Tech Club webinář

Co přinesl rok 2024 v IoT produktech?

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10.12.2024

Agenda

1. Architektury/CVD

2. Průmyslové přepínače

3. Průmyslové směrovače

4. Průmyslové bezdrátové sítě

5. Bezpečnost IIoT sítí

6. Drobný pohled na dohledy

V případě jakýchkoliv otázek se neváhejte ozvat a napsat nám je do chatu meetingu.

Comprehensive industrial IoT networking portfolio
Solutions that meet the needs of IT and operations

Industrial Ethernet switches
DIN-Rail, IP67, and Stackable Rackmount

IE3400   IE3300   IE3200   IE3100

IE3400H   IE9300, IE4010

Industrial Routers
Modular 4G/5G – for connecting remote and mobile assets

IR1100   IR1800
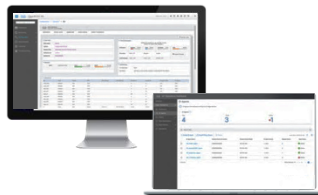
IR8300   IR8100

Industrial Cybersecurity
Cyber Vision, Secure Equipment Access

CV Sensors and SEA Agents

Data Control and Exchange
Edge Intelligence, IOx

Industrial Wi-Fi and Ultra-reliable Wireless Backhaul
For outdoor conditions

IW9165E   IW9165D   IW9167i   IW9167E   IW9167E-HZ

Embedded Networking
Embedded routers and switches

ESR6300   ESS3300   ESS9300

Management and Automation
Cisco Catalyst Center, Cisco Catalyst SD-WAN Manager, Field Network Director

Cisco IoT

Architektury

Extended Enterprise

Extended Enterprise

Solution Deployment Scenarios

A. **Extended Enterprise Non-Fabric Deployment:**
Enterprises having deployed Cisco Catalyst Center but not deployed Cisco SD-Access fabric.

B. **Extended Enterprise with Fabric Deployment:**
Enterprises having deployed Cisco Catalyst Center and Cisco SD-Access fabric.
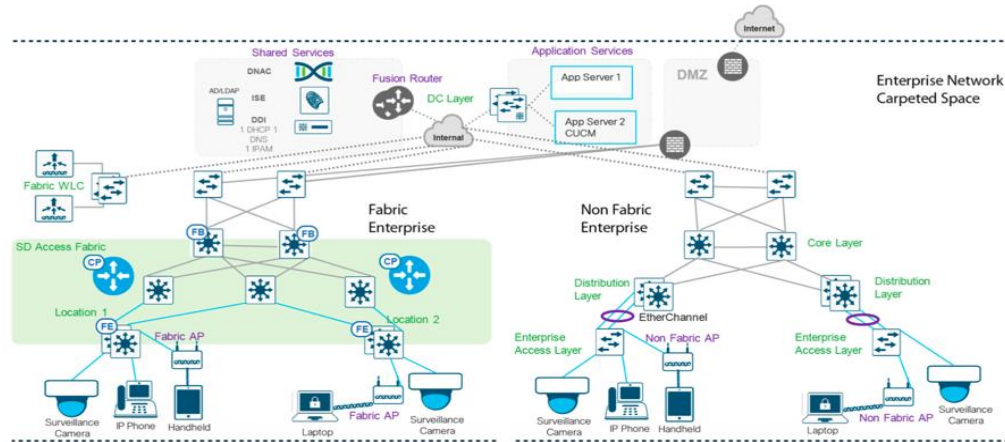
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CVD Modules

Extended Enterprise

Securely extend your enterprise network to non-carpeted spaces with Cisco IoT networking and Cisco Digital Network Architecture (Cisco DNA)
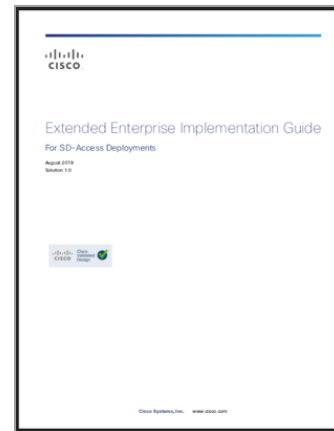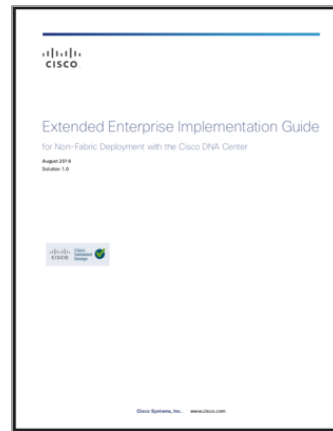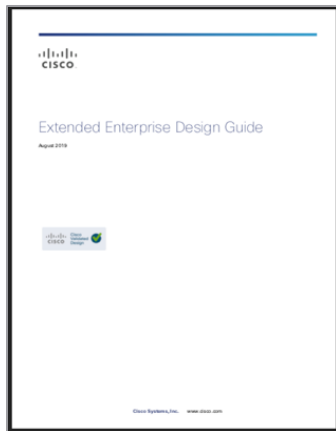
Read at-a-glance document >

Extended Enterprise Design Guide >

Extended Enterprise Implementation Guide: Non-fabric deployment >

Extended Enterprise Implementation Guide: SD-Access deployment >

Enterprise Network Design Zone >

| cisco.com/go/iotcvd | Design Guide | Implementation Guide Non-Fabric | Implementation Guide SD-Access |

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Extended Node, Policy Extended Node & Fabric Edge

	Extended Node	Policy Extended Node	Fabric Edge
Layer	Layer 2 node	Layer 2 node	Layer 3 node
Macro-segmentation	VLAN to VRF mapping	VLAN to VRF mapping	Direct to VRF
Micro-segmentation		Secure Group Tag (Inline Tagging)	Secure Group Tag (Inline Tagging)
Security Enforcement		SGACL At IoT Edge	SGACL at Fabric Edge
Overlay encap/decap			VxLAN tunneling

Catalyst IE3100/IE3200/IE3300 Rugged Series

Industrial Ethernet IE4010

Catalyst IE3400 Rugged Series

Catalyst IE3400H Heavy Duty Series

IE9300

IE9300 incl. stack (17.12.1)

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Průmysl

Blueprints to Accelerate Industrial Deployments

Manufacturing
- Industrial Automation
- Industrial Security
- Industrial Wireless
- AGVs, AMRs

Power Utilities
- Substation Automation
- Distribution Automation
- Smart Metering
- Grid Security

Oil-&-Gas
- Industrial Automation
- Connected Pipeline
- Refinery/Processing Plants, Worker Safety

Roadways & Intersectns
- Dynamic Road Signage
- Pedestrian Safety
- Signal/Camera connectivity

Smart Cities
- Smart & Connected Cities
- Digital Divide
- Video Surveillance

Ports & Terminals
- Terminal Automation
- Autonomous and Tele-Remote Operations
- OCR

Mining
- Surface Mining
- Underground Mining
- Fleet Management, Autonomous Vehicles

Renewables
- Off-shore / On-shore Windfarms
- Solar Farms
- EV Charging

Rail
- High-Speed Rail
- Urban / Light-Speed Rail
- CBTC, Passenger Wi-Fi, Train to Trackside connectivity

Mass Transit
- Fleet Management
- Passenger Wi-Fi
- Vehicle Telemetry

Proven Integrations

Rockwell Automation, Landis+Gyr, Itron, Schneider Electric, Cohda Wireless, Actility, ECONOLITE, SIEMENS, MITSUBISHI ELECTRIC, EXIMPROD Power Systems, EATON, SEL, CAT, SANDVIK, iteris, BECKWITH ELECTRIC CO.INC., CIMCON Lighting, KLAS TELECOM, iOmniscient

Cisco validated design for wireless architecture
Putting it all together

Cisco Validated Design

Industrial Automation — CISCO Cisco Validated Design — Tested Implemented Proven

Enterprise Zone
Private Cloud — Digital Twin — CNC, Robot, Machine
SOC — Security Operations Center
Secure Endpoint

Enterprise Data Center
- Splunk Enterprise
- Cyber Vision Global Center
- Security ISE (PAN), FMC
- Secure Network Analytics
- Cisco Catalyst Center

UCS

Catalyst 9000

Cisco Security Services
SEA, IW Services, XDR, Duo, Talos, Umbrella

Internet

Public Cloud
Digital Twin — CNC, Robot, Machine, Splunk Cloud

Industrial De–Militarized Zone (iDMZ)
Cisco iDMZ Applications
- Splunk Heavy Forwarder
- Firepower Management Center
- Cisco Telemetry Broker
- Smart Software Manager

Secure Endpoint

Next Gen Firewall

iDMZ Applications and Services
- File Transfers
- Remote Access
- LDAP
- Data Proxy
- SW Updates

UCS
Secure Endpoint

Industrial Site Operations Zone
Secure Endpoint — vNGFW

Cisco Plantwide Applications
- Cyber Vision Center
- Cisco Catalyst Center
- Identity Services Engine
- IW Monitor
- Wireless LAN Controller
- Cisco URWB Mesh End

Wi-Fi — Cisco URWB

Core Switch Cat9500

Third-party Plantwide Applications
- ERP, Analytics, Predictive Maintenance
- MES, Precise Time, Machine Learning
- LDAP, Historian

vNGFW
Secure Endpoint

UCS

Distribution Switch Cat9300/ IE9300 Stack

Sensor

Cell/Area Zone
Production Machine — SGT: Cell-1
Catalyst IE3300 — SEA Gateway
CNC Machine — SGT: Cell-3
Catalyst IE3200
Catalyst IE3200
Catalyst IE3400
PLC
Sensor
Catalyst IE3400
Sensor
Catalyst IE3200 — Production Line — SGT: Cell-2

Ring

Use Case 3 - Backhaul
Catalyst IW9167, Catalyst IW9165 — Cisco URWB — Buildings

Splunk Universal Forwarder
Engineering Workstation

Use Case 2 - Mobile
Cisco URWB — Catalyst IW9167 — Autonomous Guided Vehicle

Connected Worker

Catalyst IW9167 — Catalyst IW9165

Use Case 1 - Fixed
Catalyst IE3100 — SGT: Cell-4 — Fabrication Machine

Wi-Fi

Multi-protocol Support
EtherNet/IP, CC-Link IE, OPC UA, Modbus, PROFIBUS, PROFINET

Proven to work with: Rockwell Automation, SIEMENS, Schneider Electric, MITSUBISHI ELECTRIC

Use Cases
- Reliable wireless connectivity for mobile assets (e.g. AGVs, AMRs)
- Connected Worker
- Nomadic assets such as Process Skids, etc.
- Point-to-Point Communication between sites

Feature
- Resilient, reliable and secure wireless connectivity for IACS
- Visibility of IACS devices and communication
- Plant floor macro/micro-segmentation
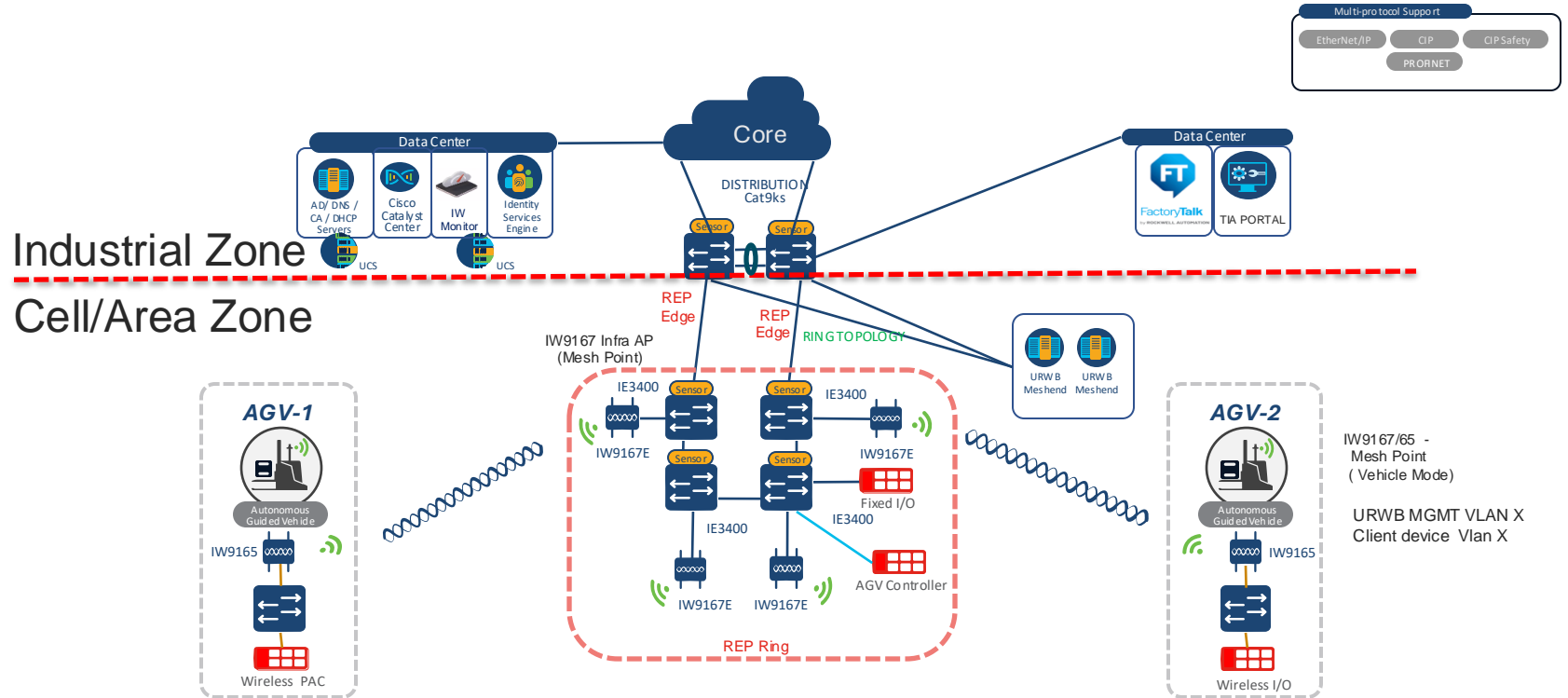- Network automation and assurance

Outcomes
- Improved uptime and OEE
- Reduced support effort & deployment errors
- Increased productivity
- Better IT/OT collaboration

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# Industrial Wireless for IA - URWB L2 Fluidity
Small Deployment

Multi-protocol Support
EtherNet/IP | CIP | CIP Safety
PRORNET

Data Center
AD/ DNS / CA / DHCP Servers
Cisco Catalyst Center
IW Monitor
Identity Services Engine
UCS
UCS

Core
DISTRIBUTION Cat9ks
Sensor
Sensor

Data Center
FactoryTalk by ROCKWELL AUTOMATION
TIA PORTAL

Industrial Zone

Cell/Area Zone

REP Edge
REP Edge
RING TOPOLOGY

URWB Meshend
URWB Meshend

IW9167 Infra AP (Mesh Point)

AGV-1
Autonomous Guided Vehicle
IW9165
Wireless PAC

IE3400
Sensor
IE3400
Sensor
IW9167E
IW9167E
Sensor
Sensor
Fixed I/O
IE3400
IE3400
AGV Controller
IW9167E
IW9167E
REP Ring

AGV-2
Autonomous Guided Vehicle
IW9165
Wireless I/O

IW9167/65 - Mesh Point (Vehicle Mode)

URWB MGMT VLAN X
Client device Vlan X

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When to choose WI-FI vs Cisco URWB?

	WI-FI	URWB	URWB w/MPO	WI-FI	URWB	URWB w/MPO
	Stationary/Wandering			**Roaming***		
Avg Latency	<10ms	<10ms	<10ms	<10ms	<10ms	<10ms
Max Latency	<60ms	<30ms	<30ms	<120ms	<30ms	<30ms
Packet Loss	<1%	<0.1%	<0.01%	<1%	<0.1%	<0.01%
Critical Traffic	No	Yes	Yes	No	Yes	Yes
Mobile Worker	Yes	No	No	Yes	No	No

*Roaming == Roaming between infrastructure access points

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Substation Automation WAN CVD Update
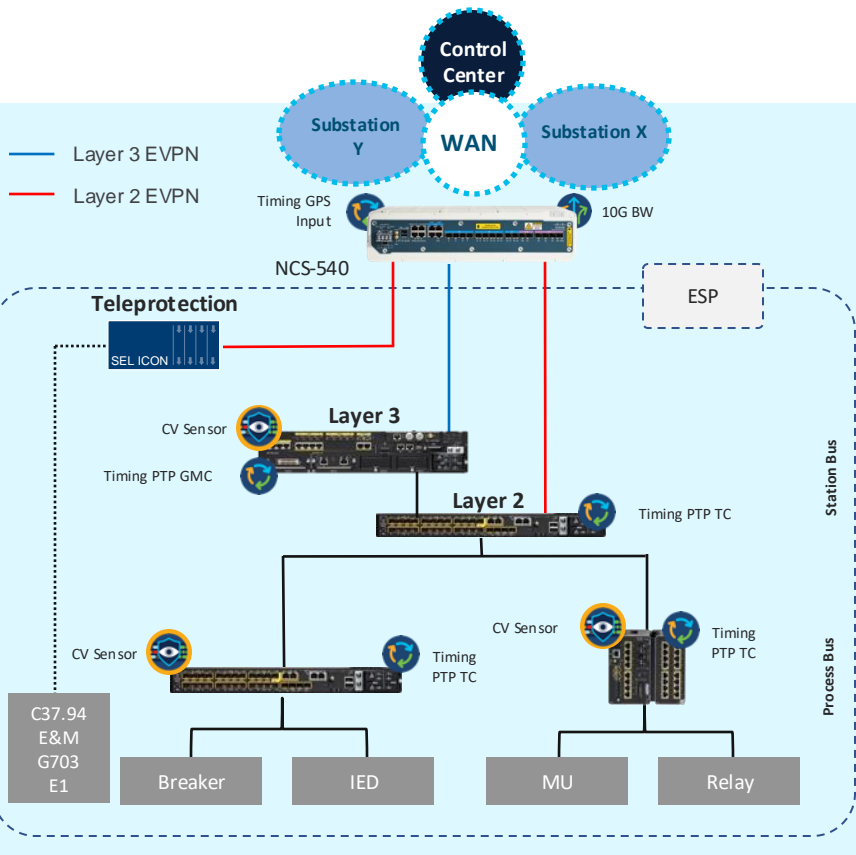
Routing

- MPLS with Segment Routing Transport network
- Data segmentation through services deployment (L3VPN & EVPN)
- High-grade, Service-Provider hardware and software
- End-to-End Traffic Engineering for specialized service requirements like Teleprotection
- Automation and orchestration options
- WAN MACsec or FlexVPN overlay
- IOx edge compute (IR & IE)
- IR8340 Firewall - ZBFW & IDS/IPS

Switching

- High performance substation LAN switching (Station/Process Bus)
- Switch stacking for high port density and reliability
- High precision PTP (e.g. Power profile)
- MACsec 256 for point-to-point Ethernet link encryption
- Cyber Vision sensor for endpoint visibility & security posture
- HSR, PRP redundancy for lossless convergence
- IOx edge compute to run applications at the edge
- IE9320 and IE3x00 Industrial switching

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Substation Automation WAN CVD

SR/EVPN
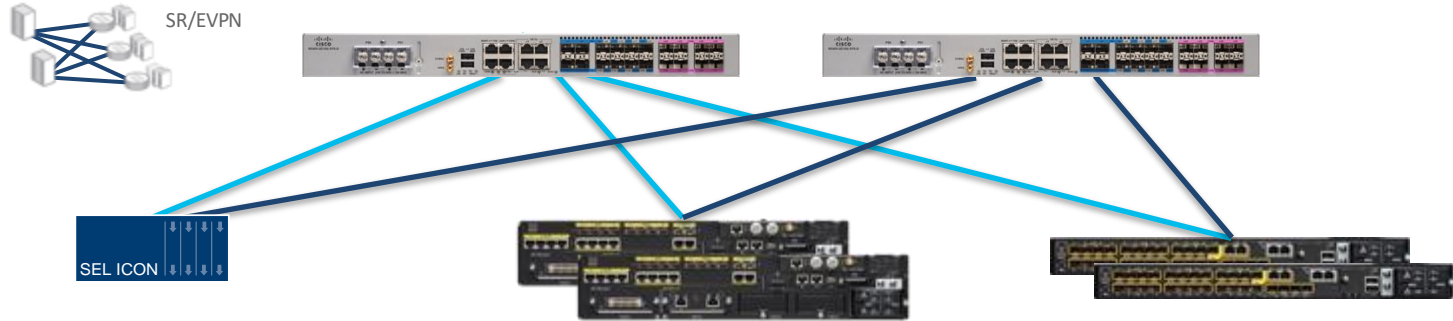
SEL ICON - Teleprotection

C37.94 (Nx64)
E&M 4W VF
G703 Codir
E1
DS1 (Sync/Aysnc)
FXO/FXS
PTP Timing
IRIG-B
Ethernet
Serial (Aysnc/Sync)

IR8340 - Layer 3 Gateway

Scada Traffic
Cybervision (App hosting)
Timing (GPS/PTP/IRG-B)
PRP/HSR Redbox
ZBFW
SD-WAN
Cellular
MPLS/Segment Routing PE
IPsec & WAN MACsec

IE9320 - Layer 2 Gateway

PRP/HSR
GOOSE based teleprotection
Trustsec
Cybervision (App hosting)
PTP C37.238/IEC61850-9-3
MACsec

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Distribution Automation / Secondary Substation

Cisco Catalyst SD-WAN

Field Network Director

On-Prem

Control Center 1

Control Center 2

C8000 Cluster

C8000 Cluster

On-Net WAN
(MPLS,uWave)

Public/ private LTE/5G 1

Public/ private LTE/5G 2

450MHz LTE

IR8100

Cisco Resilient Mesh

Renewable Energy

IR1101

IR1101

IR1101

IR 510

IR 510

IR 510

Feeder Automation

Secondary Substation
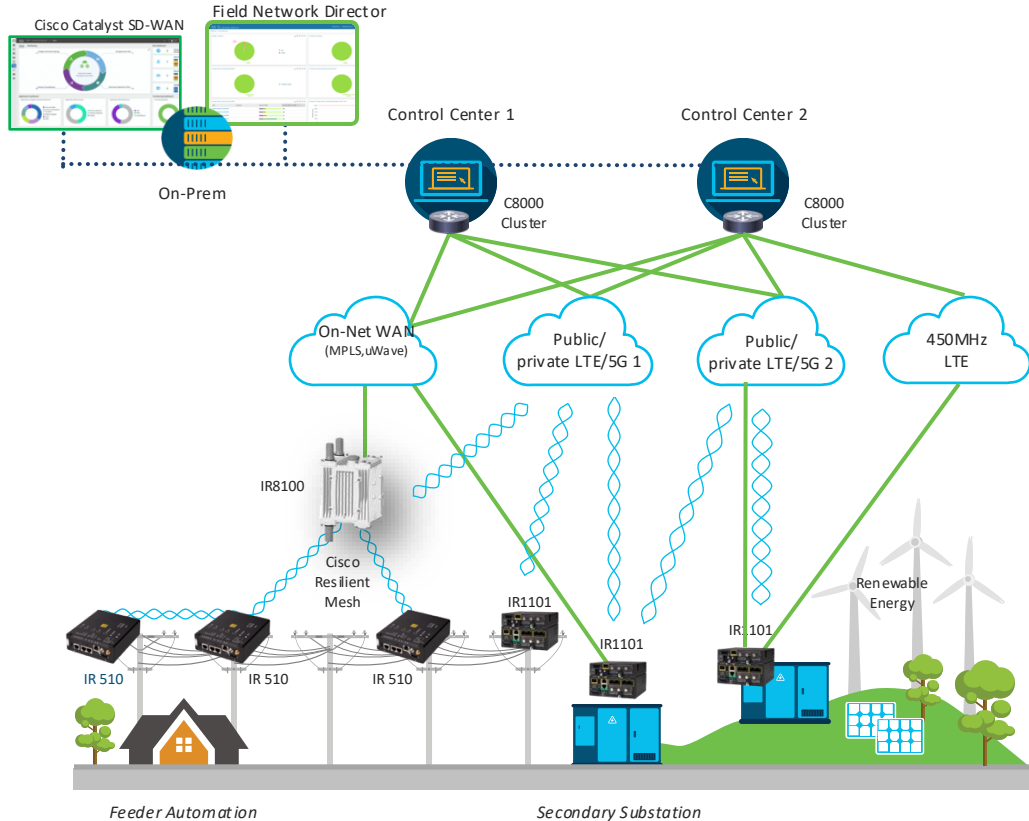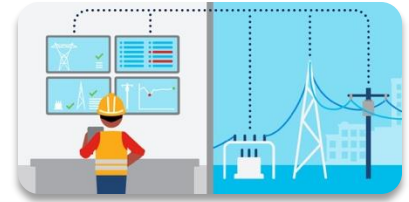
Business Outcomes

- Fewer outages and lower line losses (improve outage restoration times)
- Renewable energy integration
- Improved safety for grid infrastructure
- Real-time monitoring and analytics
- Regulatory compliance

Distribution Network Components

Routing	• IR1101 Cellular • IR8100 Cellular+WPAN IP67 • IR500 WPAN Resilient Mesh
Switching	• Catalyst IE3x00
Security	• Cyber Vision
Zero Touch Provisioning	• Field Network Director (FND) • SD-WAN or SD-Routing

Cisco Validated Design

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Security in OT areas

Cisco Validated Design

Reference architectures validated for the specific needs of your industry

Faster deployments

Less risk

Predictability

End to end designs

Design, deploy, and extend networking and cybersecurity technologies successfully

Helping industries with generic and specific designs, as well as addressing regulatory requirements

Přepínače (IE)

IoT Industrial Switching portfolio

IOS-XE

IOS - IOS

Non IOS

Feature ↑

IE 1000
- Lightly-managed
- Layer 2 only
- Din rail mount

IE 2000
- L2 or L3 (IP lite
- FastEthernet Downlinks
- Industrial, Enterprise Vertical
- Din rail mount

IE2000U
- L2 or L3 (IP services)
- FastEthernet Downlinks
- Utility Vertical
- Din rail mount

IE3100
- Layer 2
- 2 GE uplinks
- 4/8/18 GE& &8/18 GE downlinks
- Din rail mount

IE3200
- Layer 2, PoE
- 2 GE uplinks
- 8 GE downlinks
- Din rail mount

IE3300
- Layer 2/Layer3
- 2 GE uplinks
- Up to 24 GE pts
- Modular
- Din rail mount

IE3400
- Layer 2/Layer3
- 2 GE uplinks
- Advanced Features
- Up to 24 GE ports
- Modular
- Din rail mount

IE 4000
- For all industries
- Layer 2 or 3 (IP service)
- 4 GE uplinks
- Up to 20 GE ports
- Din rail mount

IE 4010
- For all industries
- Layer 2 or 3 (IP service)
- 4 GE uplinks
- 28 total GE ports
- 19" rack mount

IE9300
- Designed for all industries
- Layer 2 or 3
- 4 1 GE uplinks
- 24 GE downlinks
- Stackwise
- 19" rack mount

IE3300-10G
- Layer 2/Layer3
- 2 TenGig uplinks
- Up to 24 GE ports
- Modular
- Din rail mount

IE 5000
- Designed for all industries
- Layer 2 or 3 (IP service)
- 4 10 GE* uplinks
- 24 GE downlinks
- 19" rack mount

FastEthernet downlinks

Gigabit uplink and downlinks

IE3400H has FE Model too

10Gig uplinks

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'*' – Selected Models

EoS – IE2k, IE2kU, 4k, 5k

EOL15266, EOL15265, EOL15264

IE 2k, IE 2kU :
https://www.cisco.com/c/en/us/products/collateral/switches/industrial-ethernet-2000-series-switches/ind-ethernet-2000-2000u-ip67-poe-ser-switch-eol.html

IE4k : https://www.cisco.com/c/en/us/products/switches/industrial-ethernet-4000-series-switches/industrial-ethernet-4000-series-switches-eol.html

IE5k :
https://www.cisco.com/c/en/us/products/collateral/switches/industrial-ethernet-5000-series-switches/indus-ethernet-5000-series-switch-eol.html

CDB-8x EoS – April 20 2025
EOL15527
https://www.cisco.com/c/en/us/products/collateral/switches/catalyst-digital-building-series-switches/cdb-switches-eol.html

Milestone	Definition	Date
End-of-Life Announcement Date	The date the document that announces the end of sale and end of life of a product is distributed to the general public.	January 26, 2024
End-of-Sale Date: HW,License	The last date to order the product through Cisco point-of-sale mechanisms. The product is no longer for sale after this date.	July 26, 2024
Last Ship Date: HW,License	The last-possible ship date that can be requested of Cisco and/or its contract manufacturers. Actual ship date is dependent on lead time.	October 24, 2024
End of SW Maintenance Releases Date: HW	The last date that Cisco Engineering may release any final software maintenance releases or bug fixes. After this date, Cisco Engineering will no longer develop, repair, maintain, or test the product software.	July 26, 2025
End of Vulnerability/Security Support: HW	The last date that Cisco Engineering may release a planned maintenance release or scheduled software remedy for a security vulnerability issue.	July 26, 2027
End of Routine Failure Analysis Date: HW	The last-possible date a routine failure analysis may be performed to determine the cause of hardware product failure or defect.	July 26, 2025
End of New Service Attachment Date: HW	For equipment and software that is not covered by a service-and-support contract, this is the last date to order a new service-and-support contract or add the equipment and/or software to an existing service-and-support contract.	July 26, 2025
End of Service Contract Renewal Date: HW	The last date to extend or renew a service contract for the product.	October 21, 2028
Last Date of Support: HW	The last date to receive applicable service and support for the product as entitled by active service contracts or by warranty terms and conditions. After this date, all support services for the product are unavailable, and the product becomes obsolete.	July 31, 2029

IoT Industrial Switching portfolio

Feature

IE 1000
- Lightly-managed
- Layer 2 only
- Din rail mount

FastEthernet downlinks

IE3100
- Layer 2
- 2/4 GE uplinks
- 4/8/18 GE& &8/18 GE downlinks
- PoE models
- Din rail mount

IE3200
- Layer 2 , PoE
- 2 GE uplinks
- 8 GE downlinks
- Din rail mount

IE3300
- Layer 2/Layer3
- 2 GE uplinks
- Up to 24 GE ports
- Modular
- Din rail mount

IE3400
- Layer 2/Layer3
- 2 GE uplinks
- Advanced Features
- Up to 24 GE ports
- Modular
- Din rail mount

IE 4010
- For all industries
- Layer 2 or 3 (IP service)
- 4 GE uplinks
- Up to 20 GE ports
- Din rail mount

IE9300
- Designed for all industries
- Layer 2 or 3
- 4 1 GE uplinks
- 24 GE downlinks
- Stackwise
- 19" rack mount

Gigabit uplink and downlinks

IE3300-10G
- Layer 2/Layer3
- 2 TenGig uplinks
- Up to 24 GE ports
- Modular
- Din rail mount

IE9300
- Designed for all industries
- Layer 2 or 3
- 4 1 GE uplinks
- 24 GE downlinks
- Stackwise
- 19" rack mount

10Gig uplinks

IE3400H has FE Model too

'*' –Selected Models

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IoT Switching Portfolio – Model Comparison

	IE1000	IE3100	IE3200	IE3300	IE3300-10G	IE3400 / IE3400H	IE4010	IE9300
				DIN Rail			Rackmount	
Downlink Speeds	Fast Ethernet	Gigabit Ethernet	Gigabit Ethernet	Gigabit Ethernet	Gigabit Ethernet	Gigabit Ethernet	Gigabit Ethernet	Gigabit Ethernet
Manageability	**Light**	☑	☑	☑	☑	☑	☑	☑
PoE / PoE+ / 4PPoE	✗	☑	☑	☑	☑	☑ / ✗	☑	☑
Layer 3	✗	✗	✗	☑	☑	☑	☑	☑
MACSec 128/256	✗	✗	128	128/256	128/256	128/256	128	128/256
Modularity	✗	✗	✗	☑	☑	☑	✗	✗
Cyber Vision/IOX	✗	✗	✗	☑	☑	☑	✗	☑
Secure Equipment Acc.	✗	☑	✗	☑	☑	☑	✗	☑
SDA Fabric support	✗	Ext Node	Ext Node	Ext Node	Ext Node	Policy Ext Nd	Ext Node	FE/ PoI EN
IP67 Version	✗	✗	✗	✗	✗	☑	✗	✗
10G Uplinks	✗	✗	✗	✗	☑	✗	✗	☑
GPS/IRIG	✗	✗	✗	✗	✗	✗	✗	☑
Stacking	✗	✗	✗	✗	✗	✗	✗	☑
Licensing	NA	Network Essentials	Network Essentials	Network Essentials/ Advantage	Network Essentials/ Advantage	Network Essentials/ Advantage	LanBase / IP Services	Network Essentials/ Advantage

Common features: Ruggedized, IP30, WEB UI, Industrial Protocols such as Ethernet/IP, Plug-and-Play, TACACS+, IEEE 802.1x, Industrial environmental compliance and certifications and more

Cisco Catalyst IE3x00 Product Family – DIN Rail

Catalyst IE3100

Designed for machine builders and limited space deployments
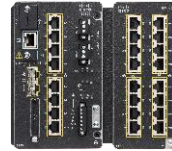
- GE speeds
- PTP, REP, MRP*, L2NAT*
- PoE

Catalyst IE3200

Your entry to power over ethernet industrial networking

- GE speeds
- PTP, REP, MRP
- SDA Extended Node
- PoE+
- MACsec 128-bit

Catalyst IE3300

Modular switch with advanced PoE, asset visibility, and edge compute for app hosting

- GE, mGE, 10GE speeds
- PTP, REP, MRP, L2NAT
- SDA Extended Node
- PoE+, 4PPoE
- MACsec 256-bit
- NetFlow
- Cyber Vision and App Hosting

Catalyst IE3400

Modular switch with advanced PoE, asset visibility, app hosting, and extended security

- GE speeds
- PTP, REP, MRP, L2NAT, DLR, PRP, HSR
- SDA Policy Extended Node
- PoE+
- MACsec 256-bit
- NetFlow
- Cyber Vision and App Hosting
- TrustSec Segmentation

Fixed Layer 2 industrial switch

Modular Layer 3 industrial switch

IOS-XE Operating Software	**Cisco DNA Center Management**	**Advanced Visibility and Security**

Cisco IoT

IE3200, IE3300, IE3400 Systems and Modules Overview

Highly flexible architecture with a wide array of module choices

IE3100, IE3200 Fixed system

- IE3100 copper fixed
- IE3100 PoE+ fixed

IE-3200-8T2S
IE3200 copper fixed system

IE-3200-8P2S
IE3200 PoE+ fixed system

*No support for expansion modules

IE3300, IE3400 Expandable systems

IE-3300-8T2S
IE3300 copper basic modular system

IE-3300-8P2S
IE3300 PoE+ basic modular system

IE-3300-8T2X
IE3300 10G basic modular system

IE-3300-8U2X
IE3300 10G & 4PPoE basic modular system

IE-3400-8T2S
IE3400 copper advanced modular system

IE-3400-8P2S
IE3400 PoE+ advanced modular system

IEM3300, IEM3400 Expansion modules

IEM-3300-8T
8p copper

IEM-3300-6T2S
2p fiber
6p copper

IEM-3300-16T
16p copper

IEM-3300-14T2S
2p fiber
14p copper

IEM-3300-8S
8p fiber

[3]IEM-3300-4MU
4p Mgig (2.5G)
4PPoE type 4

IEM-3300-8P
8 PoE+

IEM-3300-16P
16 PoE+

IEM-3400-8S
8p fiber
advanced

IEM-3400-8T
8p copper
advanced

IEM-3400-8P
8p PoE+
advanced

IE3400H Outdoor fixed system

IE-3400H-8T
IE-3400H-16T
IE-3400H-24T
8p/16p/24p
100M or GE (D-Coded or X-coded)

*No support for expansion modules

1. IEM-3400 expansion modules only work with IE3400 base
2. IEM-3300 expansion modules will work with both IE3300 base & IE3400 base
3. IEM-3300-4MU: links speed 10Mbps not supported.   Only 100/1000/2500

IE-3100/ 3105 Face Plate

Hardware

Dual power input
12VDC – 54VDC

2 Combo- GE SFP
Uplinks (Except on IE-
3100-4T2S)*

RJ45 Console port

Express Setup
button for Day-0

4/8/18 x GE copper
100/1000 downlinks

SD-Flash: Removeable storage
&
Micro-USB Console

Alarm Contacts
2 alarms in/
1 alarm out
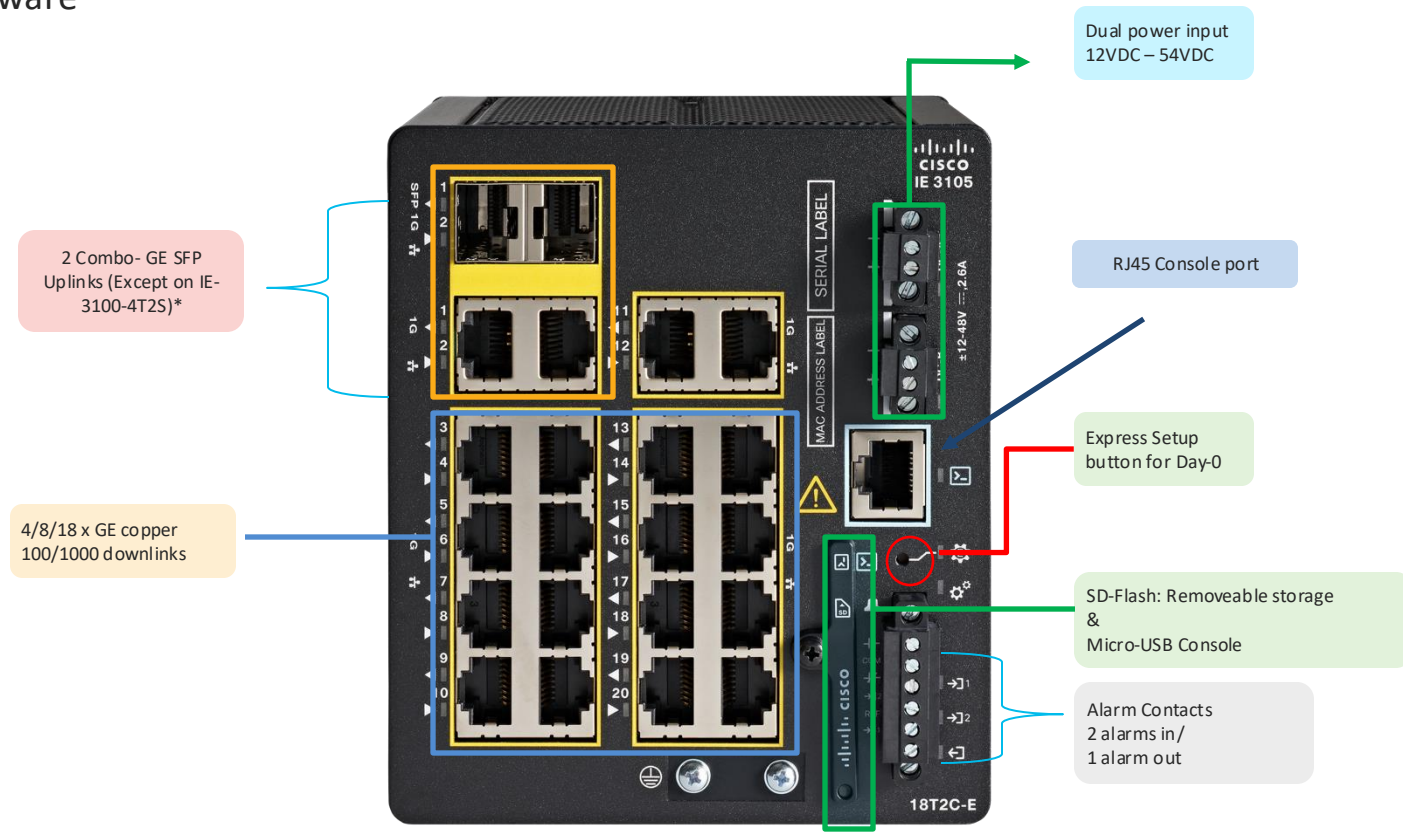
* IE3100-4T2S has 2 Non-combo SFP ports

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Catalyst IE3100 Rugged Series

Compact size with faster speeds
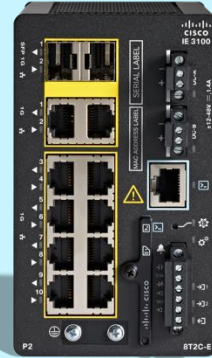
Size comparison with IE2000 Layer-2 Fast Ethernet switches

Width:
6.5cm
Height:
12.7cm
Depth:
11.0cm

19% Volume Reduction

14% Width Reduction

Width:
7.6cm
Height:
12.7cm
Depth:
11.0cm

21% Volume Reduction

17% Width Reduction

Width:
10.9cm
Height:
12.7cm
Depth:
12.9cm
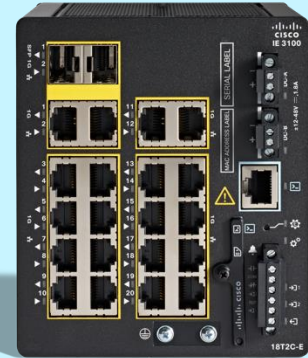
19% Volume Reduction

14% Width Reduction

Small Form Factor

Gigabit Ethernet

L2 Switching

Best-in-class security

Cisco IoT

Cisco Catalyst IE3100 Rugged Series Portfolio

*New models
Orderable: June 2024
Shipping: September 2024

IE3100 Data

IE-3100-4T2S-E
4x 1GE ports
2x 1GE SFP ports
Network Essentials

IE-3100-8T2C-E
8x 1GE ports
2x 1GE combo ports
Network Essentials

IE-3105-8T2C-E
8x 1GE ports
2x 1GE combo ports
Network Essentials
Layer 2 NAT

IE-3100-18T2C-E
18x 1GE ports
2x 1GE combo ports
Network Essentials

New

IE-3100-8T4S-E
8x 1GE ports
4x 1GE SFP ports
Network Essentials

IE-3105-18T2C-E
18x 1GE ports
2x 1GE combo ports
Network Essentials
Layer 2 NAT

Conformal Coating*

New

IE-3100-18T2C-CC-E
18x 1GE ports
2x 1GE combo ports
Conformal Coating
Network Essentials

IE3100 PoE*

New

IE-3100-4P2S-E
4x PoE/PoE+
2x 1GE SFP ports
120W PoE Budget

New

IE-3100-8P2C-E
8x PoE/PoE+
2x 1GE combo ports
240W PoE Budget

Cisco Catalyst Center | SDA Extended Node | Secure Equipment Access

Key Supported Features per License

Catalyst IE3100 Rugged Series

Network Essentials

Layer 2 Switching	802.1Q, 802.1w, 802.1ab, 802.1s, 802.3ad, Per-VLAN Rapid Spanning Tree (PVRST+), Per-VLAN Spanning Tree (PVST+), Rapid PVST (RPVST), Switch Port Analyzer (SPAN), Remote-SPAN (RSPAN), Flow-Based SPAN (FSPAN), STP, Storm Control, VLAN Trunk Protocol (VTP) v2/v3, 802.1Q Tunneling, Layer 2 Tunneling Protocol (L2TP), Q-in-Q, Selective Q-in-Q, EtherChannel
Multicast	IGMP v1/v2/v3, IGMP Snooping, MLD Snooping
Management	WebUI, MIB, SNMP, syslog, DHCP server, NETCONF, RESTCONF, Embedded Event Manager (EEM), PnP, Express Setup
Security	DHCPv6 Guard, IP Source Guard, IPv6 Destination Guard, IPv6 Neighbor Discovery Multicast Suppress, IPv6 Router Advertisement (RA) Guard, IPv6 Snooping, IPv6 Source/Prefix Guard, IPv6 Neighbor Discovery Duplicate Address Detection, PACL, VACL, Network Edge Authentication Topology (NEAT), HTTPS, RADIUS, TACACS+, X.509v3, Secure Shell (SSH), DHCP Snooping, 802.1X, Client Information Signaling Protocol (CISP), Dynamic ARP Inspection (DAI), authentication, authorization, and accounting (AAA), Secure Copy Protocol (SCP)

Quality of Service	802.1p, priority queuing, MQC, class based shaping & marking, ingress policing, egress queuing and shaping, auto QoS, DSCP mapping and filtering, Low Latency Queuing
Layer 3 routing (Limited Scale)	Inter-VLAN routing, static routing
Industrial Ethernet	Locate Switch, Swap Drive, Generic Object-Oriented Substation Events (GOOSE) messaging, SCADA Protocol Classification, PTP (Default Profile, Power Profile 2011, Power Profile 2017), Network Time Protocol (NTP) to PTP, Sampled Values
Redundancy	Resilient Ethernet Protocol (REP) ring, Media Redundancy Protocol (MRP)
Automation	YANG, NETCONF, RESTCONF

Network Advantage

No Network Advantage
for IE310x

Cisco IoT

Catalyst IE3100 Rugged Series Overview

	IE-3100-4T2S-E	IE-3100-8T4S-E	IE-3100-8T2C-E	IE-3100-18T2C-E	IE-3100-18T2C-CC-E	IE-3105-8T2C-E	IE-3105-18T2C-E	IE-3100-4P2S-E	IE-3100-8P2C-E
Ports	4x GE, 2x GE SFP	8x GE, 4 GE SFP	8x GE, 2x GE Combo	18x GE, 2x GE Combo	18x GE, 2x GE Combo	8x GE, 2x GE Combo	18x GE, 2x GE Combo	4x GE PoE+, 2x GE SFP	8x GE PoE+, 2x GE Combo
IP Rating	IP30	IP30	IP30	IP30	IP30	IP30	IP30	IP30	IP30
PoE								✓	✓
Layer 2 Port Security	✓	✓	✓	✓	✓	✓	✓	✓	✓
802.1x NAC	✓	✓	✓	✓	✓	✓	✓	✓	✓
Trustsec SXP	✓	✓	✓	✓	✓	✓	✓	✓	✓
Downloadable ACLs	✓	✓	✓	✓	✓	✓	✓	✓	✓
MRP / PTP / REP	✓	✓	✓	✓	✓	✓	✓	✓	✓
L2 NAT						✓	✓		
TSN						✓*	✓*		
SDA Extended Node	✓	✓	✓	✓	✓	✓	✓	✓	✓
Secure Equipment Access	✓	✓	✓	✓	✓	✓	✓	✓	✓

Cisco IoT

Cisco Catalyst IE3100 Power over Ethernet

New

Designed for Machine Builders and space constrained environments

PoE Boost
Provide PoE power when inputs voltage is < 48V

Fast PoE
Power up devices quickly, even before the switch recovers from a power loss

Perpetual PoE
Maintain power to end-point devices even during a switch reload

IE-3100-4P2S-E
4x PoE/PoE+
2x 1GE SFP ports
120W PoE Budget
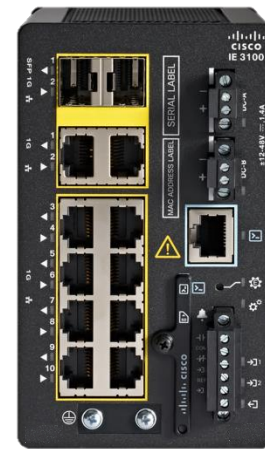
IE-3100-8P2C-E
8x PoE/PoE+
2x 1GE combo ports
240W PoE Budget

Catalyst IE3100 Rugged Series **additions!**

IE3x00 PoE breakdown

	IE-3100-4P2S	IE-3100-8P2C	IE3200-8P2S	IE-3300-8P2S	IE-3300-8U2X	IE-3400-8P2S	IEM-3300-4MU
Max PoE budget	9.6V - 18V = 31W 18V - 44V = 90W 44V - 52.5V = 120W 52.5V - 60V = 120W	9.6V - 18V = 31W 18V - 44V = 90W 44V - 52.5V = 120W 52.5V - 60V = 240W	240W	360W	480W	480W	360W
Default PoE Budget	9.6V - 18V = 0W 18V - 44V = 31W 44V - 60V = 120W	9.6V - 18V = 0W 18V - 44V = 31W 44V - 60V = 120W	125W	125W	125W	125W	NA
PoE Ports	4	8	8	8	8	8	4
MAX PoE per port(W)	30	30	30	30	60	30	90
Max PoE ports per system	4	8	8	24	24	24	NA
Spec support On base system	802.3at	802.3at	802.3at	802.3at	802.3bt type3*	802.3af	802.3bt type4**

For IE3300, IE3400, there is no limits on the permutations of base and expansion PoE module, as long as at the base system, m ax PoE budget is not exceeded

'*' – 4 Pair PoE type3
'**' – 4 Pair PoE type4

Cisco IoT

Cisco industrial DIN-rail power supplies

A full line of compact, rugged, and reliable AC and DC power supply options

PWR-IE480W-PCAC-L
480W AC to DC,
16 ports of PoE/PoE+

PWR-IE240W-PCAC-L
240W AC to DC,
8 ports of PoE/PoE+

PWR-IE170W-PC-DC
170W Low DC to DC,
PoE/PoE+

PWR-IE170W-PC-AC
170W AC to DC or
High DC to DC, PoE/PoE+

PWR-IE65W-PC-DC
65W Low DC to DC
power supply, PoE/PoE+

PWR-IE65W-PC-AC
65W AC to DC or
High DC to DC, PoE/PoE+

PWR-IE50W-AC-IEC
50W AC to DC power supply
with an IEC connector

PWR-IE50W-AC
50W AC to DC
or High DC to DC

PWR-IE50W-AC-L
50W AC to DC

Reduce wiring complexity | Control costs with less wiring, distribution panels, and circuit breakers

Cisco IoT

Cisco IOS-XE Fuels the IE3100
Software

➢ IE3100 and IE3105 Series switches run Cisco's IOS-XE Operating System

➢ IOS-XE architected to automate Onboarding, Configuration, Monitoring & Optimization

➢ IOS-XE provides in-built security features to enhance platform Integrity and Security

    ✓ **Secure Boot**
    ✓ **Image Signing**
    ✓ **Cisco Trust Anchor Module (TAM)**

Secure

➢ Allows for update of features / protocols via Install packages or complete upgrade bundles

➢ IOS-XE provides API driven configuration with open API's and data models (NetConf)

Cisco IoT
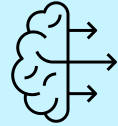
Industrial switches for 19" Rackmount

IE93xx (IE9310 & IE9320)

IE4010

	IE9300	IE4010
Gigabit Interfaces (downlink/uplink)	24/4	24/4
Advanced Industrial Features (CIP/Profinet)	Yes	Yes
Advanced IT features (MacSec, Trustsec)	Yes	Yes
PoE/PoE+	Up to 24	Up to 24
Downlinks	100M/1G	1G
Uplinks	1G/10G	1G
Stacking	StackWise*	No
Timing Interfaces (GPS, IRIG-B, TOD)	Yes*	No
IEEE 1588 PTP (Power profile, Default profile)	Yes	Yes
Conformal Coating	Yes*	No

Cisco IoT

Cisco Catalyst IE9300 Portfolio

Stackable, high performance, ruggedized industrial rackmount switches

7 IE9300 Models

IE-9310-26S2C

26x 1GE SFP ports
2x 1GE combo ports
Not Stackable

IE-9320-24T4X

24x 1GE ports
4x 10G SFP ports
Stackable

IE-9320-24P4S

24x 1GE with PoE/PoE+
Up to 385W PoE budget
4x 1GE SFP ports
Stackable

IE-9320-24P4X

24x 1GE with PoE/PoE+
4x 10G SFP ports
Up to 720W PoE budget
Stackable

FPGA

IE-9320-26S2C

26x 1GE SFP ports
2x 1GE combo ports
PRP and HSR Support
Stackable

FPGA

IE-9320-22S2C4X

22x 1GE SFP, **4x 10G SFP**
2x 1GE combo ports
PRP and HSR Support
Timing input
Conformal coating
Stackable

IE-9320-16P8U4X

8x mGig with 90W 4-pair PoE
16x 1GE with PoE/PoE+ ports
Up to 720W PoE budget
4x 10G SFP ports
Stackable

The most comprehensive industrial rackmount portfolio in the market

Cisco IoT

Cisco IE-9320-22S2C4X Front Panel

24x SFP Gigabit Ethernet Ports (Downlinks)
- 22x 100/1000M SFP ports
- 2x GE Combo (100/1000 SFP, 10/100/1000 RJ45) ports

Alarm Contacts
- FOUR Alarm Inputs
- ONE Alarm Output

Conformal Coating

Timing
- GPS

Console
- RS232
- Micro USB

Conductive Cooling
- No fans or moving parts
- Increased Operating Temp

FPGA

Mode & System LEDs
- System, Alarm
- Port Status LEDs

4x SFP+ Ten-Gigabit Ethernet Ports (Uplinks)
- 1/10G SFP

Timing
- IRIG-B

Field Replaceable Power Supplies
- High Voltage PS: 85–265 VAC , 88-300 VDC
- Low Voltage PS: 18-75 VDC

Substation Hardened
- Substation Compliant
- IEC61850-3 and IEEE1613

All Ports IEEE 1588 v2/PTP
- Power Profile C37.238, Default Profile

Storage
- SD Flash
- USB 2.0

Stacking Ports

IE9300 Models' similarities
IE9300 Models' Differences

Cisco IoT

IE9300 Power Supply Options

The IE9300 supports existing PSU models used by IE4010 and IE5000

Product Number	Wattage	Rated nominal input operating range	Input voltage operating range
PWR-RGD-LOW-DC-H	150W	DC 24-60V/10A	DC 18-75V
PWR-RGD-AC-DC-H	150W	AC 100-240V 2A 50-60H or DC 100-250V 2.0A	AC 85-264V / DC 88-300V
PWR-RGD-AC-DC-250	250W	AC 100-240V 3.3A 50-60Hz or DC 100-250V 3.3A	AC 85-264V / DC 88-300V
PWR-RGD-AC-DC-400	400W	AC 100-240V 3.3A 50-60Hz or DC 100-250V 3.3A	AC 85-264V / DC 88-300V

Available power budget for PoE/PoE+ with different power supplies

Product Number	150W	150W(dual)	250W	250W +150W	250W(dual)	400W*	400W(dual)
IE-9320-24P4S-E/A	70W	190W	170W	280W	370W	320W	385W
IE-9320-24P4X-E/A	70W	190W	170W	280W	370W	320W	720W
IE-9320-16P8U4X-E/A	70W	190W	170W	280W	370W	320W	720W

* 150W and 250W power supplies cannot be used with 400W in load sharing configuration

Cisco IoT

IE9320 – Stacking
4 times the density and easier to manage

✓ Up to 4* switches can be stacked using front panel stack ports

✓ All IE-9320 Series models support stacking. Mixing of copper & fiber models is allowed

✓ Same Cisco IOS XE and license is required on all switches of the stack

✓ Switch Stack can be managed via Cisco Catalyst Center

✓ IE-9320 stack cables come in two lengths – 0.5M and 1M

StackWise® 160

4x

Expand switching capacity, port density, and redundancy within a single control plane

*HW can support up to 8-member stack – roadmap

Cisco IoT

IE9300 Key Supported Features per License

Network Essentials

Layer 2 Switching	802.1q, 802.1w, 802.1ab, 802.1s, 802.3ad, PVRST+, PVST+, RPVST, RSPAN, SPAN, STP, Storm Control, VTP v2/v3, 802.1Q Tunneling, L2TP, QinQ, Selective QinQ, EtherChannel
Multicast	IGMP v1/v2/v3, IGMP Snooping, MLD Snooping
Management	WebUI, MIB, SNMP, syslog, DHCP server, NETCONF, Embedded Event Manager (EEM), PnP, Express Setup
Security	DHCPv6 Guard, IP Source Guard, IPv6 Destination Guard, IPv6 Neighbor Discovery Multicast Suppress, IPv6 Router Advertisement (RA) Guard, IPv6 Snooping, IPv6 Source/Prefix Guard, IPv6: Neighbor Discovery Duplicate Address Detection, Flexible Netflow, PACL, VACL, NEAT, HTTPS, RADIUS, TACACS+, X.509v3, Secure Shell SSH, DHCP Snooping, 802.1x, CISP, DAI, AAA, SCP, **L2NAT, IEEE 802.1AE MACsec-128**

Quality of Service	802.1p, priority queuing, MQC, class based shaping & marking, egress policing, egress queuing and shaping, auto QoS, DSCP mapping and filtering, Low Latency Queuing
Layer 3 routing (Limited Scale)	Static routing, OSPF, OSPFv3, RIP, PBR
Industrial Ethernet	Locate Switch, SwapDrive, GOOSE Messaging, SCADA Protocol Classification, **PTP Default Profile & Power Profile 2011, Power Profile 2017**, NTP to PTP, BFD, **IOx (App hosting)**, ModBus TCP
Redundancy	Resilient Ethernet Protocol (REP) ring, Fast REP, **HSR[1,2], PRP[2], MRP[1]**
Automation	YANG, NETCONF, RESTCONF

Network Advantage

Layer 3 Routing	HSRP, BGP, EIGRP, IS-IS, MBGP, NSF
Virtualization	VRF-Lite

Security	Cisco TrustSec – SGACL, SGACL Logging, EAP-TLS, **IEEE 802.1AE MACsec-256, L3NAT**
IP Multicast	AutoRP, MSDP, PIMv2, IPv6 Multicast with VRF-Lite support

[1] Support planned / Roadmap
[2] Supported on IE-9320-26S2C and IE-9320-22S2C4X ONLY

Cisco IoT

Směrovače (IR)

IoT Routing for all use cases

Demanding, mission critical deployments

**ATMs, low voltage substations,
roadside traffic cabinets , renewables**

Catalyst
IR1101

5G

**Remote monitoring,
streetlights, intersections, advanced metering**

Catalyst
IR8100

5G

Fleet, first-responders, pipelines

Catalyst
IR1800

5G

Mission-critical, Factory, high voltage substations

Catalyst
IR8300

5G

Cisco IoT

Cisco Catalyst Rugged Industrial Router comparison

Feature	IR1100	IR1800	IR8100	IR8300
Memory	4GB	4GB (IR1821/1831/1833) 8GB (IR1835)	8GB	8GB
Storage	8GB eMMC – 4GB usable	8GB eMMC – 4GB usable	8GB eMMC – 4GB usable	16GB Flash
Dimensions	13.3(h) x 12.5(d) x 5.8(w) cm	55.9 x 280.4 x 204.7 mm	34.04 cm x 23.88 cm x 25.27 cm	88.9 x 438.2 x 381 mm
IP rating	IP30	IP40 and IP54 with extension kit	IP67	IP30
Temperature range	-40° to 60°C +85°C Type Tested for 16 hours	-40° to 60°C +85°C Type Tested for 16 hours	-40° to 60°C +85°C Type Tested for 16 hours	-40° to 60°C +85°C Type Tested for 16 hours-
Power requirements	Nominal voltage: 12-48V DC Min/max voltage: 9.6 – 60V DC input	Nominal voltage: 12V, 24V DC Min/max voltage:9.6V to 36V DC Max/Min current: 7.8 A, 2.2 A	AC voltage range:100V to 240V AC nominal voltage:120V, 220V AC 50Hz/60Hz, 1Amp max	150W/250W dual power supply for the chassis
Cisco Battery backup	N/A	N/A	60W AC and optional 12VDC Batteries Backup Unit(s) (Power supply module upgradeable to 100W AC)	N/A
Ethernet	1 x WAN SFP/RJ45 combo GE (L3 or L2 port) 4 x RJ45 (L2 switch ports) 10/100Mbs (+ 1 SFP GE or 2 x RJ45 GE L2 on expansion module)	1 x WAN SFP/RJ45 combo GE (Layer3) 4 x RJ45(L2 switchports) 10/100/1000Mbs	1 x RJ45 (10/100/1000)Mbps 1 x SFP(1G) port	2 x WAN (RJ45/SFP) 4 x RJ45 ports 4 x Combo RJ45/SFP ports 4 x SFP ports
DSL SFP	Yes	No (17.10.1)	No	No

Cisco IoT

Cisco Catalyst Rugged Industrial Router comparison

Feature	IR1100	IR1800	IR8100	IR8300
Serial	1 x RJ45 (RS-232 DTE Async) 4 x RJ45 (RS232/485 Async) on expansion module	2 x RJ45 (1xRS-232 and 1xRS232/RS-485)/ Async (model dependent)	No	Up to 2 x Serial NIM
POE	No	Yes, 30W (IR1835 and IR1833)	Yes	Yes, 60W 4 POE or 2 POE+ or 1 UPOE
USB Storage(type A)	Yes	Yes	Yes	Yes
Console Port	Mini USB Console	Micro USB Console	RJ45	RJ45
mSATA(Storage)	Yes	Yes (IR1835 and IR1833)	Yes	Yes
Ignition power management	No	Yes	No	No
CAN-bus interface	No	Yes	No	No
Cellular Interface	1 (Base module) or 2 (with expansion module)	Up to 2	Up to 2	Up to 2
2G/3G/4G/5G	Dependent on PIM	Dependent on PIM	Dependent on PIM/UIM	Dependent on PIM
Wi-fi6	N/A	Yes	No	No

Cisco IoT

Cisco Catalyst Rugged Industrial Router comparison

Feature	IR1100	IR1800	IR8100	IR8300
Alarm port(GPIO)	1 input alarm (+4 GPIO on expansion module)	4 GPIO on IR1835 only	2 GPIO	2 input alarms, 1 output alarm
GPS from cellular	Yes	Yes	Yes	Yes
GNSS	No	Yes (IR1833 and IR1835) (GNSS FRU)	Yes (GNSS embedded)	Yes (with Timing module)
DUAL SIM	Yes, Dependent on PIM	Yes, Dependent on PIM	Yes, Dependent on PIM	Yes, Dependent on PIM
Edge Computing	Yes	Yes	Yes	Yes
Cisco IOS-XE SDWAN	Yes	Yes	Yes	Yes
Cisco IOS-XE WebUI	Yes	Yes	Yes	Yes
Centralized Management	Catalyst Center Catalyst SDWAN Field Network Director	Catalyst Center Catalyst SDWAN	Catalyst SDWAN Field Network Director	Catalyst Center Catalyst SDWAN

Cisco IoT

Configurations to be supported by IR1101
Deployment scenarios with expansion module

IR1101 + Serial Expansion Module

Majority of the use cases

IR1101 + LTE Expansion Module + Serial Expansion Module (Bottom)

Ethernet Ports on the expansion module will **not** work

IR1101 + Serial Expansion Module + LTE Expansion Module (Bottom)

SFP on the expansion module will **not** work

IR1101 + 2x Serial Expansion

Ethernet ports on the expansion module in the bottom will **not** work

Ethernet Ports on Expansion Module total throughput limited to 1Gbps

Additional PIMs to Industrial Routing Cellular Portfolio

Platforms Supporting LTE/5G Modules

IR1101

IR1800

IR8140

IR8340

- **Supports LTE CAT4/6/7/18 & 5G Sub-6 pluggable interface modules (PIMs)**

- **Pluggable: Variants supporting LTE CAT4/6/7/18 & 5G Sub-6 pluggable interface modules (PIMs)**

4G → **4G / 5G** → **5G**

LTE

CAT 4

150 Mbps DL
50 Mbps UL

LTE Advanced

CAT 6

300 Mbps DL
50 Mbps UL

CAT 7 NEW

300 Mbps DL
150 Mbps UL

LTE Advanced LTE Pro

1.2 Gbps DL
150 Mbps UL

5G Sub-6 NSA

Sub-6 NSA

3.3 Gbps DL
400 Mbps UL

5G Sub-6 SA

Sub-6 SA NEW

4.9 Gbps DL
660 Mbps UL

Cisco IoT
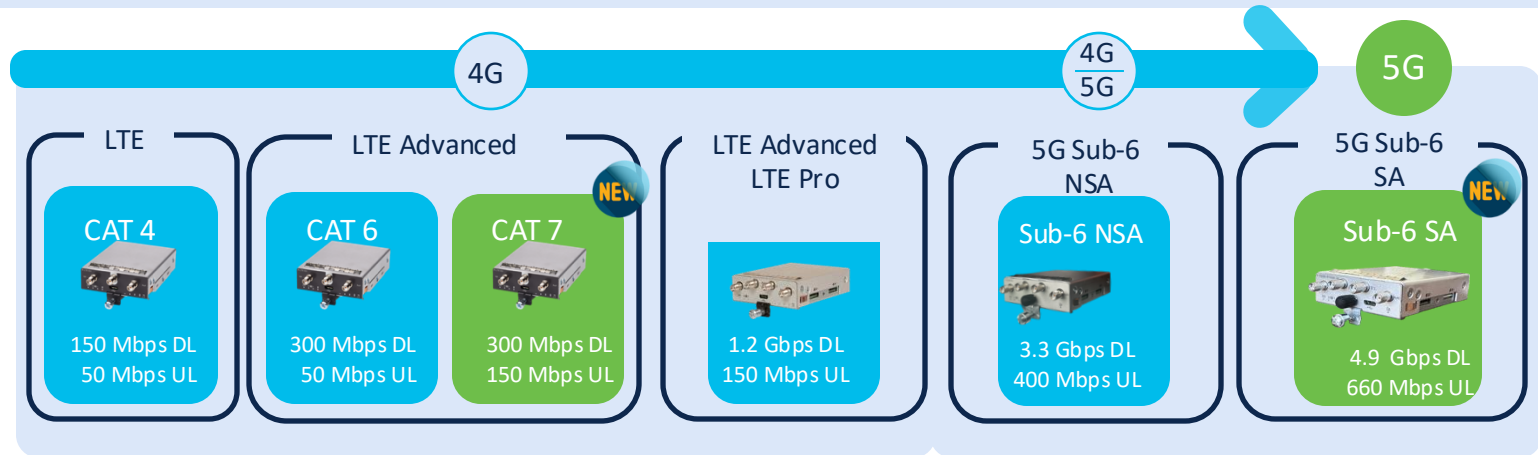
5G SA Pluggable Module

- Cellular pluggable modules with Enterprise routers and IR platforms

- 4x4 MIMO SMA antenna ports

- Console port

- GNSS port

- 2 Removable physical SIM slots

  - Supporting eUICC SIM on SIM slot 0

- LEDs for the status of module, SIM, and service

- Supported on the base and EM on IR1101

  - 5G Performance on EM is less than 400 Mbps

  (using USB2 vs using USB3 on the base)

Antenna SMA Diversity0 Connector

Antenna SMA Main1 Connector

Antenna SMA Main0 Connector

Console Port

SIM slot #1

SIM slot #0 **eSIM capable**

GNSS

Antenna SMA Diversity1 Connector

Cisco IoT
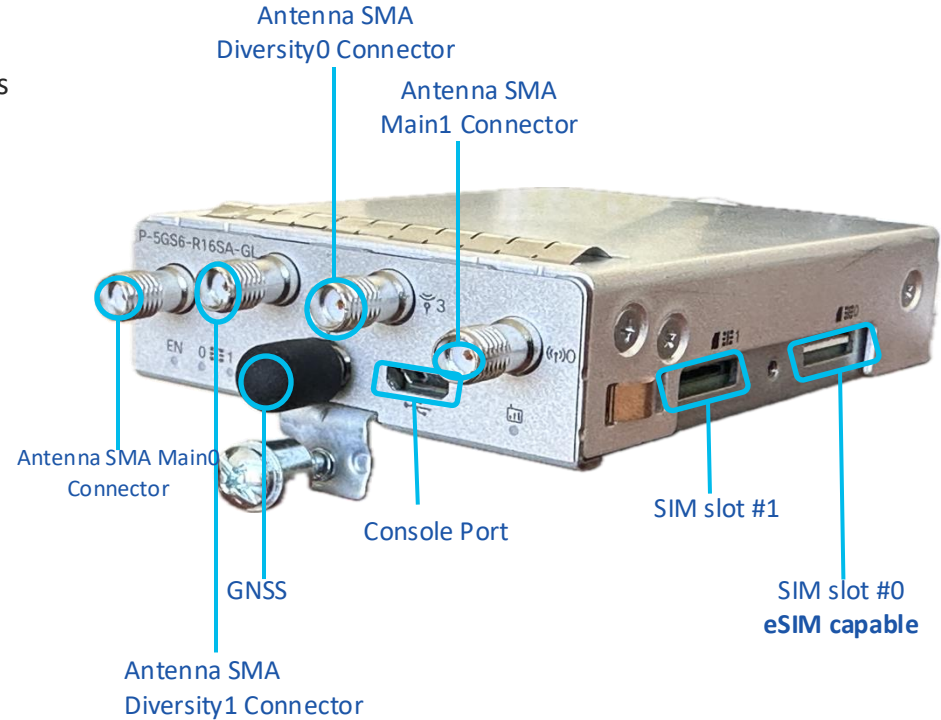
Catalyst SD-WAN for Industrial Routing

Catalyst SD-WAN Manager

Branches

Campus

Remote sites

Rugged environment

Catalyst CG522

Catalyst 8200

Catalyst 8500

Catalyst IRs

IT - temperature controlled, carpeted area

OT – outdoor, harsh environment
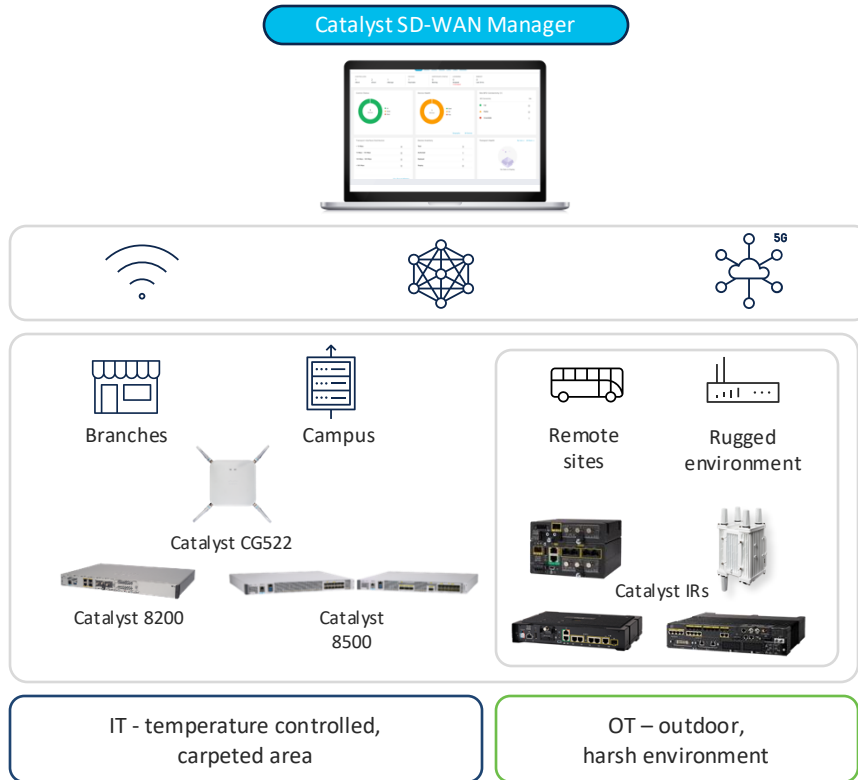
✓ Manage enterprise and IoT routers, as well as cellular gateways with Catalyst SD-WAN

✓ Use Cases: Manufacturing, Utilities, Oil & Gas, Retail, Fleet Management, Roadways & Intersections

✓ Converge IT and OT teams with a single management console

✓ Extend enterprise routing and security for IIOT with Auto-VPN for easy setup

✓ Application aware routing to optimize delivery of critical data

✓ All the same benefits, extended into non-carpeted environments

Cisco IoT

Unified Management for the Secure WAN Edge

Catalyst SD-WAN Manager

SD-Routing

Multicloud

SD-WAN

| Common management for onboarding, access, and security | Instantly provision, manage, and upgrade devices | Role based access and multi-tenant |

Cisco IoT
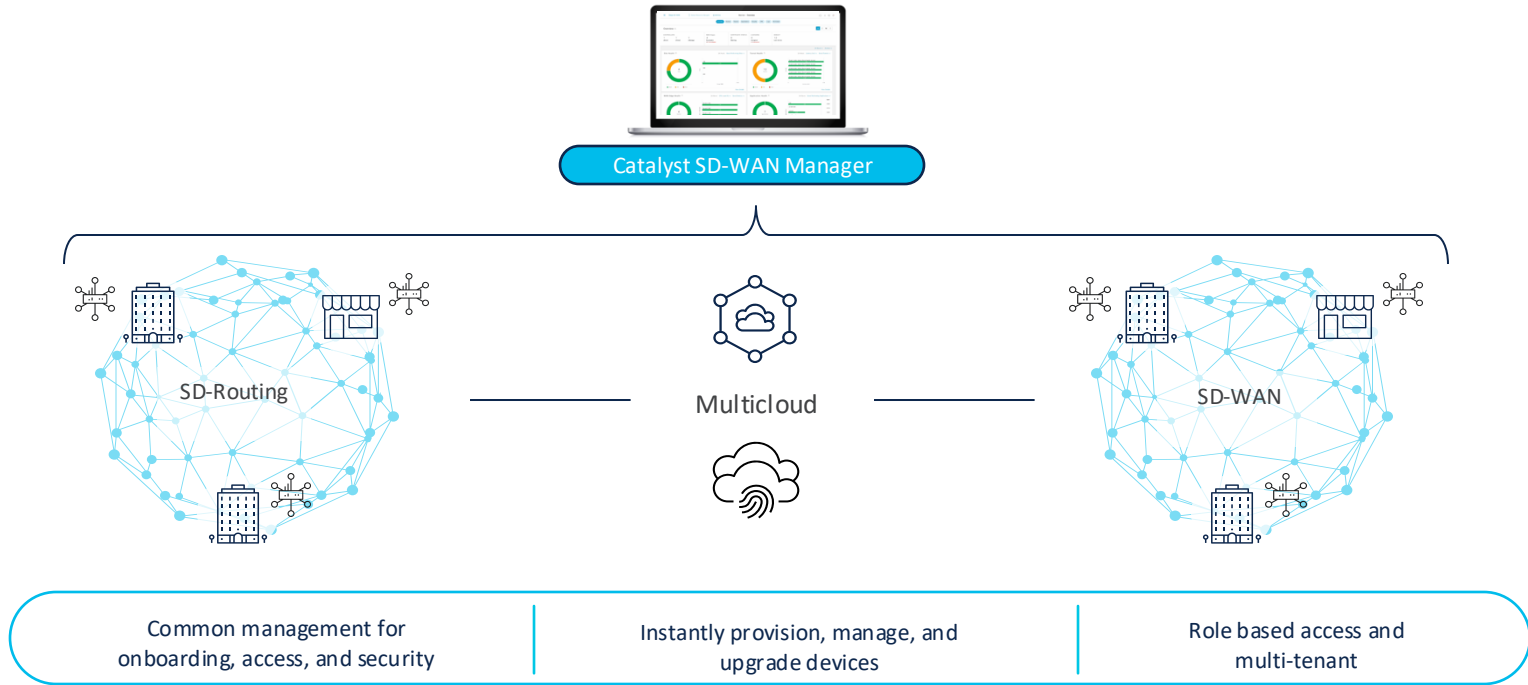
Bezdrátové sítě (IW)

Cisco's Outdoor and Industrial Wireless Portfolio
Wi-Fi 6E & Ultra-Reliable Wireless Backhaul (URWB)

NEW

Catalyst IW9167E
Cisco URWB, WGB &
Wi-Fi 6E AP

Catalyst IW9167I
Wi-Fi 6E AP

Catalyst IW9167E-HZ
Cisco URWB, WGB &
Wi-Fi 6E AP
FCS: Dec 2024

Catalyst IW9167E-STA
Wi-Fi 6E AP
FCS: Jan 2025

Catalyst Center
(Wi-Fi)

Catalyst IW9165D
Cisco URWB &
Wi-Fi 6E AP

Catalyst IW9165E
Cisco URWB, WGB &
Wi-Fi 6E AP

IEC6400 Cisco Edge Compute
Appliance for
Large Cisco URWB
deployments
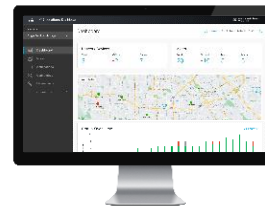
IW Service & IW monitor
IoT Operations Dashboard
(Cisco URWB)

FCS dates subject to change

Reliable wireless connectivity where you need it

Catalyst IW9167E for hazardous locations

Catalyst IW9167E-HZ

Your wireless network, your choice
Wi-Fi 6/6E, URWB, Workgroup Bridge (WGB)

Hazardous locations certifications
Class I Division 2, ATEX, & IECEx certifications
HAZLOC certified M25 ports
Hardened metal caps, GNSS port protection, and vent cap

Wide choice of certified antennas
Re-use IW6300H antennas or choose from several new options including a 6 GHz, tri-band omnidirectional dipole

Oil and gas

Chemical

Pharmaceutical
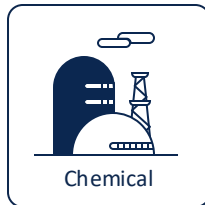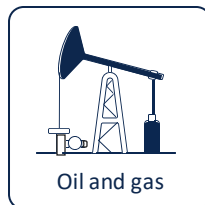
Tri-radio
2.4 GHz, 5 GHz, 5/6 GHz

4x4 MIMO
4 spatial streams

Multigigabit
RJ45 or SFP+

Heavy-duty design
IP67, -50 to +75C
EN50155
CID2, ATEX, IECEx

GNSS, BLE,
IoT radio, scanning radio

PoE+, UPOE or DC powered

Cisco IoT

What are Hazardous Environments?

Each standard devices areas into classification of explosive potential.

UL:

- Division 1 / 2

ATEX & IECEx

- Zone 0/1/2, 20/21/22

Division 1 Zone 1/21

Division 2 – Zone 2/22

Division 1 – Zone 0/20

Cisco IoT
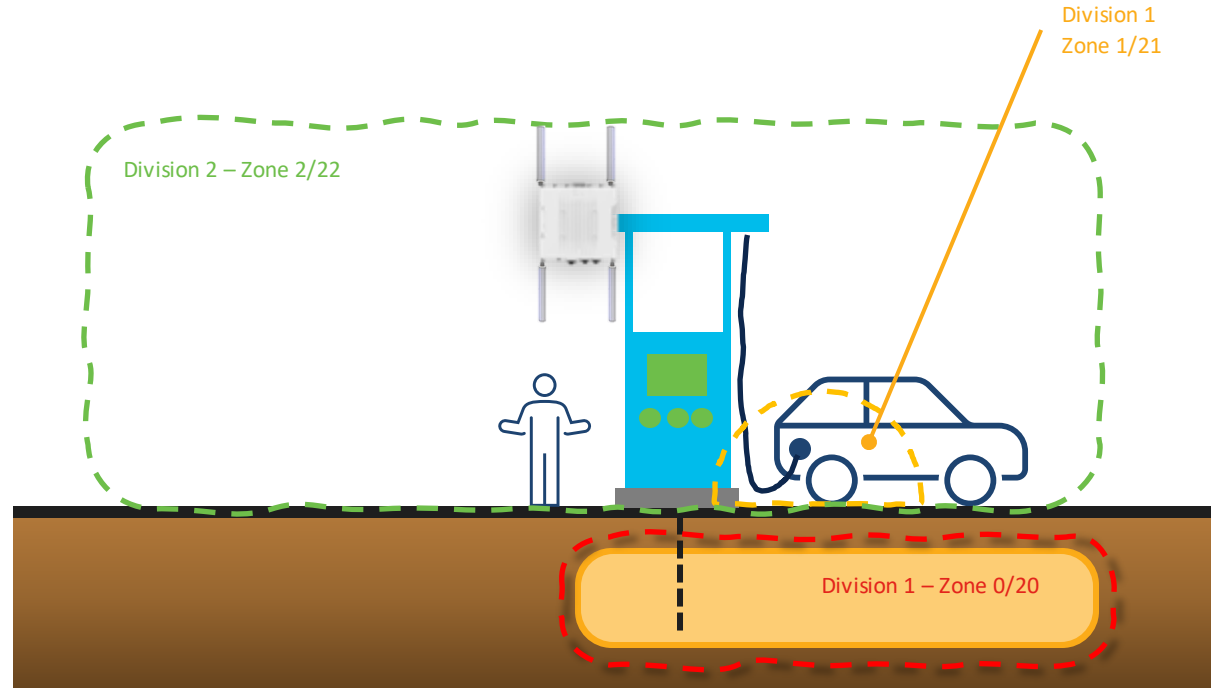
What are Hazardous Environments?

- Areas with explosive atmospheres

- Primarily focuses on explosive gasses or ignitable dust/fine particles

Obvious Industries

Chemical Industry
Power Generation
Woodworking
Biomass Plants
Metal Shops

Less Obvious

Food Industry
Wastewater
Treatment
Pharmaceuticals
Landfills
Paint Shops
Vehicle
Maintenance

UL   ATEX   IECEx

Cisco IoT

IW9167E-HZ Hardware Differences

Metal Vent Cap

M12 Adapters are not supported on IW9167E-HZ
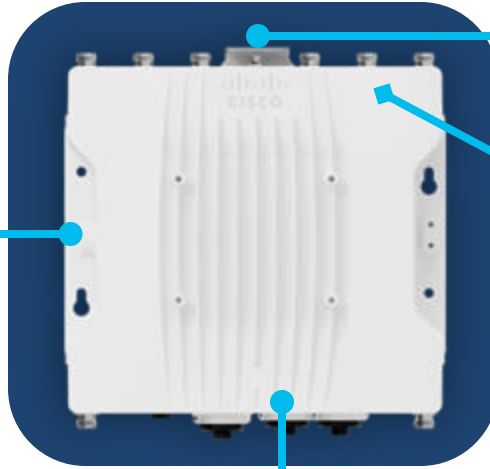
GNSS Connector Protection

I.T.E/I.T.E. FOR USE IN HAZARDOUS LOCATIONS

Class I, Division 2, Groups A, B, C and D Hazardous Locations
Class I, Zone 2 AEx ic ec IIC T4 Gc
Zone 22 AEx ic tc IIIC T90°C Dc
Ex ic ec IIC T4 Gc X, Ex ic tc IIIC T90°C Dc

c UL us
LISTED
E227129

WARNING: POTENTIAL ELECTROSTATIC CHARGING HAZARD – SEE INSTRUCTIONS

47-110394-01_B0

HAZLOC Certifications*

* Label may differ. Refer to Hardware Installation Guide and product label.

M25 Ports and metal caps

Cisco IoT

IW9167E-HZ Certified Antennas

- IW9167E-HZ supports a subset of our antenna portfolio

- HAZLOC certified when used with the access point

IW-ANT-OMV-2467-N=

AIR-ANT2547V-N-HZ=*

IW-ANT-PNL5615-NS=
(including IW-ANT-PNL515-N=)

AIR-ANT2588P4M-NS=*

AIR-ANT2513P4M-NS=*

IW-ANT-H90-510-N=

IW-ANT-SS9-516-N=

IW-ANT-DS9-516-N=

ANT-GNSS-OUT-TNC=

* Overlaps with IW6300

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Stadium AP Placements

Cisco IoT
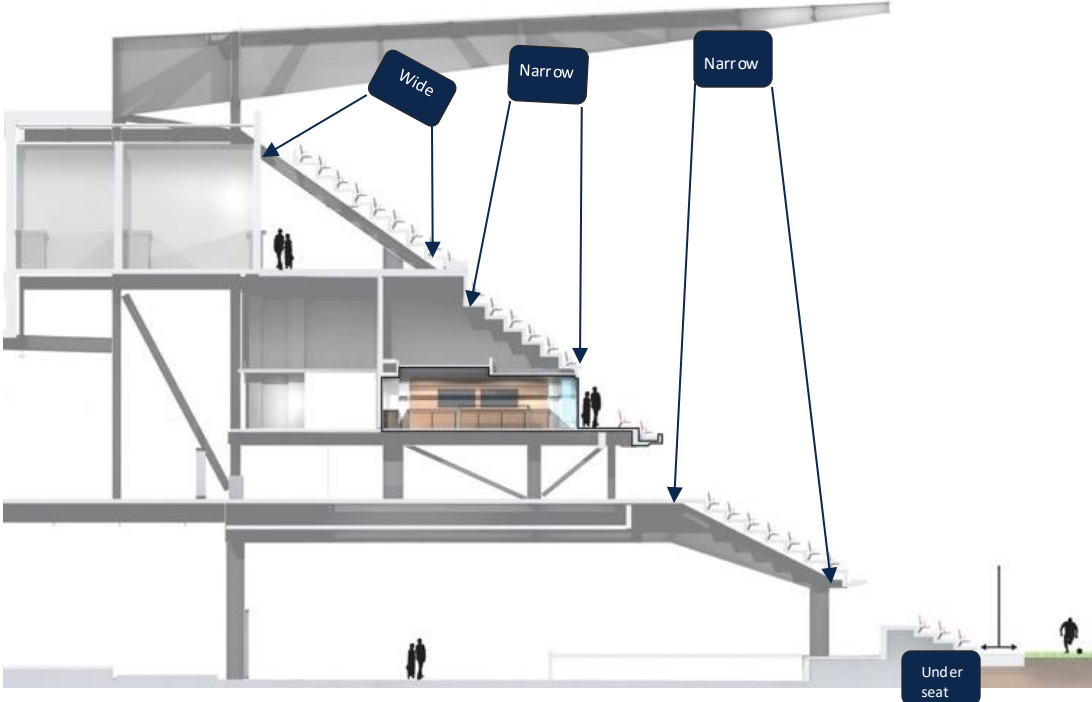
Cisco Catalyst IW9167I with Wi-Fi 6E integrated omni-directional antennas

Catalyst IW9167I
360° Wide beam
for under seat and short distance

High-performance in high-density environments
Built-in integrated omni-directional antennas that enables high-throughput connectivity for high-density Wi-Fi clients

All the benefits of Wi-Fi 6E
Higher throughput, more channels, power efficiency, and improved security.

Simplified deployment and improved aesthetics
Integrated antenna shortens deployment time, and improves aesthetics

Tri-radio
2.4 GHz, 5 GHz, 6 GHz

4x4 MIMO
4 spatial streams

Multigigabit
RJ45 or SFP+
Optional M12 adapters

Heavy-duty design
IP67, -50 to +65C

GNSS, BLE,
IoT radio, scanning radio

PoE+, UPOE or DC powered

Cisco IoT

Cisco Catalyst IW9167E with Wi-Fi 6E high-density panel antenna

Catalyst IW9167E-STA
75° Wide beam
for handrails and short distance
overhead

Catalyst IW9167E-STA2
35° Narrow beam
for mid to long range distances
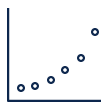
High-performance in high-density environments
High performance directional panel antenna delivers high-quality experience in high-density environments.

All the benefits of Wi-Fi 6E
6E
Higher throughput, more channels, power efficiency, and improved security.

Simplified deployment and improved aesthetics
Pre-assembled antenna and access point simplifies and shortens deployment time, and improves aesthetics

Tri-radio
2.4 GHz, 5GHz, 6GHz

4x4 MIMO
4 spatial streams

Multigigabit
RJ45, or SFP+

Heavy-duty design
IP67, -40 to +70C

GNSS, BLE,
IoT radio, scanning radio

PoE+, UPOE or DC powered

Cisco IoT

EoS for LoRaWAN & IAV
EOL15512, EOL15357

Cisco IIoT LoRaWAN Products:

- Cisco IXM Gateway
- Cisco LoRaWAN PIM
- Actility S+

Link: https://www.cisco.com/c/en/us/products/collateral/routers/wireless-gateway-lorawan/lorawan-eol.html

Milestone	Definition	Date
End-of-Life Announcement Date	The date the document that announces the end-of-sale and end-of-life of a product is distributed to the general public.	March 29, 2024
End-of-Sale Date: HW,App SW	The last date to order the product through Cisco point-of-sale mechanisms. The product is no longer for sale after this date.	April 29, 2024
Last Ship Date: HW,App SW	The last-possible ship date that can be requested of Cisco and/or its contract manufacturers. Actual ship date is dependent on lead time.	July 28, 2024
End of SW Maintenance Releases Date: HW,App SW	The last date that Cisco Engineering may release any final software maintenance releases or bug fixes. After this date, Cisco Engineering will no longer develop, repair, maintain, or test the product software.	April 29, 2025
End of Vulnerability/Security Support: HW	The last date that Cisco Engineering may release a planned maintenance release or scheduled software remedy for a security vulnerability issue.	April 30, 2026
End of Routine Failure Analysis Date: HW	The last-possible date a routine failure analysis may be performed to determine the cause of hardware product failure or defect.	April 29, 2025

Milestone	Definition	Date
End-of-Life Announcement Date	The date the document that announces the end-of-sale and end-of-life of a product is distributed to the general public.	October 1, 2024
End-of-Sale Date: HW,OS SW,Accessory,License	The last date to order the product through Cisco point-of-sale mechanisms. The product is no longer for sale after this date.	January 1, 2025
Last Ship Date: HW,OS SW,Accessory,License	The last-possible ship date that can be requested of Cisco and/or its contract manufacturers. Actual ship date is dependent on lead time.	April 1, 2025
End of SW Maintenance Releases Date: HW,OS SW	The last date that Cisco Engineering may release any final software maintenance releases or bug fixes. After this date, Cisco Engineering will no longer develop, repair, maintain, or test the product software.	January 1, 2026
End of Vulnerability/Security Support: HW	The last date that Cisco Engineering may release a planned maintenance release or scheduled software remedy for a security vulnerability issue.	December 31, 2026
End of Routine Failure Analysis Date: HW	The last-possible date a routine failure analysis may be performed to determine the cause of hardware product failure or defect.	January 1, 2026

Cisco Industrial Asset Vision Solution:

- IoTAV
- Sensors (all)

Link: https://www.cisco.com/c/en/us/products/collateral/cloud-systems-management/asset-vision/indust-asset-vision-eol.html

Cisco IoT

Bezpečnost (CV, SEA)

FORRESTER®

WAVE LEADER 2024

Operational Technology Security Solutions

"

Cisco Industrial Threat Defense is a comprehensive solution to protect, detect, and remediate across IT and OT environments.

Cisco envisions **the network as the fabric** to secure OT at scale and is building a comprehensive platform to **unify IT and OT domains**.

- Forrester Research

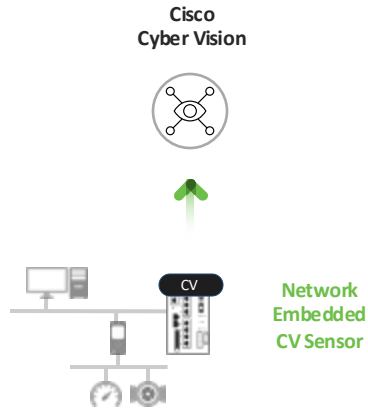**THE FORRESTER WAVE**™
Operational Technology Security Solutions
Q2 2024

Challengers · Contenders · Strong Performers · Leaders

Stronger current offering

Palo Alto Networks
Cisco
Microsoft
Fortinet
Claroty
Armis
Tenable
OPSWAT
Honeywell
Dragos
Forescout
TXOne Networks
Nozomi Networks
Industrial Defender
Hexagon

Weaker current offering

Weaker strategy → Stronger strategy

Market presence*

*A gray bubble or open dot indicates a nonparticipating vendor.

Source: Forrester Research, Inc. Unauthorized reproduction, citation, or distribution prohibited.

Cisco Industrial Security for Plant Networks

Asset Visibility & Security Posture

Cisco
Cyber Vision

CV

Network
Embedded
CV Sensor

Zero Trust for OT

Cisco
Secure Equipment Access

SEA

Zero Trust Network Access

Cisco
Secure Firewall

Cisco
ISE

Conduit

CV

CV

IEC 62443 Zones & Conduits
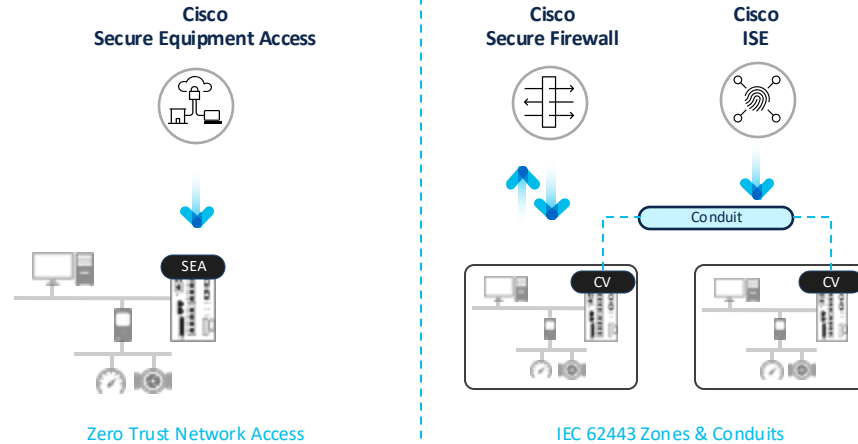
Cross-Domain Detection, Investigation & Response

splunk>
a CISCO company

Visibility across the entire attack chain

Talos Threat Intelligence **+** Talos Incident Response

Cisco IoT

Cyber Vision

Manage risks from OT assets with full visibility on
your OT security posture

- ✓ Asset Inventory & Profiling
- ✓ Asset Communications
- ✓ Asset Vulnerabilities
- ✓ Asset Risk Scores
- ✓ Behavior Baselining
- ✓ Snort Threat Detection
- ✓ Talos Threat Intelligence

Cyber Vision Center
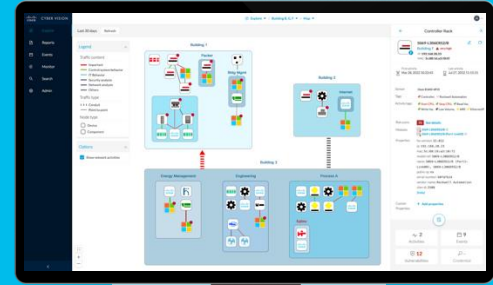
Metadata

1 0 0 1
0 0 1
0 0 1
1 0

Cyber Vision Sensors
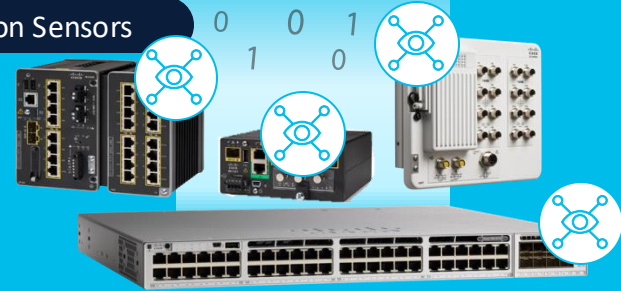
Deep Packet Inspection & Active Discovery
built into your network infrastructure

Cisco Cyber Vision portfolio

Center

Hardware Appliance
UCS based servers with Hardware RAID

CV-CNTR-M6N
- 24 core CPU
- 128 GB RAM
- 3.2TB drives

Software Appliance
Virtual Machines

VMWare ESXi OVA   HyperV VHD

Minimum requirements
Intel Xeon, 10 cores
32GB RAM and 1TB SSD
1 or 2 network interfaces

Amazon Web Services   Microsoft Azure

Minimum requirements
Intel Xeon, 10 cores
32GB RAM and 1TB SSD
1 or 2 network interfaces

Sensors

Sensor
Catalyst IE3300 and IE3400 Switches

Sensor
Catalyst IE3400HD IP67 Switch

Sensor
Catalyst IR1101

Sensor
Catalyst IR1800

Cellular Gateways

Sensor IDS
Catalyst IR8300 Multiservice Router

Sensor
Catalyst IE9300 Rugged Aggregation Switches

Sensor IDS
Catalyst 9300/9400

Network-Sensors
Deep Packet Inspection built into network-elements eliminating the need for SPAN

Sensor IDS
IC3000 Industrial Compute

Hardware-Sensor
DPI via SPAN to support brownfield

Cisco IoT

Cyber Vision network-sensor
Cisco Catalyst **9300/9300X/9400**

- Can be deployed as access, aggregation, core or as an out of band SPAN aggregation sensor

- Sensor is an application running in IOx

- Leverages ERSPAN to receive traffic from switch

- Supports Snort IDS with Advantage licenses (Talos subscriber rules available as an option)

- Catalyst 9300 and 9400

    - Official support IOS XE 17.3.1

    - **Must support application hosting (DNA Advantage License required)**

    - **Does not require SSD to run Cyber Vision as of version 4.4**

    - **SSD-240G needed for Store & Forward and packet capture functionalities (SSD required to install/run Cyber Vision before version 4.4)**

- Catalyst 9300X – Starting Cyber Vision 4.3

Cisco IoT
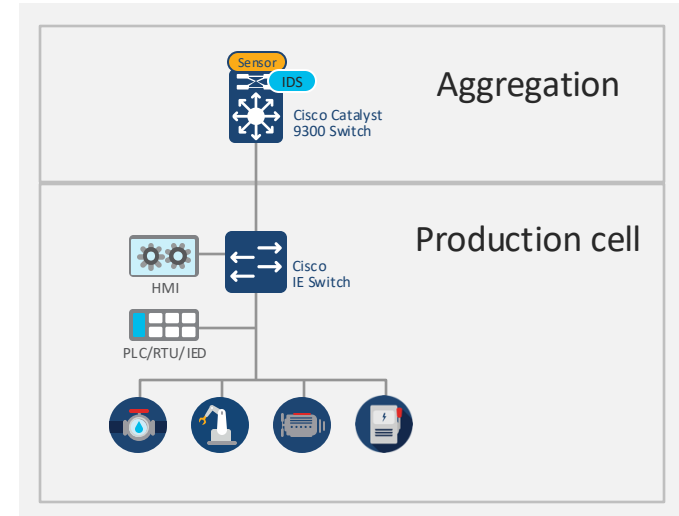
What's New in **Cyber Vision 5.0** and **5.1**?

Cyber Vision 5.0

- Catalyst IR1800 support
- Zero-touch provisioning (ZTP)
- Custom preset category
- Zone and Conduit visualization (5.0.1)

Aug 2024 — **5.0 CCO**

Cyber Vision 5.1

- Performance improvements
- Docker sensor
- API improvements
- Certificate auto renewal
- Active discovery UI
- Inventory report
- DPI enhancements
- Integrations enhancement

Nov 2024 — **5.1 EFT**

Dec 2024 — **5.1 CCO**

Secure Firewall

Secure your operational boundary with a firewall that understands your OT

- ✓ Application Aware Firewall

- ✓ Enhanced IDS/IPS with Snort ML

- ✓ Virtual Patching

- ✓ Encrypted Visibility Engine

- ✓ Crypto-accelerated decryption

- ✓ Physical and Virtual form factors

- ✓ On-prem & SaaS management

THE FORRESTER WAVE™
Enterprise Firewall Solutions
Q4 2024
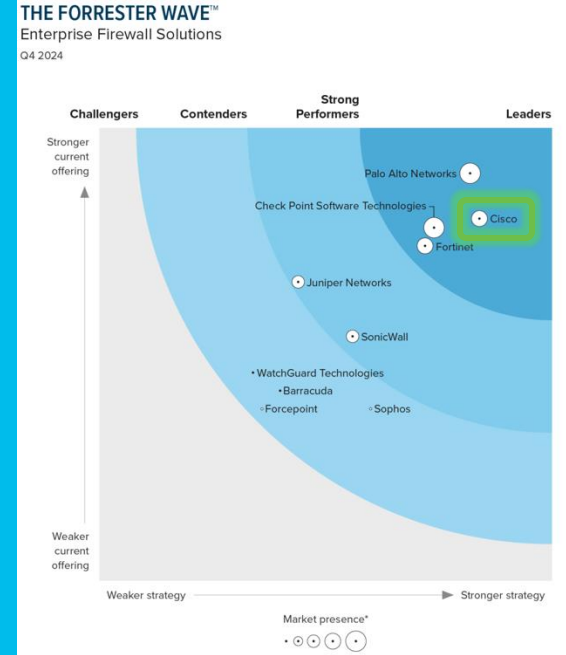
Protect critical infrastructure against **zero-day attacks** and securely **connect to cloud resources**

SCADA Preprocessing in Snort

- Snort preprocessors - plugins that analyze and normalize packets
- Snort - built in preprocessors to make OT rule creation easier for granular control of OT traffic across the firewall
- If a protocol does not have a preprocessor, it can still be detected using generic Snort packet inspection

IEC 104   MMS

DNP3   Modbus

CIP   S7+

Snort 3

Example:

alert tcp any any -> any 20000 (msg:"DNP3 confirm"; dnp3_func: 0; classtype:misc-activity; sid:1000000;)

Cisco IoT
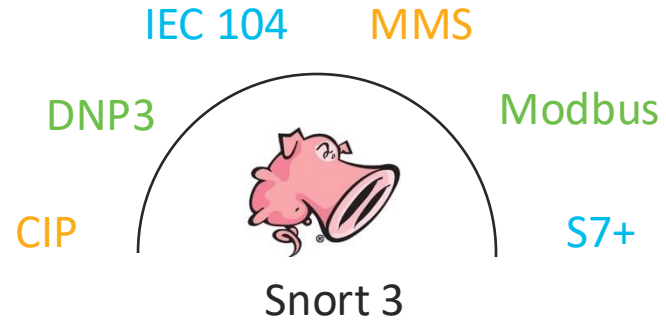
Cyber Vision Integration

Cisco Secure Dynamic Attribute Connector
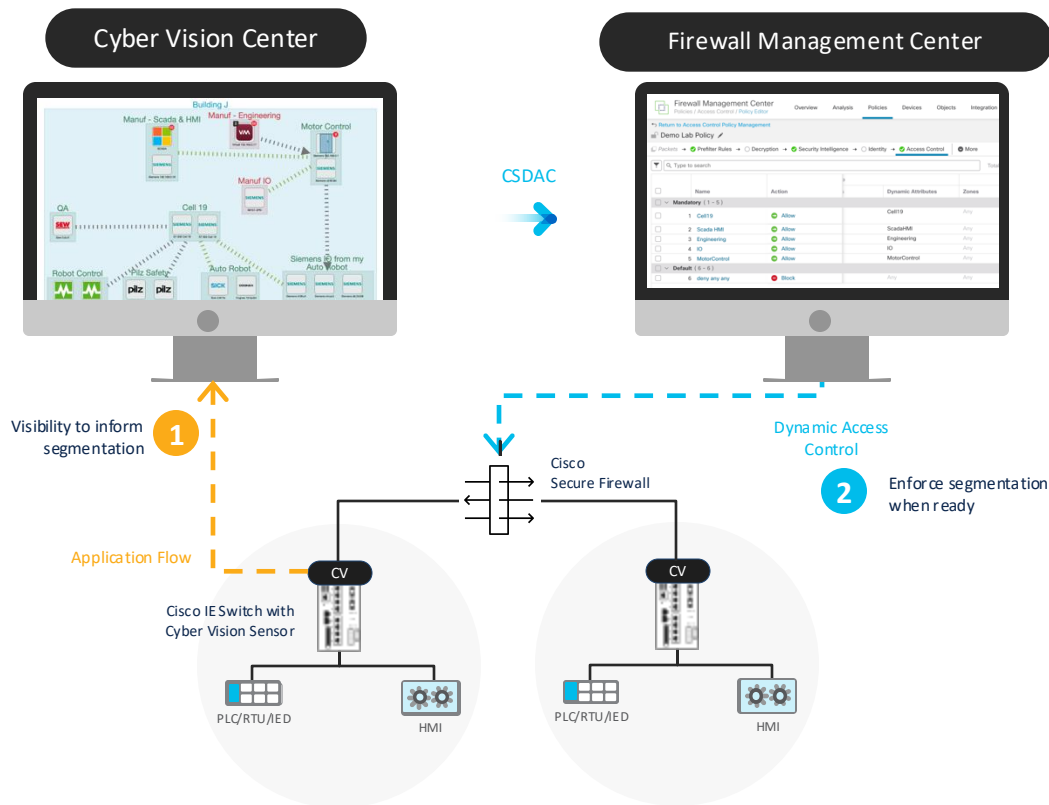
Visualize Zones & Conduits

Group endpoints into zones to visualize aggregated flows as conduits to inform segmentation policy

Dynamic Attribute Mapping

Cyber Vision grouping results in populating dynamic objects in FMC for use in access control policies

Build Application Policies

Restrict traffic across operational boundaries with OT aware application policies

Cisco IoT

Splunk OT Security

Break silos between OT & IT domains with cross-domain detection and remediation

✓ OT Asset Investigator

✓ NERC-CIP compliance reports and MITRE ATT&CK ICS correlation rules

✓ OT Perimeter Monitoring

✓ Risk Based Alerting

✓ OT Baselining

✓ OT Use Case Library
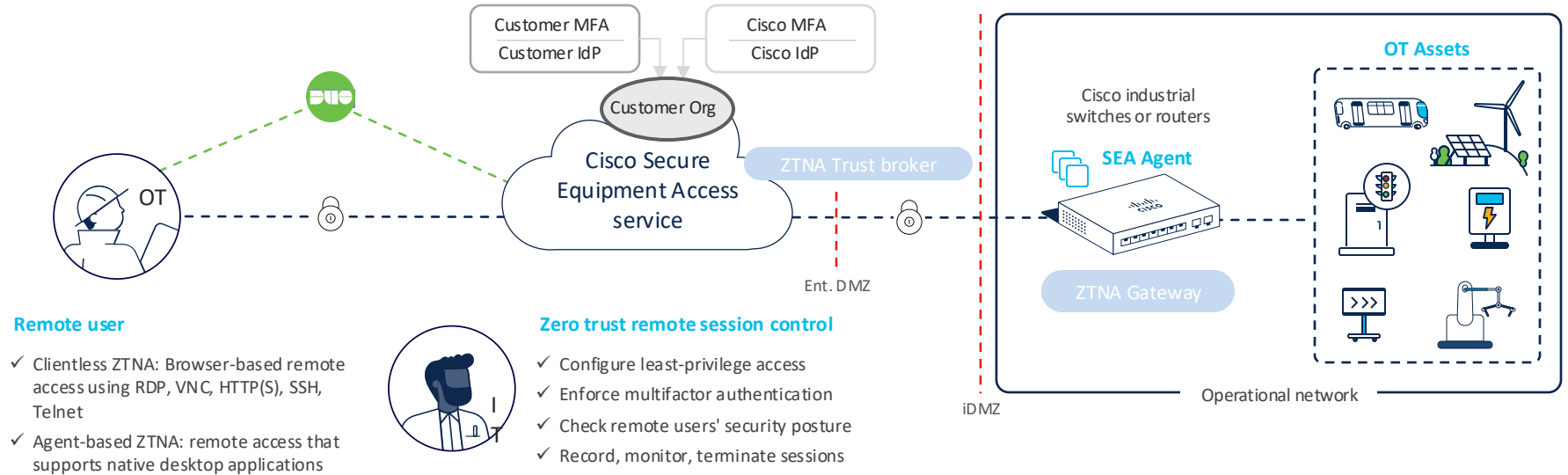
✓ Unified IT/OT security events management in Splunk SIEM
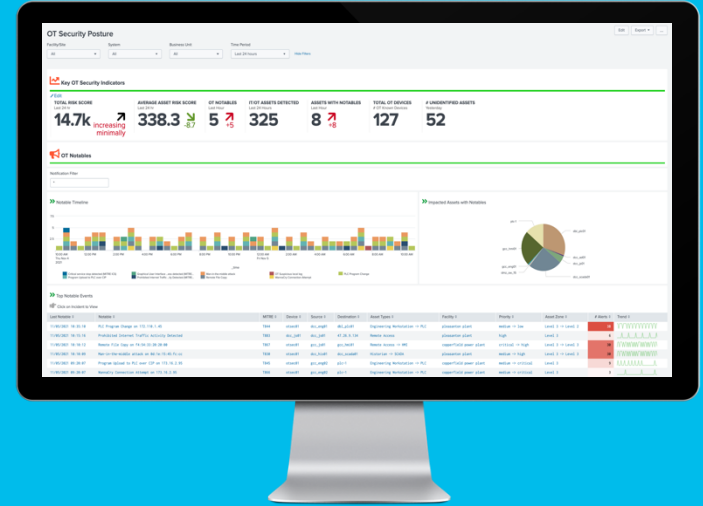
Improve threat detection, incident investigation, and response **across OT & IT domains** with telemetry from Cisco and 3rd party security products

Cisco Secure Equipment Access (SEA)

- Zero Trust Network Access (ZTNA) for OT Assets

Empower OT teams to easily perform remote operations while enforcing strong zero trust cybersecurity controls

Customer MFA
Customer IdP

Cisco MFA
Cisco IdP

Customer Org

Cisco Secure Equipment Access service

ZTNA Trust broker

Cisco industrial switches or routers

OT Assets

SEA Agent

ZTNA Gateway

Ent. DMZ

iDMZ

Operational network

OT

Remote user

✓ Clientless ZTNA: Browser-based remote access using RDP, VNC, HTTP(S), SSH, Telnet

✓ Agent-based ZTNA: remote access that supports native desktop applications

Zero trust remote session control

✓ Configure least-privilege access

✓ Enforce multifactor authentication

✓ Check remote users' security posture

✓ Record, monitor, terminate sessions

Cloud simple
Accelerate time to value

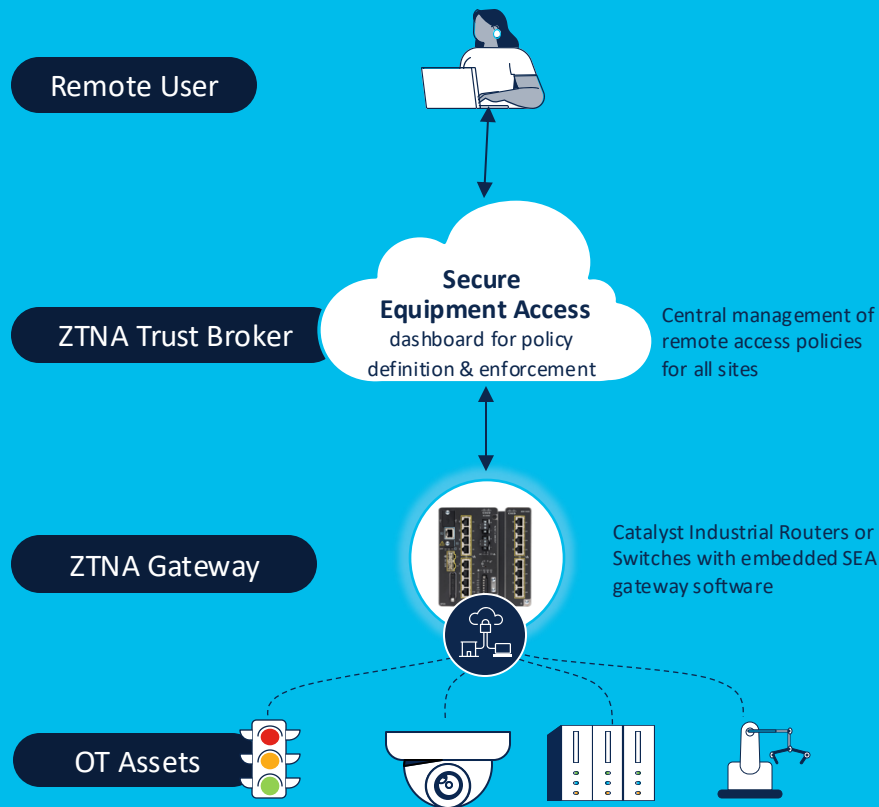**Cisco secure**
Built to keep operations safe

Designed for OT
Drive business outcomes

Highly scalable
Cloud + network working together

Cisco IoT
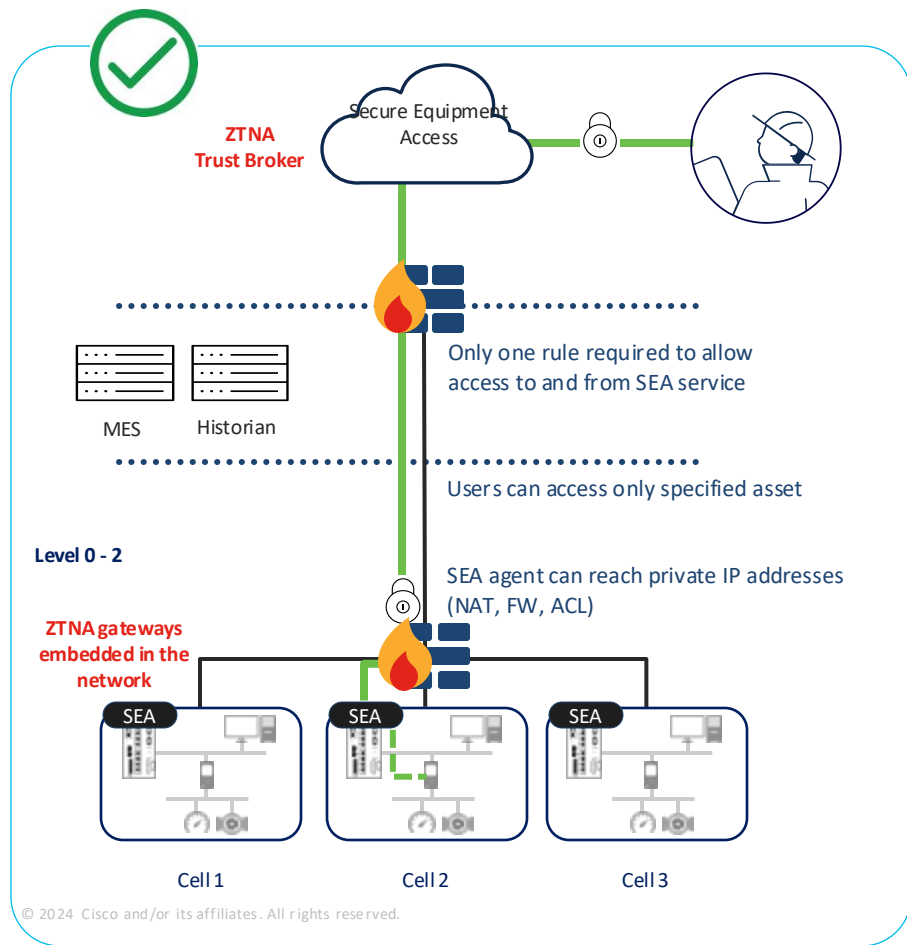
Secure Equipment Access

Manage risks from suppliers with **ZTNA** remote access to OT assets

- ✓ Zero Trust MFA & SSO
- ✓ OT Asset Resource Isolation
- ✓ Clientless & Agent-based Access
- ✓ Remote User Host Posture Check
- ✓ Session Scheduling
- ✓ Session Recording, Monitoring & Kill
- ✓ Session Approval on Request

Remote User

ZTNA Trust Broker

Secure Equipment Access dashboard for policy definition & enforcement

Central management of remote access policies for all sites

ZTNA Gateway

Catalyst Industrial Routers or Switches with embedded SEA gateway software

OT Assets

One-click **zero trust remote access to any OT asset** connected to Cisco industrial network

Cisco Secure Equipment Access (SEA)

ZTNA Trust Broker

Secure Equipment Access

Only one rule required to allow access to and from SEA service

MES   Historian

Users can access only specified asset

Level 0 - 2

SEA agent can reach private IP addresses (NAT, FW, ACL)

ZTNA gateways embedded in the network

SEA   SEA   SEA

Cell 1   Cell 2   Cell 3

Industrial Switches   (10 Concurent sesions)

SEA Agent   SEA Agent   SEA Agent

IE3300, IE3400   IE3400H   IE3100 (5 Cs)

SEA Agent

IE9300

Industrial Routers

SEA Agent   SEA Agent

IR1101   IR1800

SEA Agent

*Roadmap

IR8300

Cisco IoT

Management Solutions for Cisco IoT Devices

Manage by use case & workflow		Enable IT to manage from campus to edge	
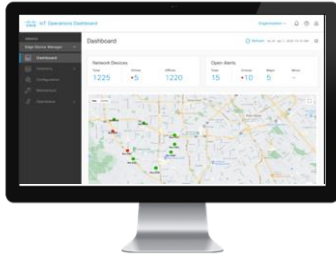
IoT OD Operations Dashboard	**IoT FND** Field Network Director	**Catalyst center (DNA-C)**	**Catalyst SDWAN (vManage)**
OT Focused	OT Focused	IT Driven	IT Driven
For select Cisco Industrial Routers and Gateways	For select Industrial Routers and FAN deployed by Utilities	Extended Enterprises: Industrial IOT Switches, Wi-Fi and Router	SD-WAN Fabric overlay: Industrial IOT IOS-XE Routers
Cloud-Based	On-Premise	On-Premise or Cloud	On-Premise or Cloud
Subscription based on usage	Up front initial investment for hardware and software	Up front initial investment for hardware and software	Subscription based on usage for cloud consumption option
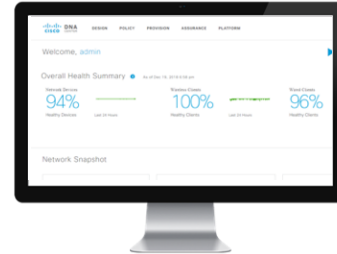
Cisco IoT

Management Capabilities

Requirements	IoT OD	IoT FND	CC	SD-WAN Manager
Management of IE	✖	✖	✔	✖
Management of IR	✖	✔	✔	✔
Management of IW	✖	✖	✔	✖
Management of CURB	✔	✖	✖ (circled)	✖
ZTD	✖	✔	✔	✔
Secure Equipment Access (SEA & SEA+)	✔	✖	✖	✖ (circled)
IOx application deployment	✔	✔	✖ (circled)	✖ (circled)
SD-WAN	✖	✖	✖	✔
SD-Routing	✖	✖	✖	✔

Cisco IoT

What's new in 4.12 and beyond

A more powerful, secure, and easier to deploy IoT Field Network Director

Simplified architecture for DA use cases, **reducing the need for 3rd party headend components like PKI, AAA, DHCP and easing deployment complexity**

Supported r**outer scale of 25K** within a single FND instance

CSMP device management made open source to enable FND management of 3rd party Wi-SUN endpoints
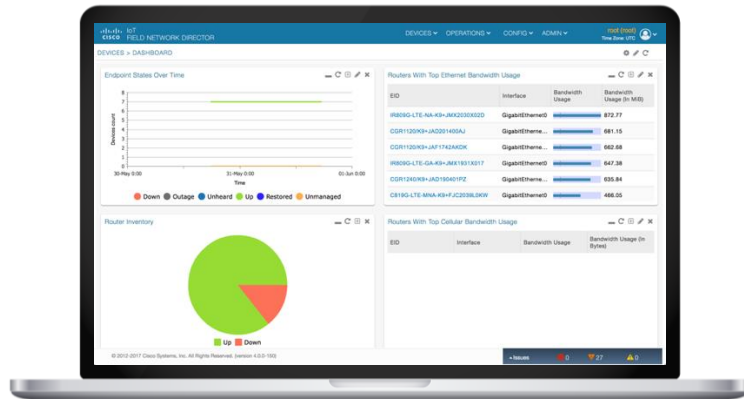
Security, scale, and simplicity for the modern grid

Cisco IoT

Děkuji za pozornost.