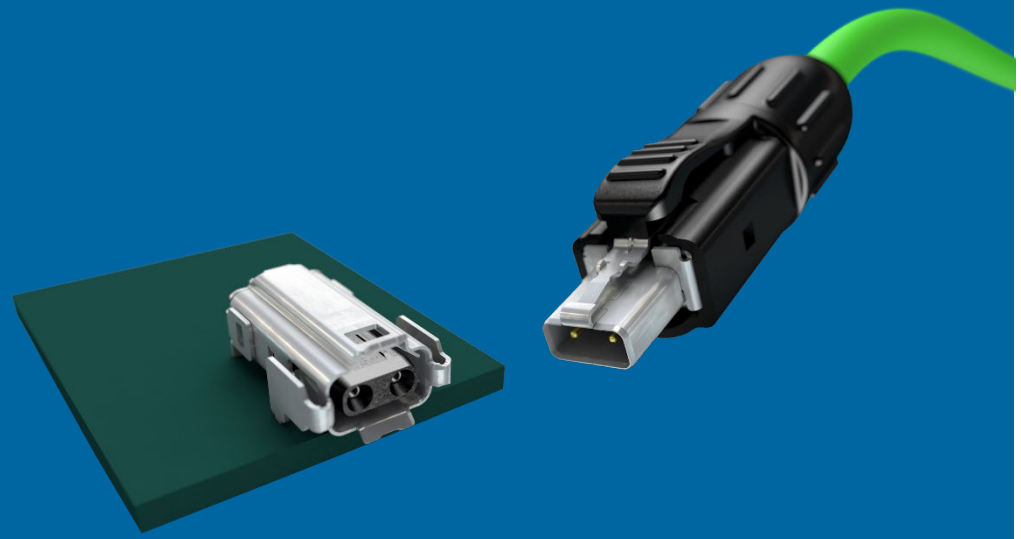
INTRODUCTION SPE T1 INDUSTRIAL CONNECTORS IP20

EVERY CONNECTION COUNTS



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Summary

- New communication standard for factory, process and building automation
- Communication infrastructure for the Industrial Internet of Things
- IP communication down to the lowest automation level, offering full transparency from sensor/actuator to the cloud.
- Substitution of legacy fieldbus systems
- Wide area of applications, incl. sensor/actuator connectivity, I/O modules, robotics & machinery, elevators and buildings

Technology

- IEEE 802.3 standards from 10 Mbps to 1 Gbps
- Connector standard series IEC 63171

Benefits

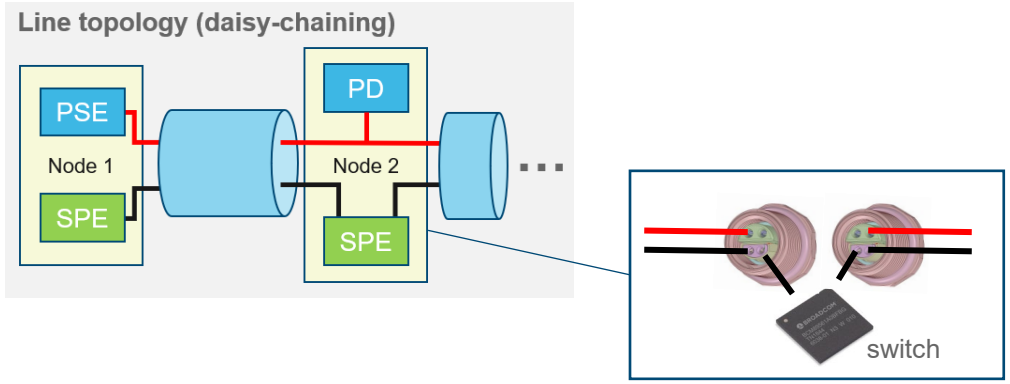
- Small diameter, more flexible and less heavy cables enable the application to move faster and use less energy
- Small connector formfactor allows miniaturization in next generationapplications
- Easy and quick cable connector assembly reduces installation cost
- Reflow solderable SPE board connector supports latest Industrial assembly processes
- Cable connector uses high reliable crimp contacts, reducing downtime

Applications

• Sensors • Actuators • Switches • Machinery • Robotics

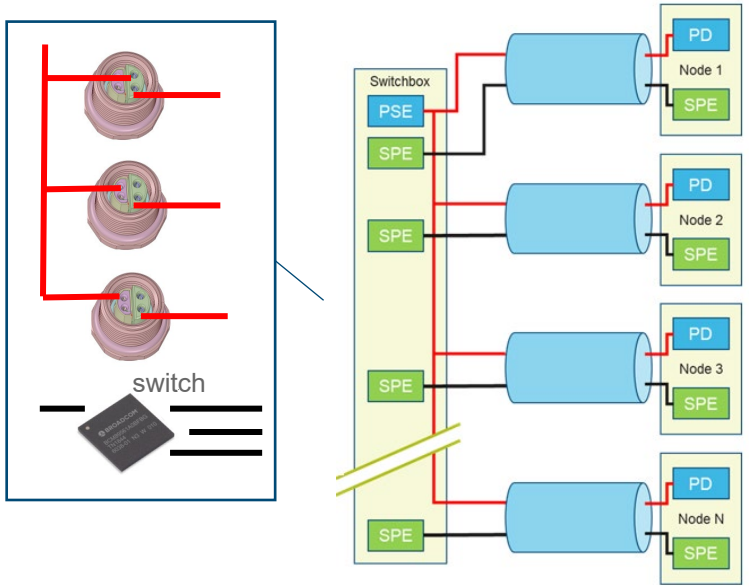
SPE T1 INDUSTRIAL CONNECTORS IP20

- Standardized in IEC 63171-6
- Enables powering of cascaded devices
- THR solder (board) and crimp contact (cable)
- Operating temperature range: -40° C - +85° C
- Conductor cross section: AWG 26-22



PoDL vs. separate Power

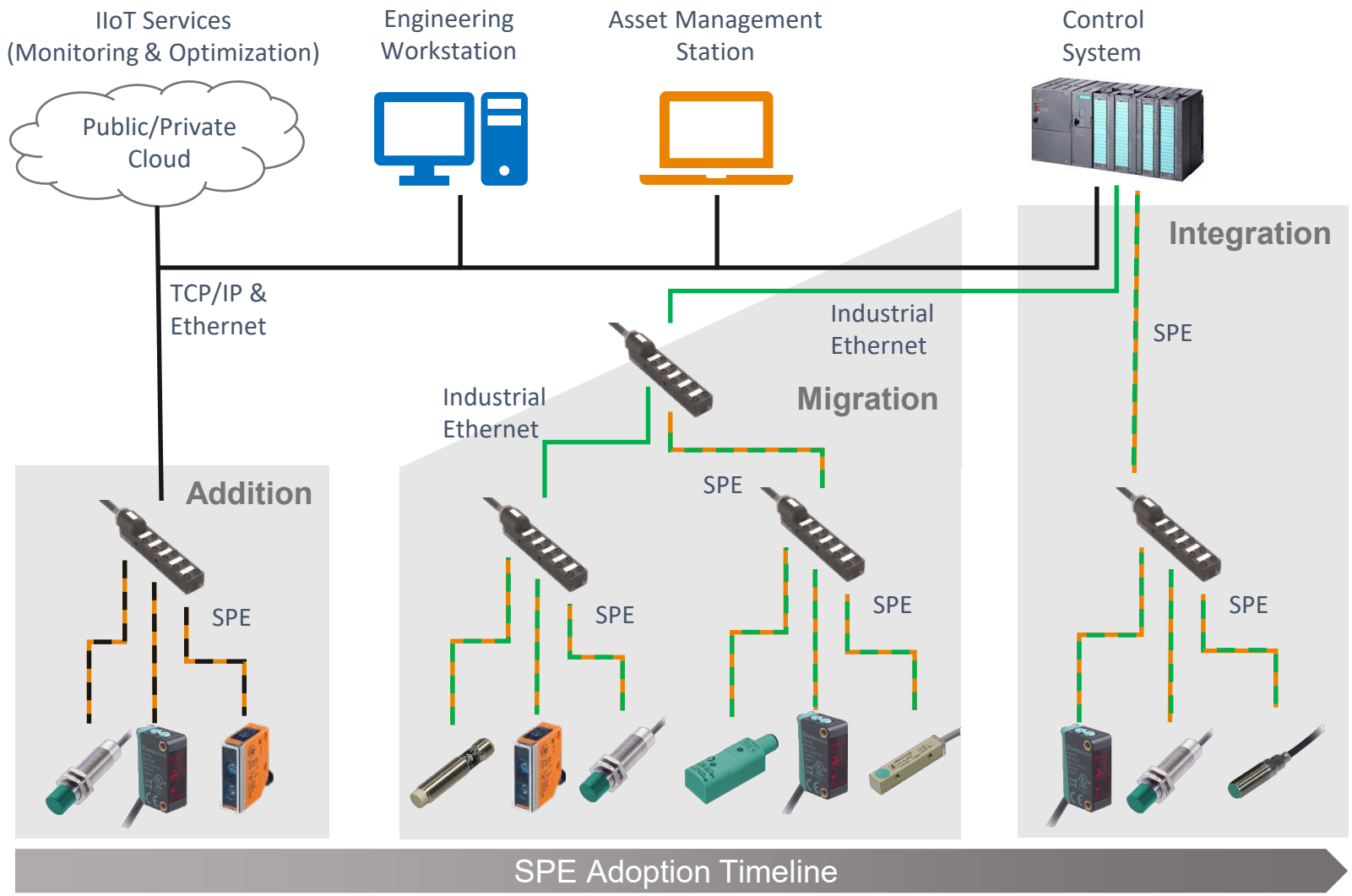
PoDL	Separate Power
+ Lower cable weight	+ Higher currents / power
+ Smaller and cost-effective cable	+ Support of multiple topologies
- Point-to-point only	- Higher cable weight
- Low noise limits for power signal	- Cable costs
- Special circuitry required	



Ethernet Use Cases at the Edge of the Automation Pyramid

EVERY CONNECTION COUNTS

SPE Implementation Scenarios



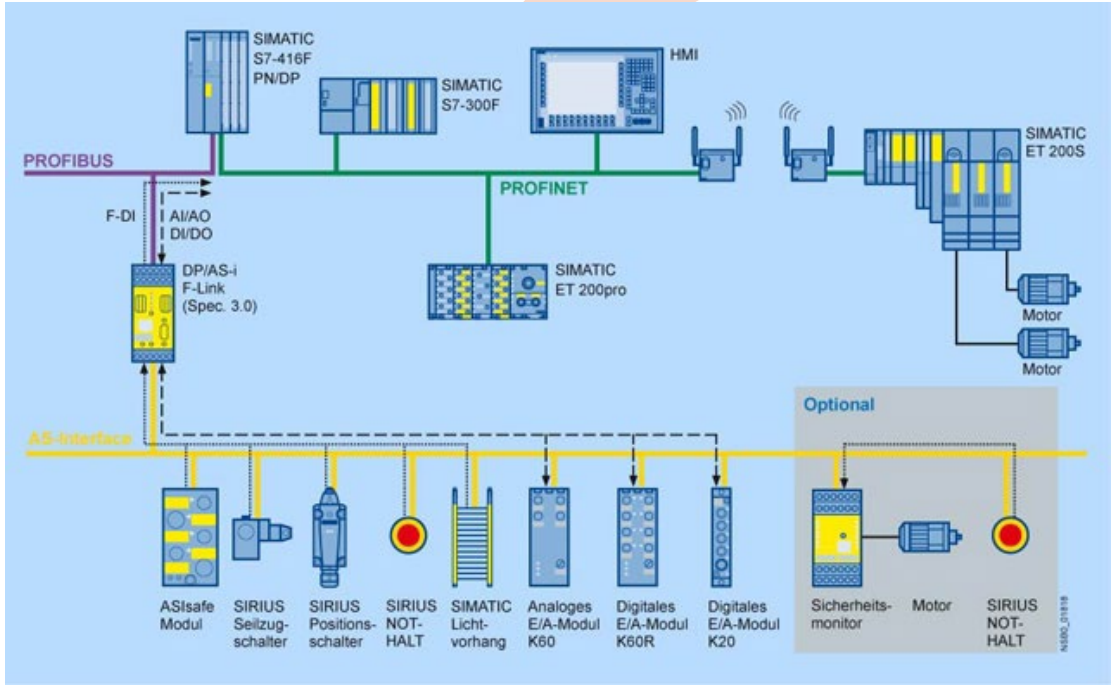
Potential Use Case

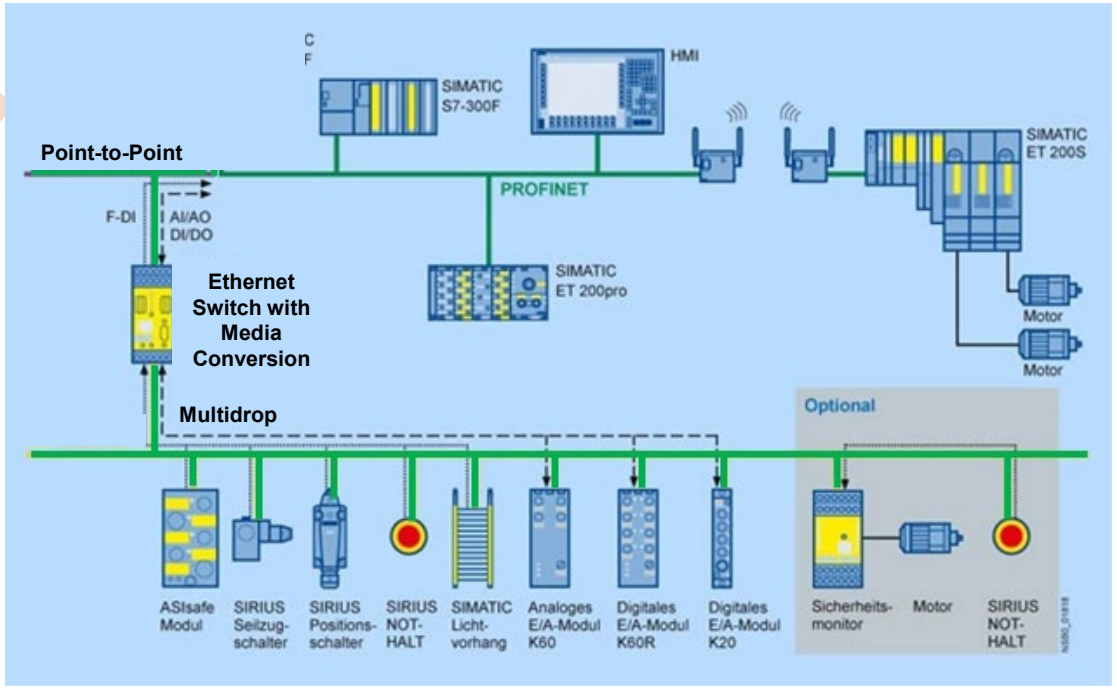
Substitution of legacy fieldbus

Ethernet down to the sensor level

Point-to-Point, up to 1 km

Multidrop, up to 25 m / > 20 nodes *



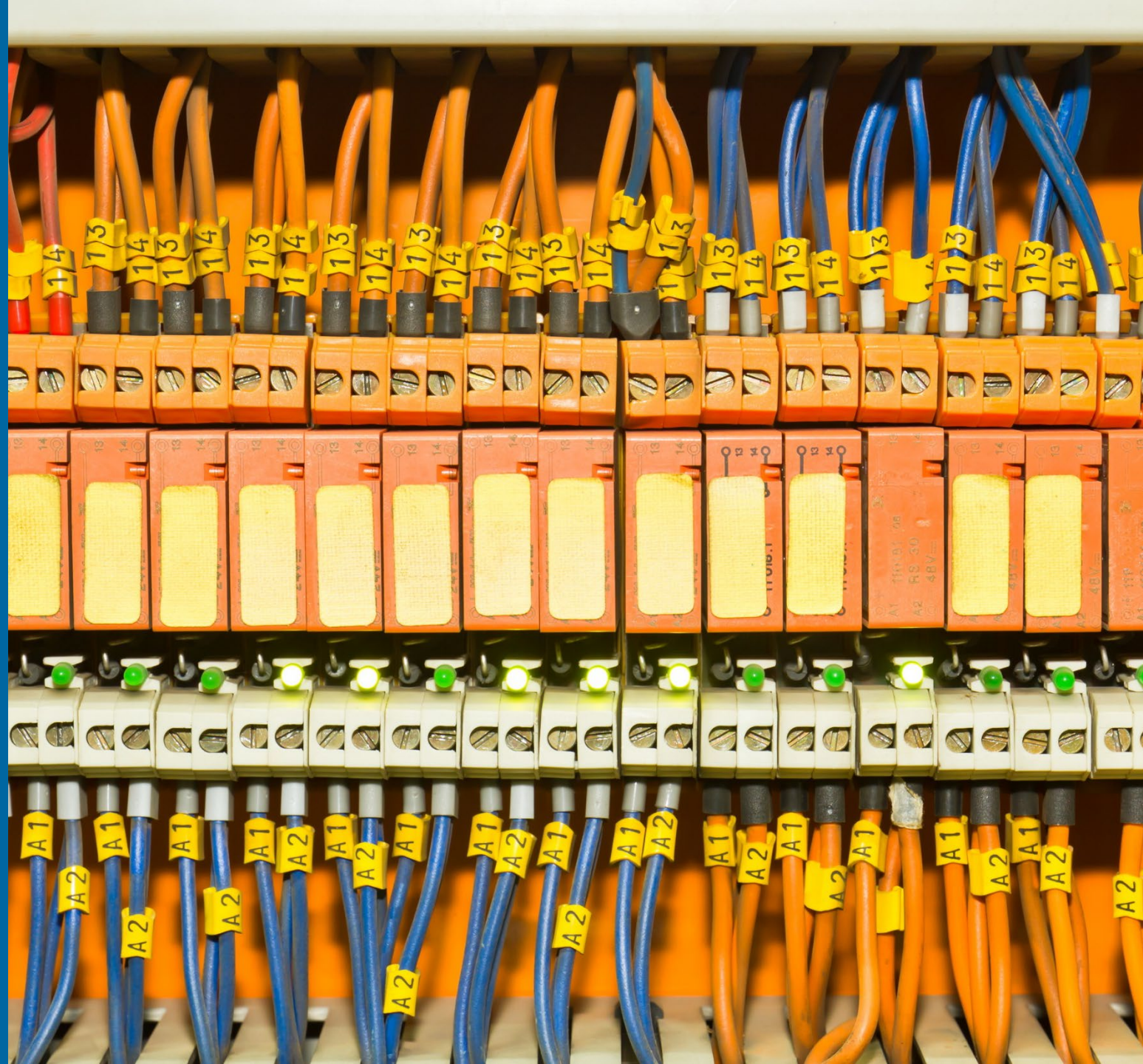


Source: www.siemens.com // Simatic documentation

* tested & simulated by TE

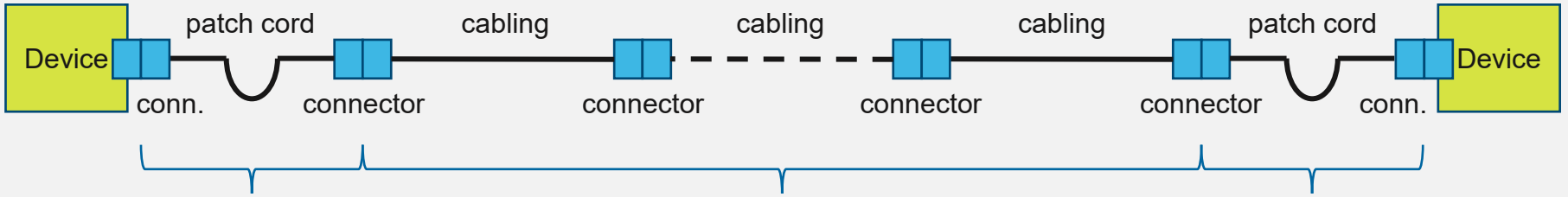
Hybrid Connectivity & Multidrop

EVERY CONNECTION COUNTS



Industrial SPE Network Options

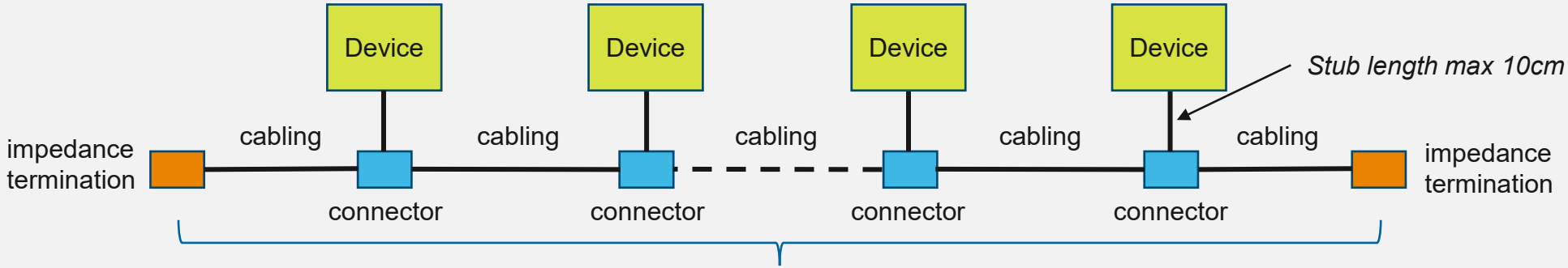
Point-to-point



1000BASE-T1 STP of max 36 m, typ. AWG 22
Up to 4 in-line connectors and 2 device connectors

10BASE-T1L STP of max 996 m, typ. AWG 18
Up to 10 in-line connectors and 2 device connectors

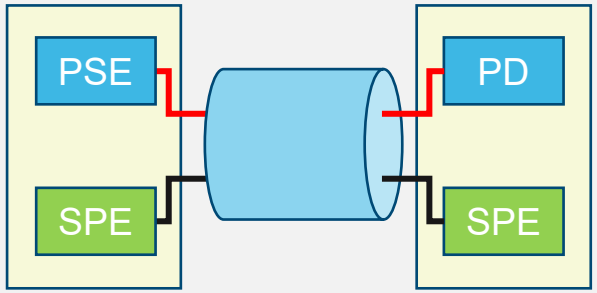
Multidrop



10BASE-T1S Unshielded wire of max 25 m
Up to (>)8 in-line connectors/devices

SPE Architectures

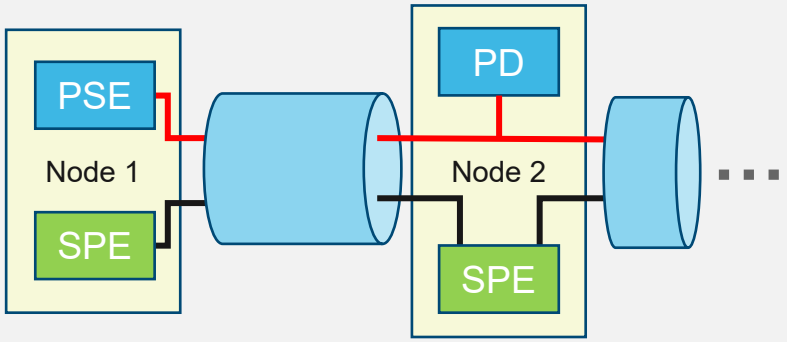
Point-to-point



Power
One PD powered by one PSE (PoDL)

Data
Point-to-point

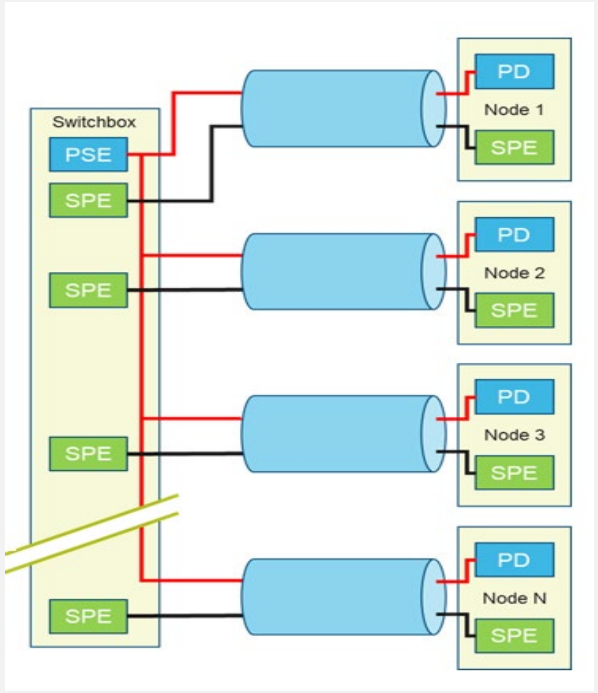
Line topology (daisy-chaining)



Power
Cascaded PDs powered by one PSE

Data
Multiple SPE nodes in series either through
1. Integrated switches per node
2. Multidrop

Star topology (distribution)



Power
- Downstream PDs powered by switch

Data
- Downstream SPE nodes connected to switch / multiple PHYs

Legend

PSE	Power Source Equipment	SPE	Single Pair Ethernet PHY
PD	Powered device		Single Pair Ethernet
			Power line

ANY CONNECTION CAN CHANGE THE WORLD

EVERY CONNECTION COUNTS

TE connectivity