

# cnPilot 2.0: Frictionless Adaptive Wi-Fi

Rapid Deployment  
Easy Operation  
Affordability with Quality

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Senior Vice President, Products



**Cambium Networks™**



**You are on Top of  
the World, When  
You are on the  
Everest!**

**cnPilot500 is  
Deployed at the  
Everest Base  
Camp!**

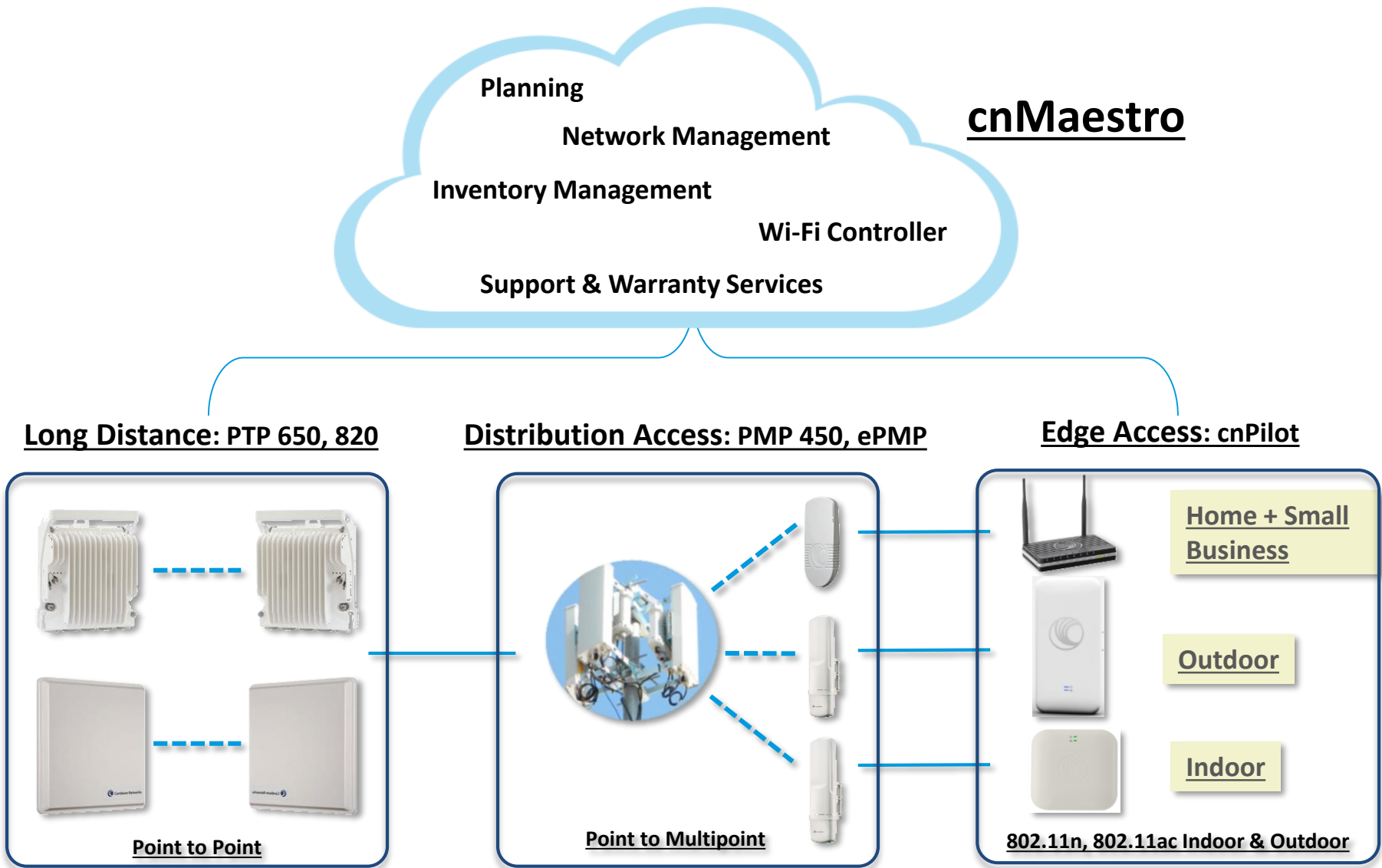
# Agenda

- 2m to 245km: Cambium's Wireless Fabric
- What are we introducing
- cnPilot Family
- Deployment Examples
- FAA: Frictionless Adaptive Architecture
  - Frictionless Rapid Deployment
  - Adaptive Easy Operation
  - Affordability with Quality
- cnPilot 2.0
  - Expanding autoTune
  - FAA Controller adapts to your network
  - Reports, MSP
  - How are we expanding the portfolio
- Demo
  - Auto Pilot
  - cnMaestro Enhanced UI



# 2 m to 245 km –

## *We Have You Networked With Cambium's Wireless Fabric*



# What Are We Introducing ?

## cnPilot 1.0

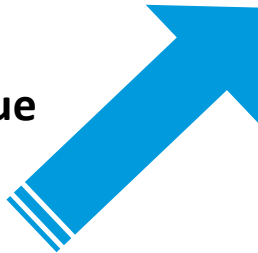
- **Creating Disruptive Value**

- 802.11ac Wave 1

- **Easy Operation**

- Free, Secure and
- Scalable Cloud

**2016**



## cnPilot 2.0

- **Performance/Quality at Disruptive Value**

- 802.11ac Wave 2
- Portfolio Expansion

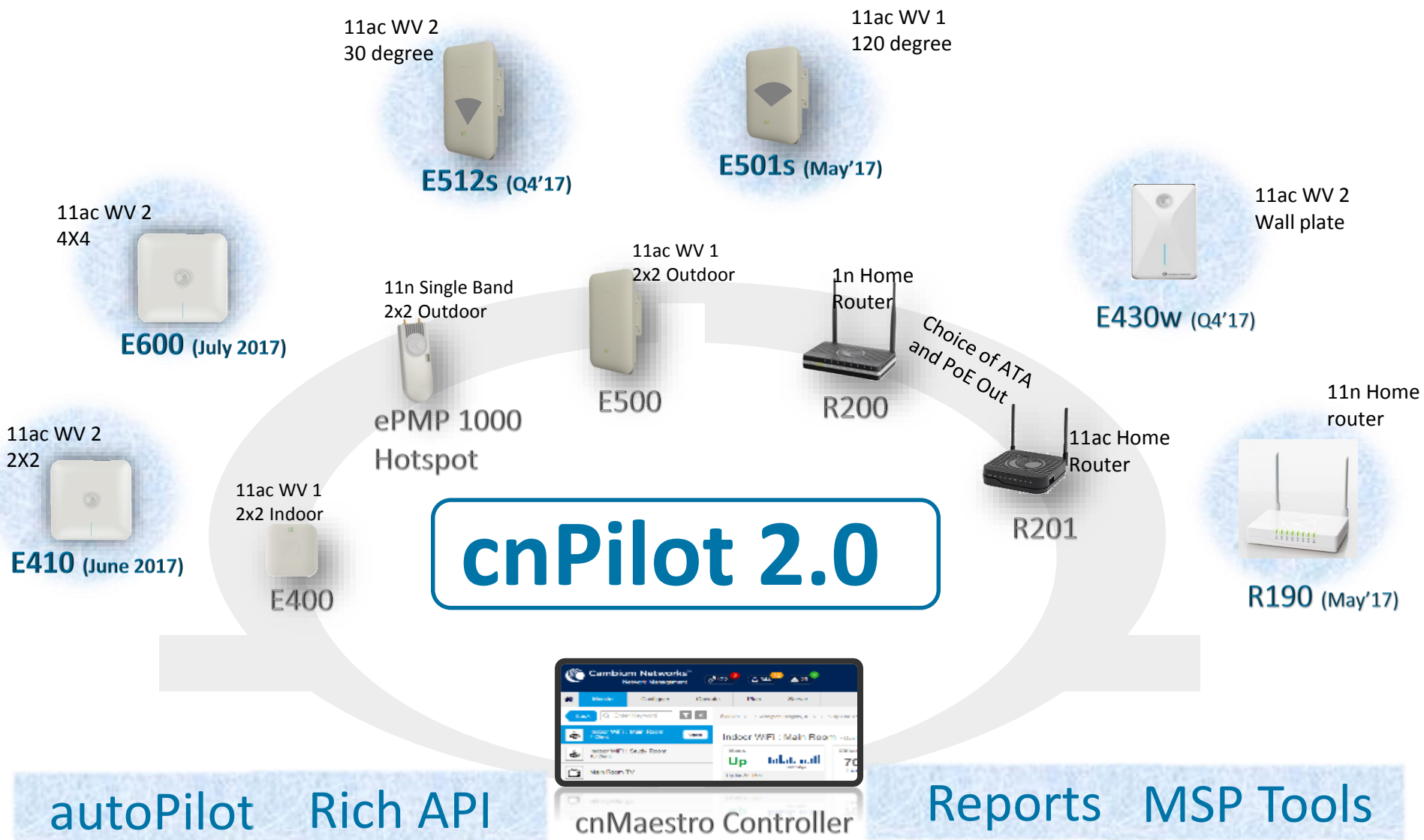
- **Easier and Richer Operation**

- Rich controller: autoPilot- Controller AP
- PCI compliance and Rogue AP detection

- **Managed Service Provider Friendly**

- RESTful API for analytics and mgmt.
- MSP View with multi-tenancy
- Textual and graphical reports

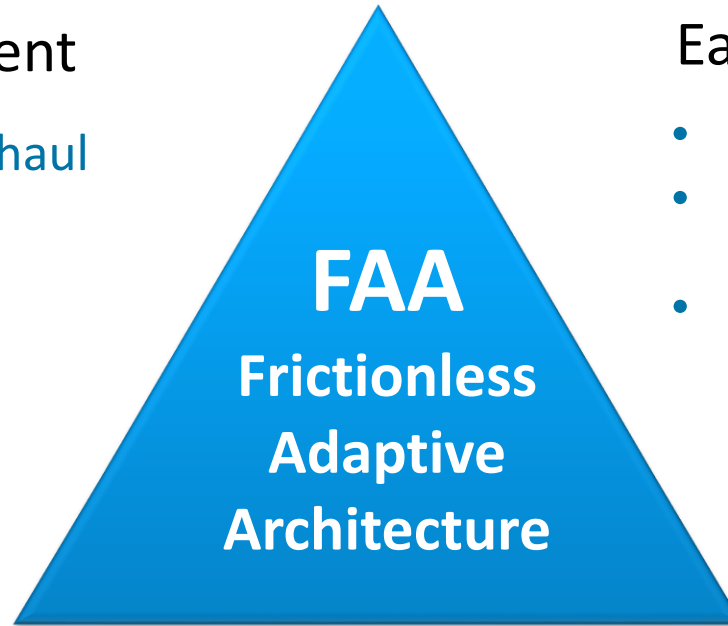
**2017**



## Frictionless

### Rapid Deployment

- Wireless Backhaul
- Zero Touch



## Adaptive

### Easy Operation

- Solution Adapts to Your Need
- **autoTune:** Automatically optimizing the Spectrum usage
- **ezDetect:** Troubleshooting is a breeze

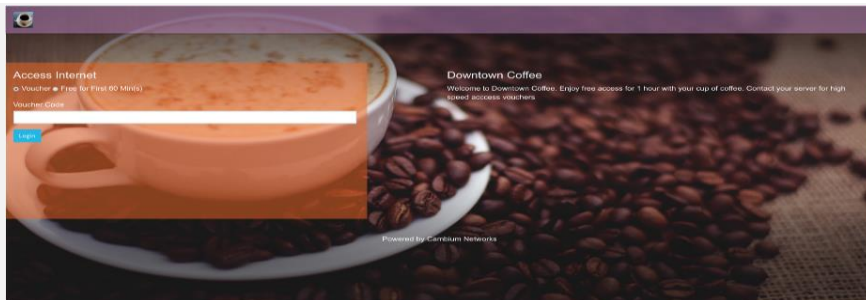
## Architecture

### Affordability with Quality

- Scalable and Robust
- Cost-Effective



# Frictionless Rapid Deployment



**ezAccess**  
Commissioning Guest Access  
Was Never So Easy

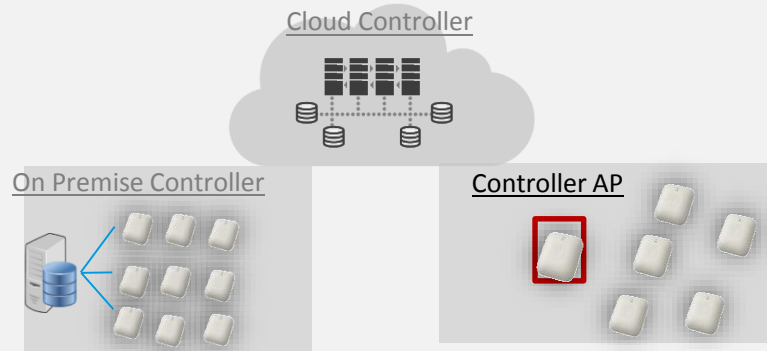
“ZERO TOUCH INSTALLATION IS GREAT,” SAYS OZRELIC of Webformix. “...**60 APs** that we installed, we completed 15 hours of pre-configuration work in **only 5 hours**....”



## Adaptive Easy Operation

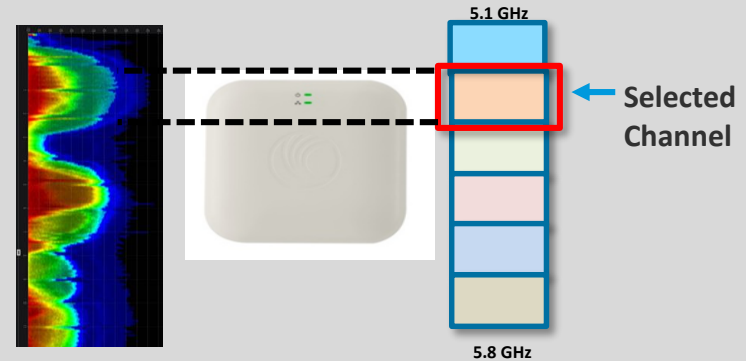
# Adaptive Architecture

## Adapts to your needs



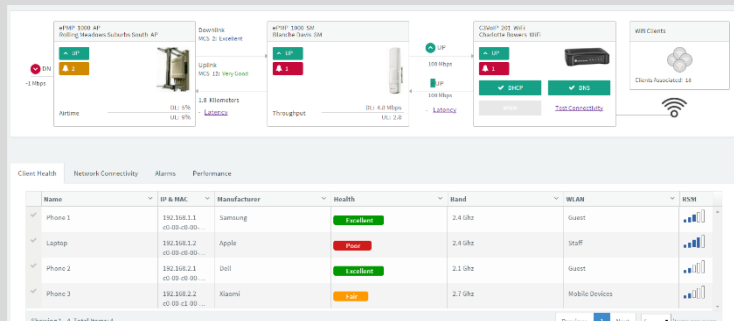
# ezTune

## Avoiding Interference & Maximizing Performance



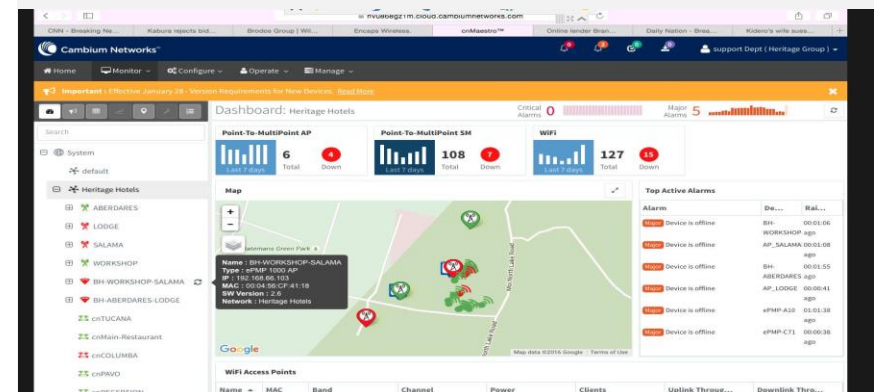
# ezDetect

## Troubleshooting In A Breeze



## Single Pane of Glass

## End To End Network



# Affordable Quality...Robust

cnPilot500 at  
Everest Base Camp



Adverse Weather

Public Wi-Fi in State of  
Rajasthan, India  
50 C, Dusty



Brazil Carnival



Scalability and Density

LTE Filters autoTune

High Gain Antenna



Tough RF

Forum and 24x7 Support



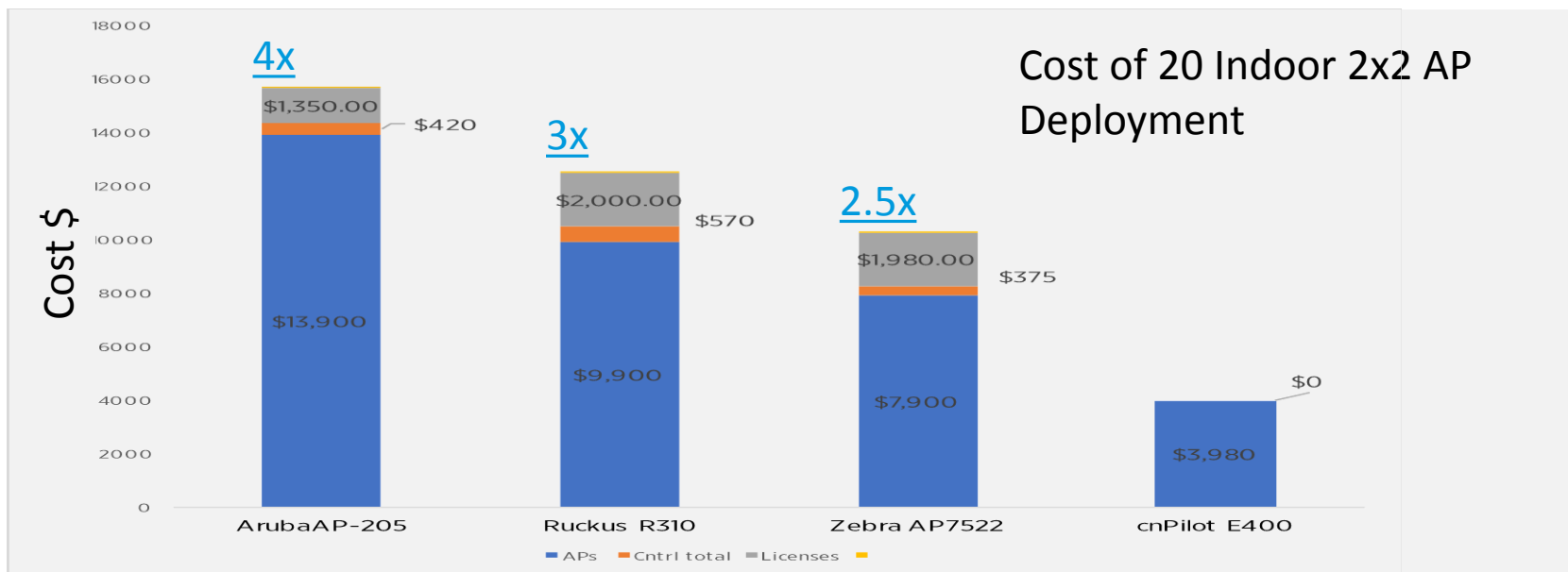
Distributed Processing

Security, Supportability, Redundancy

# Affordable Quality...Higher Performance at a Fraction of Cost



100 YouTube  
Streams on a  
cnPilot E400



# cnPilot Deployments Across the World



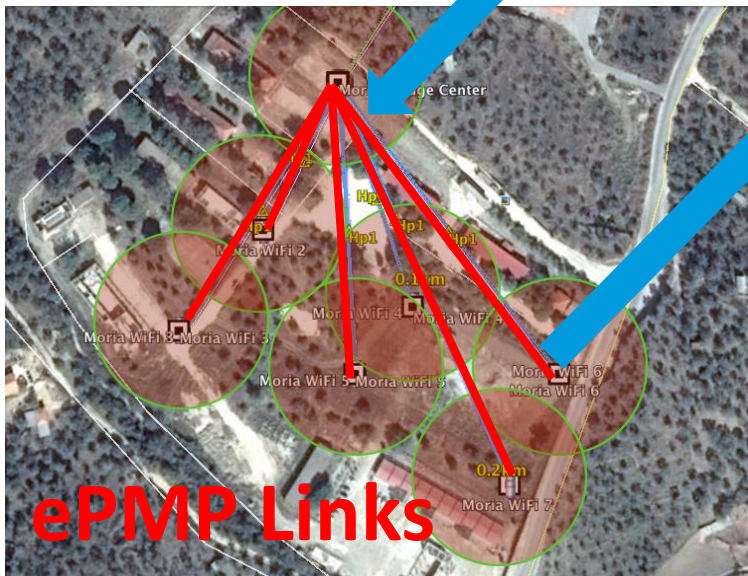


# City-Wide Connectivity, Ramos Arizpe, Mexico

- City-wide broadband and Public Wi-Fi
- 20,000 users in a 15 Square km area
  - Hospitals
  - Schools
  - Parks
  - Businesses
- Solution
  - Backhaul – ePMP
  - Distribution
    - 3 ePMP 1000 AP
    - 51 Force 180 SM
  - Access – 200 cnPilot E500 outdoor



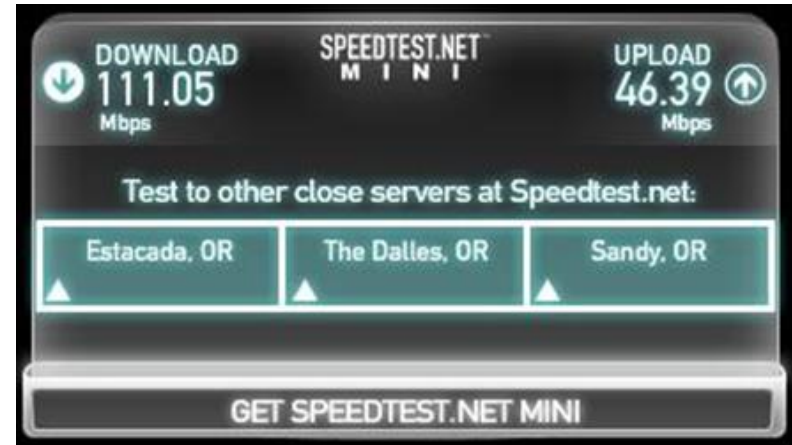
# Rapid Wireless WiFi Deployment in Lesbos, Greece



- 60w of solar panels.
- A 5GHz integrated ePMP-1000 SM pointing back to the PMP AP.
- 2.4GHz ePMP Hotspot powered from the Aux port on the SM.

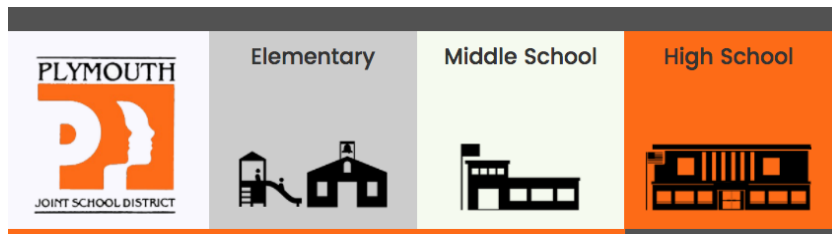
# Condominium Complex, Bend, Oregon

- Replace aging 802.11g system in multiple buildings and provide connectivity in common areas
- Improvement
  - 60 APs installed in 5 hours
  - 10x speed improvement
  - 60x capacity improvement
- Solution
  - Access – cnPilot E400 indoor, Outdoor ePMP Hotspots





# Deployments In Educational Institutions



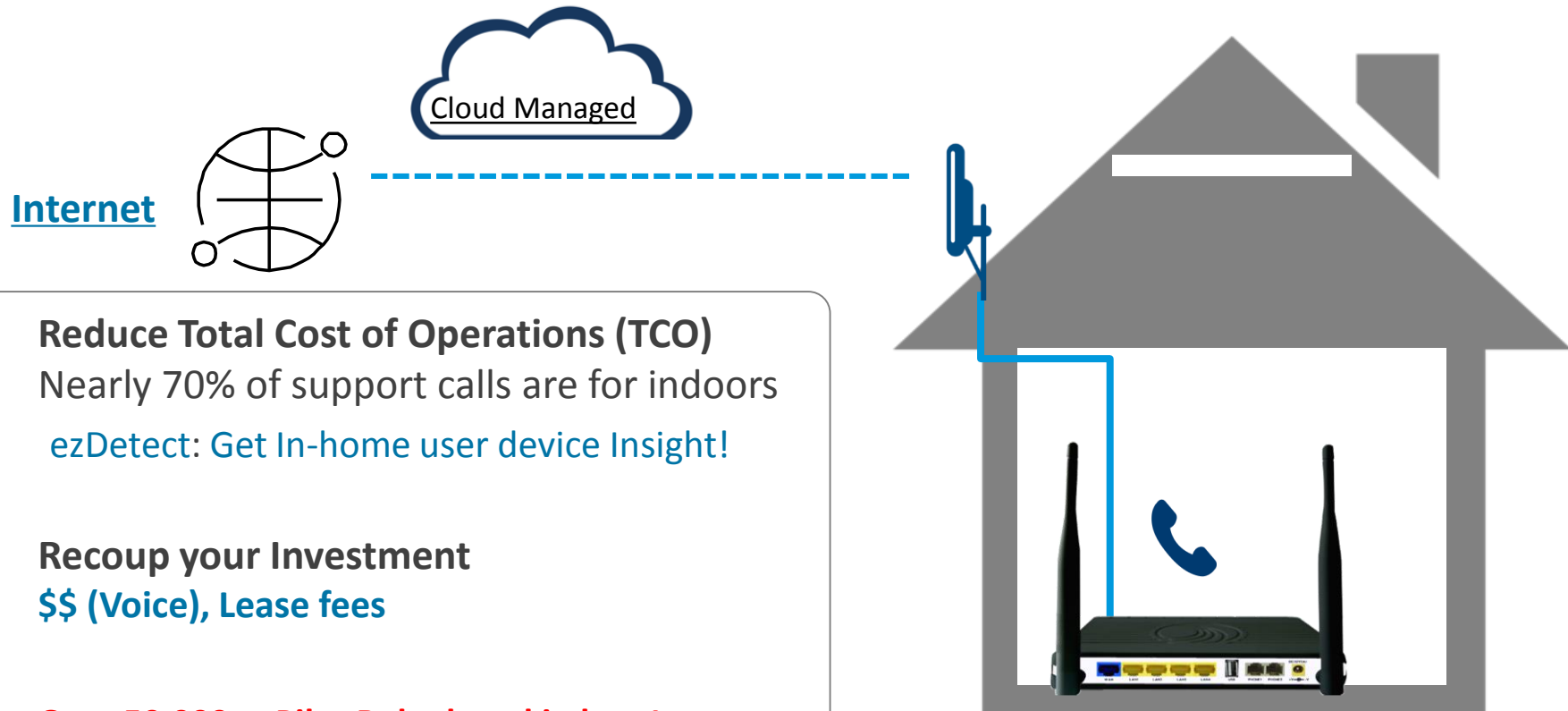
## USA - Schools

- Plymouth Sch District. Wisconsin, USA
- **5 School campuses**
- E400: 140 – 200 APs  
PTP: Inter-campus connectivity

## India - Universities

- **6 large Universities** ... and growing
- Largest: 540 APs and growing
- Tunneled controller architecture

# cnPilot R : Home & Small Business Routers – for ISPs



# Case Study: Holiday Inn Baruna, Bali



- cnPilot E400 for indoor
- cnPilot E500 for outdoor
- **cnMaestro guest access**
- Corporate and Guest SSIDs

# cnPilot for Retail Win: IMPAX Media, North America

In store Wi-Fi: Delivering video content monitoring checkout



## Selected for:

- Excellent **video streaming performance**
- High client density
- Price-performance



# The 4 Billion Opportunity - Connecting the Unconnected



**Internet.org**

**First**

**Express Wi-Fi Certified Vendor**

6 ISPs in APAC and 3  
in Africa standardized  
on cnPilot

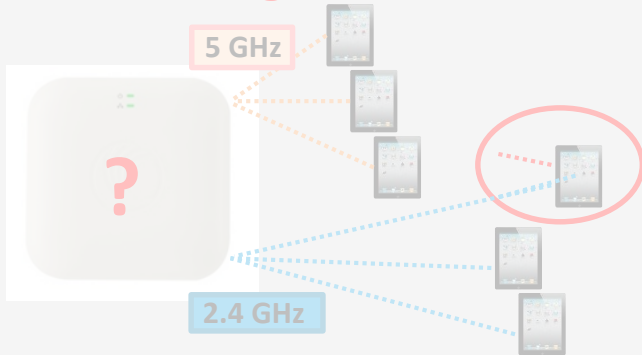


- 100+ Villages connected to date
- Growing to over 2,000 hotspots!
- Cambium Wi-Fi & Cambium Backhaul
- Common Management controller
- Robust & Resilient. Low TCO
- Cambium support

# cnPilot 2.0

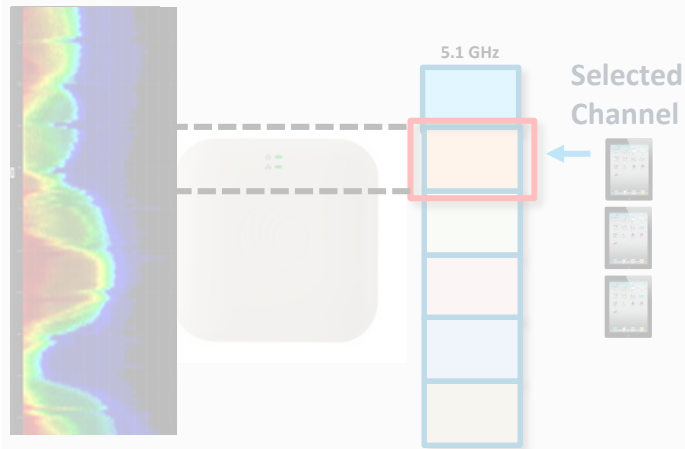
# Expanding autoTune *Automatically optimizing the spectrum usage*

## Band Steering



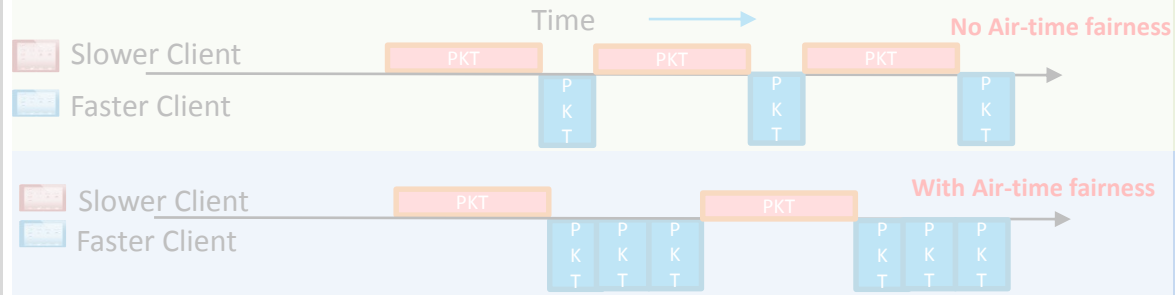
When new dual band MU joins the network, cnPilot selects the best suited band for optimum performance of the network and MU

## Dynamic Channel Selection



In the dynamic RF environment, cnPilot changes channels optimizing performance and avoiding the interference not only at client but also at various MUs

## Air-Time Fairness



Faster clients are given more opportunities to send pkts so that slower clients do not hog the air time thus optimizing network performance.

## Dynamic Power Adjustment



When the central AP dies the neighboring APs increase their power to cover the hole



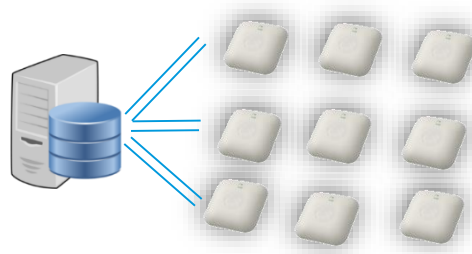
# FAA Controller Adapts to Your Network

cnMaestro  
Cambium or  
Private Cloud



- No burden to IT staff
- Designed to scale massively

cnMaestro  
On-Premise  
VMs and Rackmount  
Appliance



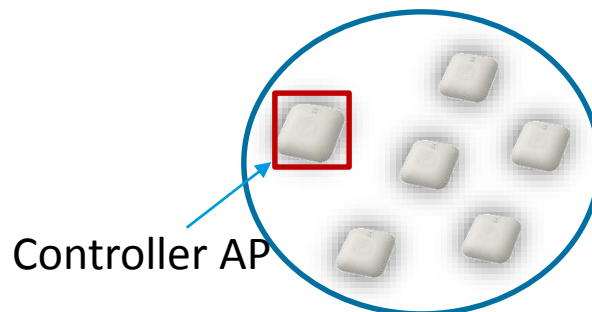
- For fully in-house deployments
- Tunneling data to the controller
- Rack Mount Appliance Controller  
100-150 AP



POI Q3 2017

Auto Pilot

May 2017



- For 32+ AP deployments
- Simple & easy with local  
controller on AP

**LBO Support : L2TP and GRE Tunnel Support on AP and Controllers to tunnel data to the svc provider gateway for inspection, accounting or recording**

# Data Report

Figure 1: Overview of the data and the analysis pipeline. The figure shows a flow from raw data (Source, Hostname, IP, Port, User, Password, Method, Status, Error) to a processed dataset (Source, Hostname, IP, Port, User, Password, Method, Status, Error). The processed dataset is then analyzed using a machine learning model (Logistic Regression) to predict the outcome (Success/Failure). The analysis results are visualized using a bar chart (Success/Failure) and a pie chart (Success/Failure). The bar chart shows the distribution of Success/Failure across different categories (Source, Hostname, IP, Port, User, Password, Method, Status, Error). The pie chart shows the distribution of Success/Failure across different categories (Source, Hostname, IP, Port, User, Password, Method, Status, Error). The bar chart and pie chart are both labeled with 'Success' and 'Failure'.

## Microsoft Power Business Intelligence (BI) - Example

Downloadable Graphical  
PDF For:

- Last Day/Week/Month
- Site/WLAN/AP Gp
- Inventory/Alarm/Perf.

June 2017

- Schedule Auto e-Mail
- Preselect Content
- Customize Logo, Front Page, Header/Footer and Graphics
- Comparative KPI analysis with Global Data
- PCI Compliance

Q3 2017

# Managed Service Provider Tools

June


*Making the Migration From a SI to a MSP Easy*


- Managed Individually or in Aggregate
  - Tenant View enables filtering and simplification
  - Tables and Tree allow for global comparison
- Tenant Accounts Have Full cnMaestro Features
  - Multiple Roles (Root, Administrator, Operator)
  - Dashboards, Statistics, Tools

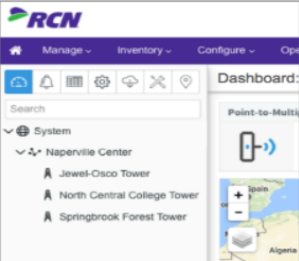
## Customize Tenant View

Accounts Customization

Login URL:  RCN

Logo:  Browse 

Brand Color: 

Preview: 

## Manage Tenant Account

Cambium Networks | cnMaestro™

Manage Inventory Configure Operate Services Report Application

Edit Tenant Account

Account Name:  Save

Networks Sites AP Groups WLANs Administrators

User Name	Email	Role	Status	Delete
Sean Eddington	sean_eddington@alliantcreditunion.org	Root	Invited	✕
Scott Johnson	scott_johnson@alliantcreditunion.org	Admin	Active	✕
Brad Wiley	brad@alliantcreditunion.org	Operator	Active	✕
Wendy Jones	wendy_jones@alliantcreditunion.org	Operator	Active	✕

Close Add New

# Growing Eco-system Interop



& many more...

# Strengthening The Home & Small Business Portfolio

cnPilot R200



## Indoor 802.11n

- Single Band
- ATA+WiFi or ATA+Wi-Fi + PoE out
- IPV6

cnPilot R201



## Indoor 802.11ac

- DualBand
- ATA+WiFi or ATA+Wi-Fi + PoE out
- IPV6

cnPilot R190



## Indoor 802.11n

- Single Band
- ATA+WiFi or Wi-Fi Only
- IPV6

May

# Strengthening The Outdoor Portfolio

cnPilot E500



## Outdoor 802.11ac Omni

- 360° Integrated Antenna
- Dual band 256 users, 16 SSIDs
- PoE Out, LTE Filters, IP 67

cnPilot E501S\*

May



## Outdoor 802.11ac Sector

- 90° ~ 120° Integrated Antenna
- 11-14dBi Antenna
- PoE Out, LTE Filters, IP 67

cnPilot E512S\*

Q4

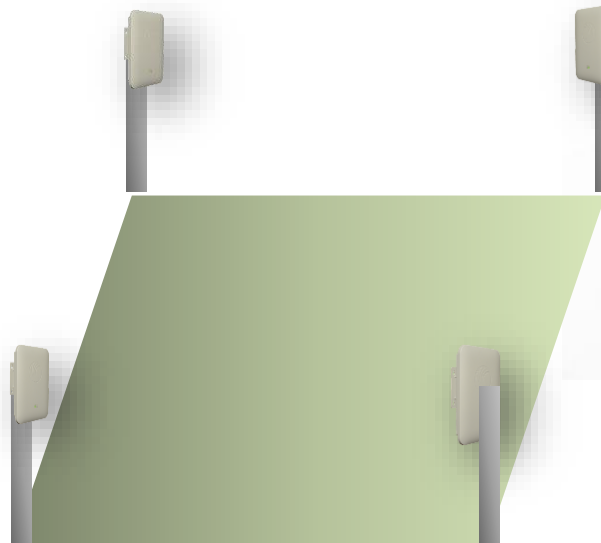
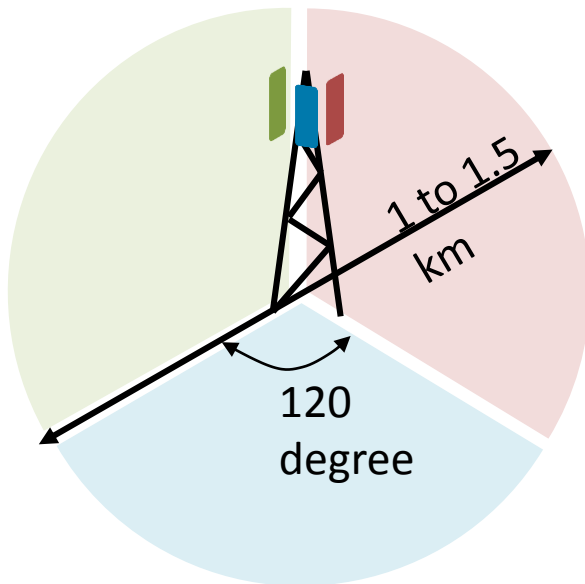


## Outdoor 802.11ac Sector

- 30° Integrated Antenna
- 12.8/17.2 dBi Antenna
- PoE Out, LTE Filters, IP 67
- Stadiums, High Noise City

# E501s – 90°~ 120° Integrated Antenna

- 802.11ac wave 1, 2x2, Dual band, 256 users, 16 SSIDs
- Rest of the features same as E500
  - LTE filter, PoE Out, IP 67 with Industrial grade components
- Tilt mount bracket
- Antenna : 10/12 dBi gain, 23 dBm front/back ratio





# Strengthening The Indoor Enterprise Portfolio

**cnPilot E400**



## Indoor 802.11ac

- Dual band, 256 users, 16 SSIDs
- 2x2

**cnPilot E410**

June



## Indoor 802.11ac WV2

- Dual band, 256 users, 16 SSIDs
- 2x2

**cnPilot E600**

July



## Indoor 802.11ac WV2

- Dual band, 512 users, 16 SSIDs
- 4x4 , 2 Ports, BLE

**cnPilot E430w**

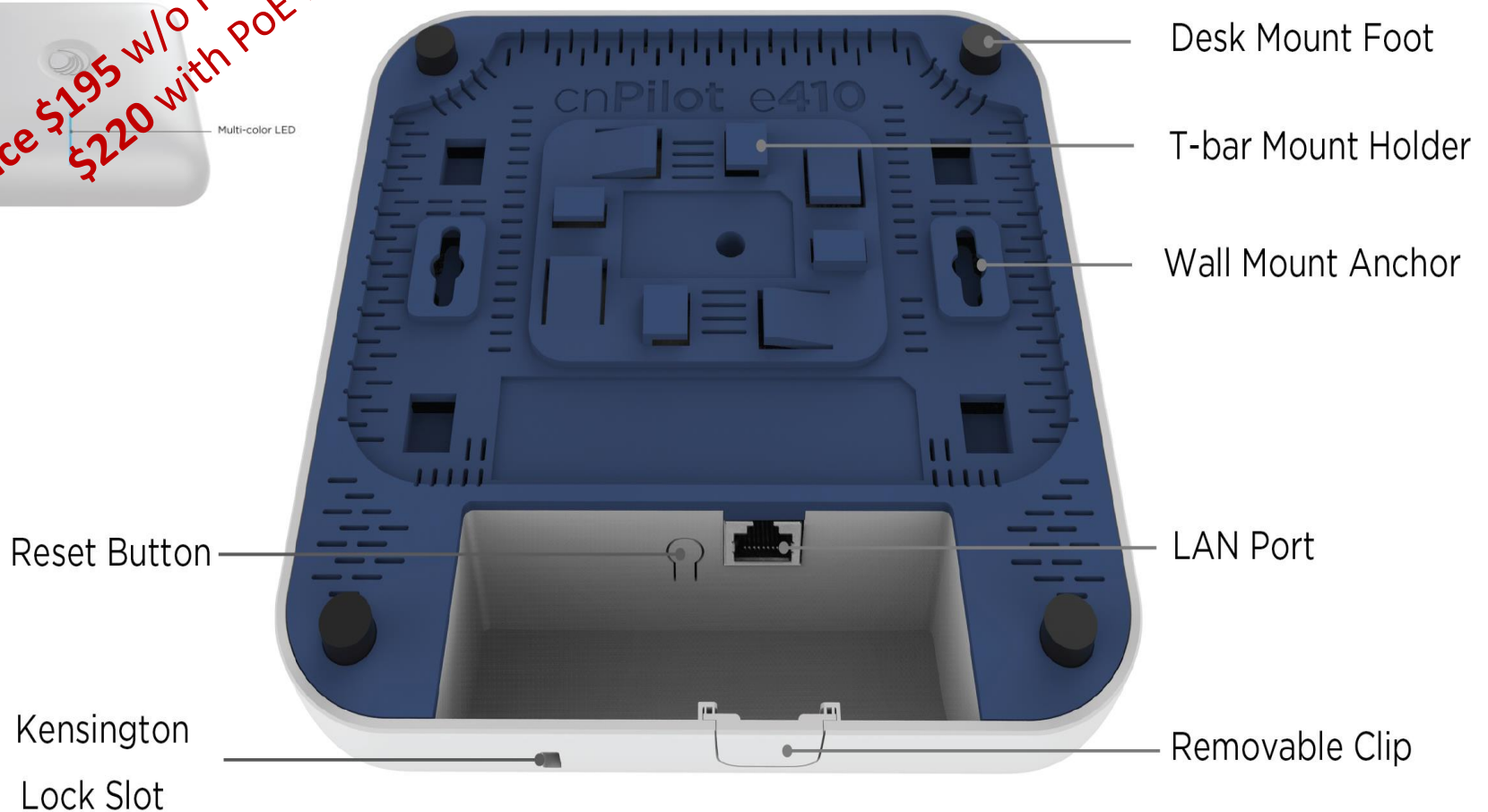
Q4



- 4 Ports (?) PoE pass through
- Dual band 802.11ac wave 2
- PoE out for IP Phone
- 11ac Wv2 2x2
- BLE built-in
- 18 dBm Tx power

# cnPilot E410: 2x2 11ac WV2 , 16 SSID, 256 Users

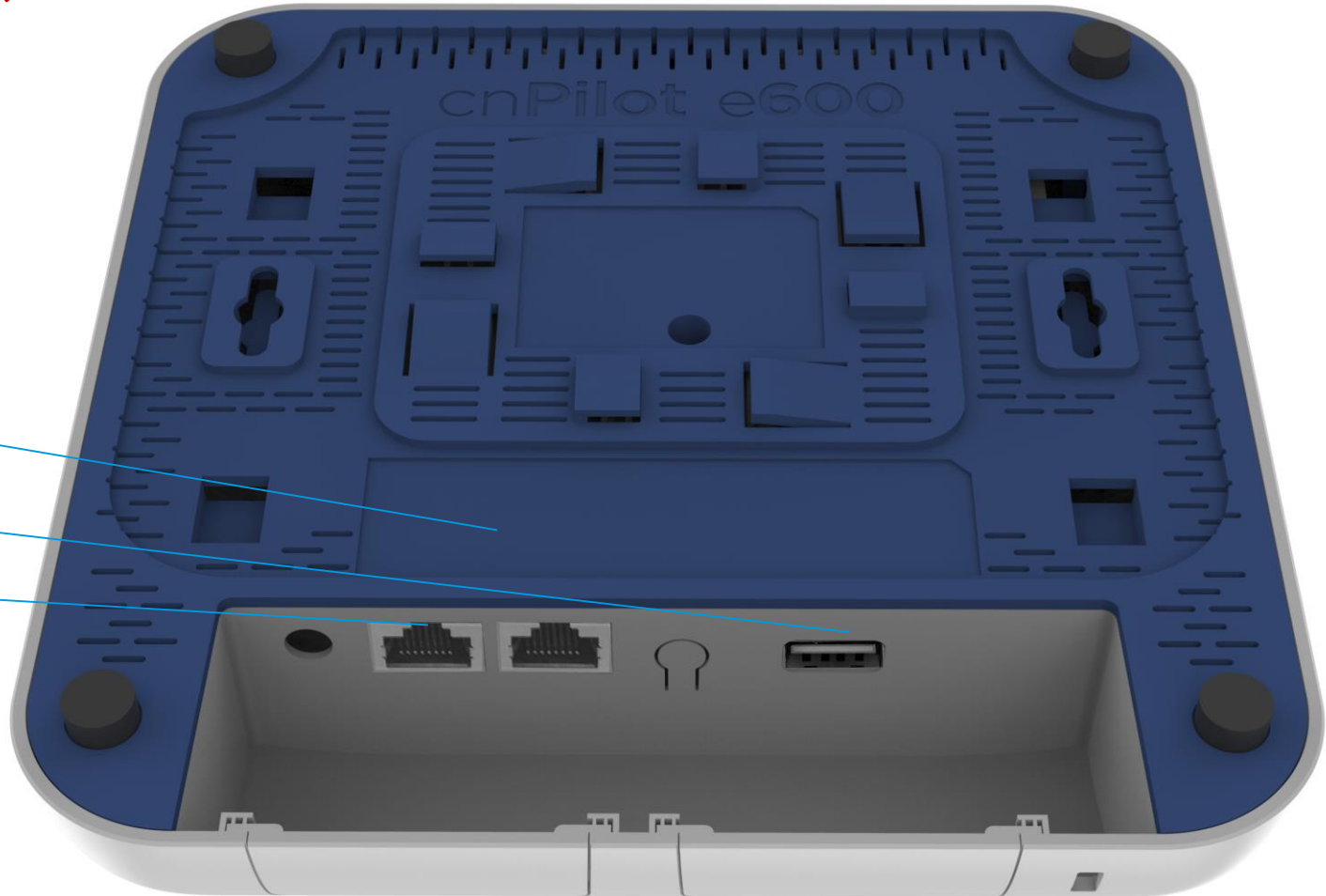
List Price \$195 w/o PoE Inj.  
\$220 with PoE Inj.

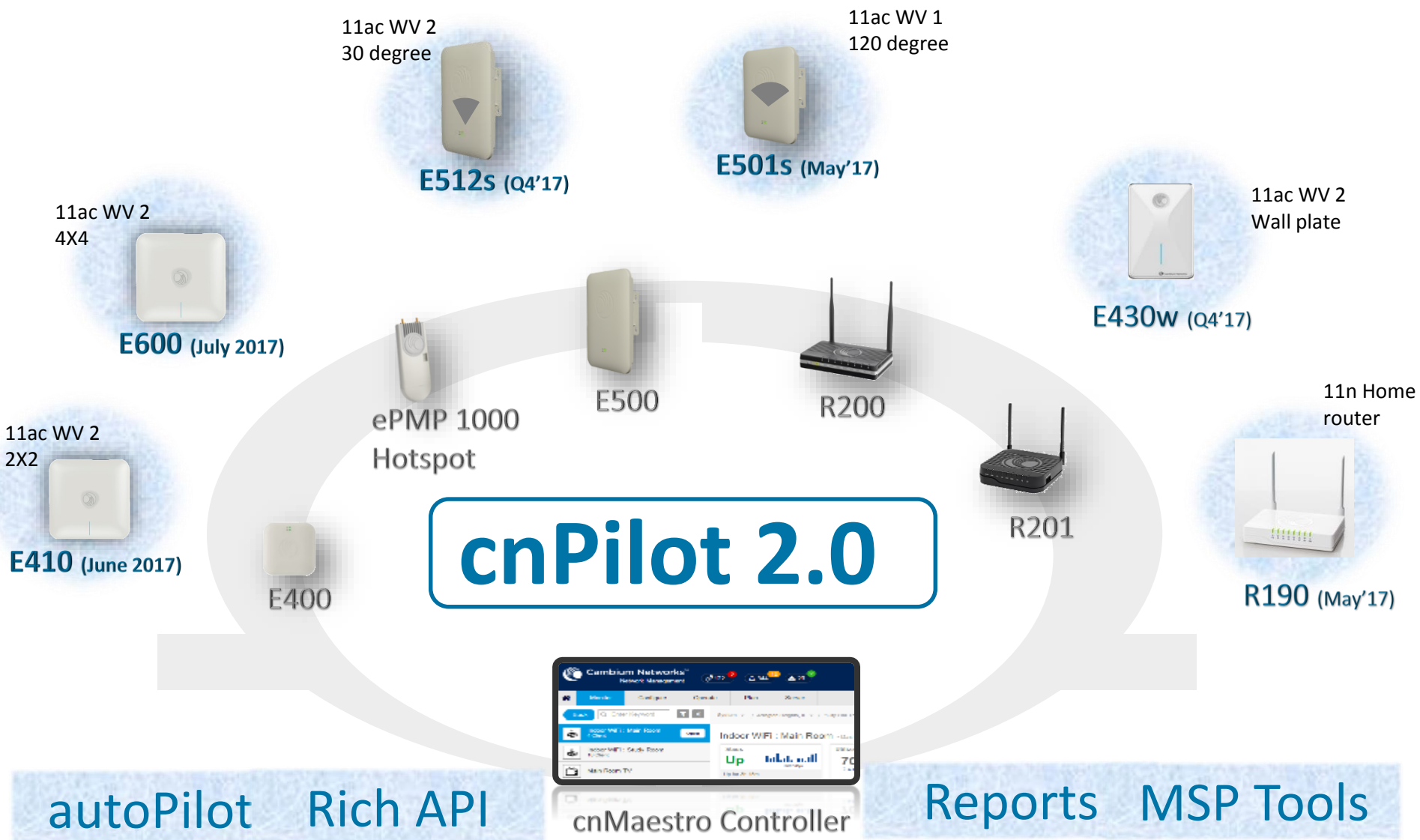


# cnPilot E600: 4x4 11ac WV2 , 16 SSID, 512 Users

List Price \$325 w/o PoE Inj.  
\$345 with PoE Inj.

BLE  
USB  
2 GE Ports





# Demo and Q&A