



**YOUR NETWORK
RUNS ON COMMSCOPE™**

ION-U & ION-E Product Overview and Positioning

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Willy Ramirez

willy.ramirez@commscope.com

+1-210-241-1646

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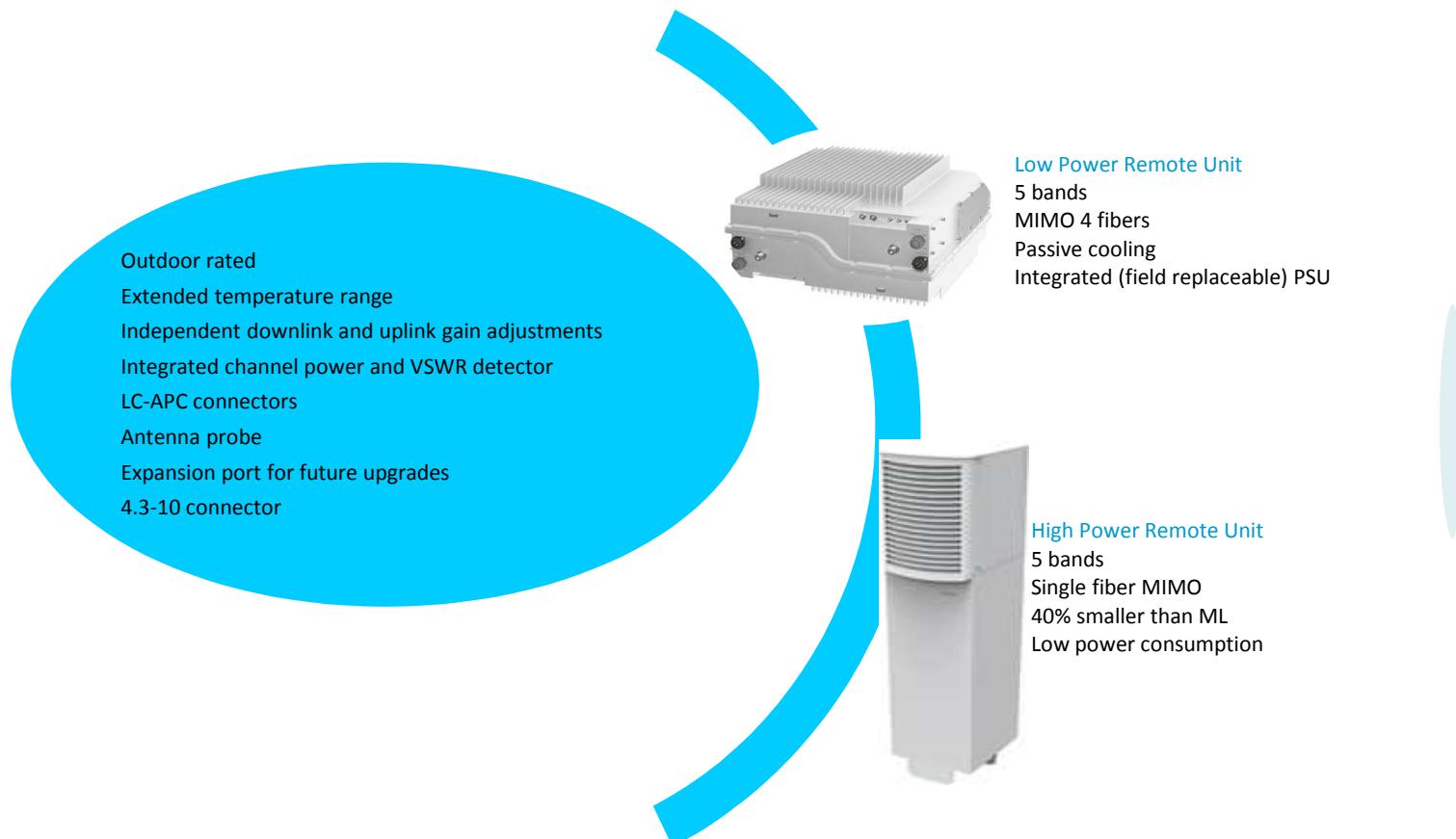
ION-U HP Product Overview

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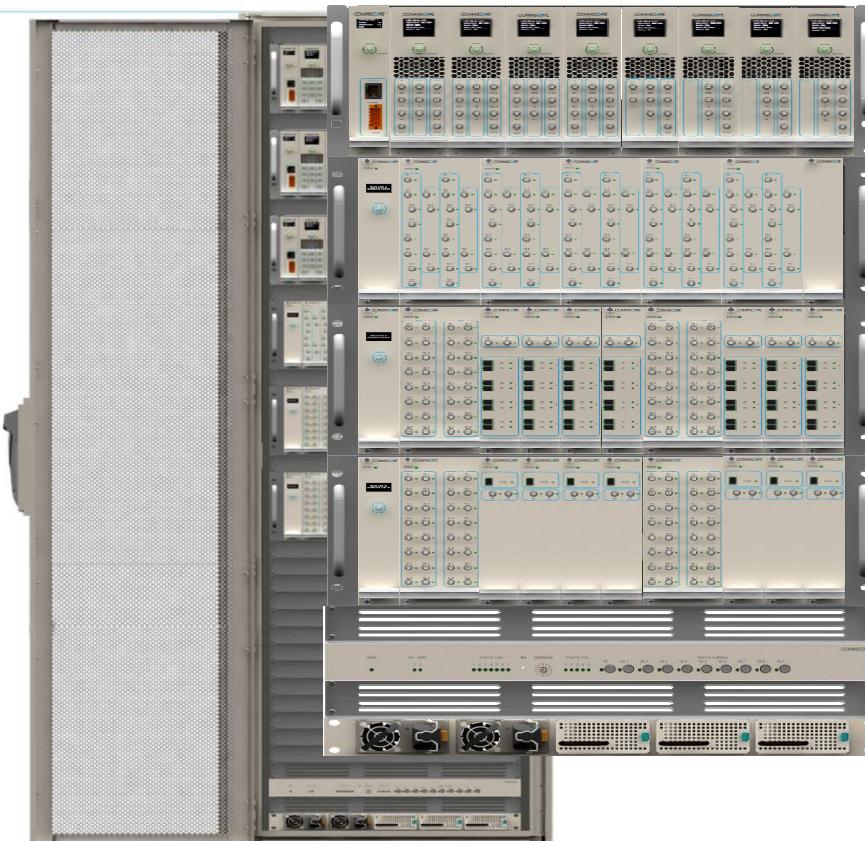
ION-U: Unified Low and High Power Platform

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ION-Unified Head End System

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i-POI Subrack

Sector Matrix Subrack

LP Signal Distribution Subrack

HP Signal Distribution Subrack

Power Distribution Subracks

No separate fan trays

Understanding ION-U



To appreciate the benefits of ION-U, we must first understand general DAS topology and terms:

Understanding ION-U



To appreciate the benefits of ION-U, we must first understand general DAS topology and terms:

- Sectors

Understanding ION-U



To appreciate the benefits of ION-U, we must first understand general DAS topology and terms:

- Sectors
- Zones

Understanding ION-U



To appreciate the benefits of ION-U, we must first understand general DAS topology and terms:

- Sectors
- Zones
- Nodes

Provided for capacity by each operator

- eNodeB
- Base Station

Provided for capacity by each operator

- eNodeB
- Base Station

The number of sectors depends on the operator's capacity goals

Every DAS includes one or more zones

- Each zone is a unique coverage area

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- Each zone is a unique coverage area

Each operator's sector will cover at least one zone

Every zone will include at least one node

- A node is a cluster of Remote Units
- Usually, nodes are identical

Every zone will include at least one node

- A node is a cluster of Remote Units
- Usually, nodes are identical

The number of nodes per zone depends on coverage requirements

Putting It All Together



1. Specify how many sectors the DAS will support

Putting It All Together



1. Specify how many sectors the DAS will support
2. Define the DAS zones

Putting It All Together



1. Specify how many sectors the DAS will support
2. Define the DAS zones
3. Determine the nodes for each zone

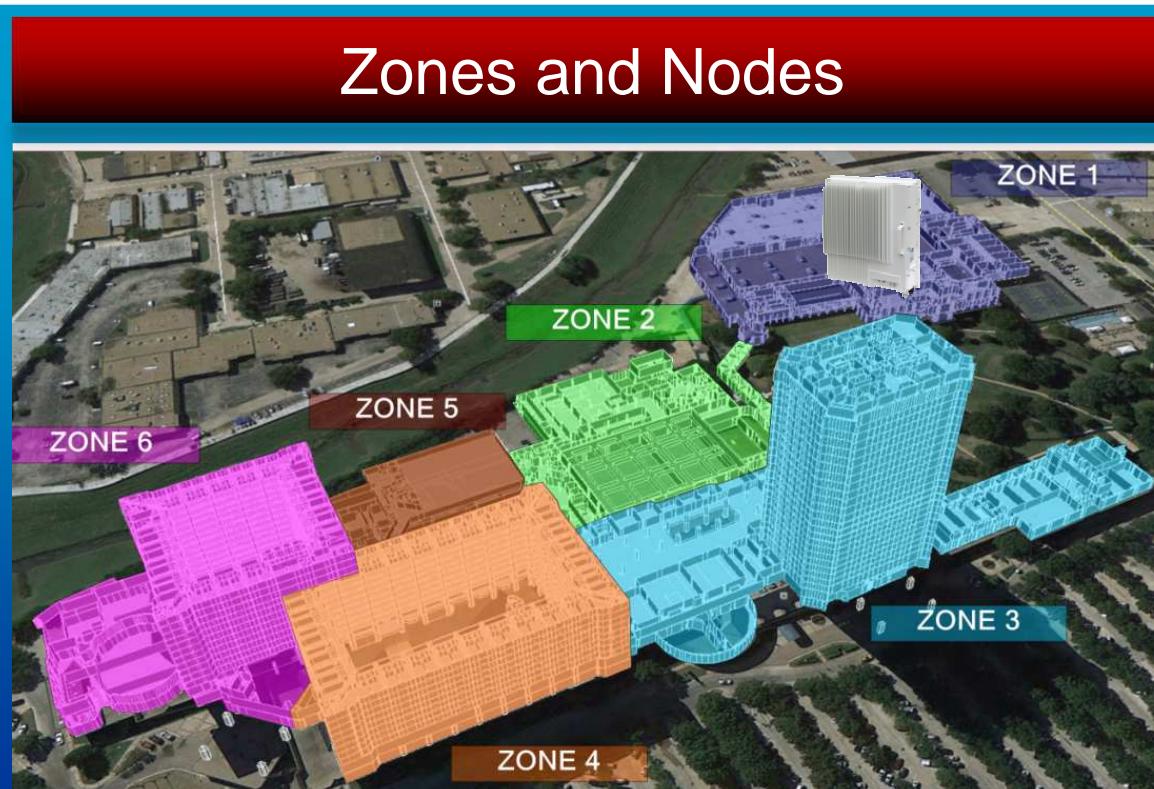
DAS Zones and Nodes

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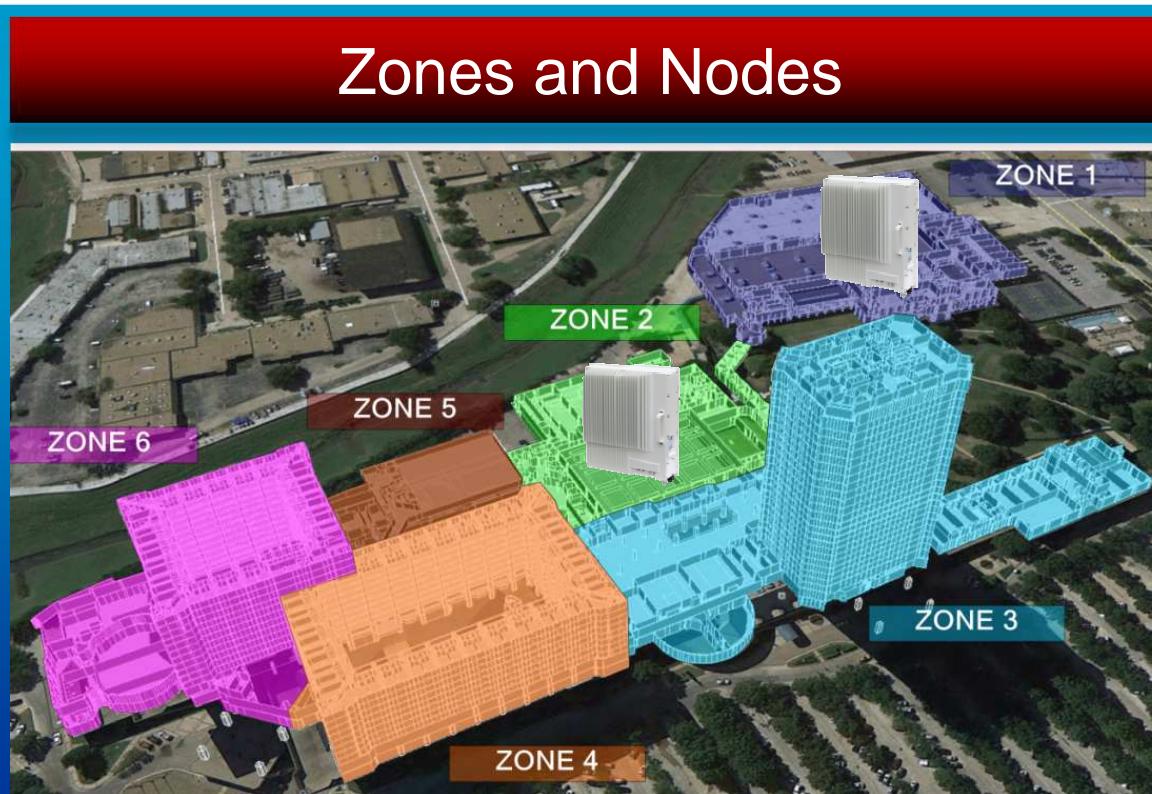
DAS Zones and Nodes

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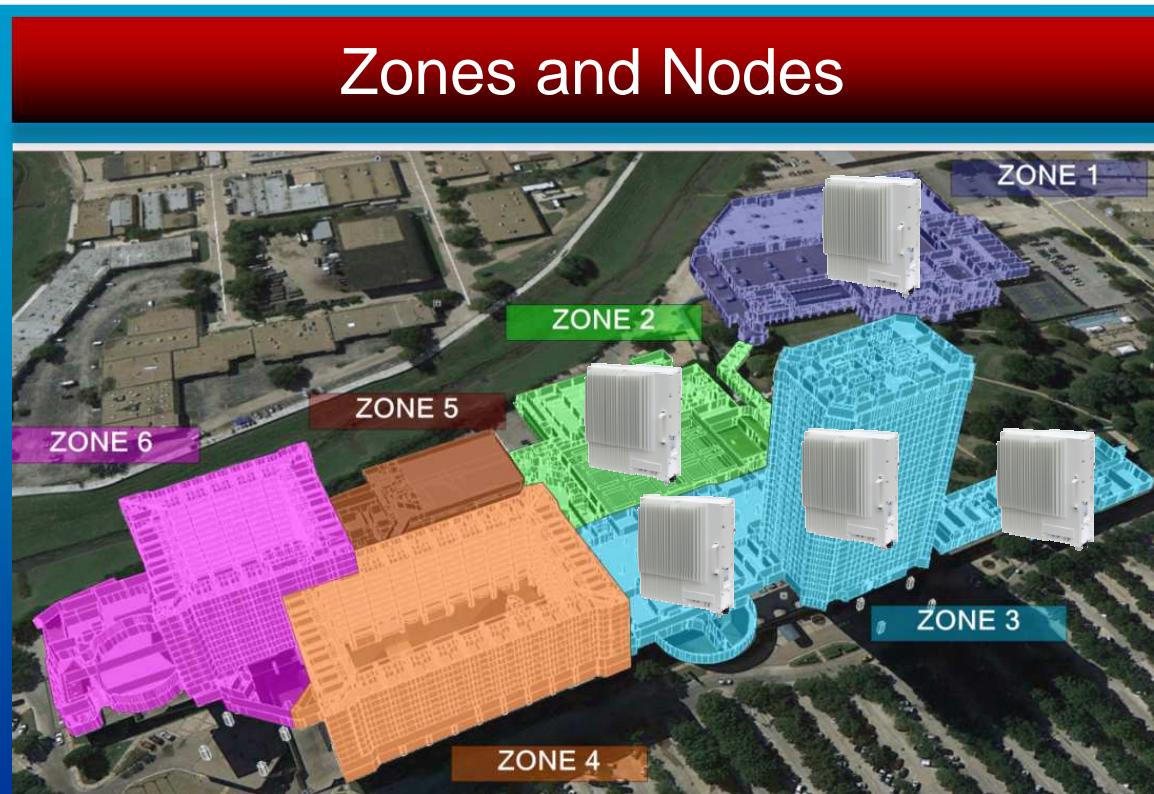
DAS Zones and Nodes

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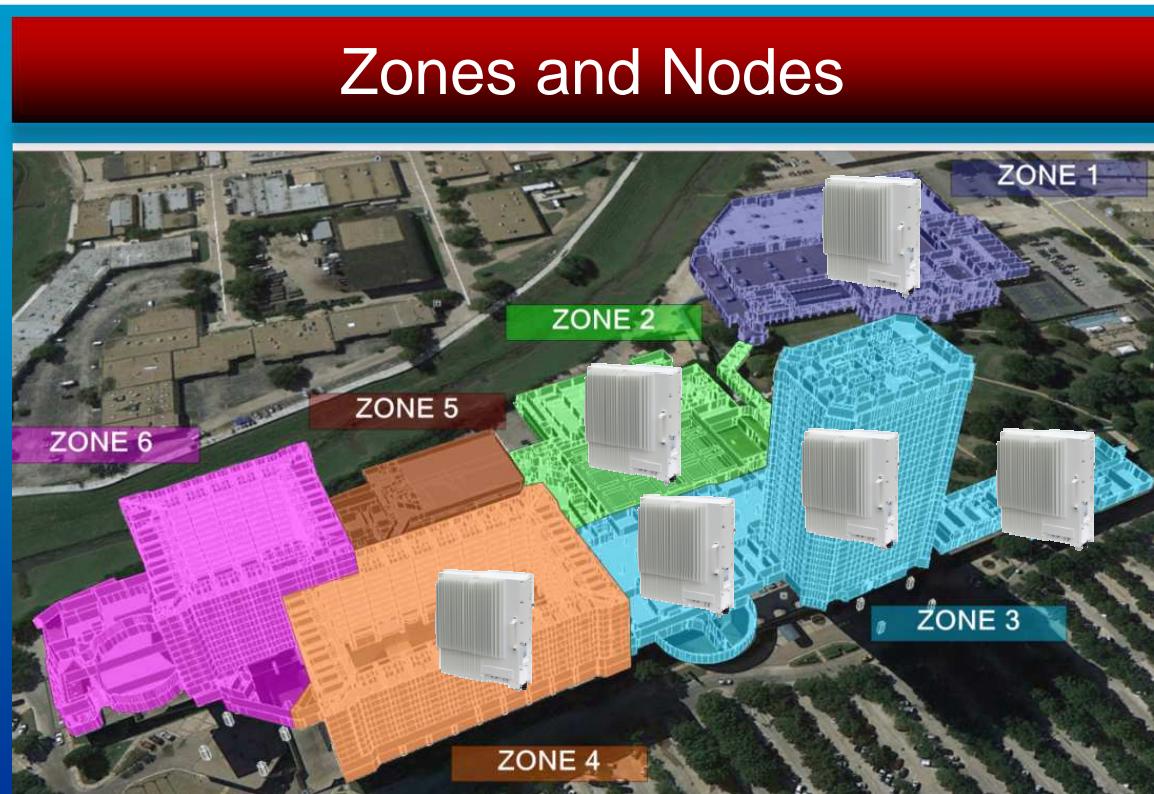
DAS Zones and Nodes

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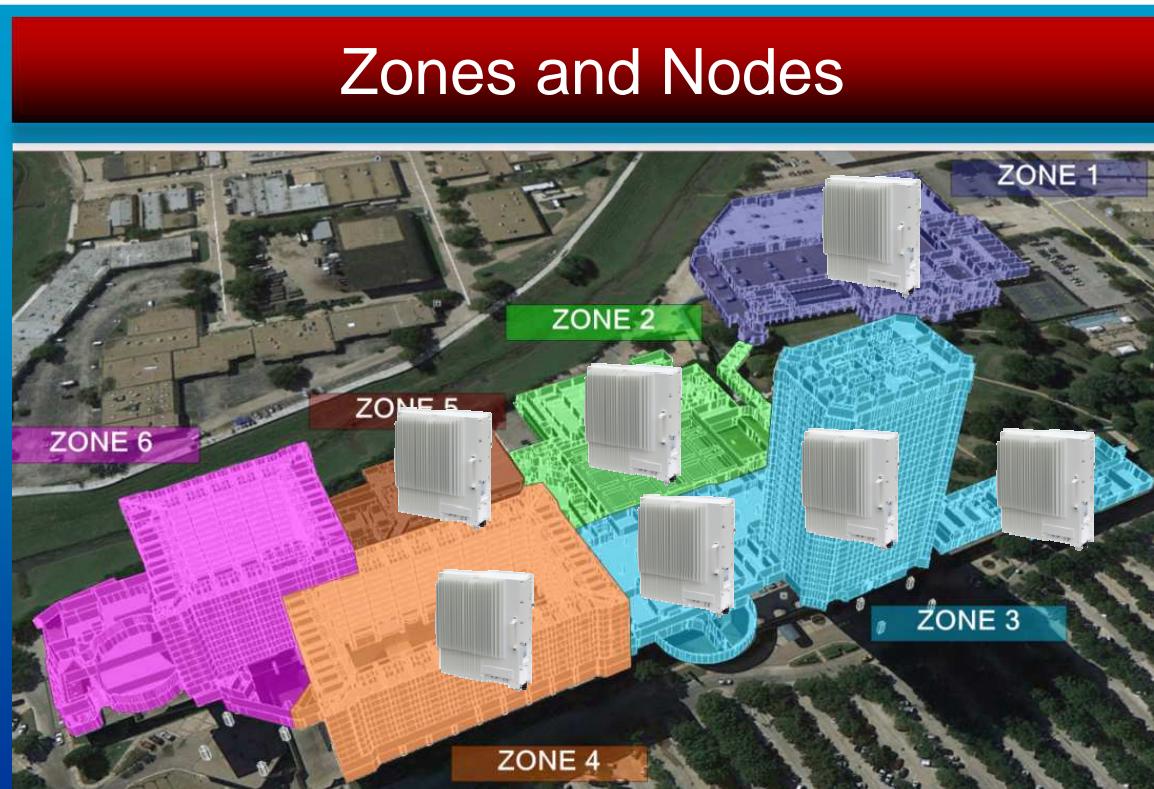
DAS Zones and Nodes

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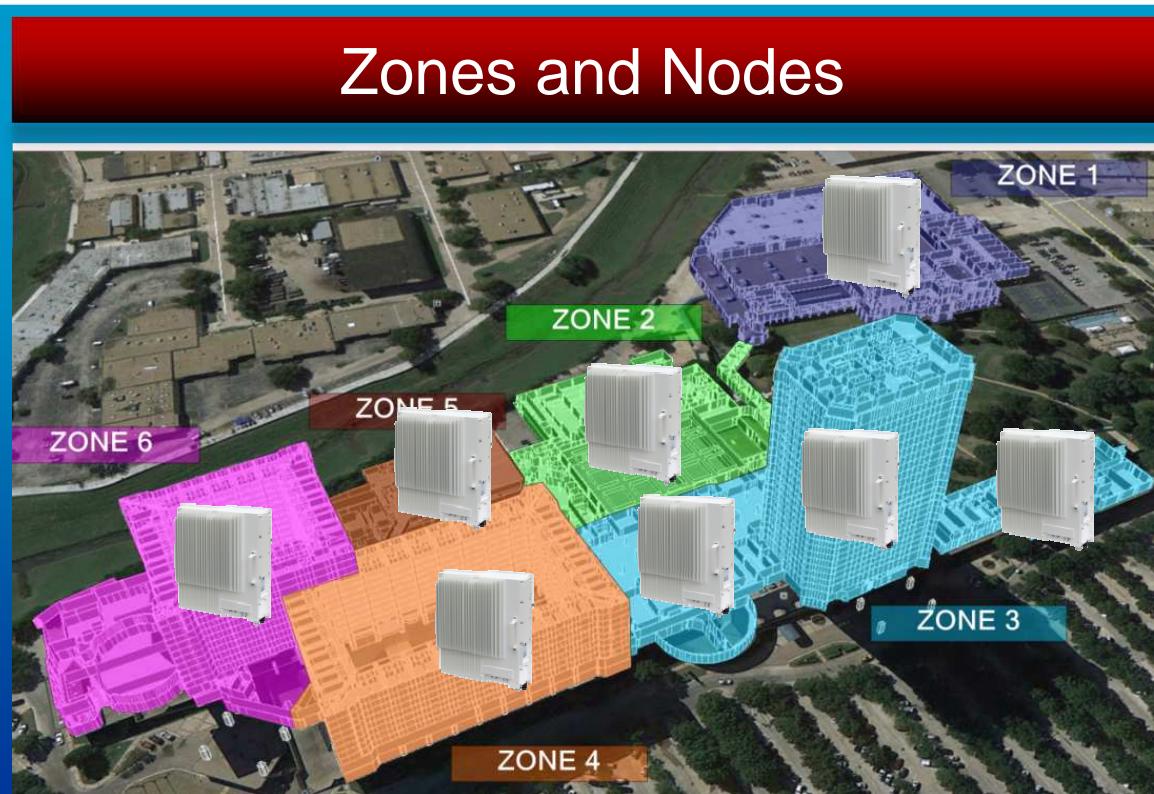
DAS Zones and Nodes

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DAS Zones and Nodes

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ION-Unified Head End System

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i-POI™



- 2 x 46 dBm
Duplexed / Non-Duplexed
- Power Management
- Real Time Measurements
- Test Tone Generator



Intelligent Point of Interface (i-POI)

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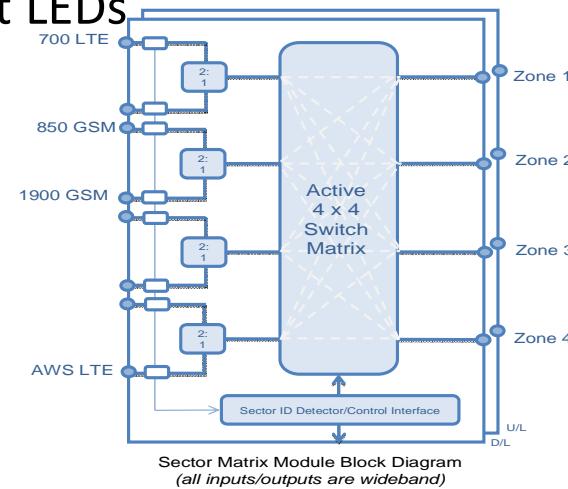
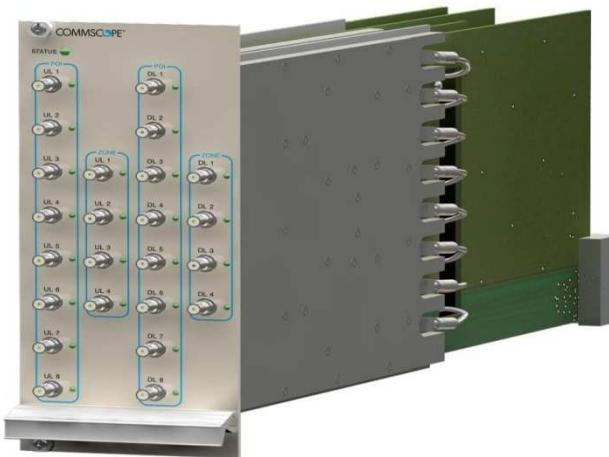
- 46 dBm input power per BTS port (2 ports)
- Supports duplexed, non-duplexed & uplink diversity BTS inputs
- -153 dBc PIM @ 2 x 20 Watts
- Up to 8 POI modules (sectors) per subrack
- Automatic level control with a 60 dB range in 0.5 dB increments
- Integrated tone generator for end-to-end signal leveling
- Real time power measurement & display
- End-to-end front panel fault indication (SW dependant)
- Can be used with third party DAS systems (internal web server) and fully integrated to the CommScope DAS solution

ION-U Head End System

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Sector Matrix

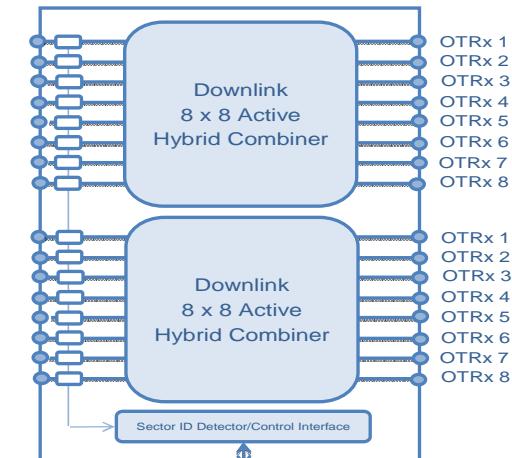
- Maps 8 (4 x 4) Sectors to 4 Zones
- Remote Flexible Sectorization
- Connection Assist LEDs



Sector Matrix Module Block Diagram
(all inputs/outputs are wideband)

Zone Combiner

- Combines Sectors for a Single Zone
- Broadband Inputs
- Connection Assist LEDs



Zone Combiner Block Diagram

Signal Measurement Receiver (dSMR)



- Spectrum Analysis
- PIM measurement
- Channel power measurement

ION-Unified Head End System

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High Power Optical Transceiver



SiSo



MiMo

- 20 dBo Optical Budget
- Visibility on Individual Uplink
- LC-APC Optical Connectors
- 4-band MiMo over Single Fiber

ION-Unified High Power Remote

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- 4 x 20 Watts
- 70/80-85/17/19 o 9/18/21/26
- Single Fiber MiMo / Multiple Sectors
- LC-APC Connectors



ION-U Low Power Remote

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- Outdoor Rated
NEBS Class 4
- 33dBm
- 7/8/85/17/19 with 4-Band MiMo
- 9/18/21/26
- Higher Power
- Only 42% more for MiMo
- LC-APC Connectors



Low Power Optical Transceiver

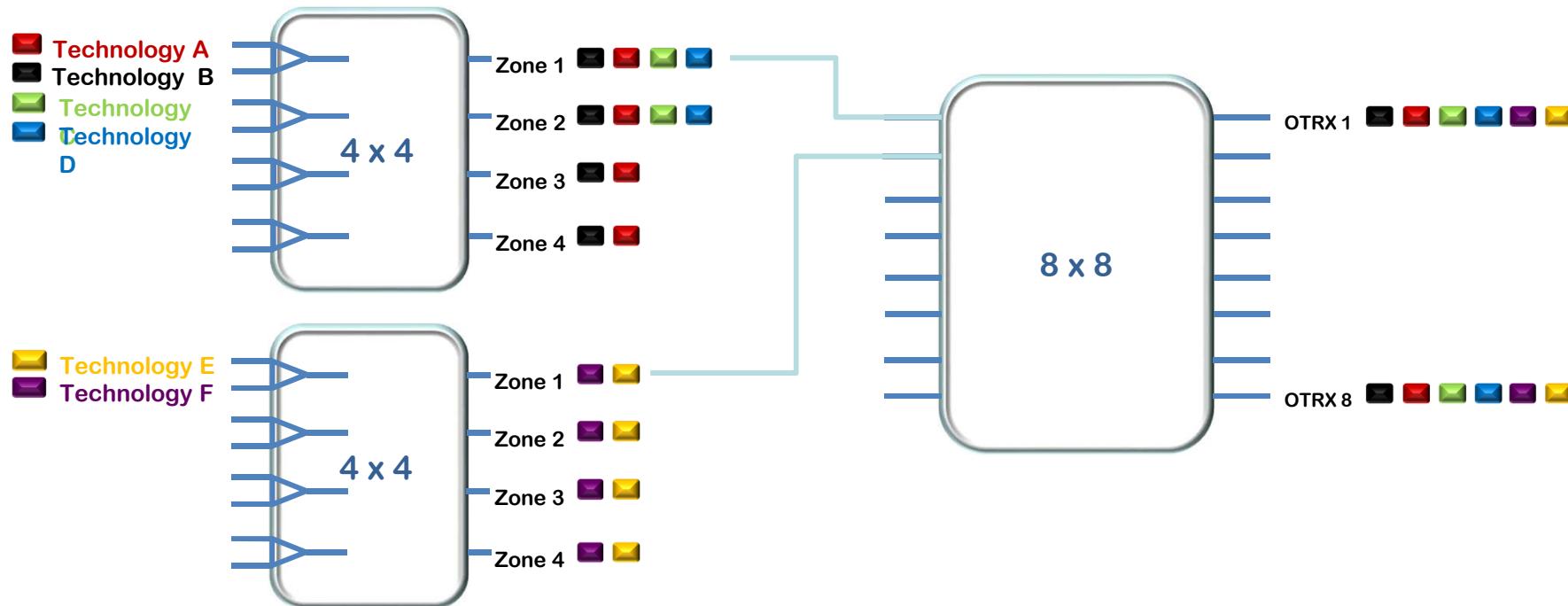


- Extended frequency bandwidth (380-2,700 MHz)
- 5 dBo Optical Budget
- Visibility on Individual Uplink
- Duplexed LC-APC

ION-U Head End System

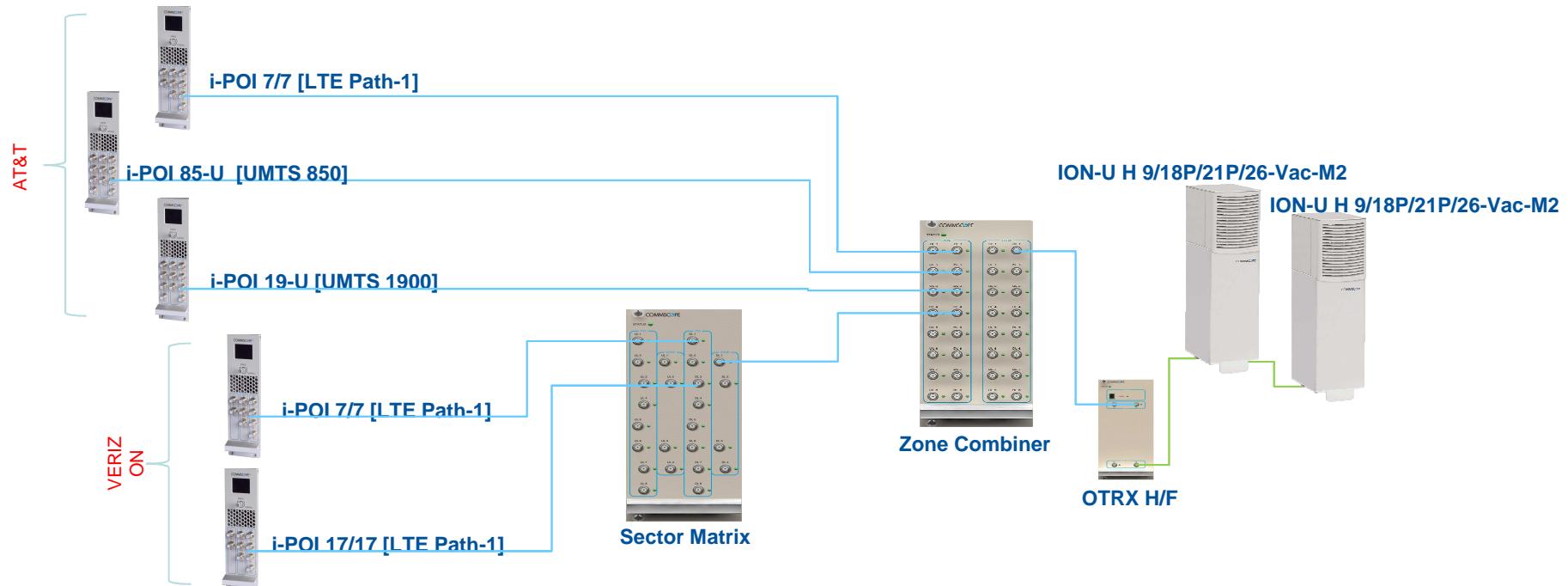
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Sector Matrix & Zone Combiner



ION-U HP Downlink Loss Diagram

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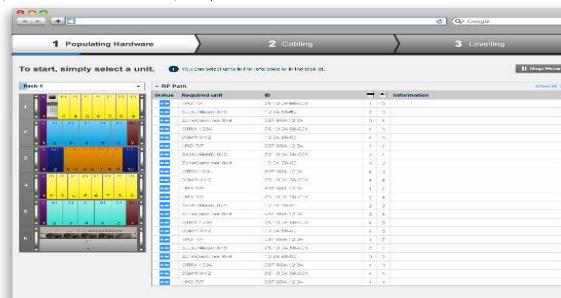
Building ION-U (Start to Finish)



*Required Input
*MMO isn't supported in current phase.

System Configuration Tool

Equipment List Report					
Project name:	xxx - Rev10				
Creation date:	dd/mm/yyyy				
Design company:	Commscope				
Designer:	xxz				
Type	Manufacturer	Model	IdentNum	Description	Qty
Module	Commscope	IPOI 19U	7634508-01	I-POI 1900 MHz band - U configuration	2
Module	Commscope	IPOI BU	7634510-00	I-POI 1900 MHz band - U configuration	2
Module	Commscope	IPOI 19D	7634511-00	I-POI 1900 MHz band - D configuration	2
Module	Commscope	IPOI BS	7634509-01	I-POI 1900 MHz band - S configuration	2
Module	Commscope	Sector Matrix	7653884-00	ION-U Sector Matrix B&B	2
Module	Commscope	Zone Combiner	7657752-00	ION-U Zone Combiner	2
Module	Commscope	OTRX-LP	7653870-00	ION-U OTTRX Low Power	5
Module	Commscope	PC - Standard	7643370-00	PC - Standard	1
Module	Commscope	SC	7643407-00	SC	5
Subrack	Commscope	IPOI Subrack	7643288-00	I-POI Sub-Rack w/o guidewalls	1
Subrack	Commscope	ION-U Subrack	7644783-00	ION-U Sub-Rack w/o dSMR backplane	3
Subrack	Commscope	Cable Tray	7654942-00		
Subrack	Commscope	POD	7644846-00		
Subrack	Commscope	PSU	7641608-01		
Subrack	Commscope	RMC	7637572		
Rack	Commscope	Rack-47U	7643312		
Cable	Commscope	19FPCM-CR 1 Meter	C195-CM001M-3H-AA		
Cable	Commscope	19FPCM-CR 2 Meter	C195-CM001M-3H-AA		
Remote Unit	Commscope	RU-LP	7638961-00		



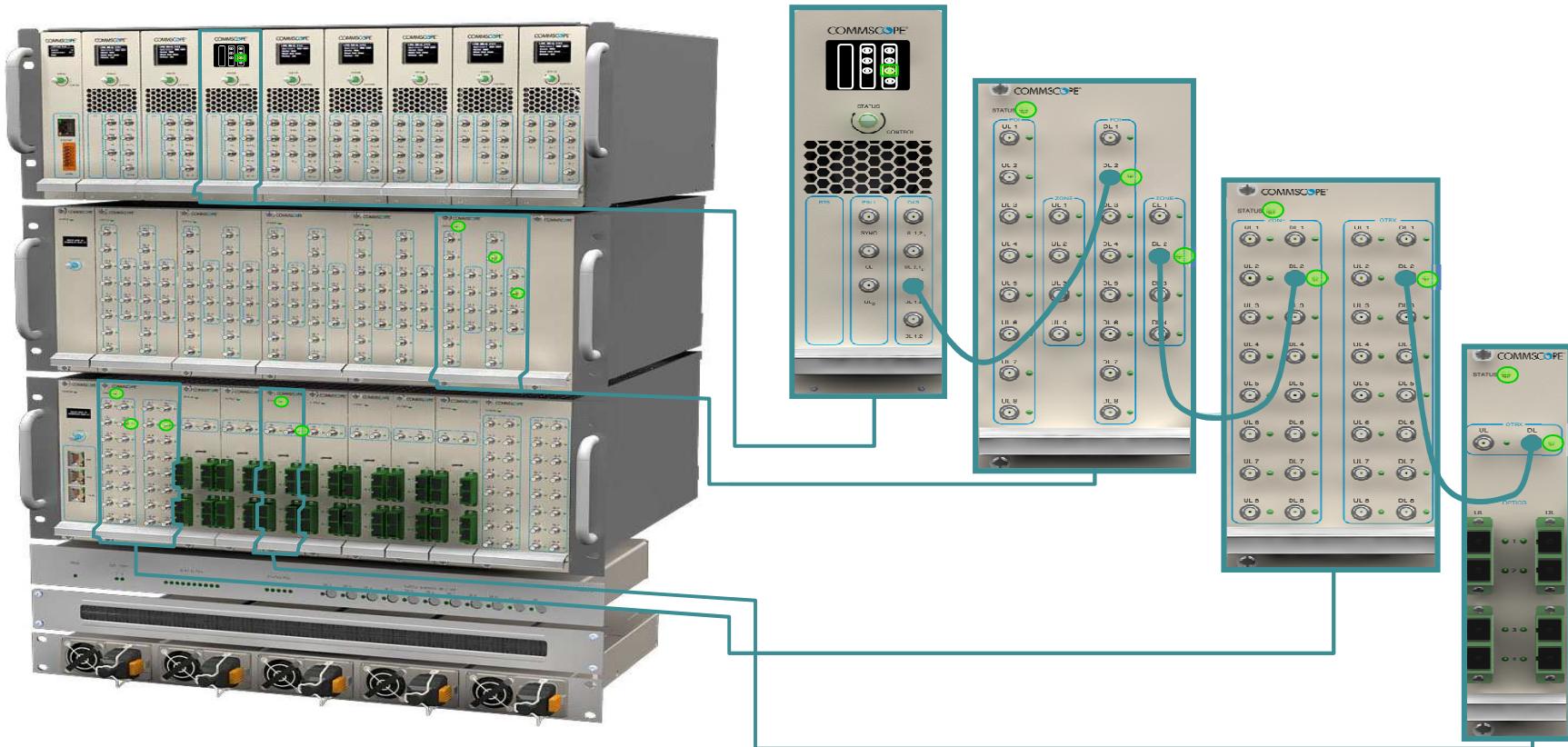
Commissioning Wizard



PRIVA

ION-U Features: Intra-Cabling Assist

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Commissioning Wizard Complete

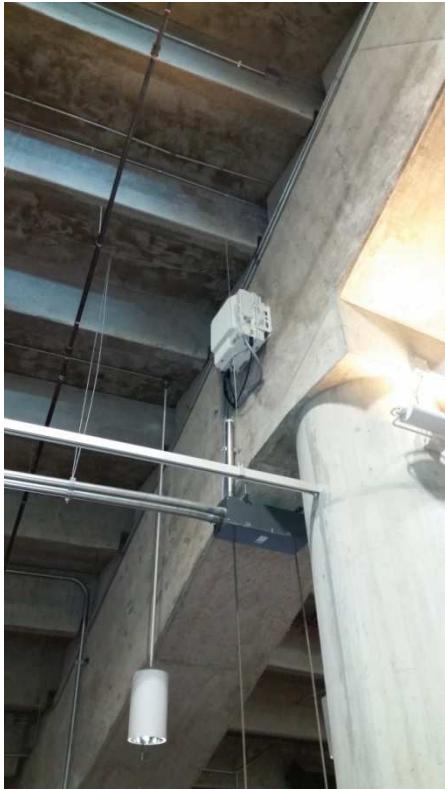
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System ready for Auto-Leveling

Remote Unit Install

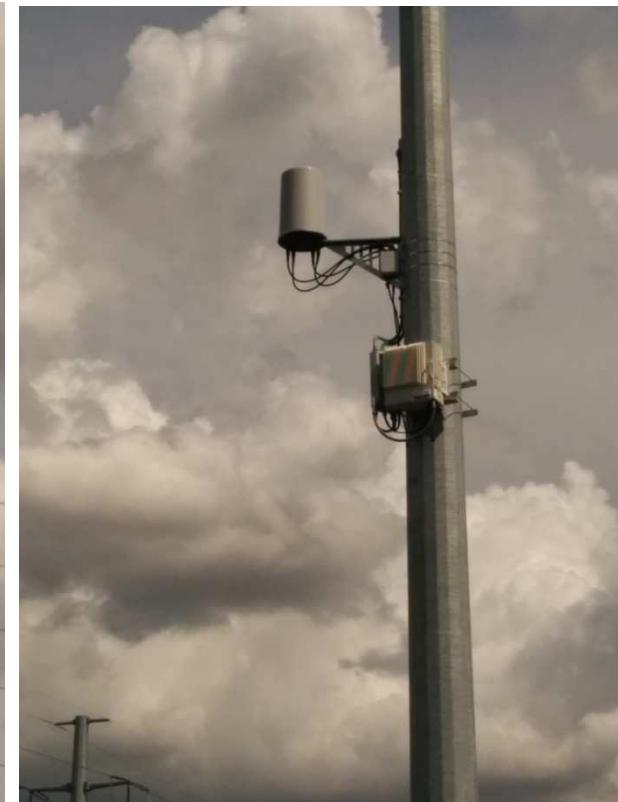
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ION-U Remote unit

Remote Unit Install

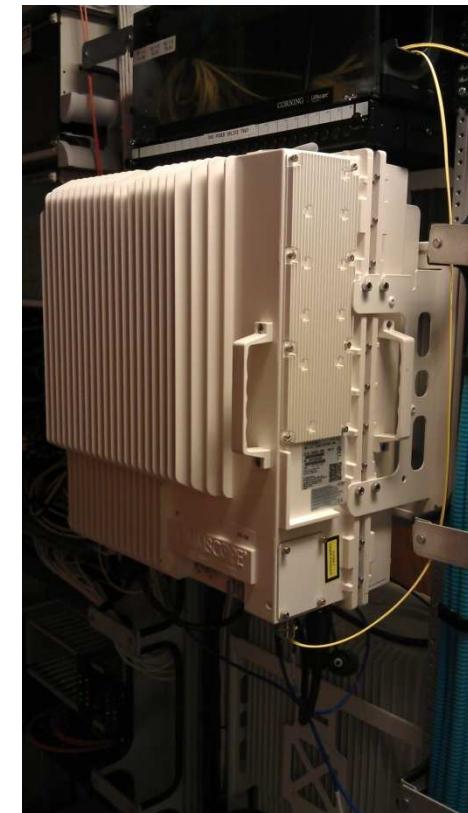
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ION-U Remote unit

Remote Unit Install

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ION-U Remote unit

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ION-E Product Overview

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Unified Wireless Infrastructure

Brings together licensed wireless, unlicensed Wi-Fi and power into one unified wireless infrastructure, scalable to building size, ultra flexible in technological ability and agnostic to frequency.

ION®-E is a UWI solution that utilizes standard IT infrastructure to support both wired *and* wireless networks.



What if..



- Enterprise DAS would mirror IT data network?
- DAS would be easy to install and commission?
- DAS would provide ultimate flexibility in traffic steering and expansion?
- DAS would be guaranteed to be free of PIM – forever?
- Support LTE advanced (Carrier Aggregation, etc)
- Support selection on MIMO interleaved SW (Matrix)

Simplicity



The ease with which a user can design, install, and maintain the system quickly and reliably.



• Design

- 380 – 2700 MHz operation for all hardware
- Simplified RF planning similar to WiFi
- Consistent performance across all frequencies
- Structured cable design rules. i.e. 100 meter Cat6A

• Installation

• Commissioning

• Maintenance

Simplicity



The ease with which a user can design, install, and maintain the system quickly and reliably.



- Design
- Installation
- Commissioning
- Maintenance

- IT based infrastructure
- Large Installer base
- Field termination
- Media that cannot create PIM

Simplicity



The ease with which a user can design, install, and maintain the system quickly and reliably.



- Design

- Installation

- Commissioning

- Maintenance

- Signal detection that is automatic
- System setup that is automatic
- Final commissioning steps may be performed remotely with minimal on-site presence

Simplicity



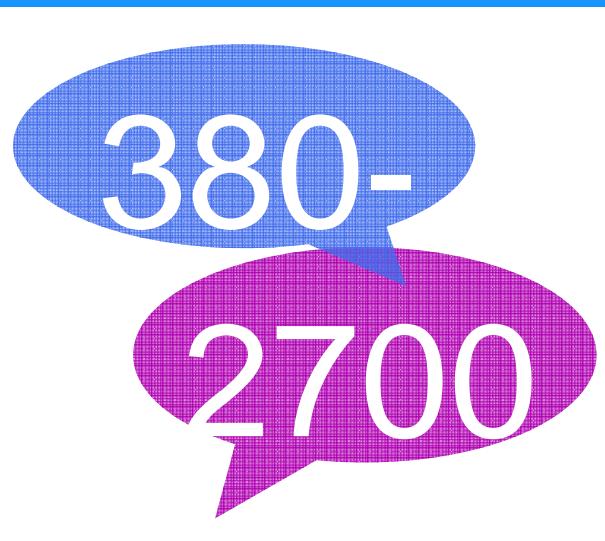
The ease with which a user can design, install, and maintain the system quickly and reliably.



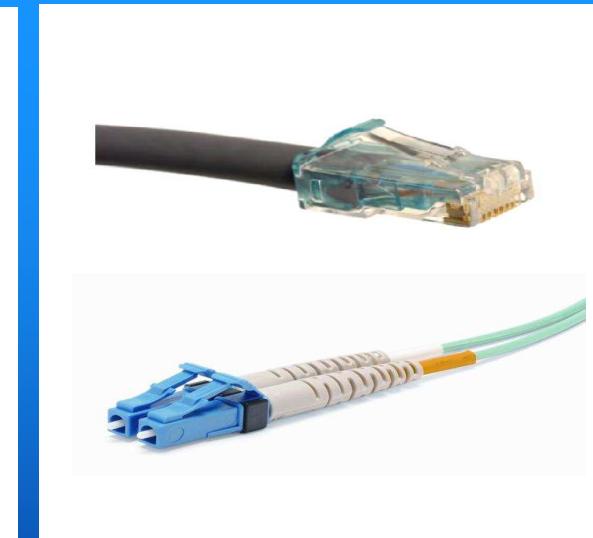
- Design
 - Installation
 - Commissioning
 - Maintenance
- Limited SKUs that are field replaceable units
 - Hot swap
 - Automatic detection and re-engage

3 Key Values

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2G 3G 4G
wi-fi



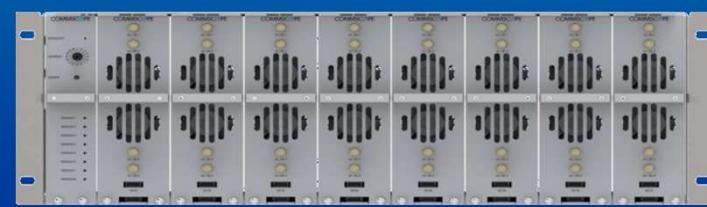
Frequency
Agnostic
From 380-2700 MHz

Multi-operator &
Multi-technology
TETRA | GSM (GPRS, EDGE) |
UMTS | LTE | 1000BASE-T

Standard IT
infrastructure
OM3/OM4 | LZ300/LZ550
OS1/OS2 | TeraSPEED
Class E_A/Cat 6A | GSX10D

Universal Hardware (4 items)

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- 12 common SKU used anywhere
- Interchangeable subracks
- Performance from 380 – 2700 MHz

ION-E System Components

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CAN

Central Area Node

- Signal source
- System control



TEN

Transport Expansion Node

- for extended distribution
- Remote power source for UAP
- Gigabit Ethernet transport



UAP

Universal Access Point

- All frequencies and all technologies
- Wireless plus Gigabit Ethernet applications
- Enhanced POE

e-POI Point of Interface

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- RF Attenuation of High Power Signals
- 8 e-POI Modules per Subrack
- 4 RF Ports per Module, 380 – 2700 MHz



RF Inputs to POI and Donor Card

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Module Location In Subracks

- All modules are wideband
- ePOI modules provide fixed 30 dB attenuation to four paths
- RF Donor module can accept 4 duplex or simplex connections



WCS-4 Wireless Communications Switch

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- 4U Subrack
- CAN or TEN, more common to use as CAN
- Supports 32 UAPs, PoE in left lower 4 slots
- Fill open slots with blank cards
- SUI optional in TEN, Required in CAN



WCS-2 Wireless Communications Switch

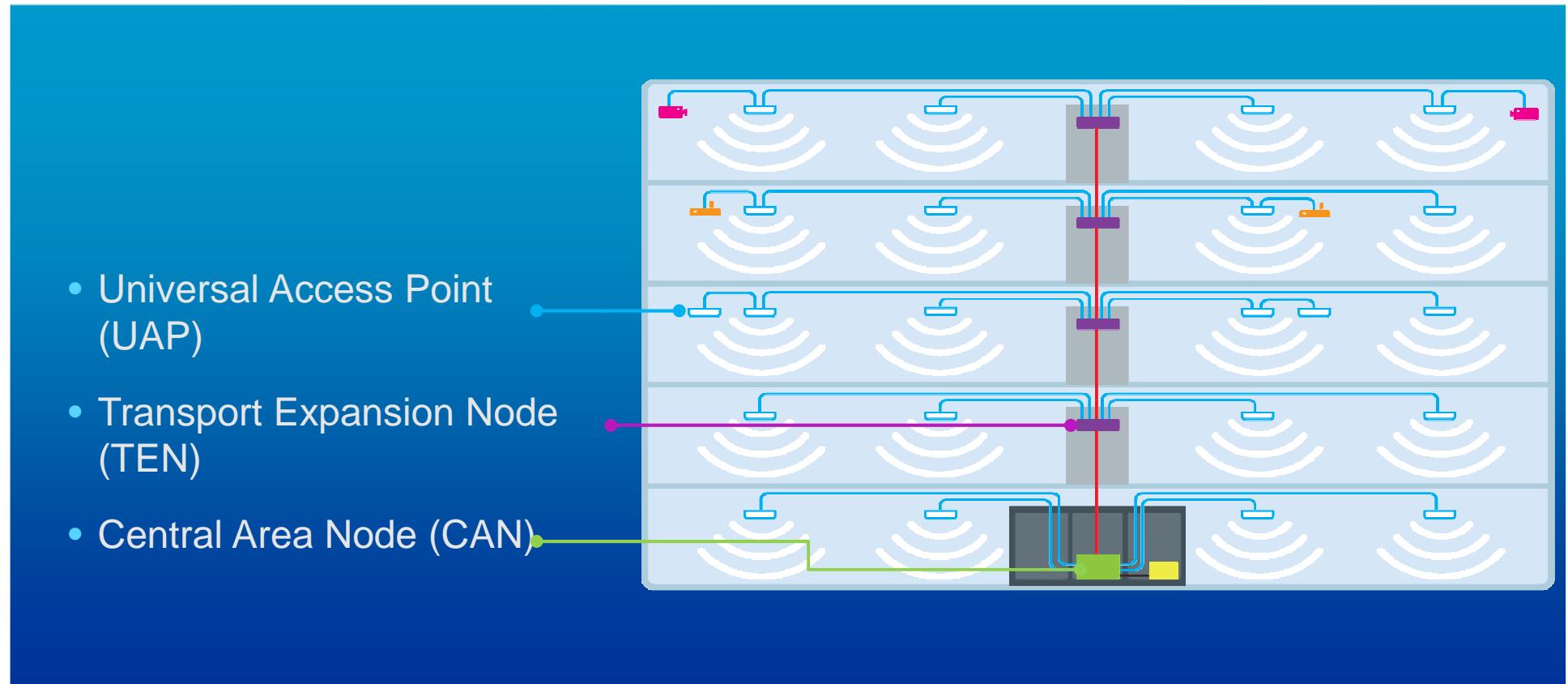
COMMSCOPE®

- 2U Subrack
- CAN or TEN, more common to use as TEN
- Supports 32 UAPs, PoE in left slots
- Fill open slots with blank cards
- SUI optional in TEN, Required in CAN



Simple Architecture

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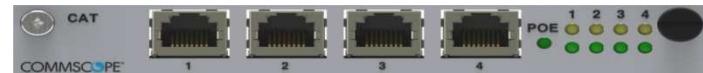
Universal Cards



RFD Interface to signal source
(QMA)



CAT Interface to UAP
(RJ-45)



OPT Interface between CAN/TEN
(LC)



SUI Interface to local/remote users
(RJ-45 & USB)



AUT Interface to 1G bypass
(RJ-45)



Universal Access Point (UAP)

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- One model to support 380 – 2700 MHz
- Integrated antenna – wall or ceiling mount
- Data and Enhanced PoE from CAN/TEN using Cat 6A



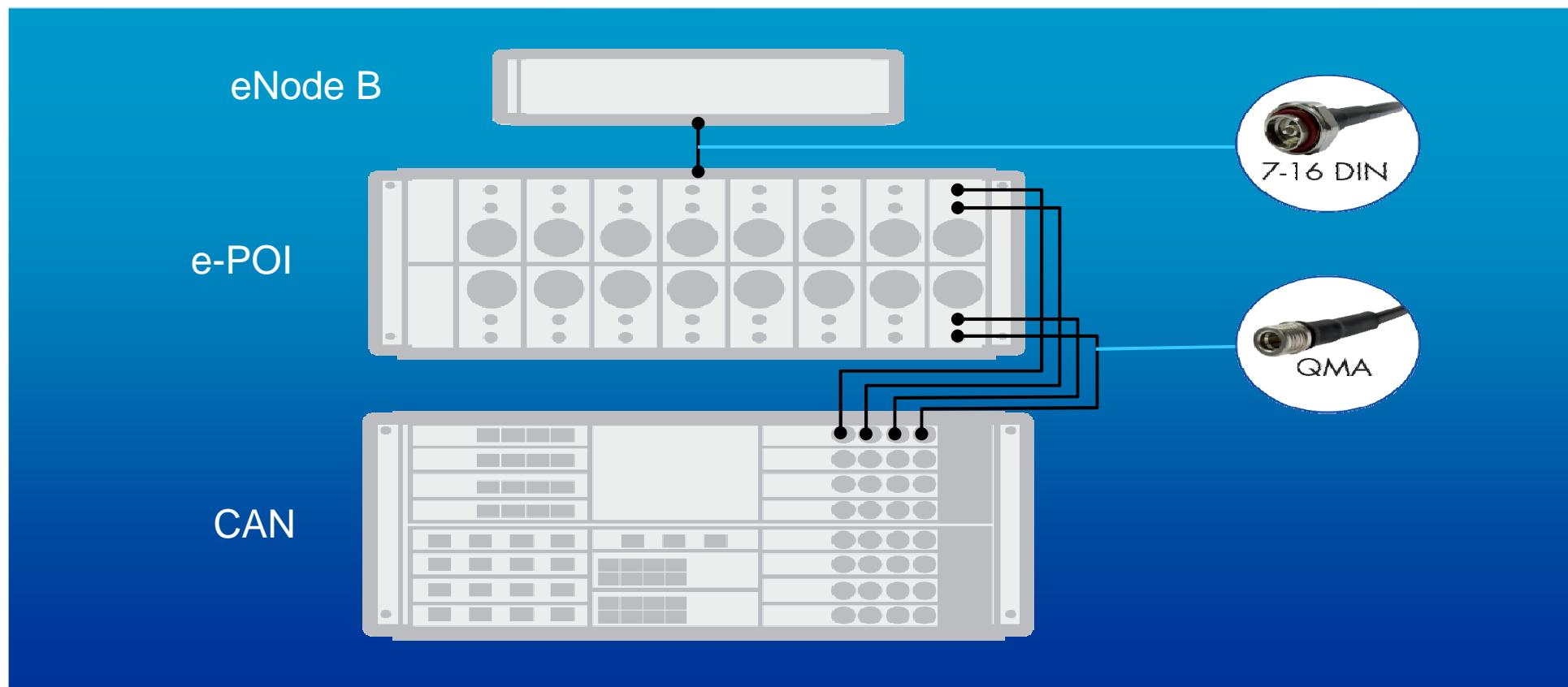
Power Supply Subrack and Modules



NAME	- Power Supply Unit
FUNCTION	Provides 12 VDC to subracks and 57 VDC to UAPs
HARDWARE	- 1U, 19" subrack 12 VDC module 57 VDC module (Up to 2 redundant) (Up to 2 redundant)

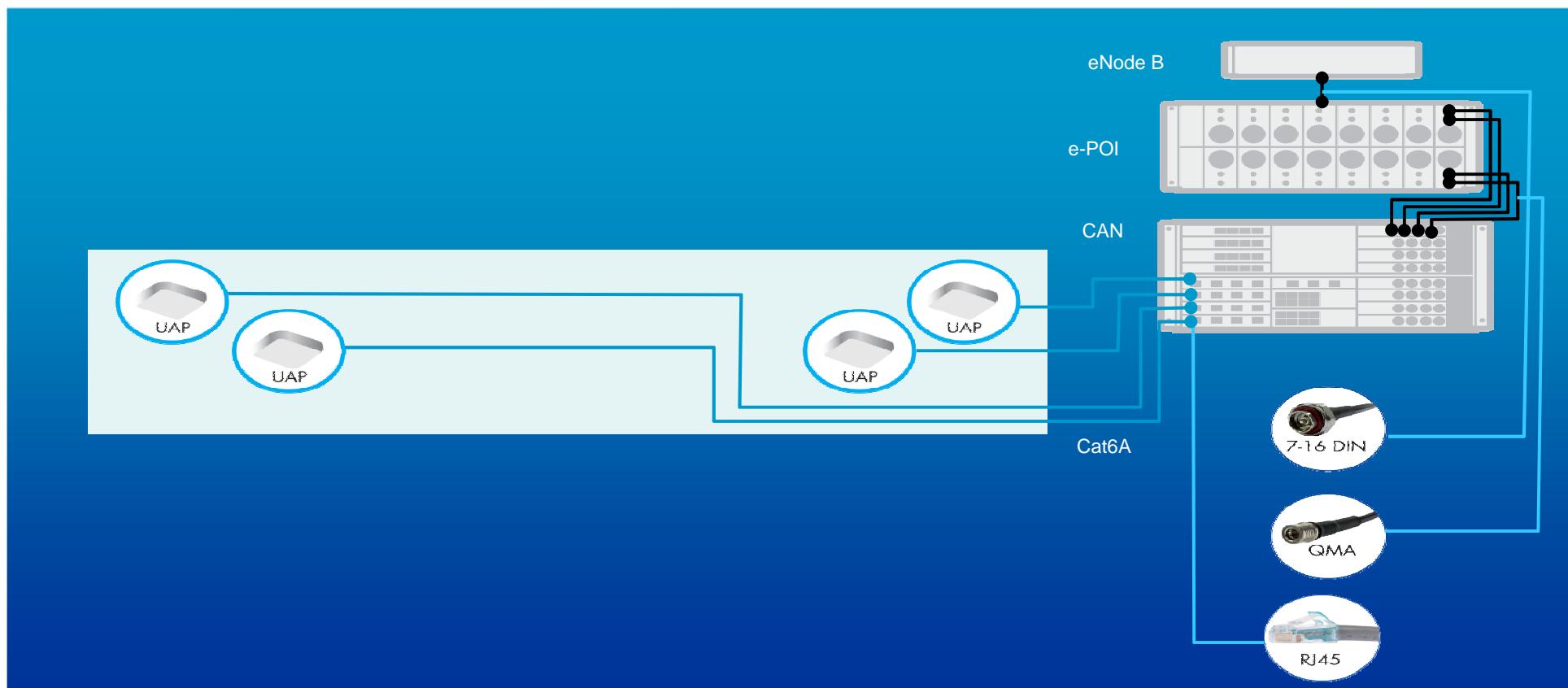
System Architecture: RF Connect

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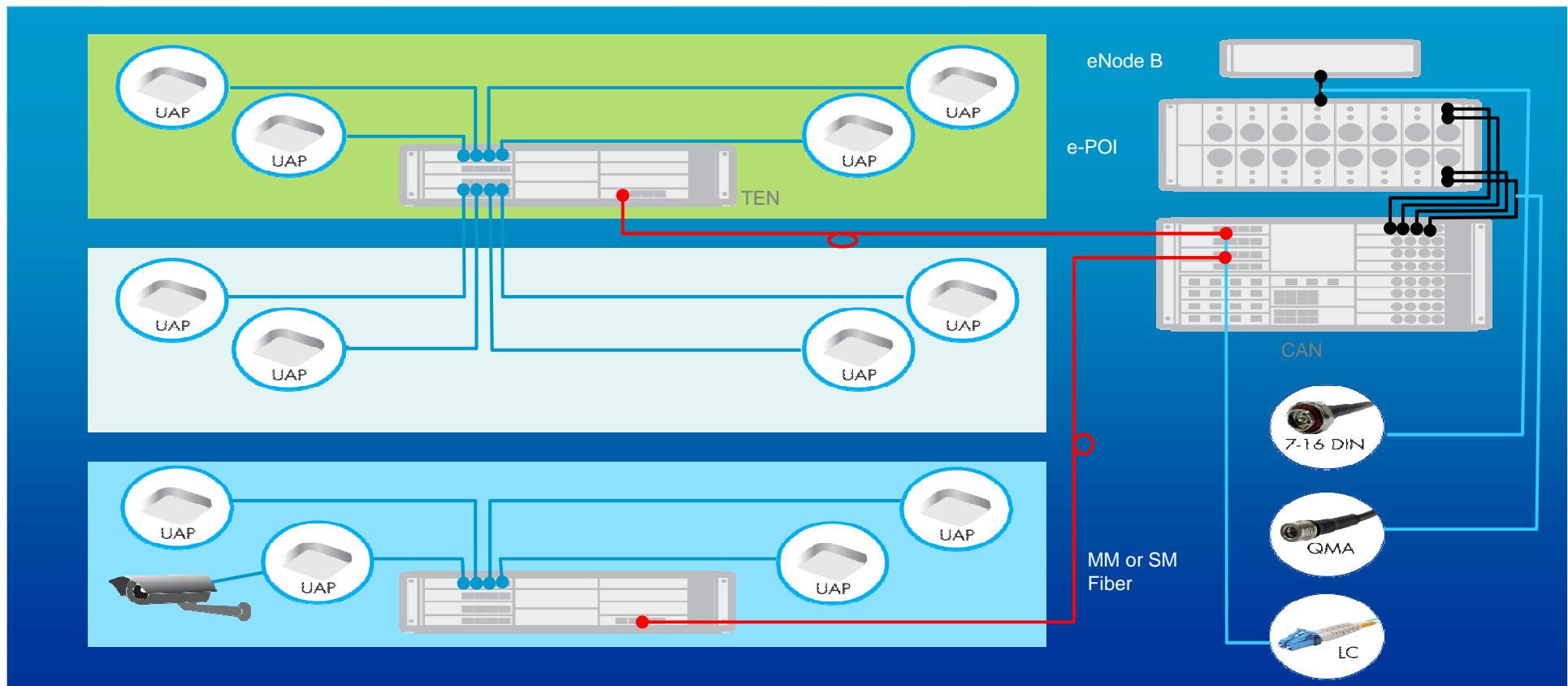
System Architecture: CAN to UAP

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Architecture: CAN to TEN to UAP

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Management / Alarm view

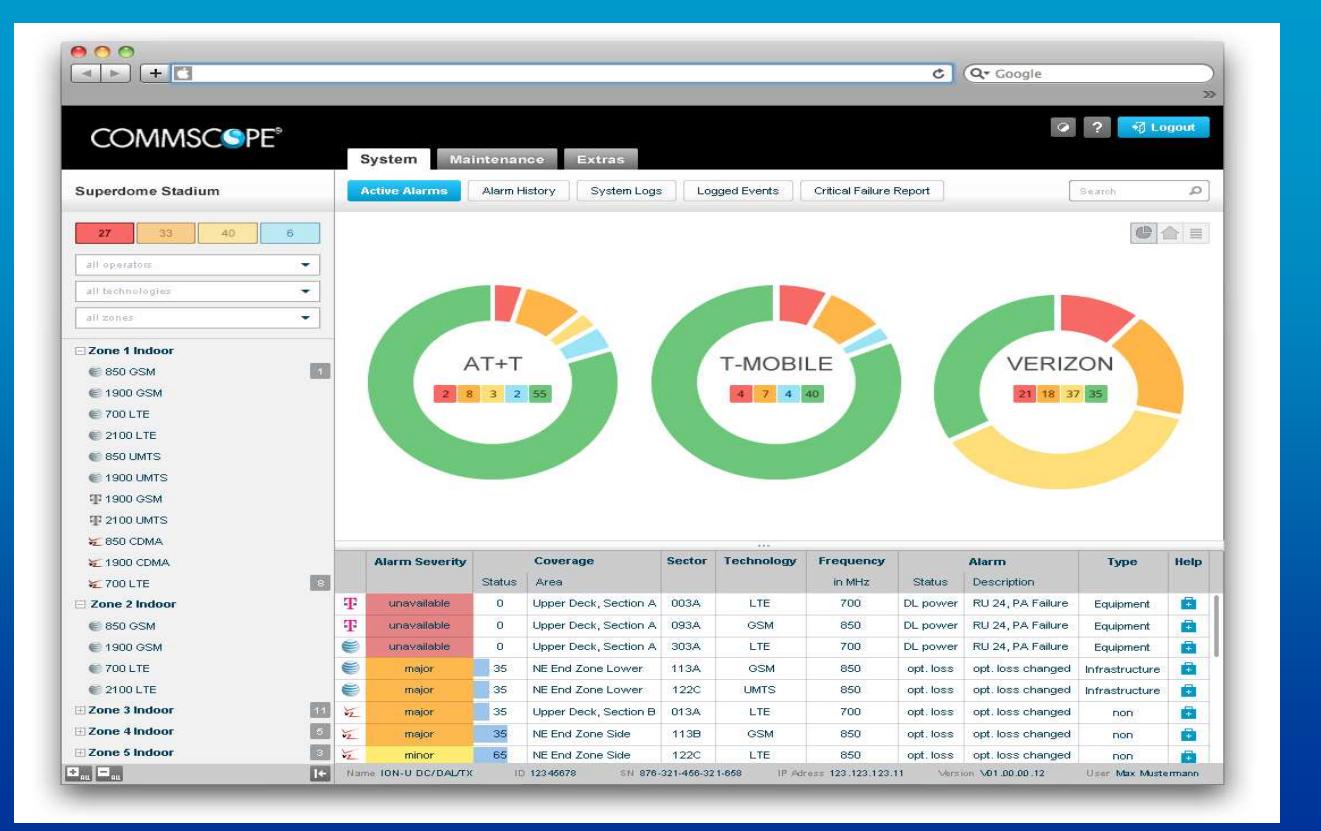
COMMSCOPE®

Multi-Operator
Support

Service Level
Alarming

End-to-End
Fault Detection

Parametric
Trend Analysis



How can we help you?

