

Designers Lighting Forum

PoE Lighting in Smart Building Design

By:

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Questions related to specific materials, methods, and services will be addressed at the conclusion of this presentation.



Learning Objectives

At the end of this course, participants will be able to:

1. Attendees will be able to describe the differences between PoE and line voltage lighting with regards to safety, controls, IoT, and sustainability.
2. Attendees will be able to critically evaluate the cyber security implications of a PoE lighting infrastructure.
3. Attendees will be able to identify and complete a basic layout of the components of a PoE lighting system, including PSE, Ethernet cable, PD device, fixtures, power supply, and switches.
4. Attendees will understand how PoE technology enables a smart building ecosystem.



PoE Smart Building Capabilities

In a smart building, a PoE system not only powers and automates devices, but can receive sensor-based energy consumption data across multiple systems. (A Connected System).

Connected systems gives owners and managers a 360 view to manage buildings more efficiently.

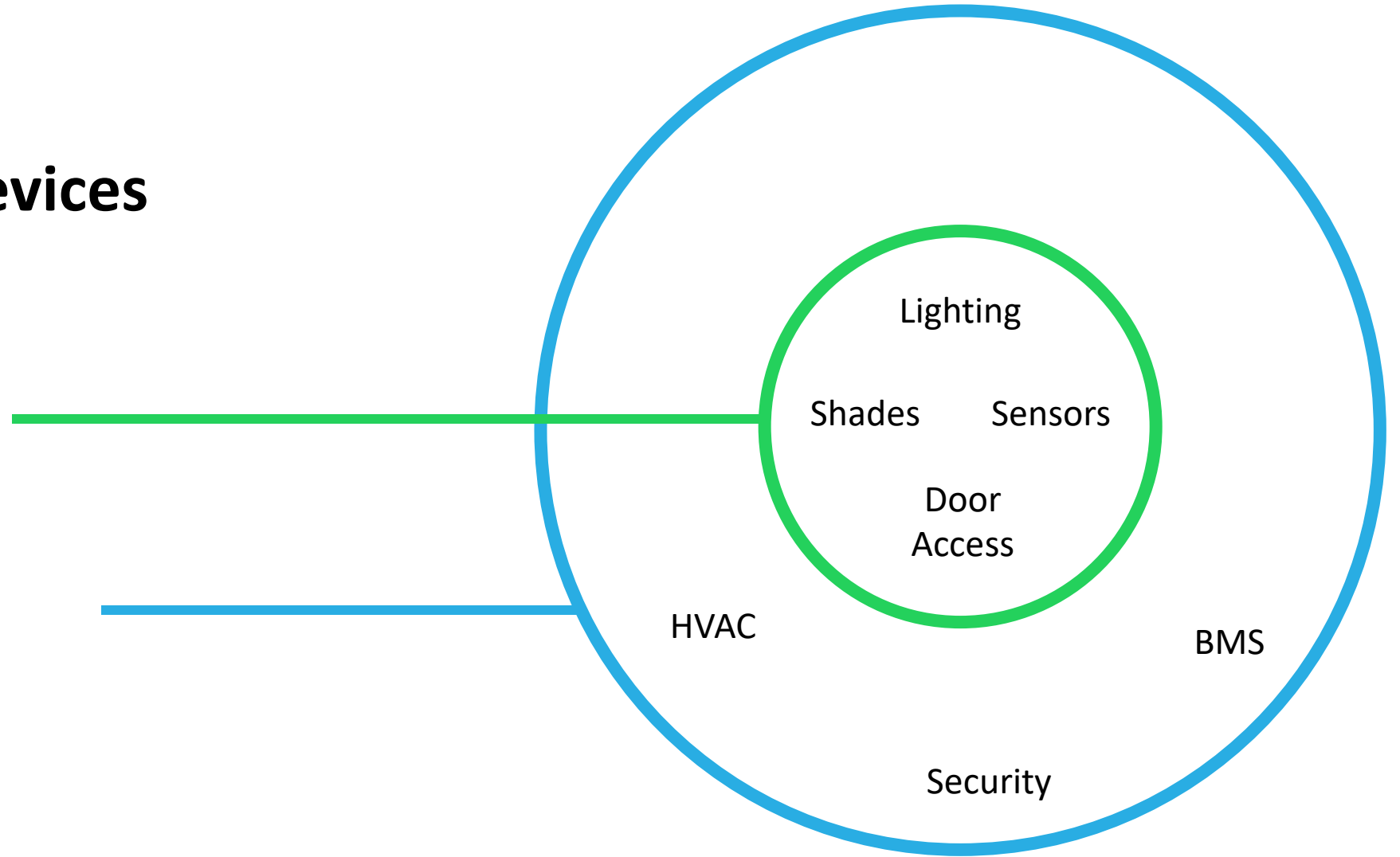


PoE Powered Devices

What you can **POWER**

VS.

What you can **INTEGRATE**



PoE Standards and Timeline

CAT5E and higher will support PoE on all voltages.

Levels of Power	IEEE Standard	Watts Supplied
Type 1	IEEE 802.3af	Up to 15.4W
Type 2	IEEE 802.3af	Up to 30.8W
Type 3	Ultra PoE / 802.3at	Up to 60W
Type 4	IEEE 802.3bt	Up to 90W



Benefits of PoE



Safer and Easier to Install



Data-Gathering



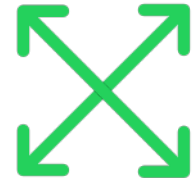
Increased Comfort & Productivity



BMS Integration



Flexible



Scalable



Benefits of PoE

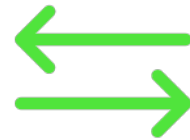
- Reduced installation cost – 20%-30%
- On-Going savings through automation
- Smart policies and alerts
- Control systems that provide feedback and intelligence
- Expand your “smart” building options – integrated for further savings
- Potential credits for LEED and Green Building incentives



PoE Lighting & Energy Efficiency



Energy Consumption



Energy Efficiency
From AC to DC

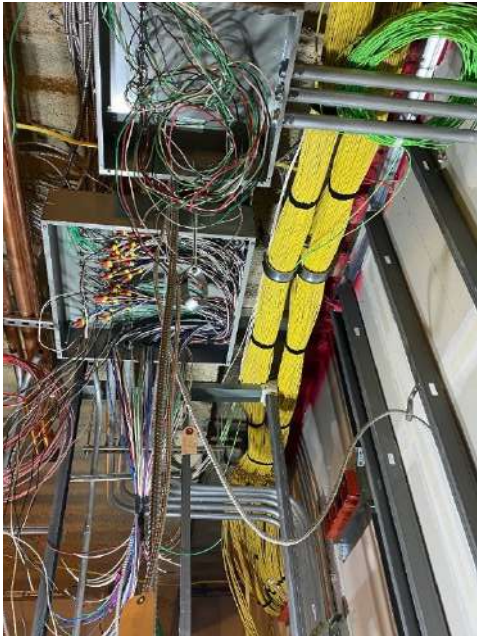


Overall PoE Energy Savings



PoE Lighting Installation

Line Voltage vs. PoE Installation



PoE simplifies
the electrical wiring needed for
powering lighting fixtures

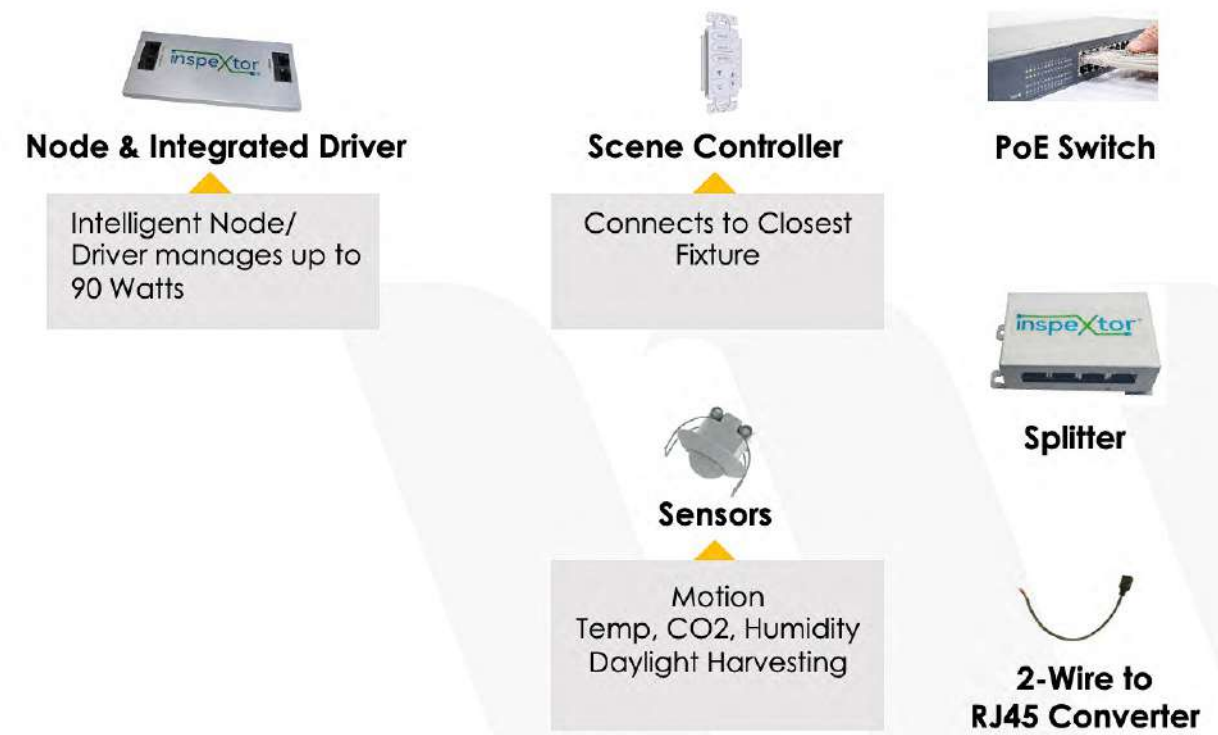


Materials Used	High Voltage	Low Voltage	Materials Saved
Copper	26g/foot	5g/foot	80% less copper
Plastics	44g/foot	3g/foot	93% less plastic
Conduit	Depends	0	100% less conduit

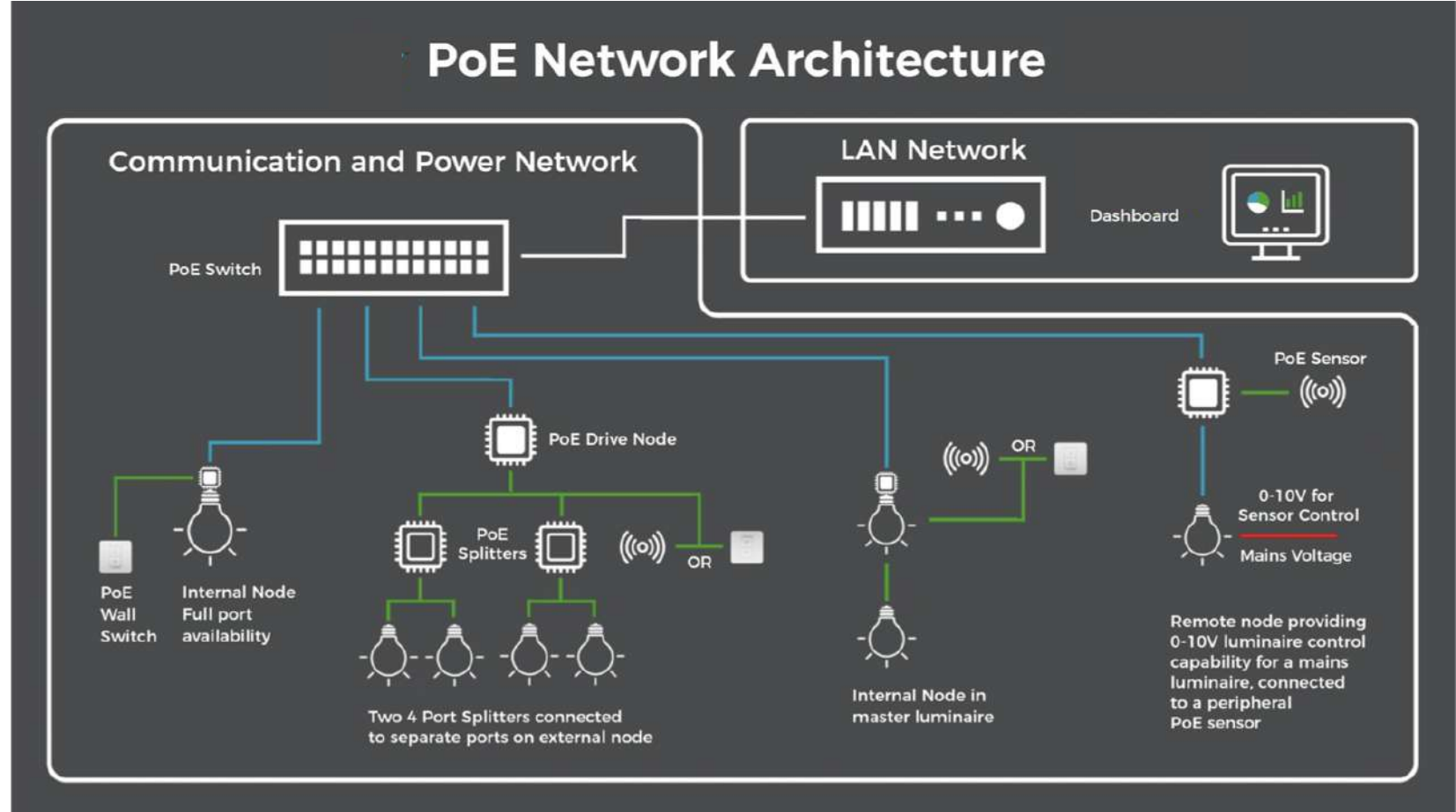


PoE Lighting Devices

It all starts with platform components

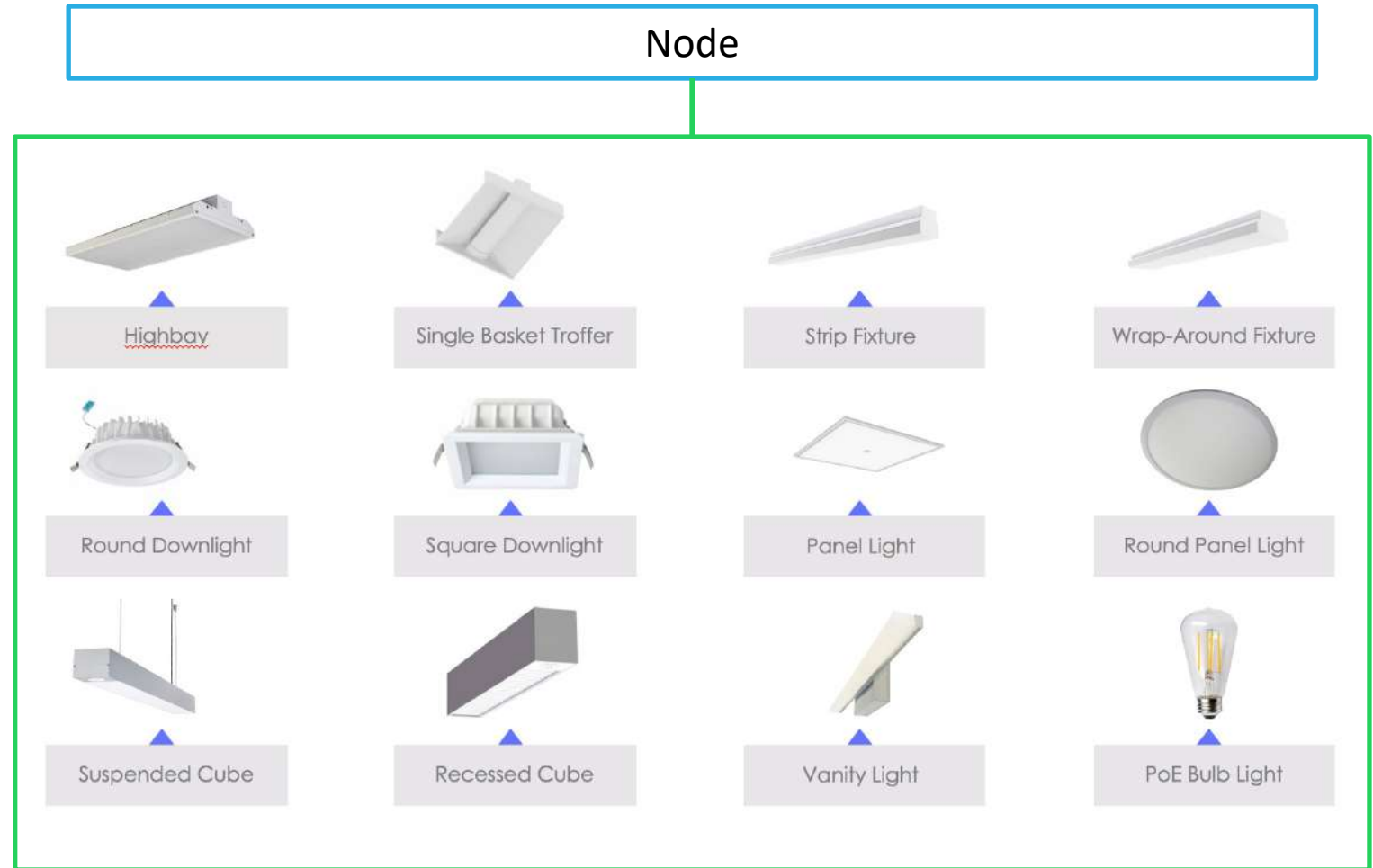


PoE Lighting Architecture



PoE Light Fixture Agnostic

Compatible with all LED Light
Fixtures



PoE Lighting Controls

PoE controls can do everything lighting controls can do...and more!

Daylight Harvesting

- The process of using daylight instead of artificial light to illuminate a space. This is accomplished through sensors and dimming technology.

White Temperature Tuning

- The ability to change the Kelvin Temperature from a warm 2700K to a cool 5700K.

Plug and Play Installation

- Installing a PoE lighting system is now safer, easier, and more affordable than it has ever been.

Demand Response

- In a PoE system you can easily dim lights to a pre-set level, and the sensors can relay information to the main BMS which will adjust accordingly.



3 Ways to do PoE Emergency Lighting

1. Combined method with line voltage and PoE
2. Centralized method all PoE
3. Decentralized method all PoE



Importance of PoE Software

PLUS the criteria for choosing a PoE software solution (Autonomous software - something that you don't need the server to be around to operate the building; Easy to use app/solution for end users that is separate from what building owners/facility managers see; Open API; experience with lighting / history

The world of the possible – all devices with PoE BUT highest quantity is lighting fixtures

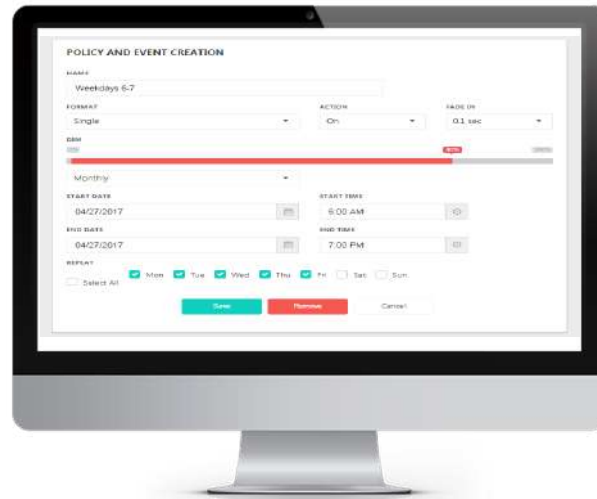


PoE Data Gathering

PoE lighting is managed by remote software, which means data metrics like power consumption / occupancy / people counting can be monitored and adjusted from anywhere.



Software Interface



Software Controlled



Sustainable PoE Lighting



Installing a PoE lighting system fulfills up to 35 points for LEED certification.



The total carbon footprint of the materials being produced, shipped and installed is lower, CAT cable vs BX, EMT, etc.



PoE Building Security and Reliability

Is a PoE building reliable, scalable, and secure?

RELIABILITY / SCALABILITY

- PoE power comes from a central and universally compatible source and not from a collection of distributed wall adapters. It can be backed up by an uninterruptible power supply (UPS), allowing for continuous operation even during power failures. PoE also allows for devices to be easily disabled or reset from a centralized controller.

SECURE

- IEEE 802.3af/at/bt compliant PoE technology is safe.



PoE Lighting is Scalable

Large Scale Project Profiles:



750,000 Sq. Ft mixed use project in Long Branch NJ. High-end residential, retail and dining experiences open to the public on the ground level. High-end facilities such as gyms, works spaces and amenity areas for residents (The Lofts)



33 story residential building including common areas, amenity spaces, gym, spa, basketball court and more

Scalable: PoE makes it simple to add new equipment to a network without the need for professional electrical installers.



This concludes The American Institute of Architects
Continuing Education Systems Course



PoE Q&A

Feel free to reach out!



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PoE Glossary

Power over Ethernet (PoE)

PSE

PD

RJ-45

CAT 5 Ethernet Cable

Node/Gateway

BMS

Smart Building

Building Automation

Digital Ceiling

Future Proof

Pull schedule

Network Switch

Future Proof

Daylight Harvesting

White Temperature Tuning



Further Reading

Cisco Systems:
What Is Power over Ethernet (PoE)?

<https://www.cisco.com/c/en/us/solutions/enterprise-networks/what-is-power-over-ethernet.html>

The Ethernet Alliance:
Power over Ethernet Standards

https://ethernetalliance.org/wp-content/uploads/2018/04/WP_EA_Overview8023bt_FINAL.pdf



About MHT

Founded in 2008, MHT Technologies is an industry leading New York-based PoE building automation software company and lighting manufacturer.

MHT's offerings include their flagship product, Inspextor, an end-to-end PoE-based solution including the hardware and software necessary to create a smart building. Inspextor's hardware powers, manages, and integrates systems such as lighting, shades, sensors, access controls, and security devices. The Inspextor software provides actionable consumption data that building owners and managers can use to set energy efficiency policies and controls – all within one dashboard.

Inspextor leads the market with features such as a specialized sustainability dashboard for reporting and ESG goals, AI capabilities, an intuitive graphic user interface (GUI), and the highest encryption security available on the market today. This gives Inspextor clients an unprecedented level of data insights, space personalization, and enhanced control of their environment.

