

Power Over Ethernet Technology

Key Parameters of PoE Networks

1. Power Sourcing Equipment (PSE) and Powered Devices (PD)

- **PSE:** Devices that provide power over the Ethernet cable, such as switches or injectors.
- **PD:** Devices that receive power, such as IP cameras, VoIP phones, and wireless access points.

2. Power Classes and Power Allocation

- PoE standards define different power classes to manage and allocate power efficiently.
- **Classes** range from 0 to 4, with higher classes providing more power.

3. Cable Considerations

- The type and quality of Ethernet cables significantly impact PoE performance.
- **Category 5e or higher** cables are recommended for optimal performance.

4. Heat Dissipation

- As power levels increase, so does the heat generated within the cables.
- Proper heat management is crucial to maintain network reliability.

5. Power Budgeting

- Ensuring that the total power consumption of all connected devices does not exceed the available power budget of the PSE.

PoE Standards

1. IEEE 802.3af (PoE)

- **Power Delivery:** Up to 15.4 watts at the source.
- **Voltage Range:** 44-57 volts.
- **Current:** Up to 350 mA.
- **Supported Devices:** VoIP phones, wireless access points, and IP cameras.

2. IEEE 802.3at (PoE+)

- **Power Delivery:** Up to 30 watts at the source.
- **Voltage Range:** 50-57 volts.

- **Current:** Up to 600 mA.
- **Supported Devices:** PTZ cameras, advanced wireless access points, and video phones.

3. IEEE 802.3bt (PoE++)

- **Type 3 (60W):**
 - **Power Delivery:** Up to 60 watts at the source.
 - **Voltage Range:** 50-57 volts.
 - **Current:** Up to 960 mA.
 - **Supported Devices:** Video conferencing systems, LED lighting, and advanced IoT devices.
- **Type 4 (100W):**
 - **Power Delivery:** Up to 100 watts at the source.
 - **Voltage Range:** 50-57 volts.
 - **Current:** Up to 1,500 mA.
 - **Supported Devices:** High-power devices like laptops, large displays, and high-performance wireless access points

<Source: Microsoft Pilot inquiry>

Comments on use of PoE in industrial environments.

Since voltage used is 50 to 57 volts, PoE cables must be treated as electrically hazardous (greater than 48 volts).

Cabinets in hazardous areas must also have switches to interrupt PoE power when doors are opened for service.

The power available (15 to 100 Watts) means that PoE cannot be used in Intrinsically-safe environments, even with SIS/SIL barriers.