

# Managing Your PoE Infrastructure with AIM

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CommScope

# What is AIM?

# Automated Infrastructure Management

# AIM Standards

**ISO/IEC 18598**

**CENELEC EN 50667**

**ANSI/TIA-5048**

**ISO/IEC 14763-2**

**ANSI/TIA-606B**

**ANSI/TIA-5017**

**BICSI 009-2019**

AIM Standard

AIM Standard

AIM Standard

Amendment 1

Addendum 1

Physical Network Security

DC Operations &

Maintenance Best Practices

# The Typical AIM System



Document cabling infrastructure



Automatic Detection of the insertion and removal of cords



Network Device Discovery and their location information



Real-time monitoring of connectivity changes

# AIM Documentation

## Circuit Trace Details

The screenshot displays the COMMSCOPE interface for a circuit trace. At the top, it shows 'Rack 1 → Rack 2' with a 'Change' button and a refresh icon. Below this is a network diagram with two server racks connected by a plus sign. The interface is divided into four main sections:

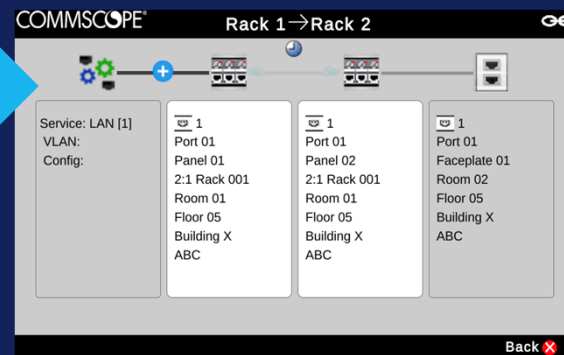
- Left Section:** Shows a green triangle icon, the date '2017-08-02', 'Device 01', 'IP: ...:17.88.0C:5A:5B', and 'PoE Class: Class 4'.
- Center-Left Section:** Lists details for Port 23: '23', 'Port 23', 'Panel 01', '2:1 Rack 001', 'Room 01', 'Floor 05', 'Building X', and 'ABC'.
- Center-Right Section:** Lists details for Port 20: '20', 'Port 20', 'Panel 01', '2:1 Rack 001', 'Room 01', 'Floor 05', 'Building X', and 'ABC'.
- Right Section:** Shows a green lightning bolt icon, the date '2017-07-31', 'Service: Voice', 'VLAN: 114', 'Config: 2.5G', and 'PoE Information: 60 (W), Type 3, 8.56 W Static'.

A blue bar at the bottom of the interface reads 'Current Connection: Rack 1 Panel 1 Port 23'. The COMMSCOPE logo is visible at the bottom center.



# AIM Documentation

## Work Order Tracking



# AIM Documentation

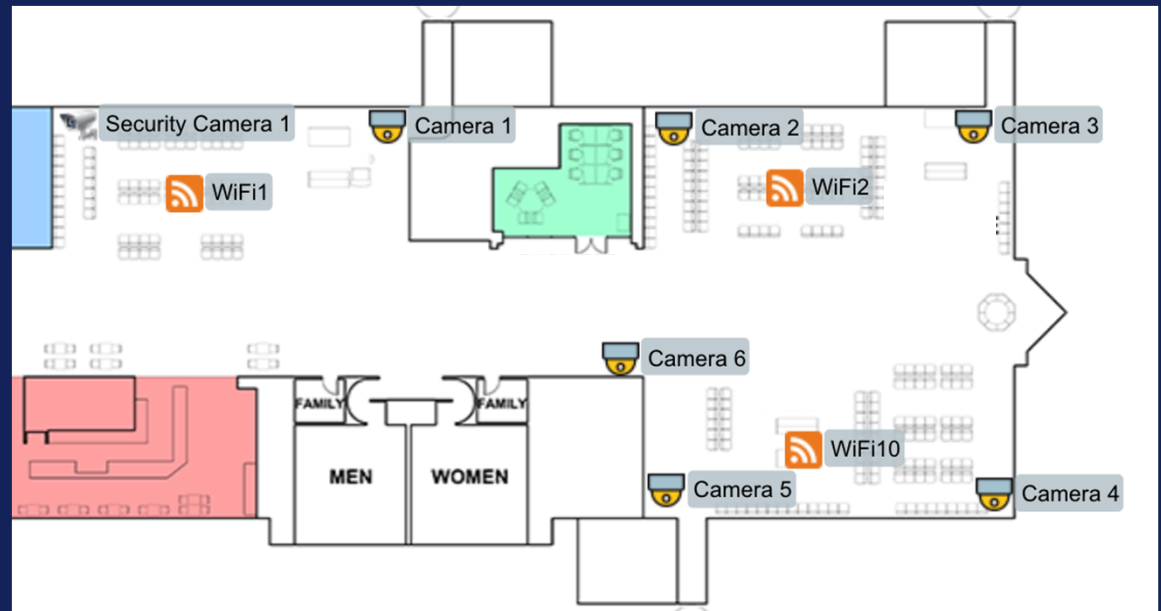
## Device Location & Mapping





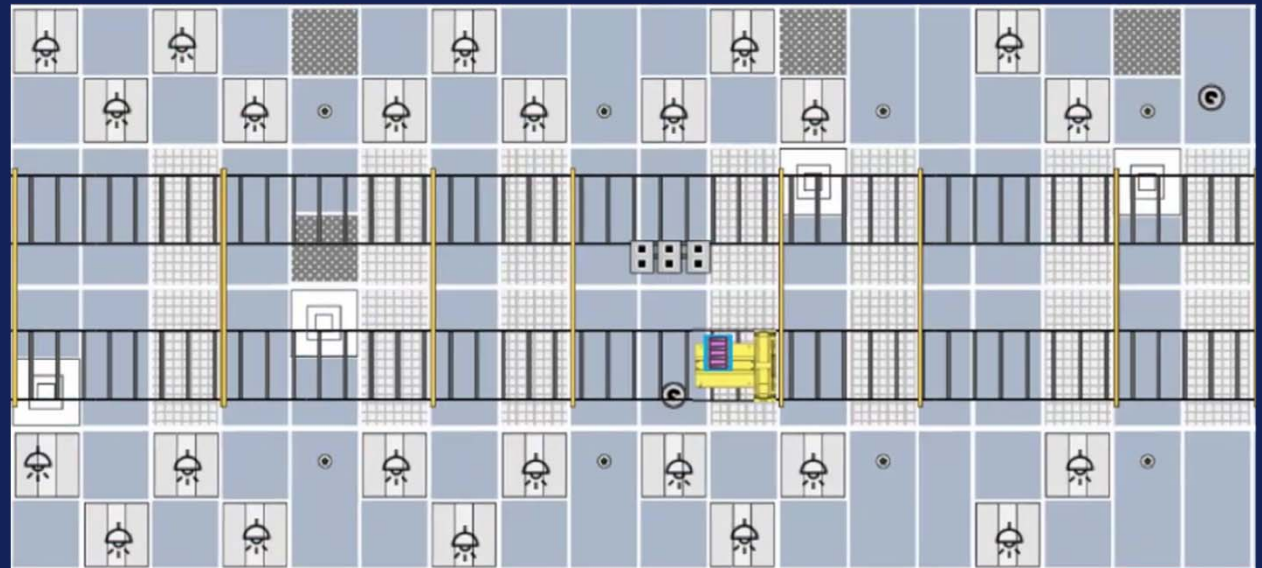
# AIM Documentation (option B)

## Device Location & Mapping



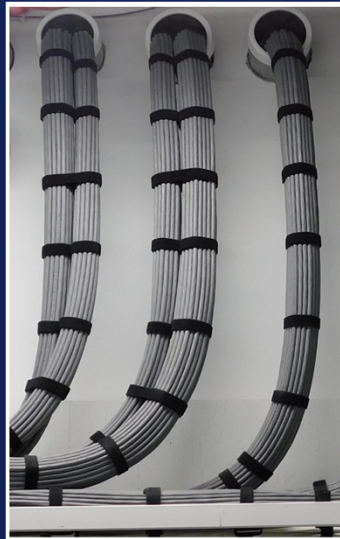
# AIM Documentation (option C)

Device Location & Mapping



# AIM Documentation

## PoE Information for Cable Bundles

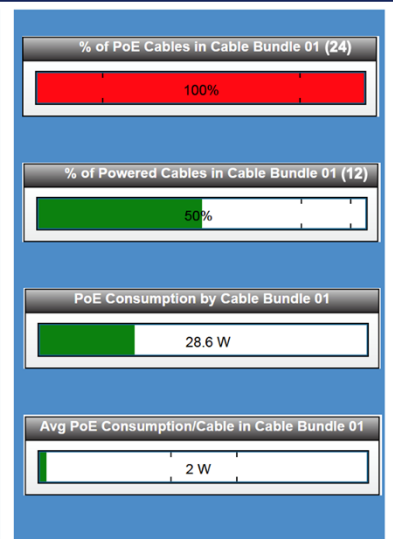


% of Cables Connected to PSE ports in a Bundle

% of Powered Cables in a Bundle

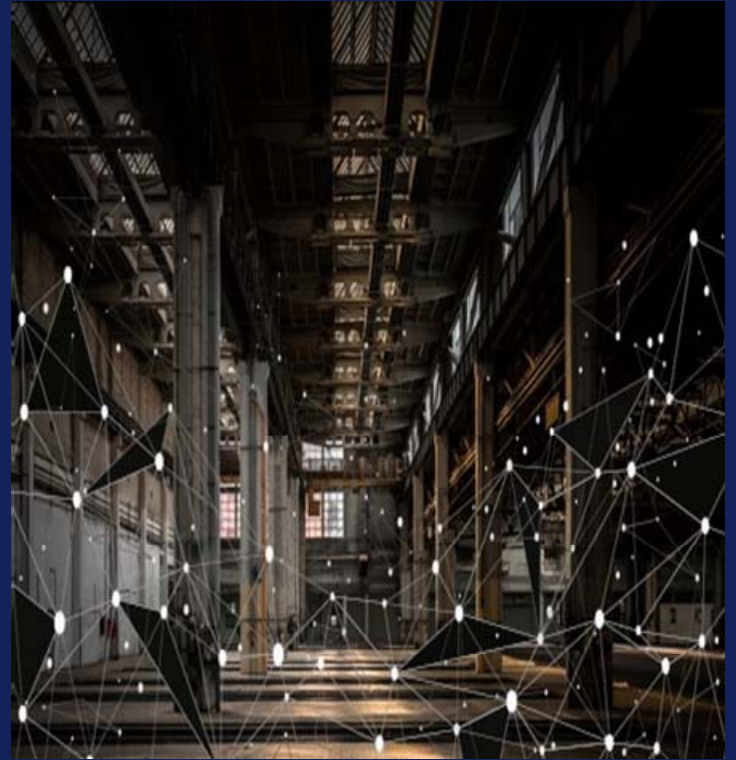
PoE Usage by Bundle (W)

Average PoE Usage per Cable in a Bundle (W)



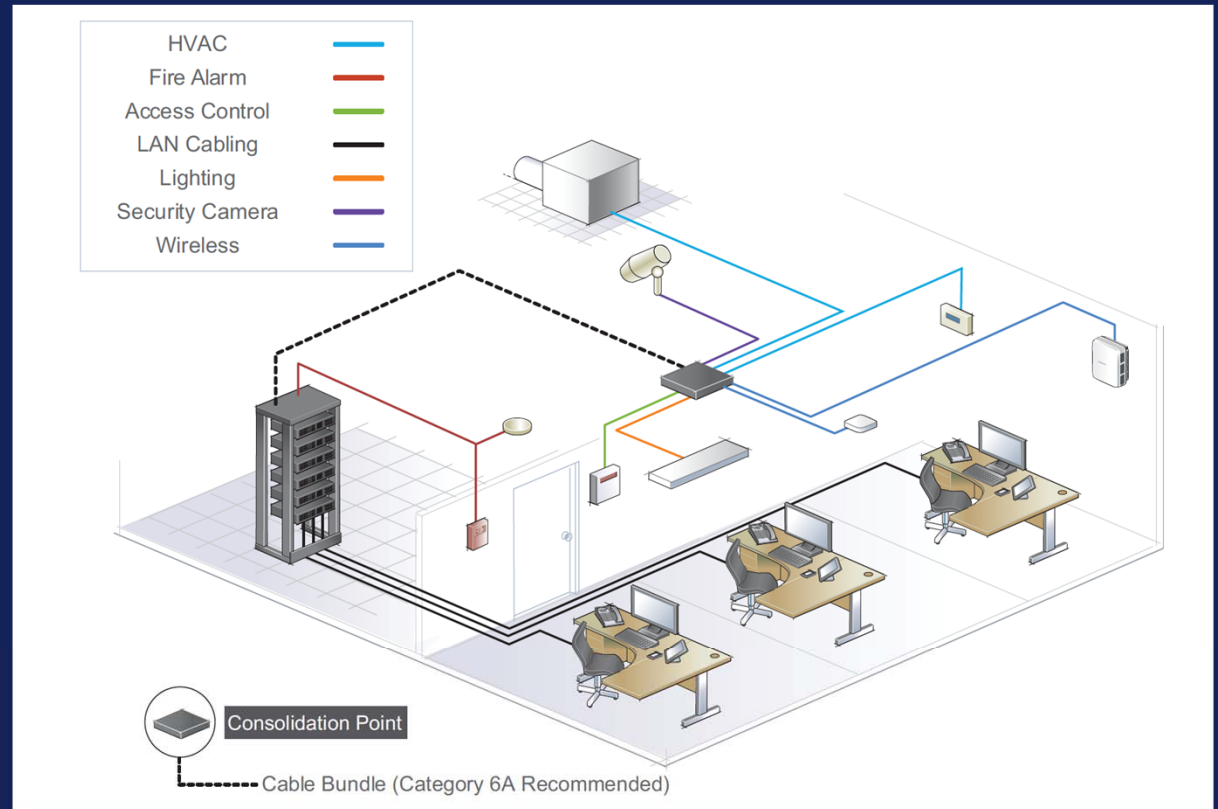
# AIM Documentation

Future Applications






















# PoE Today

# PoE Design



# Evolution of PoE

<p>Up To <b>15.4</b> Watts</p>	<p>Standard: IEEE 802.3af, Type 1 (2002), 2-Pair PoE</p>	<div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;">  Thin Clients         </div> <div style="text-align: center;">  Biometric Access Control         </div> <div style="text-align: center;">  802.11n Wireless         </div> </div>
<p>Up To <b>30</b> Watts</p>	<p>Standard: IEEE 802.3at Type 2 (2009), 2-Pair PoE+</p>	<div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;">  Card Readers         </div> <div style="text-align: center;">  PTZ IP Cameras         </div> <div style="text-align: center;">  Alarm Systems         </div> <div style="text-align: center;">  VOIP Phones         </div> <div style="text-align: center;">  Lighting         </div> </div>
<p>Up To <b>60</b> Watts</p>	<p>Standard: Cisco Proprietary (2011), 4-Pair UPoE, IEEE 802.3bt Type 3 (2017), 4-Pair PoE</p>	<div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;">  Access Controls         </div> <div style="text-align: center;">  Laptops         </div> <div style="text-align: center;">  POS Readers         </div> <div style="text-align: center;">  PTZ IP Cameras         </div> <div style="text-align: center;">  Nurse Call         </div> <div style="text-align: center;">  802.11ac Wireless         </div> <div style="text-align: center;">  Kiosk Displays         </div> </div>
<p>Up To <b>90</b> Watts</p>	<p>Standard: Power Over HDBASE-T (2011), 4-Pair POH IEEE 802.3bt Type 4 (2016-2017), 4-Pair PoE</p>	<div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;">  Desktop Computers         </div> <div style="text-align: center;">  Televisions         </div> <div style="text-align: center;">  Video Conferencing         </div> <div style="text-align: center;">  High Power Wireless         </div> </div>

# Ethernet Convergence

Global Market  
CAGR (2019-25)  
**>15%**

APAC Market  
CAGR (2019-25)  
**20%**

## Market Share By 2025

PSE and Device  
Segment

**>40%**

IoT Connectivity  
Application

**>30%**

Industrial POE  
Solution Market

**20%**

Global Market  
Share (2018)

**>\$700M**

CAGR (2019-25)

**>15%**

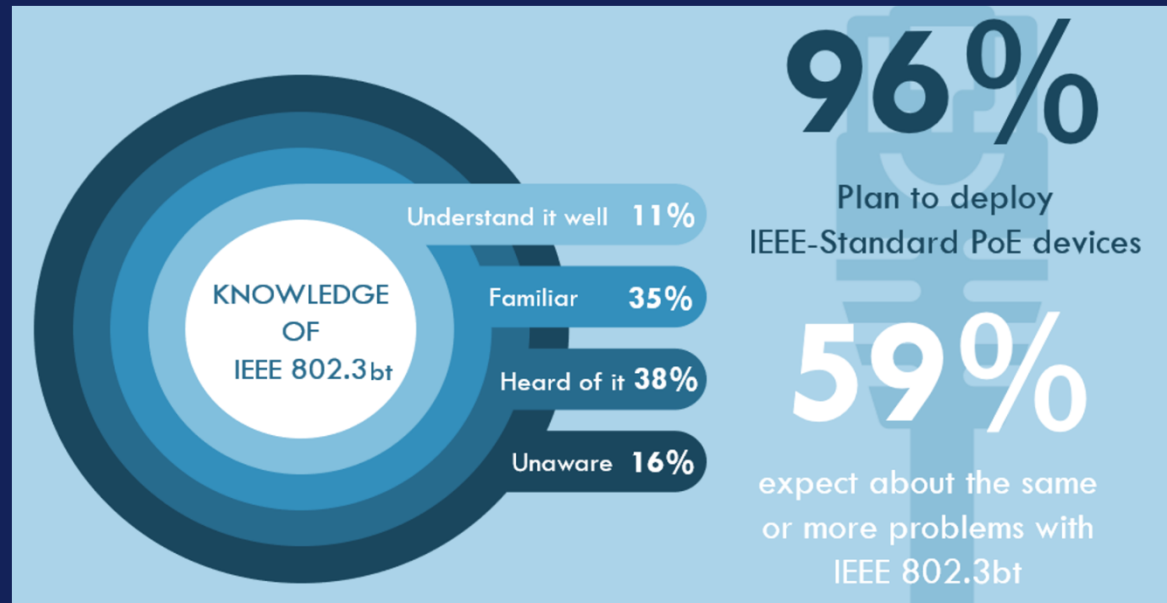
Global Market  
Share By 2025

**>\$2B**



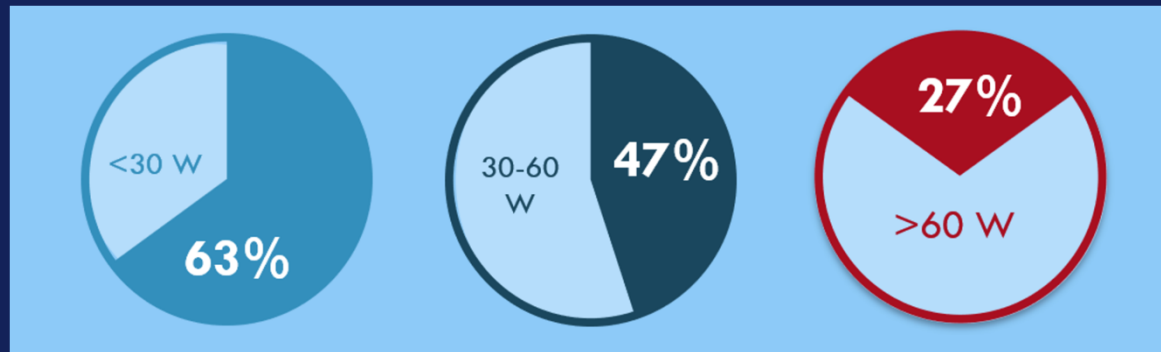
# Ethernet Alliance - PoE Survey

Familiarity with IEEE 802.3bt



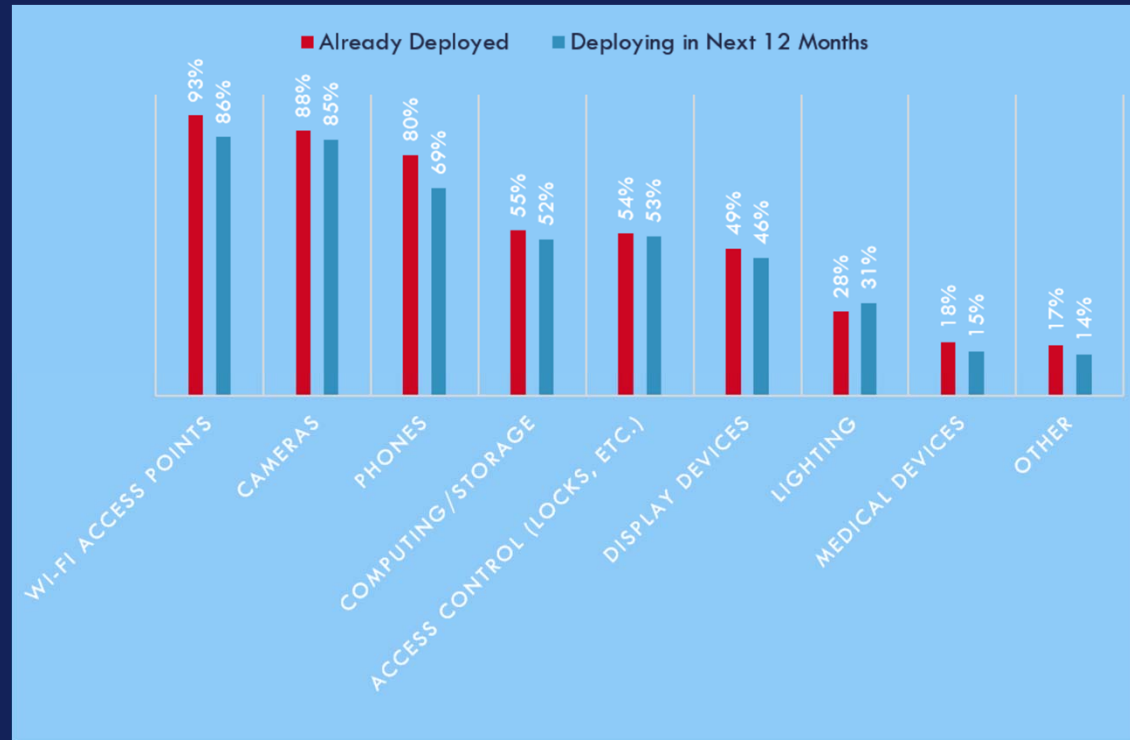
# Ethernet Alliance - PoE Survey

Plans for deploying PoE by power level



# Ethernet Alliance - PoE Survey

## PoE Device Deployment



# Ethernet Alliance - PoE Survey

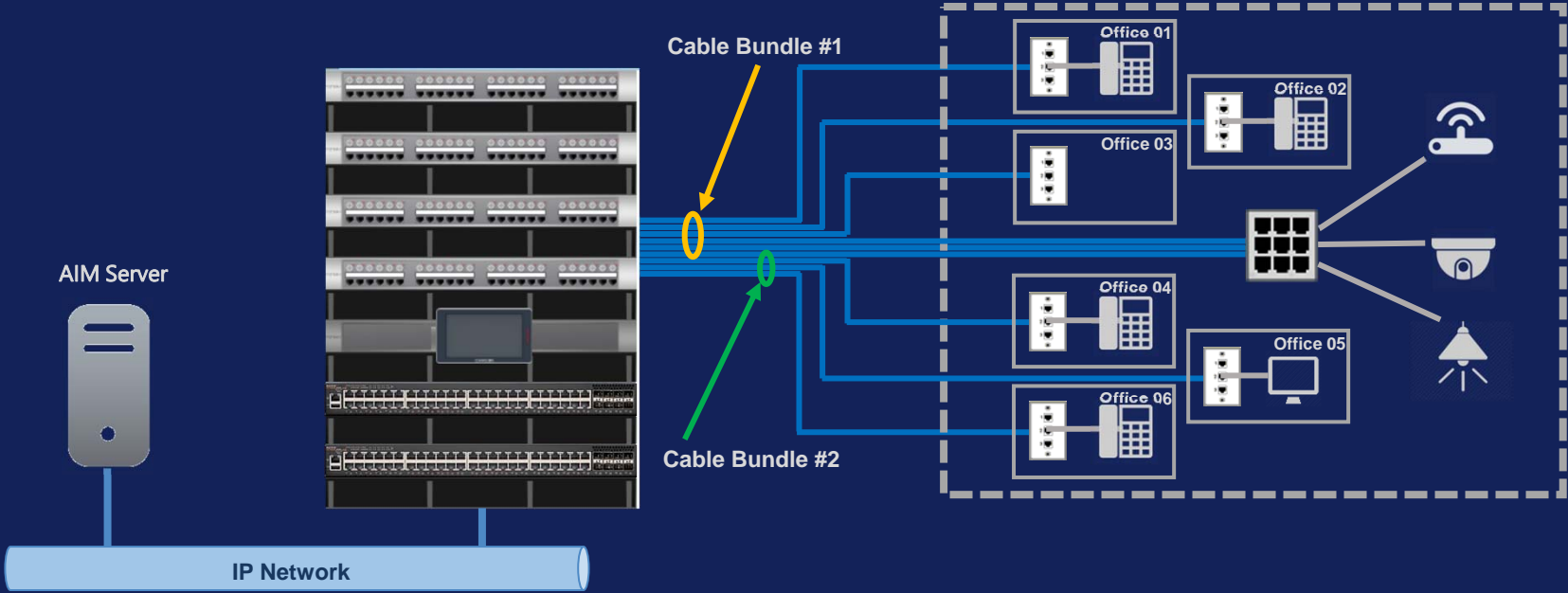
4 out of 5 report having problems with PoE devices



# AIM + PoE

# AIM Systems & PoE

ISO/IEC 18598 – amendment 1 (adopted as ANSI/TIA-5048-1)



# PoE Data From Switches

*In line with TIA/EIA 606C*

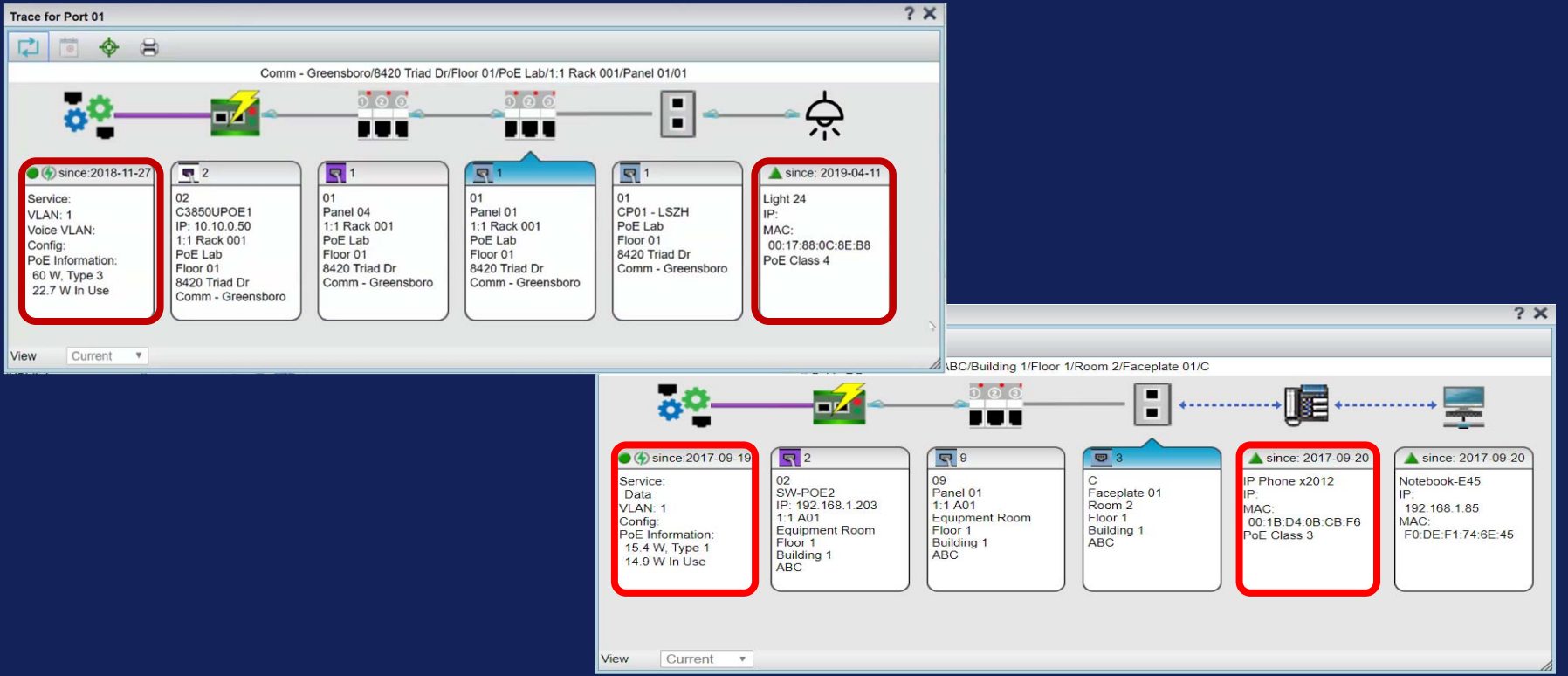


- PoE Capable (PS)
- PoE Type
- PoE Ports
- Ports with PoE In Use
- PoE Total Capacity (W)
- PoE Allocated Capacity (W)

Position	Port Status
1	Available
2	Available
3	Available
4	Available
...	...
20	Available
21	Available
22	Available

Port /Link Status	PoE Status
Enabled (link Up)	in use
Enabled (link Up)	not in use
Enabled (link Up)	disabled
Enabled (link down)	not in use
Enabled (link down)	disabled
Disabled	Not in Use
Disabled	disabled

# Add Cabling Information





# Impacts to Cable Operating Temp

ISO/IEC TR 29125 and TIA-184A provide thermal models and cable bundling guidelines:

**Max Recommended Bundle Size = 24 cables (worst case)**

**Worst case is based on:  
AWG 24 in a conduit**

$T_{\text{ambient}} = 45^{\circ}\text{C}$

$I_{\text{conductor}} = 0.48\text{A}$



$T_{\text{ambient}}$



Wire size (AWG)



Cable Diameter



Cable Bundle Size

## Installation Conditions



Open Air



Support Tray



Open Conduit



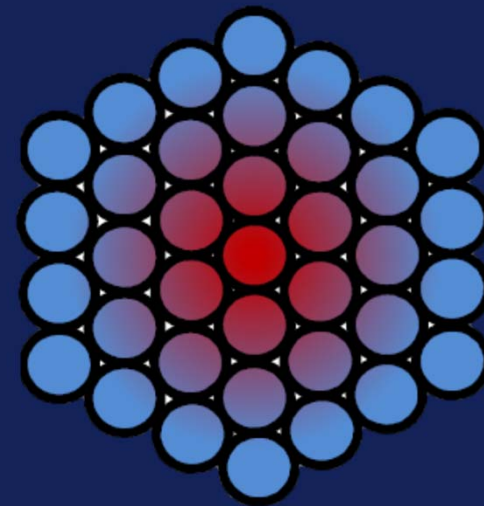
Conduit  
w/Sealed Ends

# Heat Dissipation

Heat generated in cable =  $I^2 \times R$

Increased temperature of installed cables will increase channel attenuation/insertion loss

Increased temperature may exceed the specified operating temperature



# Tracking Cable Bundles

In line with TIA/EIA 606C

The screenshot displays the COMMSCOPE imVision System Manager interface. The left sidebar shows a hierarchical tree view of the network structure, with '1S044' selected under '2601 Telecom Parkway'. The main area features a table with the following data:

Bundle ID	Number of Cables	Number of PoE Cables	PoE Consumption (W)	PoE Allocated (W)	Highest PoE Type
CB001	13	2	6.5	21.5	15.4 W, Type 1
CB002	23	0	0.0	0.0	

Below the table, a 'Properties' panel is visible, showing details for the selected bundle (1S044):

- Name: 1S044
- Zone Mode: Multiple Zones
- Contact: (empty)
- Description: (empty)

A red box highlights a network icon in the bottom toolbar.

- Bundle ID
- Number of Cables
- Number of Cables delivering PoE
- PoE Consumption
- PoE Allocated
- PoE Type

# In line with TIA/EIA 606C PoE in Cable Bundles

COMMSCOPE imVision® System Manager

Site Manager Administration Tools Reports

admin Log Out

Search Site Manager

1S044 (Richardson TX/ART Facility/2601 Telecom Parkway/1st Floor)

Bundle ID	Number of Cables	Number of PoE Cables	PoE Consumption (W)	PoE Allocated (W)	Highest PoE Type
CB001	13	2	6.5	21.5	15.4 W, Type 1

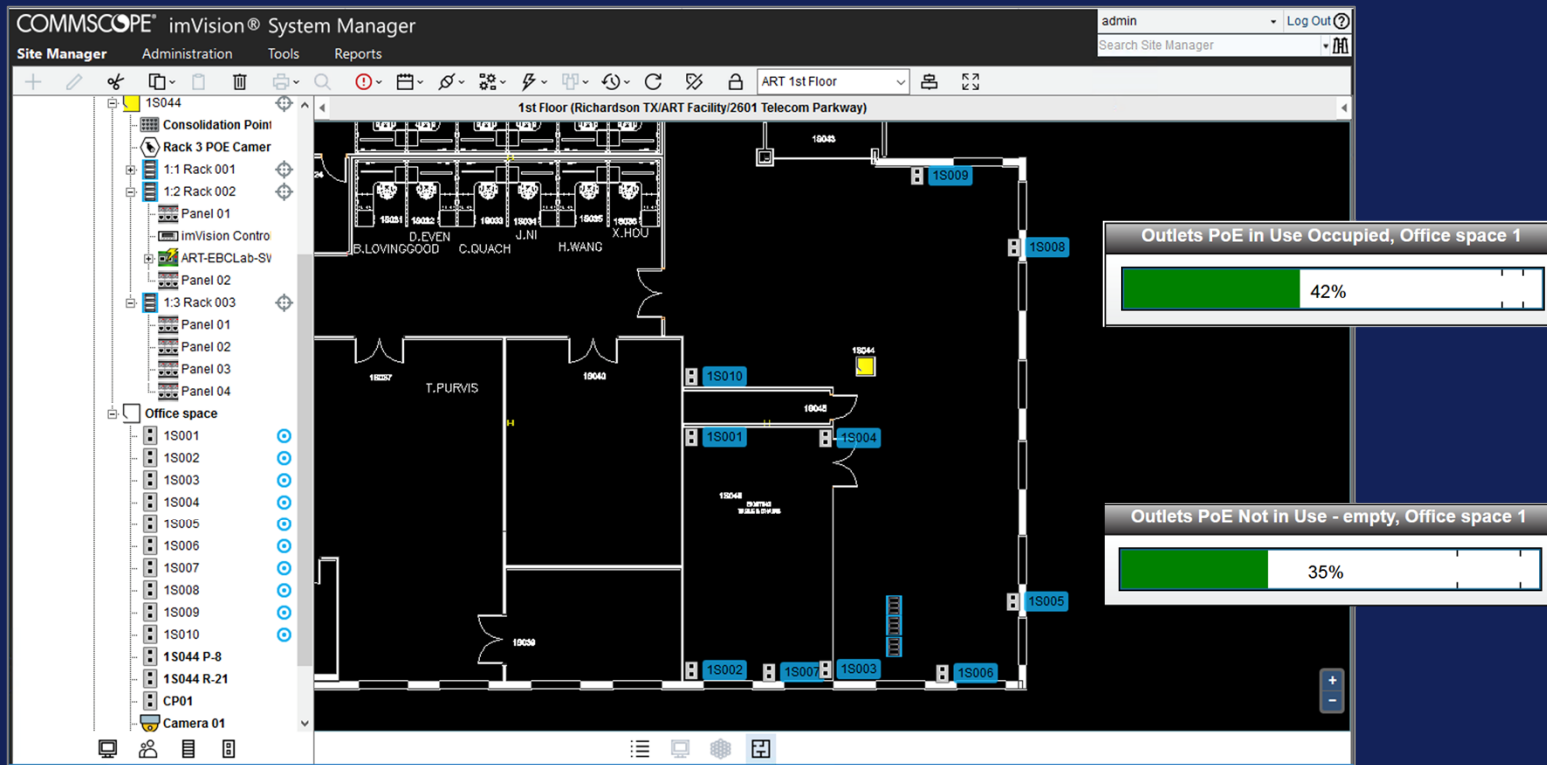
Cable Bundle Details for CB001 - Mozilla Firefox

imvisionsm.commscope.com/SystemManager/Aspx/cablingbundledetail.aspx?bundleid=1&bundlename=Q0lwMDE=&userid=2

Rack	Panel	Port	PoE Consumption	PoE Allocated	PoE Type	Switch IP	Device Name	Cabled To
1:2 Rack 002	Panel 02	13				---	---	Office space/1S001/A
1:2 Rack 002	Panel 02	14				---	---	Office space/1S002/01
1:2 Rack 002	Panel 02	15				---	---	Office space/1S003/01
1:2 Rack 002	Panel 02	16				---	---	Office space/1S004/01
1:2 Rack 002	Panel 02	17				---	---	Office space/1S005/01
1:2 Rack 002	Panel 02	18				---	---	Office space/1S006/01
1:2 Rack 002	Panel 02	19				---	---	Office space/1S007/01
1:2 Rack 002	Panel 02	20				---	---	Office space/1S008/01
1:2 Rack 002	Panel 02	21				---	---	Office space/1S009/01
1:2 Rack 002	Panel 02	22				---	---	Office space/1S010/01
1:2 Rack 002	Panel 02	23	3.5	6.1	15.4 W, Type 1	10.61.190.35	Phone 01	Office space/1S044 P-8 /01
1:2 Rack 002	Panel 02	24	3.0	15.4	15.4 W, Type 1	10.61.190.35	Camera 01	Office space/CP01/01
1:2 Rack 002	Panel 02	25				---	---	Office space/1S044 R-21/A

- Panel/Port
- PoE Consumption
- PoE Allocation
- PoE Type
- Switch IP
- Device name
- Cable end Location

# PoE Availability on Outlets



# AIM + PoE =

- Enables PoE status tracking of cable bundles
- Generate summary reports to assist inspectors with assessment of installation safety
- Location based PoE capacity management
- Future proofed infrastructure

Questions?  
Please contact:

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