



Industrial Ethernet Switches Market Update

Chantal Polsonetti

Vice President
ARC Advisory Group
cpolsonetti@arcweb.com



Background

- Results of bi-annual independent ARC Advisory Group market update
 - Base year 2018, five year forecast through 2023, census-based primary research
- ARC Advisory Group
 - Leading technology research and advisory firm for industry, infrastructure, and cities
 - Founded in 1986, >30 years covering industrial automation, industrial IoT, infrastructure, supply chain, enterprise
 - In-depth coverage of operational technologies (OT), information technologies (IT), engineering technologies (ET) and associated business trends
 - Analysts and consultants with first-hand industry knowledge
 - Strategic market research for technology suppliers
 - Help end user clients develop appropriate adoption strategies and select the best technology solutions for their needs.

Executive Summary

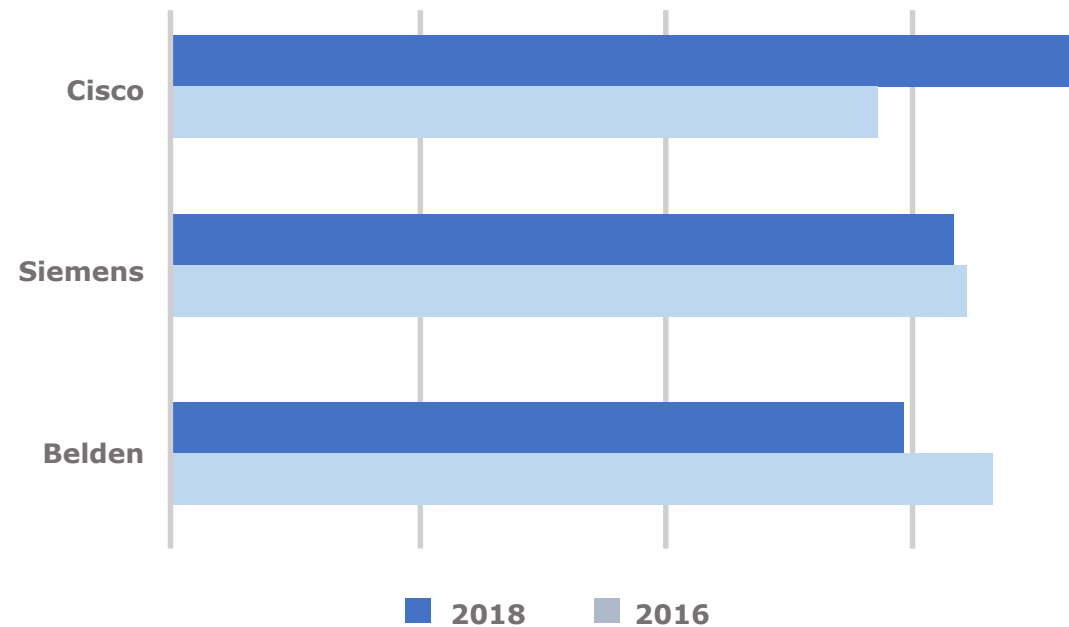


Industrial Ethernet switches play a pivotal role in connectivity-enabled business transformation initiatives.

Cisco has emerged as the leading global manufacturer of Industrial Ethernet Switches and continues to lead the market in adoption of new value-added network infrastructure developments.

Chantal Polsonetti

Vice President, ARC Advisory Group

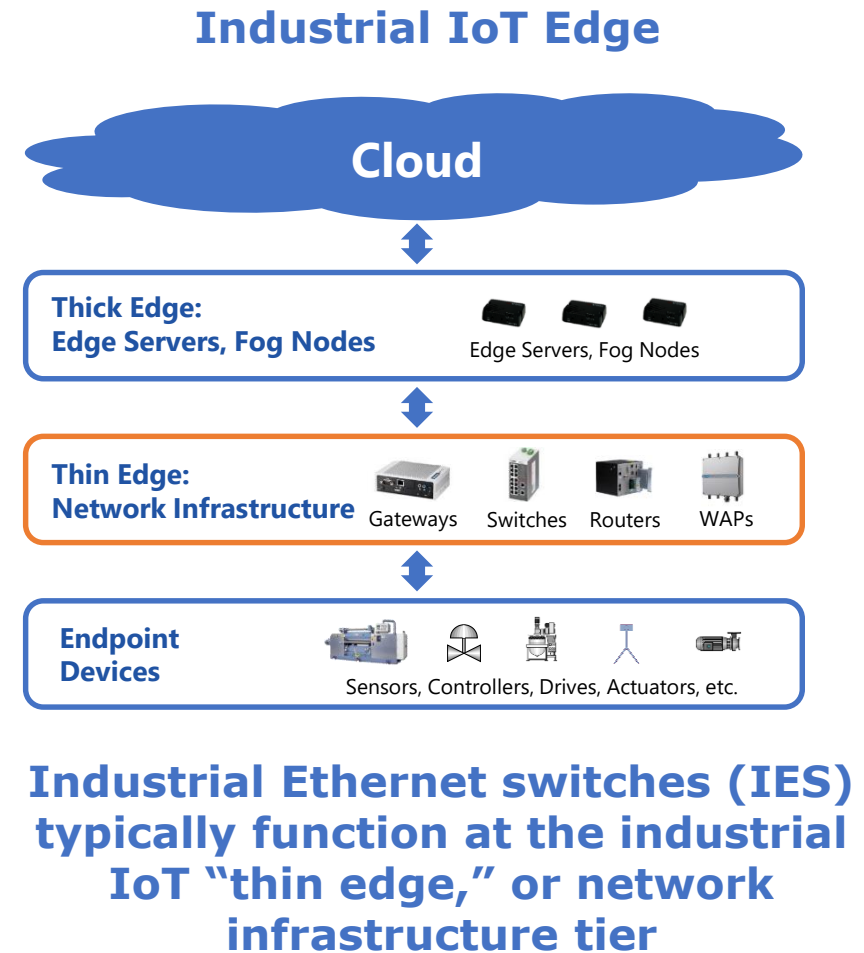


Cisco
#1
In 2018

Industrial Ethernet Switch Scope

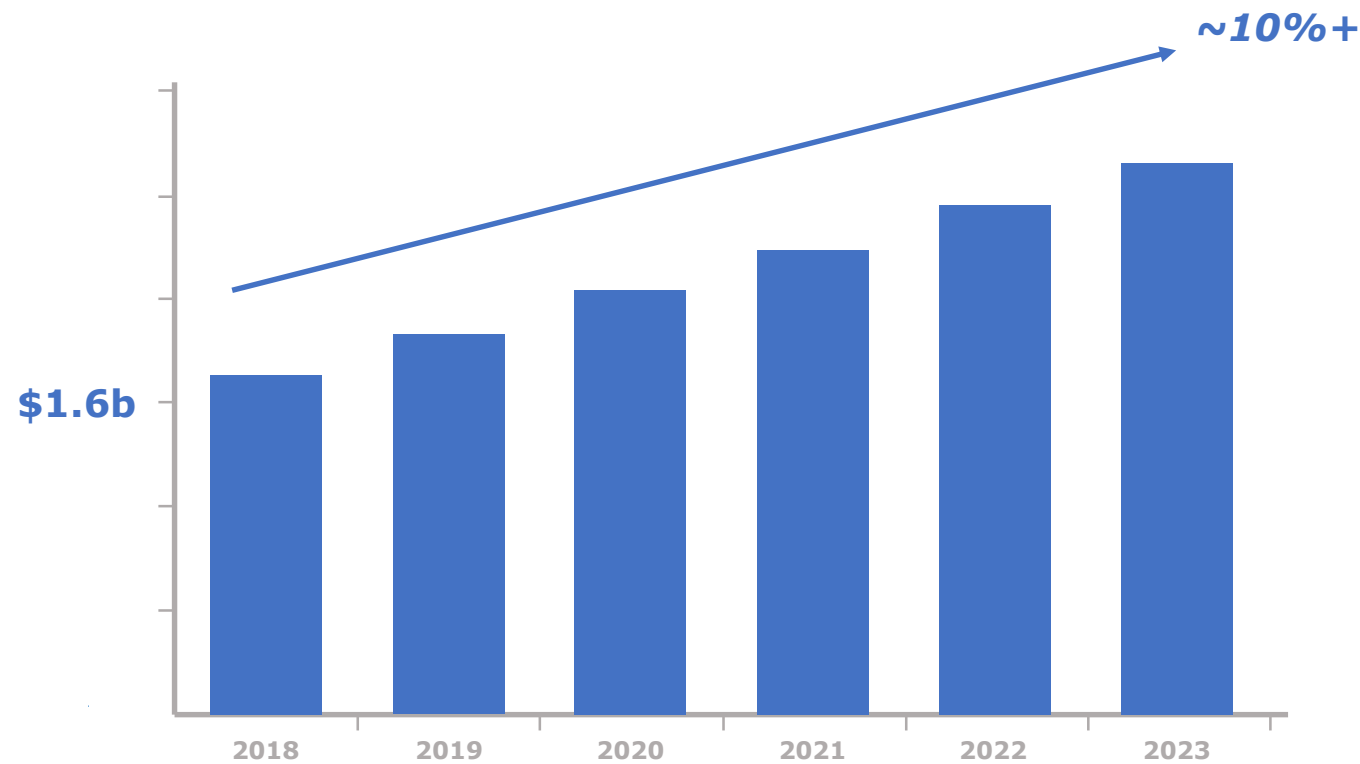
Functions:

- Transmit data between devices on an Ethernet network via packet switching
- Communicate between devices supporting the same network protocols
- Deployed at the Industrial IoT “thin edge”
- Industrial characteristics
 - DIN rail, rack mount, embedded form factors
 - Extended operating temp
 - Passive cooling
 - Redundant components
 - Industrial connectors
 - Higher IP rating
 - EMI protection
 - May support industrial network protocols



Industrial Ethernet Switch Market Overview

- The global industrial Ethernet switch market totaled over \$1.6 billion in 2018
- Projected growth of over 10 percent annually over the next 5 years exceeds that of the overall industrial automation marketplace



Industrial Ethernet Switch Market Dynamics

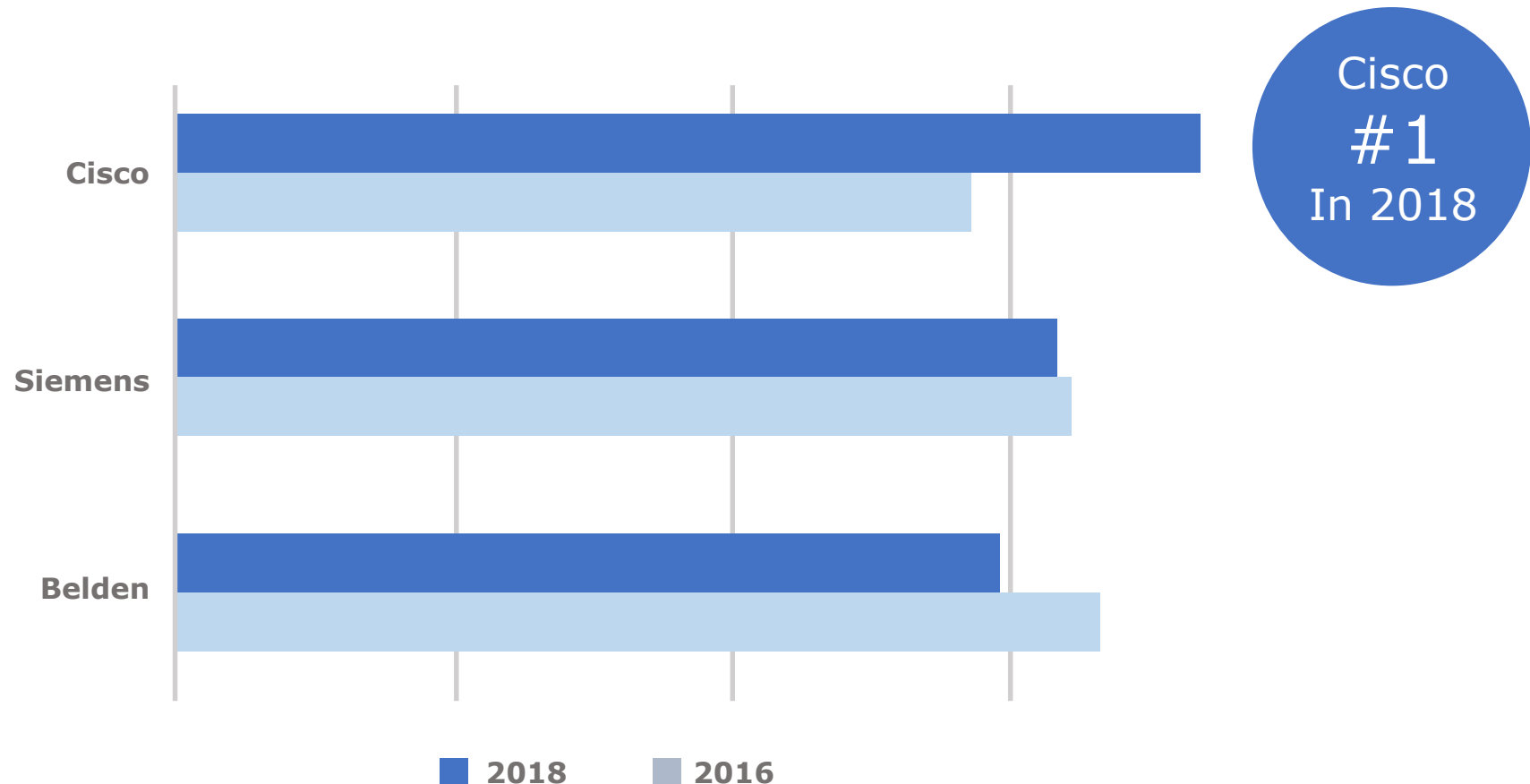
- Escalating connectivity & bandwidth requirements driven by pursuit of incremental business process & performance improvement
- Core component powering the Industrial IoT “thin edge”
- Growth in infrastructure vs. legacy industrial automation
- Ongoing technical improvements
 - Migration toward managed switches
 - IEEE 802.1 TSN, OPC UA
 - Gigabit Ethernet (GE)
 - IEEE 802.3bt (90 watt PoE)
 - Environmental hardiness
- Cisco’s ascent to market leadership position

Cisco Industrial Ethernet Switch Profile

- Continues to build out industrial product line
 - Industrial characteristics: form factor, port counts, enclosures, environmental ratings, standards support, security, TSN, PoE
 - Supports industrial automation protocols, (EtherNet/IP, PROFINET, Modbus/TCP), as well as industry-specific protocols (IEC 61830-3, EN50155, etc.)
- Portfolio appeals to core IT customer as well as OT
 - OT: partnerships with OT-oriented providers such as Rockwell Automation, with whom it promotes the Connected Enterprise vision
 - Offerings emphasize IT/OT connectivity by enabling advanced features and use of IT-based tools for management and security while operating in harsh environments
 - IESs can be managed through Cisco DNA Center platform, enabling IT to extend Intent-Based Networking and single security policy framework from data center, through the enterprise network, to the ruggedized network
 - The company leads all competitors in bringing edge-to-cloud integration capabilities to the industrial IoT “thin edge,” or network infrastructure tier

Leading Manufacturers of Industrial Ethernet Switches

- *Cisco is the leading global manufacturer of Industrial Ethernet switches*
- *Cisco's rapid growth continues to outpace the overall Industrial Ethernet switch market*



Market Shares by Geography

- *Cisco is the leading global Industrial Ethernet Switch manufacturer*
- *Cisco is the North American market share leader*
 - *Together with partner Rockwell Automation they command >30% market share*
- *The company is a top three competitor in EMEA, the leading market by geography, and is gaining increasing share in the important Asian market*

Industrial Ethernet Switch Leading Served Industries

Cisco is a leading competitor in several large IES markets

Electric power
T&D



Transportation



Surveillance



Water & Waste

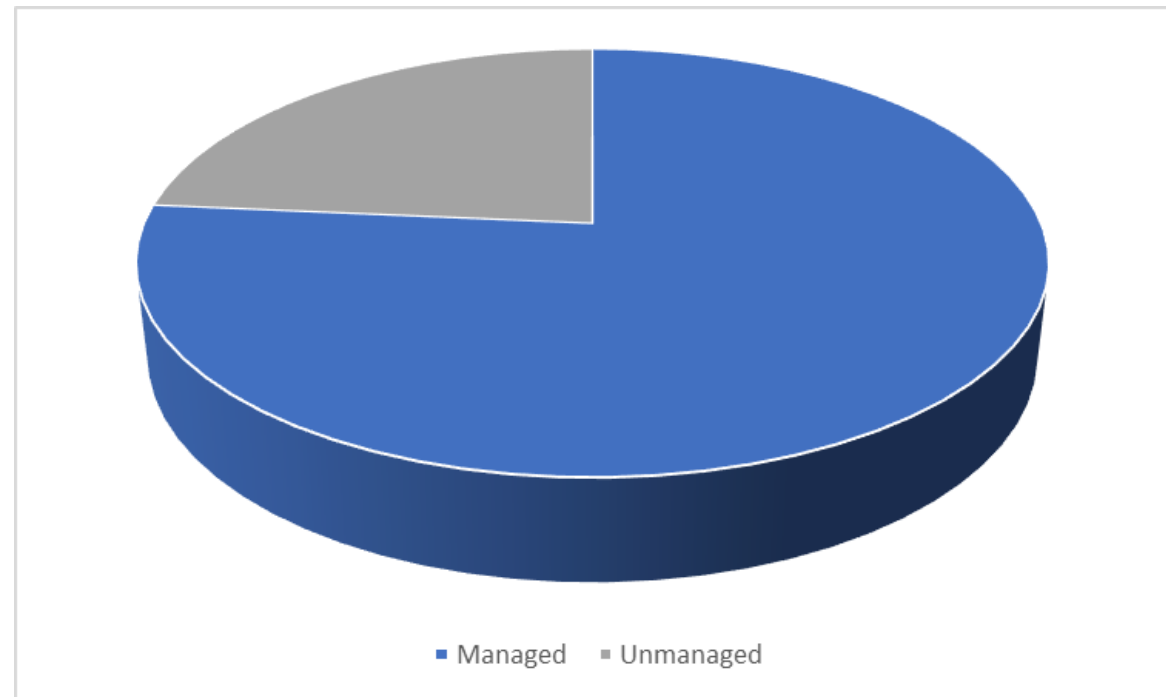


Migration toward Managed Industrial Ethernet Switches

Cisco is the leading manufacturer of managed industrial Ethernet switches at both Layer 2 and Layer 3

Managed Switch Advantages:

- *Configurability*
- *Manageability*
- *Visibility*
- *Security*
- *Redundancy*
- *TSN capable*



IES Market by Switch Type (2018 \$s)

Cisco Leads in Industrial Ethernet Switch Growth Segments

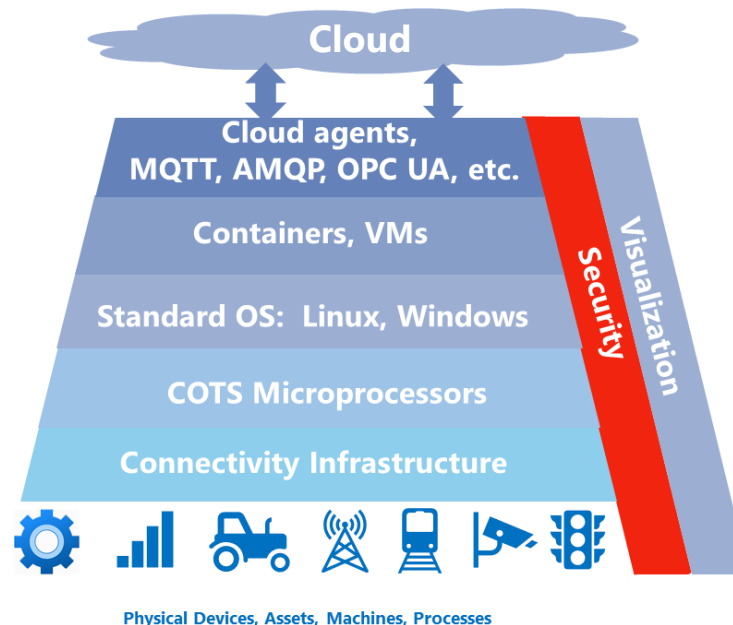
- IEEE 802.1 TSN (Time Sensitive Networking)
 - *Enables standard real-time, deterministic networks vs. proprietary implementations*
 - *Cisco is the leading global manufacturer of TSN-capable IES*
- Gigabit Ethernet (GE)
 - *Migration from 100 MBS Fast Ethernet to GB and GB+ = better performance, fewer bottlenecks, and ability to meet escalating connectivity demands*
 - *Cisco is the leading global manufacturer of >1 GB IES ports*
- Environmental hardiness
 - *IP65+ rated switches are required for harsh, demanding environments and on-machine mounting in industrial settings*
 - *Cisco is the leading global manufacturer of IP65+-rated IES*



Appendix

Industrial IoT Edge 2.0 Definition

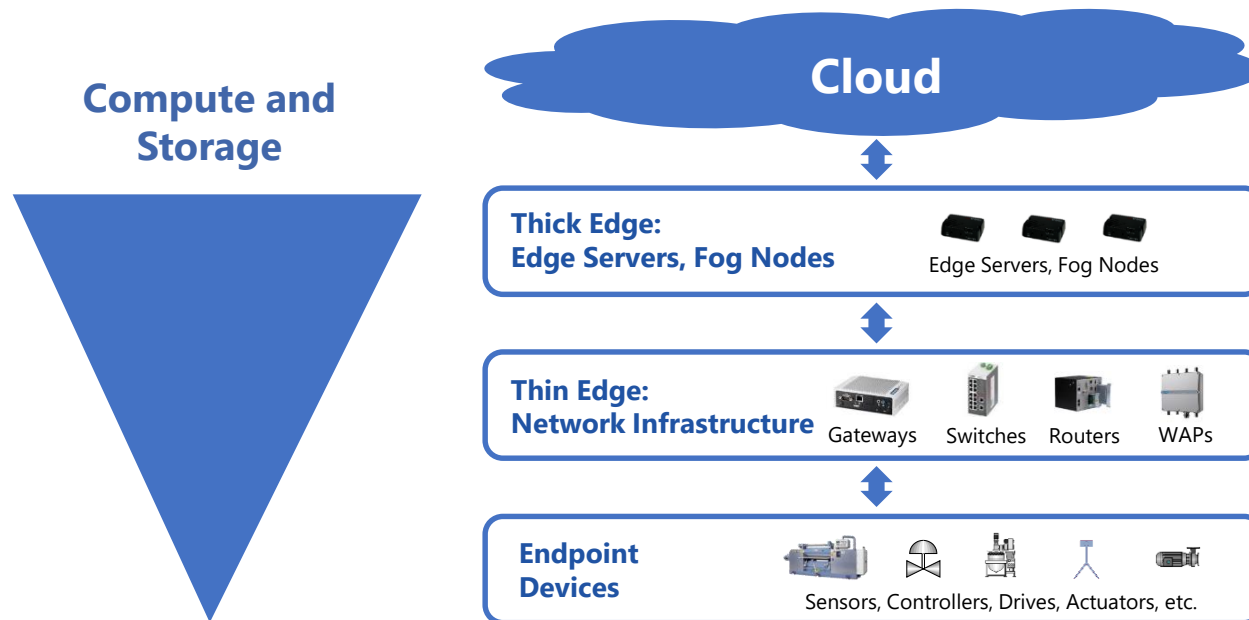
- The Industrial IoT edge is the place where physical devices, assets, machines, processes, and applications intersect with internet-enabled portions of the architecture.
- Industrial IoT edge devices provide input to, and may receive output from, industrial internet-enabled systems, applications, and services, but reside outside of clouds and data centers
- Edge systems typically operate on-premises but are distinct from traditional non-internet connected automation and control systems



Physical Devices, Assets, Machines, Processes

Thick Edge vs. Thin Edge

Escalating functional requirements at the Industrial IoT edge are pushing incremental compute and storage capacity to this tier of architecture, driving distinction between a compute-intensive “thick edge” and a resource-constrained “thin edge.”



“thick edge” = high-end edge servers that meet escalating edge compute and storage requirements

“thin edge” = connectivity, automation protocol support and conversion



For More Information

Author:

Chantal Polsonetti

Vice President
ARC Advisory Group
cpolsonetti@arcweb.com

