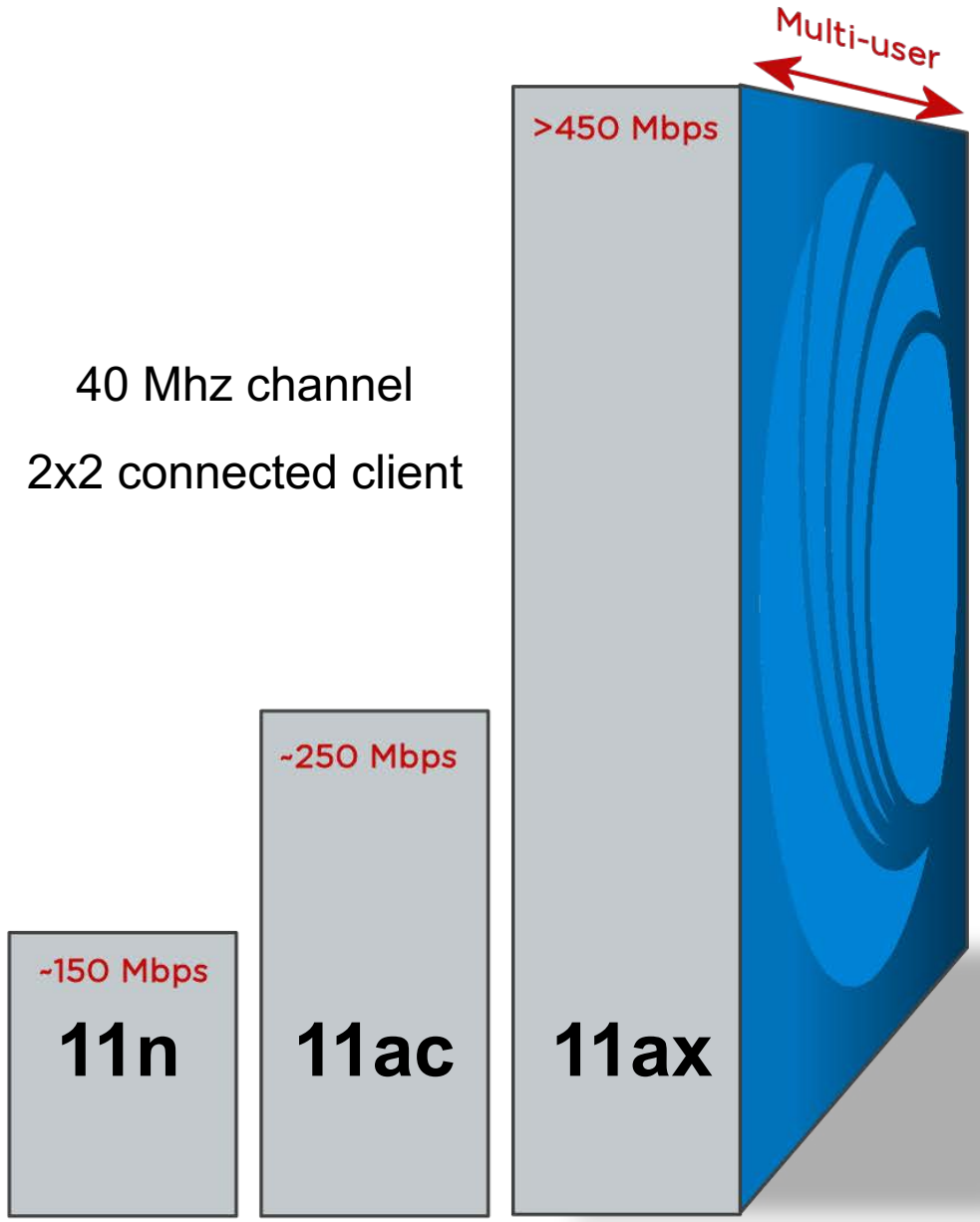

Faster & Higher Capacity

MU-OFDMA	Up to 37 concurrent clients
MU-MIMO	Up to 4 clients, 2x2 each
Bi-Directional	Downlink & Uplink

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Enterprise Wi-Fi from SMBs to Large Businesses

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Single Cloud Dashboard
for Broadband/Eth/Wi-Fi

XMS

Simple Management
App Control, Security

- **EasyPass™** Access Control
- **CommandCenter™** Multi-tenant Control
- **Zero-touch** Provisioning
- **Policy Enforcement** L1-L7 Control
- **XPS Location** Integrated Service
- **Analytics** Who, What, Where

Broad Range of Dual Radio, Software-Defined, and High-Density APs

Small Form Factor to High Density Wi-Fi Solutions from Wi-Fi 5 (11ac) and Wi-Fi 6 (11ax)
Segmented IOT, BYOD, WIFI, App Ctrl, Security services

Intelligent PoE Switches

Hotels/Dorms | Small Offices | Offices | Classrooms | Auditoriums | Stadiums/Conventions

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Introducing Two New Wi-Fi 6 Access Points

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Cloud / On-Prem Management ★ Wi-Fi 6 ★ 802.3bz Multi-gig Uplink ★ Application Control

XV3-8

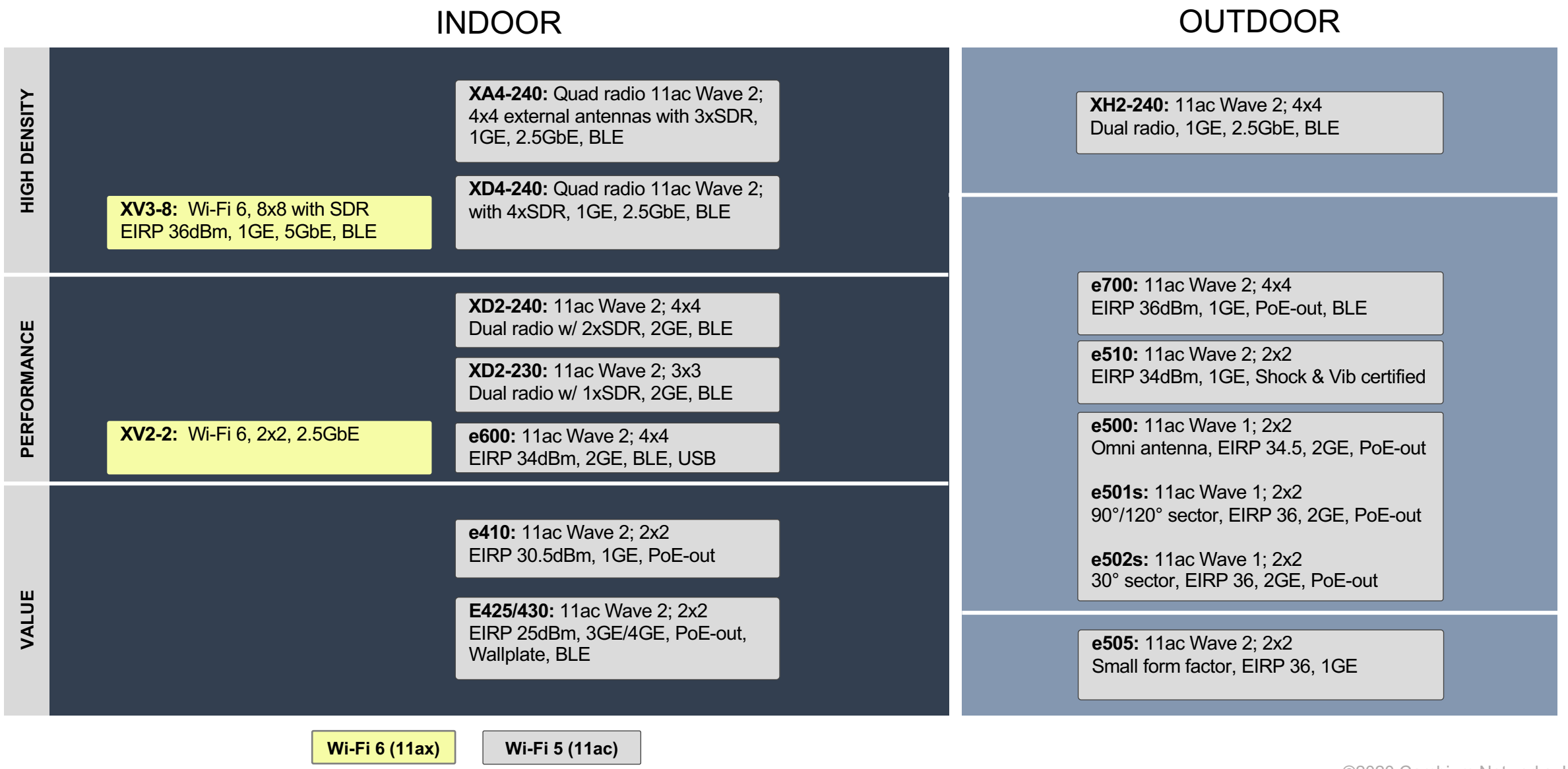
Optimized for High Density

	XV3-8	XV2-2
Unique Value	Tri-Radio 11ax with **Software Defined Radios** and Dedicated Sensor	High performance 2x2, cost effective 11ax, standards-compliant
802.11 Radios	2 or 3 (Software Defined Radio)	2
Streams	4x4 in 2.4G; 8x8 in 5GHz; or dual 4x4 5GHz	2x2 in 2.4G; 2x2 in 5GHz
Antennas	Internal	Internal
Bluetooth	Yes, BLE 4.0	No
Sensor	Dedicated dual-band sensor radio. 2x2:2 for WIPs / Location services / RF scan / Network scan	Shared sensor with data radios. WIPs / Location services / RF scan / Network scan
Security	WPA3	WPA3
Wired	1 x GigE + 1 x 5GigE	1 x 2.5GigE
Power	802.3at	802.3at
Management	XMS-Cloud or cnMaestro	XMS-Cloud or cnMaestro
Use Cases	Education, Public Venues, Enterprise	SME, Education, Hospitality, Retail

XV2-2

Cost-effective performance for a broad set of use cases

Portfolio Fit



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XV3-8 Competitive Comparison

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High Density

Software Defined

Compelling Value

Functionality	Cambium XV3-8	Aruba AP-555	Cisco 9130AX	Meraki MR55	Ruckus R850
User Radios	3	3	3	2	2
SW Defined Radios	Yes	Yes	Yes	No	No
Uplinks	1-5GigE 1-1GigE	2-5GigE	1-5GigE	1-5GigE	1-5GigE 1-1GigE
Sensor Radio	Yes	No	Yes	Yes	No
L7 DPI in AP	Yes	Yes	No	No	No
List Price AP	$1095	$1895	$2095	$1849	$1695
List Price Cloud (1 Year)	$90 or $0	$100	Not Available	$150	$95

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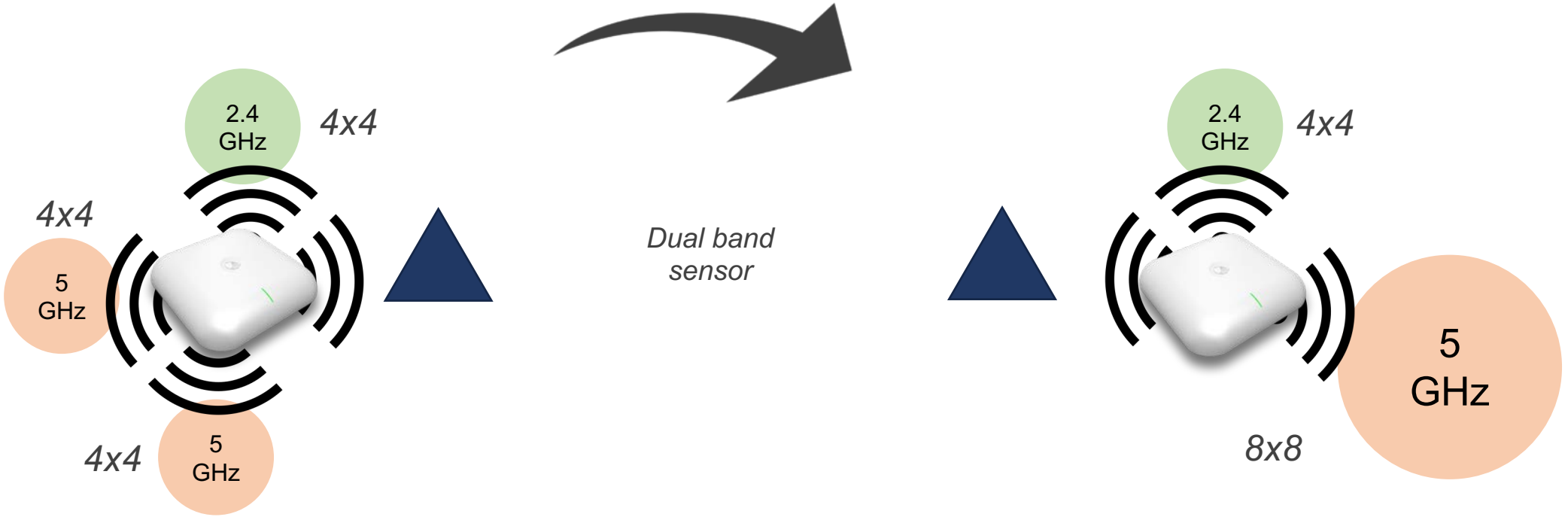
XV3 Software-Defined Radios



Legacy Networks: Double 5GHz capacity for Education, Hospitality, Enterprise

Ideal for 11n, 11ac mixed with new 11ax devices

802.11ax: Migrate to 8x8 for full MU-OFDMA, MU-MIMO, IOT ready

Ideal for 11ac, mostly 11ax, IOT mixed networks

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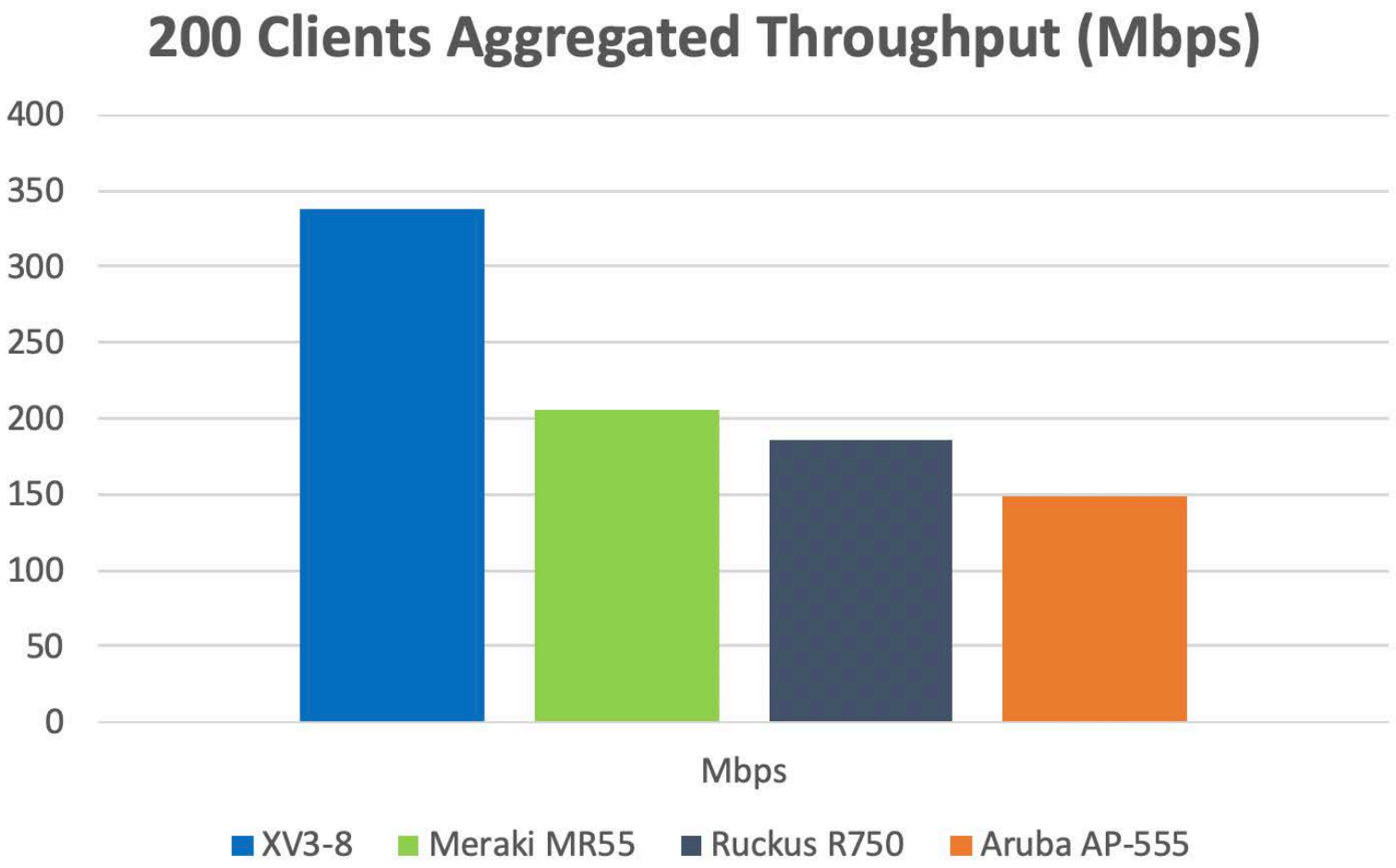
XV3-8 High Density Performance vs. Competitors



Cambium Advantage:
Average **91%** Higher Performance vs. 3 Competitive 8x8 APs

What is happening?

- High density tri-radio spreads load
- Software-defined radios optimize for 5GHz performance

Test Details
Mix of laptops, tablets, phones
Mix of FTP, HTTP, Fast Ping traffic
Ruckus R750 could not associate >103 clients

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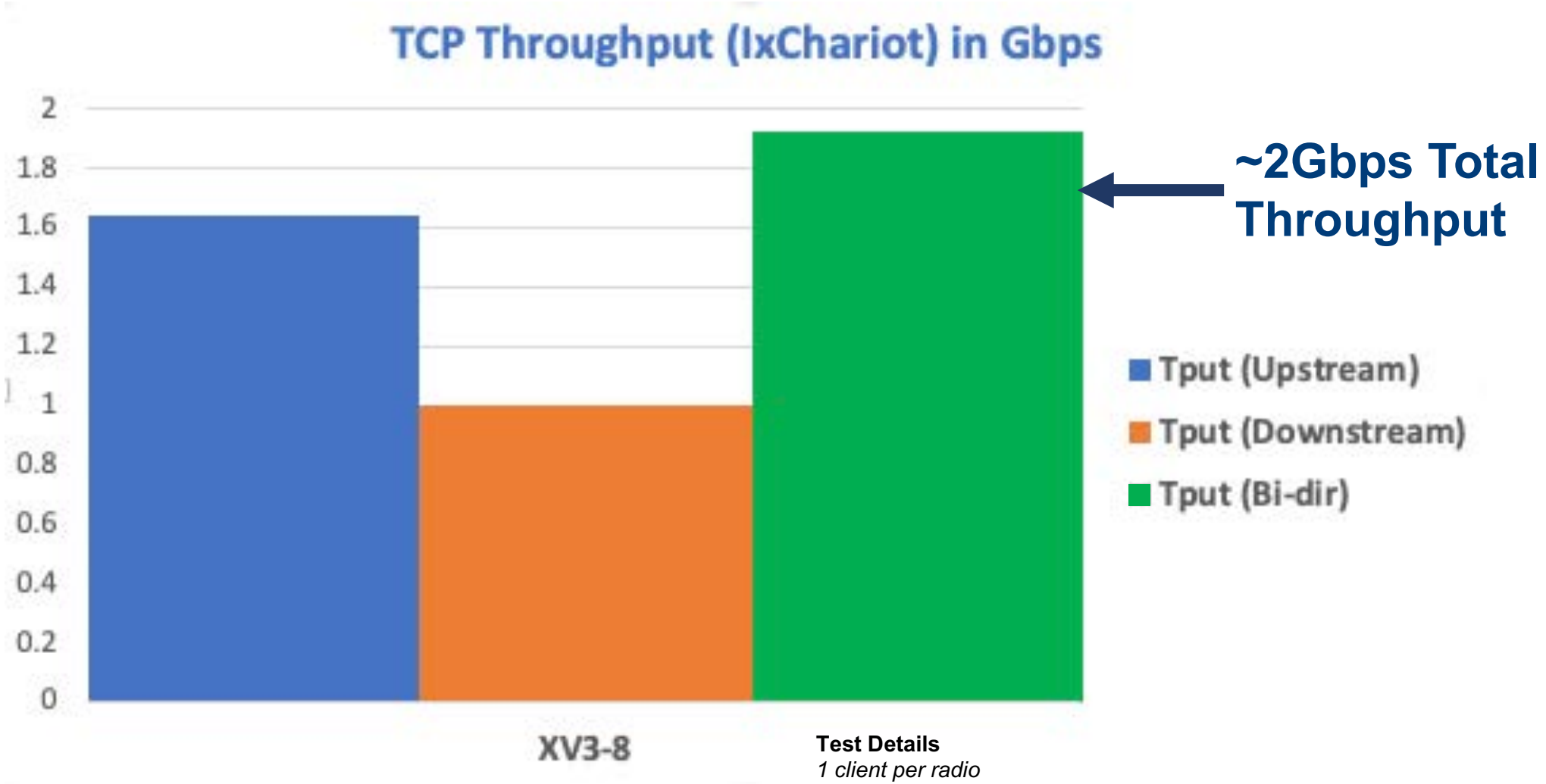
XV3 Delivers Multi-Gig Performance



Test Details
1 client per radio
Macbook Pro 3x3 clients

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XV2-2 Competitive Comparison

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High Performance

Flexible Management

Disruptive TCO

Functionality	Cambium XV2-2	Aruba AP-505	Extreme AP305C	Meraki MR36	Ruckus R550	Ubiquiti
User Radios	2	2	2	2	2	NA
Uplinks	1-2.5GigE	1-1GigE	1-1GigE	1-1GigE	2-1GigE	NA
Sensor Radio	No	No	No	Yes	No	NA
L7 DPI in AP	Yes	Yes	No	No	No	NA
List Price AP	$395	$730	$555	$849	$895	NA
List Price Cloud (1 Year)	$90 or $0	$100	$150	$150	$95	NA

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New Switch Solutions

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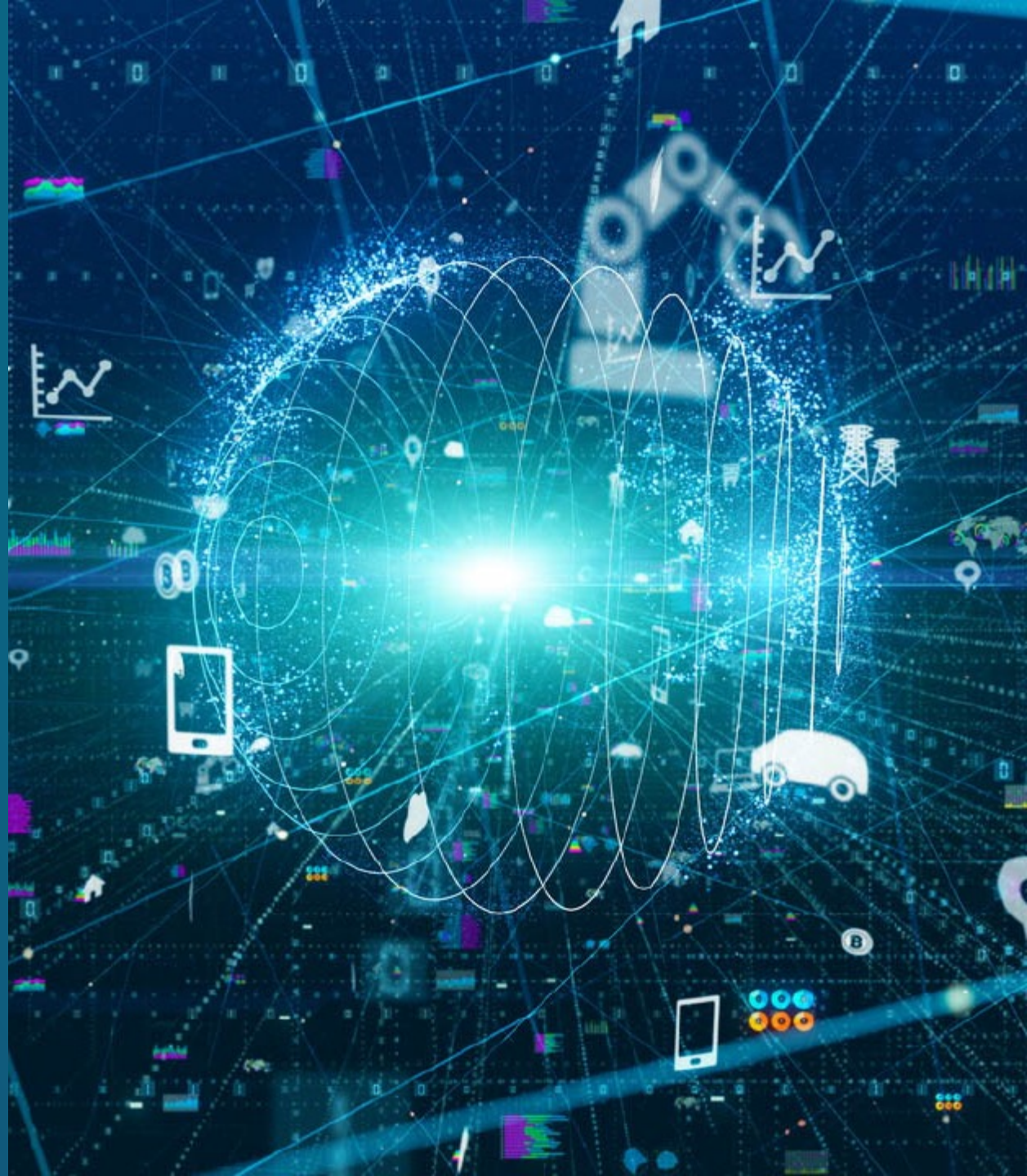
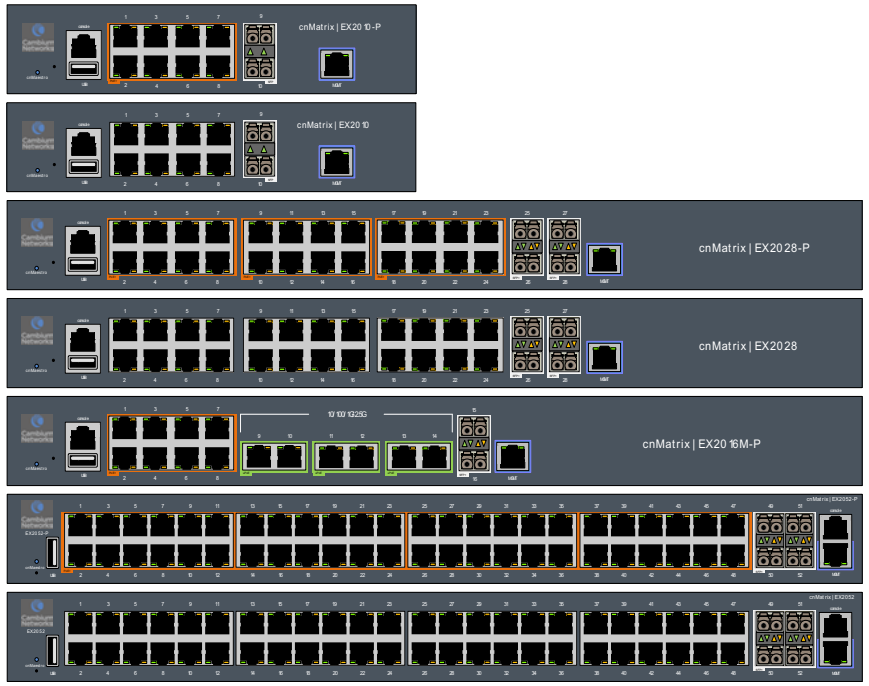


Deploy Resilient Networks with cnMatrix Switching



cnMaestro

XMS

COMING SOON

- Policy Based Automation
- Cloud/On-Prem Management
- Enterprise-grade L2-L3 Capabilities
- Best-in-Class Total Cost of Ownership

Wired-Wireless Deployment Made Simple with cnMatrix

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Policy Based Automation is a key differentiator for cnMatrix Switches

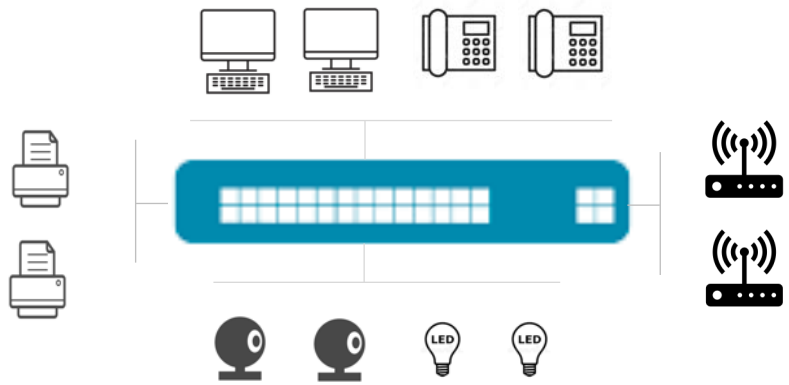
- Simplifies wired-wireless deployments
- Improves security for IoT deployments
- Minimizes Human Errors
- Improves Network Resiliency
- Reduce Cost of operating the network

POLICY BASED AUTOMATION

Zero Touch Provisioning | **Device Profiling** | **Policy Enforcement**

- Automatically Profile Devices
- Automatically Apply Policy Based on Device Type
- Automatically Segment devices and block unauthorized access

Increasing number of user devices and “Things” connect to a converged IP network



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Introducing Six New Gigabit Switches

EX2016M-P

- Optimized for Wi-Fi 6 deployments
- Hybrid solution for low cost and high performance
- 802.3bz support (2.5Gbps)
- PoE 802.3bt – 4PPoE (up to 60W)

EX2052 – 3 48-port Models: Non-PoE, PoE, Flexible PoE

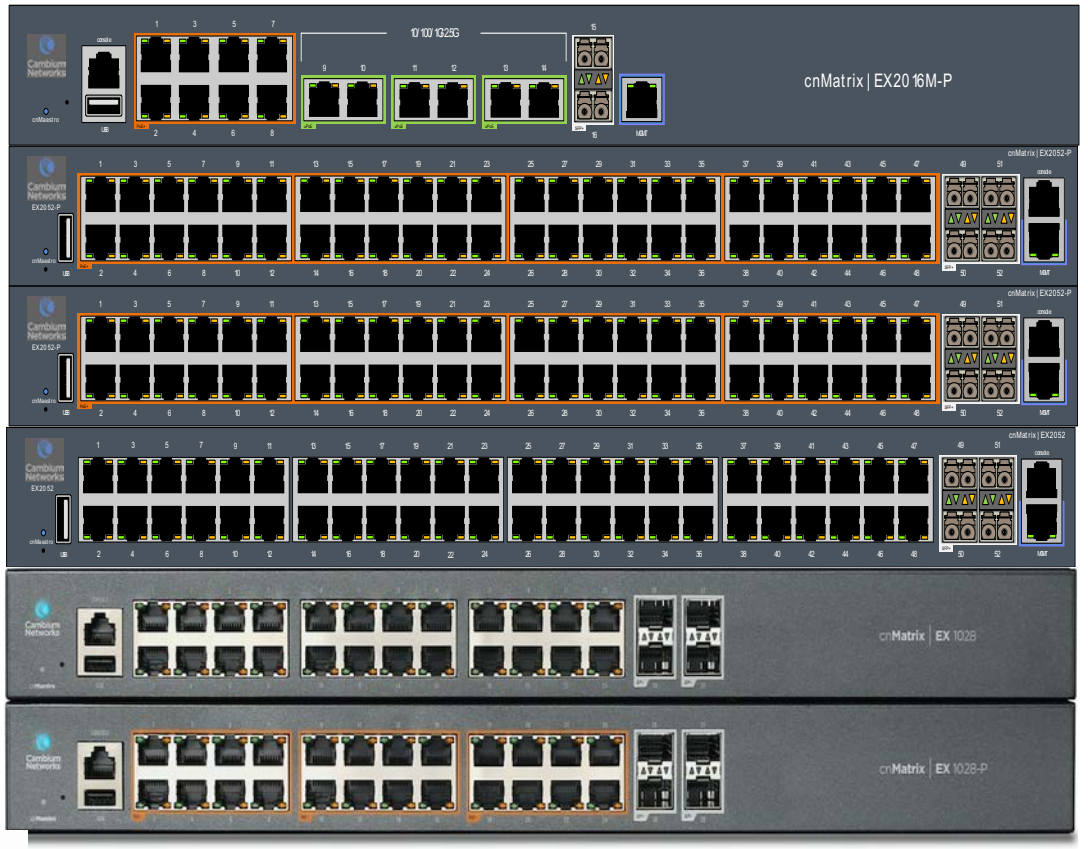
- High Port Density (48 ports, 4 SFP+ 10G fiber uplinks)
- Flexible Power Options: 400W-1000W of PoE
- Supports AC or DC installations

EX1028 – 2 24-port Models: Non-PoE, PoE

- Value line of L2 switches
- 24-ports, 4 SFP 1G uplinks

ACCESSORIES

- Cambium branded transceivers
- CRPS 500w, 800w, 1000w AC & DC power supplies



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Why cnMatrix?

Cambium Networks™

Comprehensive Access Layer Solution: Cloud Management + Wi-Fi + Switching

Simplify Operations with Policy Based Automation & Zero Touch Provisioning

Improve Security with Auto Segmentation, Device Profiling & Policy Enforcement

Improve **network resiliency**, reduce manual configuration errors

Do It All at a low **Total Cost of Ownership**

"Exceptional Performance – cnMatrix is easy to deploy and manage. The performance is exceptional compared to other brands which we used. Our user productivity has increased 10% after deploying cnMatrix and cnPilot"
Healthcare, CIO on Gartner Peer Insights

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Software Tools

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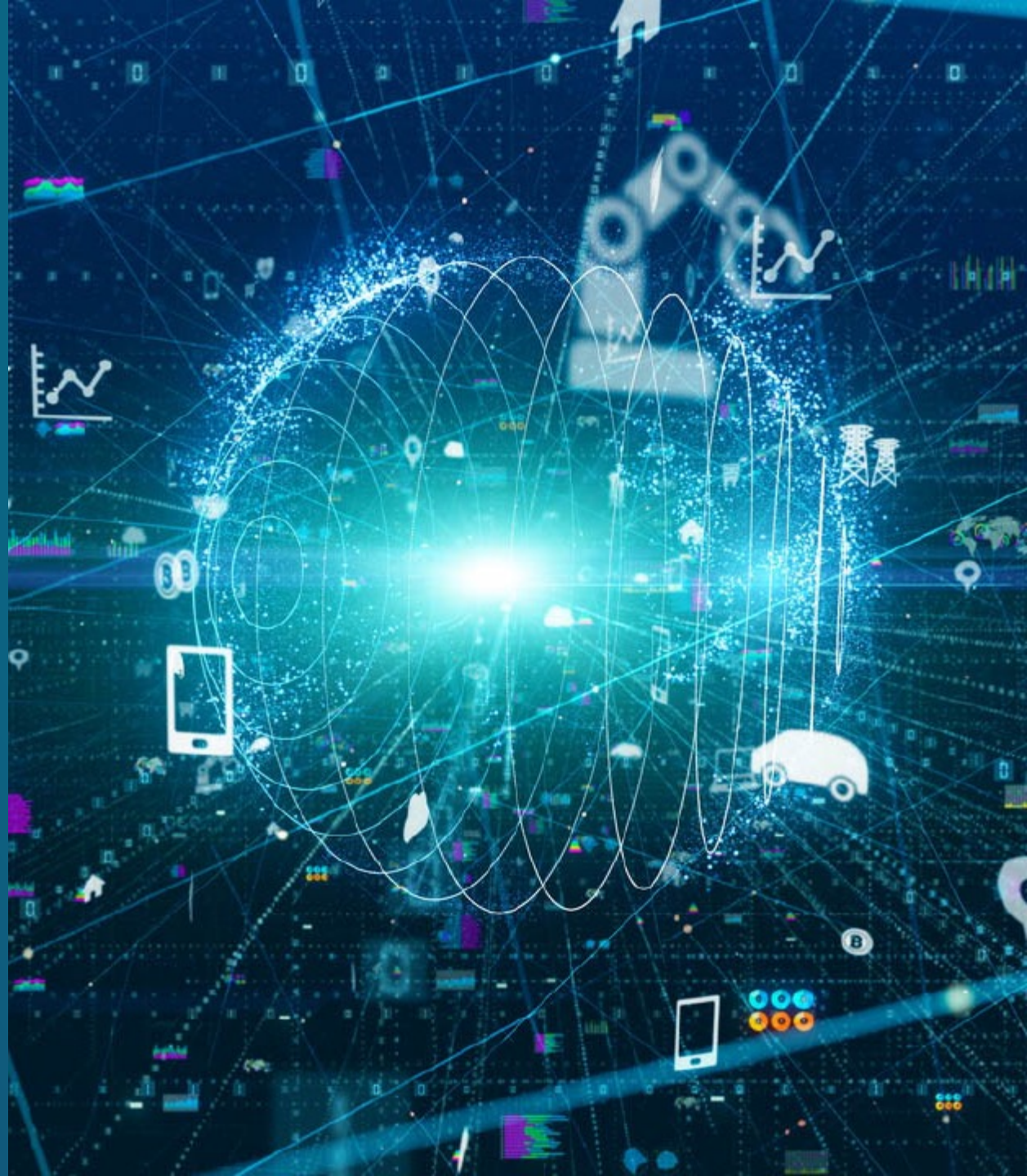

Wi-Fi Designer Overview

- Online Wi-Fi design tool
- Access from the Cambium web site
  - Products -> Software -> Wi-Fi Designer
- Place APs to visualize coverage
- Generate BOM and report
- Supports Wi-Fi 6, Xirrus and cnPilot APs

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Wi-Fi Designer Benefits

- No cost, license free
- Accessible online from anywhere
- Automatically updated
- Fast and easy to use
- Supports unique Cambium/Xirrus APs
  - High density Wi-Fi – multi-radio APs
  - Software-defined Wi-Fi – 5GHz/2.4GHz

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Wi-Fi Designer Demo

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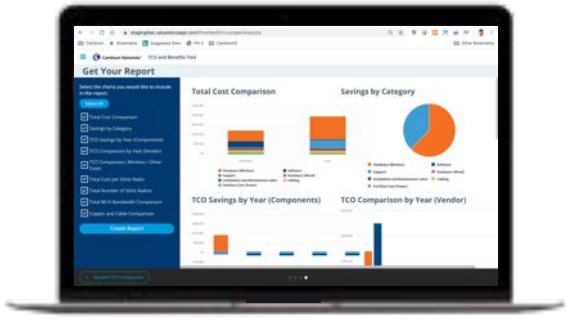
The TCO Profiler

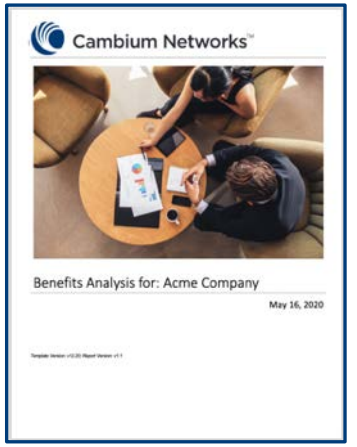
Compare Cambium enterprise Wi-Fi to competitors:

- Key Benefits
- Total Cost of Ownership
- Total Wi-Fi Performance
- Environmental Impact



Supports

- All Cambium Wi-Fi APs
- Cisco, Meraki, Aruba, Ruckus, and Extreme
- Ability to model other competitor products



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TCO Profiler Components

INPUTS
CAPEX
Hardware (APs)
Software (Perpetual)
Switching
Cabling
Installation
OPEX
Subscriptions (Cloud)
Support
Ongoing Maintenance
Power Consumption

OUTPUTS
Key Benefits
Top 4 Benefits to Position vs. Competitor
Total Cost of Ownership
Per Year and Total (up to 5 years)
Performance
Default and Total Wi-Fi Bandwidth
Cost per Mbps of Bandwidth
5GHz Radios and Cost per 5GHz Radio
Environmental Impact
Tons CO2, Copper Usage, Cable PVC

Color Code:
Wi-Fi vendor costs
Additional costs

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XV3 TCO and Performance – Cambium vs. Meraki

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Cambium Advantage:

32% Lower 5 Year TCO
32% Lower Cost/Mbps

100% More
5GHz Radios

Comparison of:
100 Cambium XV3-8's + Cloud
100 Meraki MR55's + Cloud

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XV2 TCO and Performance – Cambium vs Meraki

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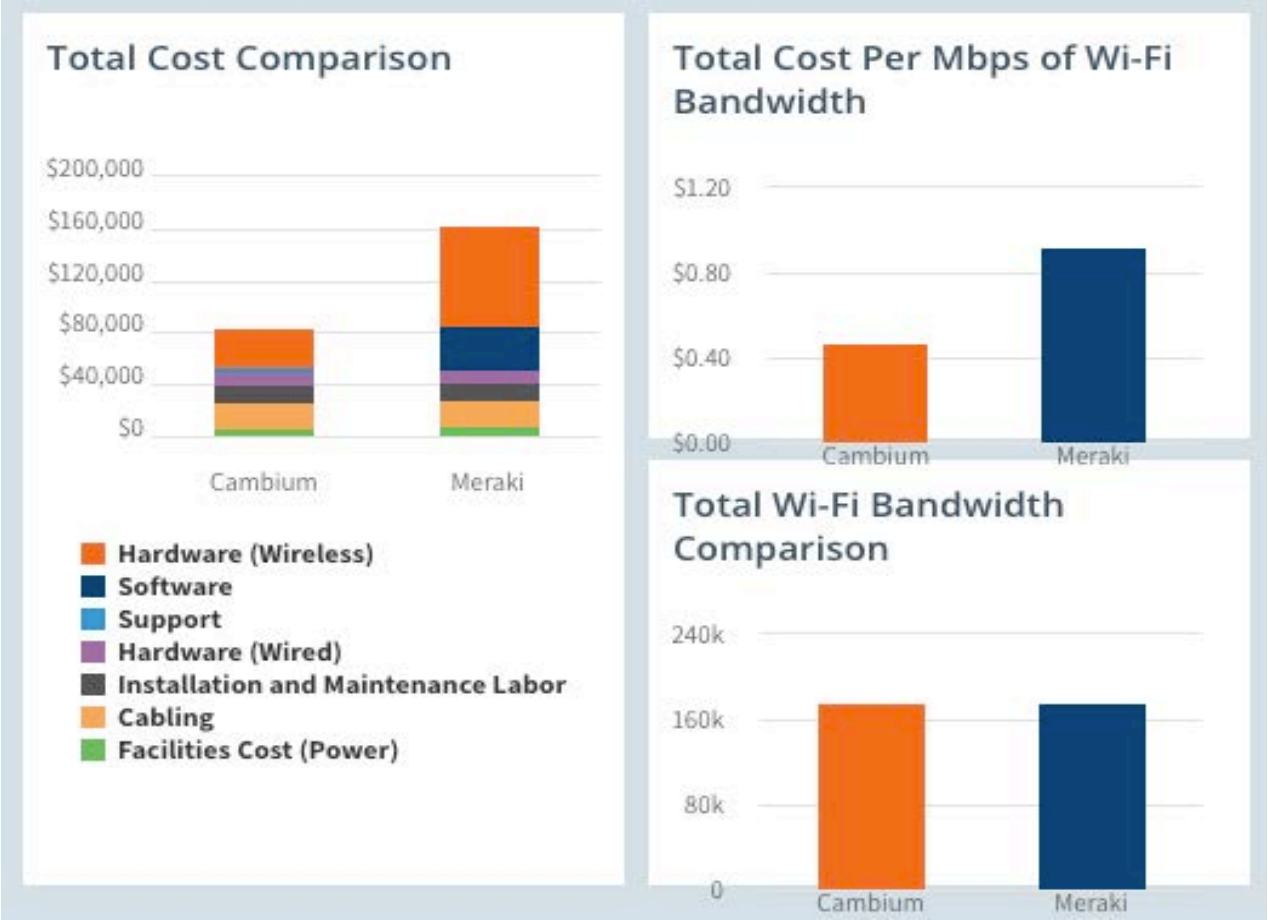
Cambium Advantage:

50% Lower 5 Year TCO
50% Lower Cost/Mbps



Comparison of:
100 Cambium XV2-2's + cnMaestro
100 Meraki MR36's + Cloud

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Wrap Up

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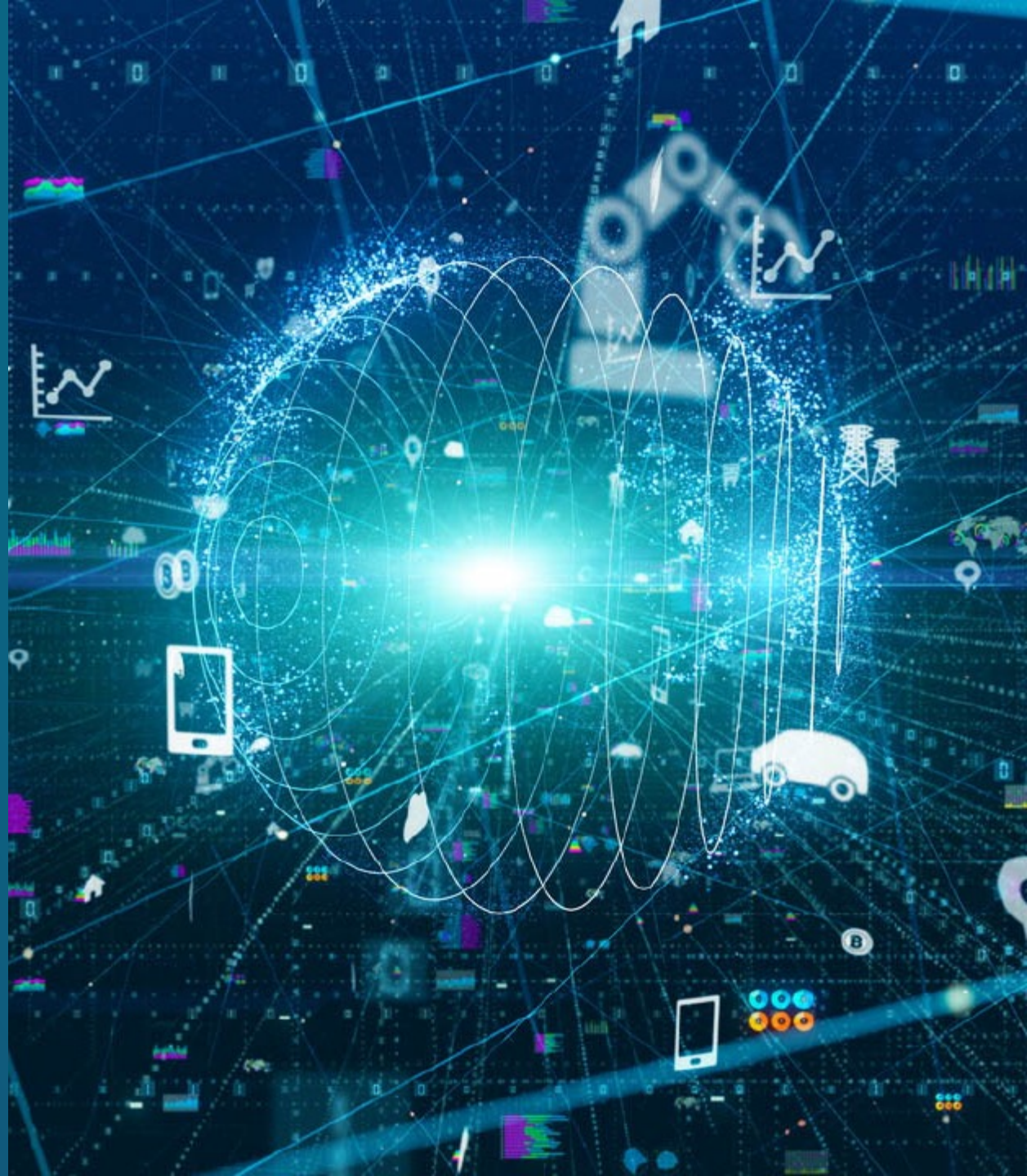

Cambium Networks New Training Certifications

Now Available!

XV3 Technical Training Certification

XMS-Cloud Administration Certification (formerly XCWT)

cnMaestro Administration Certification

cnMatrix Administration Certification

cnVision (7 courses available)

learning.cambiumnetworks.com

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Key Actions

- **The 3 Key Benefits of this Announcement:**
  - Improve Your Wireless **Performance** Now
  - Sophisticated Cloud Management **Simplifies** Operations
  - Deliver Wi-Fi 6 Performance without Premium **Cost**
- **Check out Wi-Fi Designer:**
  - Cambium web site -> Products -> Software
- **Get a TCO Profiler assessment:**
  - Contact your Cambium reseller
- **Join the Cambium Community (33,000 users)**
  - http://community.cambiumnetworks.com
- **Download the Handouts from this webinar**
  - This presentation, Wi-Fi 6 and cnMatrix Switch data sheets

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Questions

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