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Cisco Industrial IoT Portfolio

www.cisco.com/go/iot

Contents

Bring Cisco scale and security to IoT

Stop worrying about the challenges and start imagining the possibilities with Cisco IoT

Deploying IoT at scale isn't easy. It requires configuring and managing countless assets and devices and dealing with complex operational and industry requirements. Moreover, it creates potential blind spots that increase your security risks.

Cisco provides the most secure, dependable IoT portfolio on the market

Cisco IoT is an end-to-end IoT architecture. Built on our industry-leading networking and security capabilities, it provides

Rock-solid infrastructure

Extend the Cisco network you know and trust to scale your IoT deployment using reliable infrastructure, automation, and familiar management tools

Unparalleled visibility and control

Protect your business with Cisco's industry-leading security portfolio which gives you complete visibility and control

Trusted expertise

Partner with a trusted leader who offers continuous innovation, market-leading products, an extensive developer program, and resources like deployment blueprints to make you successful

IoT enables transformative use cases

Remote
monitoring

Asset
tracking

Worker
safety

Connected
car

Fleet
management

Predictive
maintenance

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Cisco offers an unparalleled end-to-end IoT architecture

Interconnect assets, applications and data to uncover transformative business insights

Network connectivity

Extend the network you know and trust to operational environments

Device management

Manage industrial assets and devices at scale with automated solutions

Data control and exchange

Efficiently move the right data to the right place at the right time

Edge computing

Push data processes to the edge to enable fast decision-making in the field

Security

Protect your business from end to end with Cisco's industry-leading security portfolio

Our 67,000 customers are already seeing tremendous results

" Within a month, we increased our manufacturing floor productivity by over 10 percent.

— **Yair Avigdor**, COO, Lordan

" We gained an additional 10,000 hours of availability system-wide.

— **Eric Rupp**, Principal Network Engineer, Great River Energy

Visit www.cisco.com/go/iot to learn more

Cisco Industrial Ethernet Switching Portfolio

The Cisco® Industrial Ethernet (IE) switching portfolio includes ruggedized, secure, easy-to-use switches built for extending the enterprise to harsh, industrial environments. They provide secure connectivity across challenging environments and industries such as manufacturing, utilities, transportation, oil and gas, mining, and smart cities. These Cisco switches offer best-in-class Cisco IOS® or Cisco IOS XE Software with advanced Layer 2 and Layer 3 features, along with industrial protocol support, such as PROFINET and EtherNet/IP to support industries' digital transformation. IE switches are available with a robust security feature set, including software-based segmentation, connected assets and flow visibility for security-threat detection and isolation. Scaling is easy with many management options. Enable intent-based networking to the Internet of Things (IoT) edge with Cisco Software-Defined Access (SD-Access), and easily manage IoT network with the same tools that manage the IT network, such as Cisco DNA Center, which simplifies configuration and reduces time and cost of deployment. Choose from other management options such as the included web management tool.

Cisco Catalyst IE3400 Rugged Series

- Advanced modular DIN rail switch expandable up to 26 ports
- All Gigabit Ethernet platform, layer 2 or layer 3
- Up to 24 ports of PoE/PoE+ [Power budget up to 480W]
- Copper, fiber, and PoE+ expansion modules
- Cisco DNA Center for management
- SD-Access policy extended node
- Advanced industrial protocols and additional security features
- Edge compute, Cisco Cyber Vision

Cisco Catalyst IE3400 Heavy Duty Series

- Wall mount IP66/IP67 switch with M12 interfaces
- Up to 24 all Gigabit Ethernet or all Fast Ethernet ports, Layer 2 or layer 3
- Cisco DNA Center for management
- SD-Access policy extended node
- Advanced industrial protocols and additional security features
- Edge compute, Cisco Cyber Vision

Cisco Catalyst IE3300 Rugged Series

- Modular DIN rail switch expandable up to 26 ports
- All Gigabit Ethernet platform, layer 2 or layer 3
- Up to 24 ports of PoE/PoE+ [Power budget up to 360W]
- Copper, fiber, and PoE+ expansion modules
- Cisco DNA Center for management
- SD-Access extended node

Cisco Catalyst IE3200 Rugged Series

- Fixed DIN rail switch, 10 ports
- All Gigabit Ethernet platform, layer 2
- 8 ports of PoE/PoE+ [Power budget up to 240W]
- Cisco DNA Center for management

Cisco Catalyst IE9300 Rugged Series

- 19" rack mount switch, 28 ports
- Based on the Cisco UADP ASIC
- All Gigabit Ethernet platform, layer 2 or layer 3
- 26 Fiber + 2 Combo GE ports
- Cisco IOS XE Software
- Vertical stacking up to 8 members
- Advanced industrial and redundancy protocols
- Edge compute, Cisco Cyber Vision
- Cisco DNA Center for management
- SD-Access fabric edge node

Cisco IE 5000 Series Switches

- 19" rack mount switch, 28 ports
- All Gigabit Ethernet platform, layer 2 or layer 3
- 4 x 10G fiber uplinks (on select models)
- Up to 12 ports of PoE/PoE+ [power budget 360W]
- Horizontal stacking up to 4 members
- GNSS/GPS antenna interface
- Advanced industrial protocols and additional security features
- Conformal coating (on select model)
- Cisco DNA Center management
- SD-Access extended node

Cisco IE 4010 Series Switches

- 19" rack mount switch, 28 ports
- All Gigabit Ethernet platform, layer 2 or layer 3
- Up to 24 ports of PoE/PoE+ [power budget up to 385W]
- Advanced industrial protocols and additional security features
- Cisco DNA Center management
- SD-Access extended node

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Cisco IE 4000 Series Switches

- Fixed DIN rail switch, up to 20 ports
- 4x 1G combo uplinks
- All Gigabit Ethernet platform, layer 2 or layer 3
- Up to 8 ports of PoE/PoE+ [power budget up to 200W]
- Advanced industrial protocols and additional security features
- Cisco DNA Center management
- SD-Access extended node

Cisco IE 2000 Series Switches

- Fixed DIN rail switch, up to 20 ports or Wall mount, IP67 rated, up to 24 ports with M12 interfaces
- Up to 18 x FE ports, 2x 1G combo uplinks (on select models)
- Layer 2 or layer 3 (limited features)
- Up to 4 ports of PoE/PoE+ [power budget up to 120W]
- Conformal coating (on select model)
- Optimized for use in utilities (select models)
- Cisco DNA Center management

Cisco IE 1000 Series Switches

- Fixed DIN rail switch, up to 10 ports
- Up to 8 x FE ports, 2x 1G combo uplinks (on select models)
- Lightly managed layer 2
- Up to 8 ports of PoE/PoE+ [power budget up to 180W]
- Security: Port security, TACACS, 802.1X
- Plug and Play (PnP) for easy deployment

Cisco Industrial Ethernet 2000U Series Switches

- Optimized for use in utilities
- Fixed DIN rail switch, up to 20 ports
- Up to 18 x FE ports, 2 x 1 G uplinks
- Layer 2 or layer 3
- Up to 4 ports of PoE/PoE+ [power budget up to 120W]
- Conformal coating (on select model)
- Cisco DNA Center management

Next steps

To find out more about
Cisco's Industrial Ethernet Switching Portfolio,
visit www.cisco.com/go/ie

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Cisco Industrial Router and Gateway Portfolio

The Cisco Catalyst Industrial Routers are a range of ruggedized modular platforms on which you can build a highly secure, reliable, and scalable communications infrastructure.

All Cisco industrial routers share a core set of common characteristics. They are certified to meet marsh environmental standards – and have modular designs that can help extend product life and lower costs. This flexible design enables WAN redundancy and is ready to handle 5G, public LTE – including FirstNet, and private LTE – including Citizens Broadband Radio Service (CBRS), as well as enhanced data throughputs and differentiated services. They are powered by Cisco IOS XE, and offer a choice of management options, allowing you to extend your network from the enterprise to the industrial edge using common security policies, tools, and management policies.

Modular design

Enjoy many module options, such as LTE, private LTE, 5G, Wi-Fi 6, and additional storage. The platform can adapt as your connectivity needs grow.

Scale with choice of management

Scale and simplify operations. Equip IT and operations teams with powerful management tools such as IoT Operations Dashboard, Field Network Director, Cisco DNA Center, and Cisco vManage.

Robust security to protect critical data

Built in enterprise-grade security helps protect your network from attacks. With these powerful routers, you don't need separate hardware to deploy security. In addition, add Cisco Cybersvision for industrial asset level visibility.

Take action right at the edge

Use the platform's built-in edge compute and Cisco IOx support to build and run your own applications at the edge.

Ruggedized

Designed for industrial deployments, including harsh, extreme temperature environments.

Secure scalability with SD-WAN

Deploy a common set of policies, automate security setups, and optimize traffic using Cisco vManage for SD-WAN.

Cisco Catalyst IR1100 Rugged Series Routers - FirstNet Ready

- Modular and expandable hardware design to extend product life

- Ruggedized and compact with low power consumption

- Software-defined WAN , IOS XE, and edge compute-enabled

- Enterprise grade security built-in, Cyber Vision

- Choice of WAN interfaces like Ethernet, DUAL Cellular and DSL

- FirstNet Ready

- IEC 61850-3 and IEEE 1613 certified

- Dual Cellular for WAN redundancy

- 100 GB of additional storage for edge applications

- Cloud and on-premises management

Cisco Catalyst IR1800 Rugged Series Routers

- Highly secure, high-performance, modular routers with 5G and Wi-Fi 6

- Automotive certification and CAN-bus support

- Built-in edge compute and SD-WAN-enabled

- 2 cellular slots, 1 Wi-Fi slot

- 8 GB memory

- CAN bus, PoE/PoE+, ADR GNSS slot, SSD slot

- 4 digital I/O ports, advanced security features, 1 RS232/485 combo port

Cisco Catalyst IR8100 Heavy Duty Series Routers

- IP67, fully modular industrial routers with built-in battery backup

- 5G, public and private LTE, and more

- Multilayered cybersecurity and hardware security

- Built-in edge compute and SD-WAN-enabled

- PoE enabled chassis

- 1 Gigabit copper with PoE output

- 1 Gigabit fiber/SFP

- 3 additional I/O slots

- AC powered

- 12V DC for external devices

Cisco Catalyst IR8300 Rugged Series Router

- Rugged, 5G, integrated routing and switching platform for many industries and use cases

- Utility substation compliance IEC-61850-3 and IEEE 1613 for utility environments

- Hot-swappable, fully redundant power supplies and high-availability design for maximum network uptime and redundancy

- Multiple interface options, including Ethernet switch, T1/E1, and Serial (RS-232)

- Enhanced security and advanced QoS for compliance with critical infrastructure protection mandates

- Multilayered security, with support for ICS visibility

- Precision timing source

- Built-in edge compute and SD-WAN-enabled

Cisco IoT Gateways

Cisco IoT Gateways provide simple, essential connectivity for assets at mass scale. They offer low upfront costs with an affordable monthly cloud subscription. The gateways take just a few minutes to deploy with minimal IT support. Day-0 setup is fast: Plug in and power on, with no staging required. The SIM provisioning is automated, requiring no manual intervention. Essential security is built in to secure the hardware, interfaces, and all communications between the gateway and the data center. The IoT gateways are centrally managed through the easy-to-use Cisco IoT Operations Dashboard. You can remotely deploy, monitor, and troubleshoot the gateways at scale. With the IoT Operations Dashboard, you can gain insights into network usage and carry out updates remotely without sending anyone onsite

- Simple, essential connectivity for mass scale

- All-in-one solution with IoT Operations Dashboard

- Low up-front costs with affordable subscription

- Category 4 LTE, 2 x GE ports

- Integrated Wi-Fi, GNSS, external antenna

- IP30 rating, extended temperature

- DIN-rail or wall mount

Next steps

Learn more about Cisco Industrial Integrated Services Routers

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Cisco Ultra-Reliable Wireless Backhaul

Formerly Fluidmesh

Reliable, scalable, easy to install, and suitable for the most demanding wireless applications, Cisco Industrial Wireless Ultra-Reliable Backhaul is the leading-edge solution for vehicle connectivity for mission-critical applications. Developed by Fluidmesh Networks - now part of Cisco - the solutions portfolio covers Point-To-Point (PTP) and Point-To-Multipoint (PTMP) links and complex mesh networks. It delivers high-throughput and low-latency communications for vehicles.

Radio platforms (formerly Fluidmesh)

Cisco FM 3500 ENDO, 4500 MOBI, and 4500 FIBER represent the latest 2x2 Multiple-Input, Multiple-Output (MIMO) radio platforms, able to deliver reliable wireless connectivity under the most demanding conditions. The platforms can be used to create static, nomadic, and fast-roaming wireless backhaul networks for OT applications. They have been designed and successfully deployed in rail, mining, smart cities, container terminals, entertainment, smart factories, military, automotive, and video broadcasting industries. The MPLS-based secure wireless protocol that enables this technology can provide a set of benefits that surpasses other standards and industrial solutions.

High bandwidth

More than 500 Mbps stable bandwidth, making it the ideal choice for demanding applications such as real-time video surveillance, onboard Wi-Fi for edge devices, depot telemetry download, and much more.

Seamless handoff

Handoff is one of the primary challenges in vehicle-to-wayside communications. Standard technologies have a hard time when the vehicle is roaming from one base station to the next, resulting in poor signals or signal loss and therefore downtime for the application!

Ultra-low latency

When real-time interaction is required, latency must be negligible compared to the reaction time. Thanks to their MPLS-based protocol, these radio platforms have incredibly low latency, making them the ideal choice for remote control, machine-level protocols, VoIP, and autonomous and semi-autonomous applications.

Stability and reliability

Mission-critical OT networks cannot allow downtime. Losing connection in OT means stopping machines and processes, often resulting in a huge loss of money. Thanks to the latest technologies and dedicated network design and deployment, Cisco will help make your wireless data network smooth and seamless.

Fast failover

Sometimes stability is not enough. Applications such as communications-based train control (CBTC) require a failover system in case of communication or hardware default. To accomplish this, Cisco introduced a special algorithm that can reconfigure the network on redundant hardware in less than 500 ms.

Network management system

Keeping control of assets and connections is essential. Thanks to the on-premises software FM-MONITOR, you can easily configure a dashboard with the main KPIs of the wireless network for an intuitive, real-time overview and control.

Next steps

To learn more about how
Cisco's Industrial wireless products can help,
visit: www.cisco.com/go/iw

Cisco FM 3500 ENDO

- Suitable for pole installation on wayside/trackside
- Supports a wide range of antennas to better suit each use case
- Unlicensed frequency bands: 5.1 to 5.8 GHz (see data sheet)
- 2x 10/100/1000 Tx-RJ45 ports
- 2x RP-SMA radio connectors, ASTM B-117 compliant
- Throughput up to 500 Mbps
- NPT-1 threaded cable gland for conduit direct mounting
- Compact form factor: 230 x 132 x 60 mm
- Multiple power supply options: 48V DC active 802.3at PoE; 48V DC passive PoE output
- Low power consumption: Max 20W

Cisco FM 4500 MOBI

- Ideal for fiber connection
- Unlicensed frequency bands: 5.1 to 5.8 GHz (see data sheet)
- 2x QMA radio connectors, ASTM B-117 compliant
- 1x dual LC ruggedized SFP XCO connector 100/1000 Mbps; 1x 10/100/1000 M12 port
- Throughput up to 500 Mbps
- Operating temperature: –40°C to 80°C (–40°F to 176°F)
- Humidity 5% to 95% noncondensing
- Compact form factor: 167 x 132 x 60 mm
- Multiple power supply options: 48V DC active 802.3at PoE; 48V DC passive PoE input; 48V DC M12 power input
- Low power consumption: Max 20W

Cisco FM 4500 FIBER

- Compact and rugged, ideal for both moving vehicles and wayside
- The ideal choice in high-vibration environments
- Wide range of antennas available
- Unlicensed frequency bands: 5.1 to 5.8 GHz (see data sheet)
- Rail certifications: EN50155, EN50121-3, EN50121-4, EN45545, EN50129, IEC 60571, AREMA 11.5.1, CBTC: EN50129
- 2x 10/100/1000 M12 ports
- 2x QMA radio connectors, ASTM B-117 compliant
- Throughput up to 500 Mbps
- Compact form factor: 167 x 132 x 60 mm
- Multiple power supply options: 48V DC active 802.3at PoE; 48V DC passive PoE; 48V DC M12 power input
- Low power consumption: Max 20W

Next steps

To learn more about how Cisco's Industrial wireless products can help, visit: www.cisco.com/go/iw

Industrial Wireless Access Points

The number of connected things in oil and gas, mining, transportation, and manufacturing is increasing dramatically. This expansion of IoT and equipment inter-connectivity enables new use cases and opportunities, but it also places new demands on your infrastructure. Cisco responds to these demands with the new Catalyst IW6300 Heavy Duty Series Access Point and the Industrial Wireless 3702 Access Point for extended, high-performance wireless connectivity.

Cisco Catalyst IW6300 Heavy Duty Series Access Points

Engineered for hazardous environments

Building on over 10 years of successful hazardous location wireless deployments, Cisco's newest heavy-duty access points are purpose-built to deliver reliable connectivity to our customers' most challenging Class I Division 2 environments.

Intelligence beyond boundaries

Cisco's intent-based networking, together with the Cisco Catalyst® IW6300 Heavy Duty Series Access Points, extend policy and visibility from the enterprise to the IoT edge, which streamlines IT and OT network management and helps reduce costs. Use Cisco IOx container support to host IoT applications at the edge for faster decision making.

More use cases with partner IoT gateways

Expand use cases using partner IoT gateways for WirelessHART and ISA.100, which easily attach to the Catalyst IW6300 Wi-Fi access point while still being fully HazLoc certified as a single solution.

Deployment almost anywhere

While they're designed for the most extreme temperatures and environments and include IP67 waterproof and dust resistance, they're still our lightest and most compact hazardous-location access points yet.

Secure connectivity and flexibility

These mesh access points deliver certified, dependable 802.11ac Wave 2 with WPA3 wireless encryption, three PoE ports, and one SFP port.

Wireless without the worries

Cisco DNA Assurance works with the Cisco Catalyst IW6300 Heavy Duty Series Access Points to proactively and predictively resolve network issues.

Next steps

To learn more about how Cisco's Industrial wireless products can help, visit: www.cisco.com/go/iw

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Cisco IW3702 rugged access points

Delivers superior wireless performance, resilience, and mobility

Key features:

- **Delivers industry-leading 802.11ac** Wi-Fi to the extreme edge to improve user experiences and safety for mass transit systems, mining sites, and other IoT deployments

- **Designed and certified for extreme environments** with extended operating temperature ranges of -50 to +75°C; vibration rated to IEC 60068-2-6 environmental standards with M12 I/O connectors; and rugged IP67- rated housing to protect against liquid and dust ingress

- **Sustains reliable connections at higher speeds** farther from the access point than competing solutions and supports significantly increased roaming speeds for mobile applications

- **Includes Power over Ethernet (PoE)** output to enable external devices such as ruggedized IP cameras for improved worker and passenger safety and better asset security

- **Employs a scalable and secure mesh** architecture for highly resilient Wi-Fi services

- **Extends the Cisco Unified Wireless Network,** which can scale up to 18,000 access points with full Layer 3 mobility across central or remote locations

Next steps

To learn more about how
Cisco's Industrial wireless products can help,
visit: www.cisco.com/go/iw

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Cisco Utility and Field Area Networking Portfolio

Cisco Catalyst IR8100 Heavy Duty Series Routers

- Rugged routers designed for harsh environments, such as those found in the utilities industry

- Ideal for integrating multiple applications, such as Advanced Metering Infrastructure (AMI), distribution automation, Distributed Energy Resources (DER), street lighting, and remote workforce automation, onto a single platform

- IP67, fully modular industrial routers with built-in battery backup

- 5G, public and private LTE, and more

- Multilayered cybersecurity and hardware security

- Built-in edge compute and SD-WAN-enabled

- PoE enabled chassis

- 1 Gigabit copper with PoE output

- 1 Gigabit fiber/SFP

- 3 additional I/O slots

- AC powered

- 12V DC for external devices

Cisco Catalyst IR8300 Rugged Series Router

- Rugged, 5G, integrated routing and switching platform with utility substation compliance IEC-61850-3 and IEEE 1613 for utility environments

- Hot-swappable, fully redundant power supplies and high- availability design for maximum network uptime and redundancy

- Multiple interface options, including Ethernet switch, T1/E1, and Serial (RS-232)

- Enhanced security and advanced QoS for compliance with critical infrastructure protection mandates

- Multilayered security, with support for ICS visibility

- Precision timing source

- Built-in edge compute and SD-WAN-enabled

Not available for Europe

IR510   IR530   **Resilient** Mesh

Cisco IR510 WPAN Industrial Router

- High-performance ruggedized router with 1.2 Mbps data rate
- Provides unlicensed 915- MHz, ISM-band Wireless Personal-Area-Network (WPAN) communications that enables IoT applications
- Open RF mesh solution based on the following standards: IEEE 802.15.4 g/e/v, IETF 6LoWPAN, IETF Routing Protocol for Low Power and Lossy Networks (RPL), IETF Mapping of Address and Port - Translation (MAP-T, and IETF Constrained Application Protocol (CoAP)
- IOx ready

Cisco IR530 Series Resilient Mesh Range Extenders

- Extend the range of the RF wireless mesh network, providing longer reach between WPAN endpoints and other WPAN networks
- Deliver unlicensed 902-928MHz, ISM-band IEEE 802.15.4g/e/v Wireless Personal-Area Network (WPAN) communications to diverse Internet of Things (IoT) applications
- Increases communications network uptime and grid availability, helps ensure message delivery through a rugged industrial hardware design and highly resilient solution architecture
- Lower Total Cost of Ownership by consolidating disparate communications networks used for Advanced Metering Infrastructure (AMI) and DA applications

Cisco Catalyst IE9300 Rugged Series

- 19" rack mount switch, 28 ports
- Based on the Cisco UADP ASIC
- All Gigabit Ethernet platform, layer 2 or layer 3
- 26 Fiber + 2 Combo GE ports
- Cisco IOS XE Software
- Vertical stacking up to 8 members

- Advanced industrial and redundancy protocols
- IEC 61850 networking standards
- IEEE 1588 v2 precision timing and synchronization
- Edge compute, Cisco Cyber Vision
- Cisco DNA Center for management
- SD-Access fabric edge node

Next steps

Learn more about Cisco Utility and Field Area Network Portfolio

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Cisco Solution for LoRaWAN

LoRaWAN is unlicensed, Low-Power Wide-Area (LPWA), long-range wireless technology applicable to both private and public Internet-of-Things (IoT) infrastructure. It is used to connect a range of devices with low data rates and long battery lives that operate unattended for extended periods of time.

The Cisco® LoRaWAN solution addresses opportunities and challenges in LPWA sensor networks through the Cisco LoRaWAN gateway. This gateway can be deployed in standalone mode (Ethernet backhaul) and can extend the existing functionality of the Cisco 807, 809 and 829 Industrial Integrated Services Routers (ISR) or CGR 1000 with Cisco IOS® virtual-LPWA interface.

The Cisco LoRaWAN solution offers customers a fully integrated and functional architecture that supports both service providers and industrial customers and complies with the architecture and specifications defined by the LoRa Alliance.

Cisco IXM LoRaWAN gateways are deployed with on premises or via SaaS Thingpark Enterprise or Thingpark Wireless (SP) offered by Cisco. For third- party network servers, SDK is available from DevNet.

Cisco's LoRaWAN solution offers key features, such as:

- Compliant with LoRa Alliance 1.0 and 1.1 specification
- Supports the ISM band of 863–870 MHz and 902–928 MHz or the subsets
- Supports spreading factors and adaptive data rate
- Supports class A, B, and C end devices
- Supports geo-localization through Time-Differential-Of-Arrival (TDOA) technology
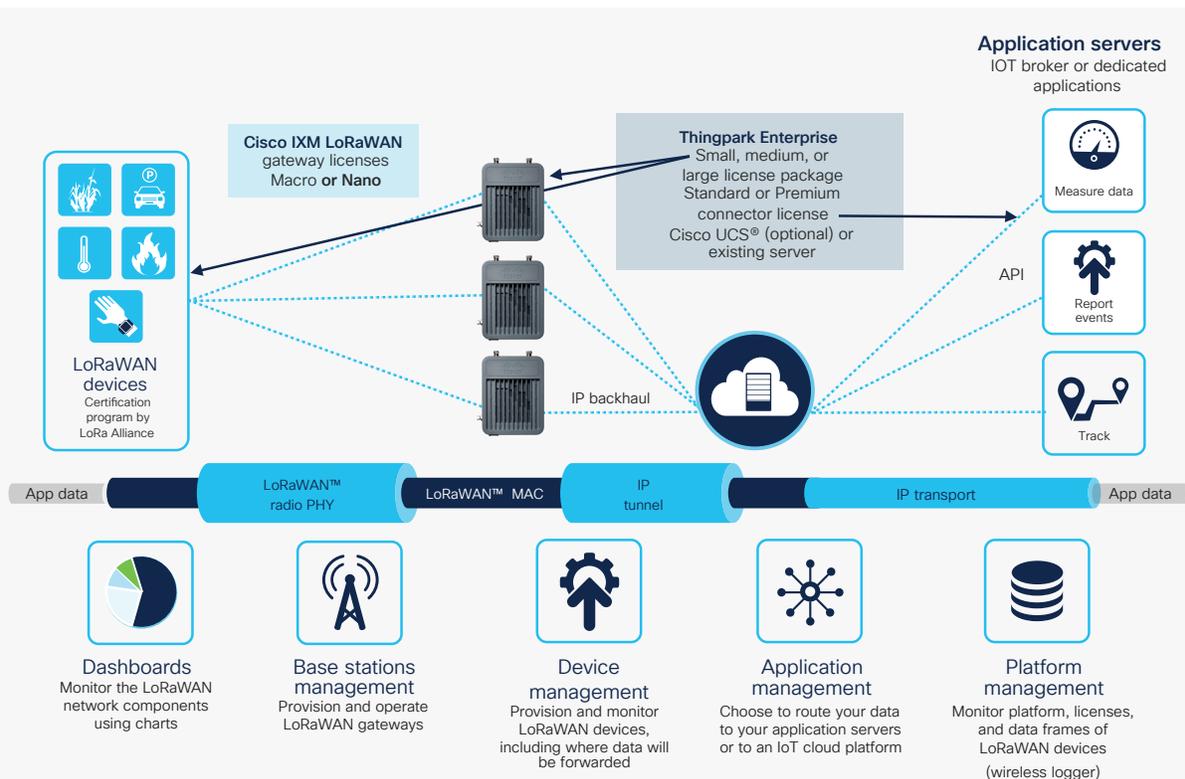
To find out more about Cisco's LoRaWAN solution, visit www.cisco.com/go/lorawan

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Cisco Industrial IoT Embedded Networks Portfolio

The Cisco® Embedded IoT Portfolio includes access points, routers, and switches that utilize Cisco's networking technology packaged into highly ruggedized, low size, weight, and power networking components. Their small form factor coupled with mobile and edge specific features, make these products ideal for applications across industries such as mining, oil and gas, transportation, shipping, and defense, where highly-secure, reliable performance is required during extreme conditions.

Cisco 6300 Series Embedded Services Access Points (ESW6300)

Wi-Fi integration for challenging use cases

Get access points purpose-built for integration into smart-city and industrial environments.

Intelligence beyond boundaries

Extend policy and visibility from the enterprise to the edge with Cisco's intent-based networking together with the 6300 Series Embedded Services Access Points, which streamline network management and help reduce costs. Use Cisco IOx container support to host IoT applications at the edge for faster decision making.

Enhanced connectivity and flexibility

You'll get resilient 802.11ac Wave 2, with three PoE ports, one SFP port, and one USB port.

Deployment almost anywhere

Cisco 6300 Series access points are designed for the most extreme environments and temperatures (-40 to 85 degrees C).

Cisco ESR6300 Embedded Services Router

Exponentially faster

The ESR6300 offers significantly faster crypto throughput than the previous generation of ESRs, to meet increased bandwidth needs arising from the rapid growth of sensor data and video streams.

Cisco trustworthy systems

The onboard Cisco Trust Anchor Module (TAM) plus image signing, secure boot, and runtime defenses help ensure that the code running on the Cisco ESR6300 is authentic, unmodified, and operating as intended.

Simplified integration

At 3 inches by 3.75 inches, the ESR6300 is smaller than its predecessors, making it easier to integrate into compact solutions. It is hardened for extreme temperatures, shock, and vibration to achieve the highest standard of reliability.

Modularity options

The ESR6300 provides two WAN ports of Gigabit Ethernet that give you a choice of media type and four LAN ports of Gigabit Ethernet with PoE/PoE+ ready options. As your needs evolve, add mSATA storage for Cisco IOx edge compute.

Streamlined management with Cisco IOS XE

Cisco IOS XE is highly programmable, with open and standards-based APIs and next-generation, multilayer security built in. This unified software stack is ideal for process and workflow automation, so you can qualify and deploy new services faster.

Software-defined WAN on the ESR6300

The ESR6300 is hardware ready to support SD-WAN. In the near future you will be able to leverage IT expertise to a distributed network, operate at scale, and lower TCO. Cisco SD-WAN architecture delivers scale, simplicity, and unified management for extending the enterprise network to a distributed IoT deployment.
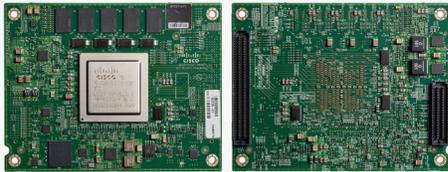
Cisco Catalyst ESS9300 Embedded Series Switch

- High-bandwidth with 10 ports of 10GE Small-Form-Factor Pluggable Plus (SFP+)
- Ruggedized for the harshest conditions, including extreme temperatures (-40 ˚C to +85 ˚C), shock, and vibration
- Low power consumption: 35W
- RJ45 Ethernet management port (optional)
- RJ45 or USB micro-B console port
- Common +3.3V and 5V power inputs
- Crucial security features including secure boot and zeroization
- Advanced Cisco IOS® XE operating system and WEBUI management

Cisco Embedded Service 3300 Series Switches

- High-speed PC 104 compact form-factor switch
- Ruggedized to operate in harsh environments (-40 ˚C to +85 ˚C)
- Low power consumption (mainboard 16W, expansion 8W)
- 2 10G uplink ports, 8 1G downlink ports on mainboard
- 16 1G downlink ports on expansion board for high port density
- Modern Cisco IOS® XE operating system and WEBUI management
- PoE-ready architecture and software
- Layer 2 Network Essentials feature set at First Customer Ship (FCS)

Cisco 5915 Embedded Services Router

- Small size: PC/104 form factor
- Ability to operate in extreme environments (-40˚C to +85 ˚C)
- Low power consumption (less than 7W)
- Mix of route and switch ports
- Reliable and secure connectivity for remote/extreme edge applications
- Specialty features: networking on the move, secure voice and video, satellite communications

Cisco 5921 Embedded Services Router

- Lightweight software router that provides networking functions to mobile and portable communication systems
- Flexibility for a wide range of use cases: install bare metal or hypervisor
- Supports up to 20 ports
- Tiered data rates from 5 to 500 Mbps to meet a wide variety of needs
- Infrastructure-less networking: reaching beyond range of a fixed network
- Ideal for low-power systems, portable solutions, battery- powered devices

Next steps

Find out more about Cisco's IoT Embedded Networks

Cybersecurity

Cisco Cyber Vision

Bringing unprecedented scale and simplicity to IoT security
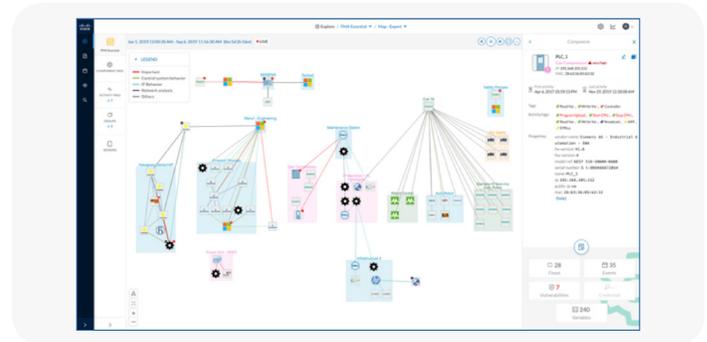
Industrial Control Systems (ICS) are increasingly connected to corporate IT networks. You are now also deploying Industrial Internet of Things (IIoT) technologies. This deeper integration between IT, cloud, and industrial networks is creating many security issues that are becoming the primary obstacles to your industry digitization efforts.

Cisco Cyber Vision gives you full visibility into your ICS, including dynamic asset inventory, real-time monitoring of control networks and process data, and comprehensive threat intelligence, so you can build secure infrastructures and enforce security policies to control risk.

Combining a unique edge monitoring architecture and deep integration with Cisco's leading security portfolio, Cisco Cyber Vision can be easily deployed at scale so you can ensure the continuity, resilience, and safety of your industrial operations.

Benefits

Visibility embedded into your industrial network

Know what to protect. Cisco Cyber Vision is embedded into your industrial network so you can see everything that connects to it.

Operational insights for OT

Maintain system integrity and production continuity. Cisco Cyber Vision keeps track of process data, asset modifications, and variable changes.

Holistic threat detection

Detect threats before it's too late. Cisco Cyber Vision identifies known and emerging threats as well as process anomalies and unknown attacks. Fully integrated with the Cisco security portfolio, it extends the IT Security Operations Center (SOC) to the OT domain.

OT security you can deploy at scale

Cisco Cyber Vision leverages a unique edge computing architecture that enables security monitoring components to run within Cisco's industrial network equipment. No need to source dedicated appliances and build a dedicated out-of-band network. Network managers will appreciate the unique simplicity and the lower costs of the Cisco Cyber Vision architecture when looking to deploy OT security at scale.

Cisco Cyber Vision integrated with ISE and Stealthwatch®

Build converged IT/OT security operations. Here's how it works:

- Cyber Vision shares industrial asset identity with Cisco Identity Services Engine (ISE) and Stealthwatch
- Allows the creation of dynamic security groups based on asset type and role to easily enforce zones and conduits through TrustSec
- Security policy now easily accommodates changes to the control system triggered by OT intent
- You can now identify industrial assets within Stealthwatch to accelerate incident response and forensic analysis
- This new integration allows you to define IoT-specific security policies more easily

Next steps

Visit www.cisco.com/go/cybervision
or contact your local Cisco account representative to learn more

Cisco Secure Firewall ISA3000

Developed specifically to withstand the harshest industrial environments, the Cisco Secure Firewall ISA3000 offers uncompromising end to end security with industrial design and operation in mind.

Featuring a compact DIN-rail unit ruggedized design, these Industrial Security Appliances are true industrial firewalls that provide OT targeted protection based on proven enterprise class security leveraging Firepower Threat Defense (FTD) services or Adaptive Security Appliance (ASA) with FirePOWER Services.

Cisco Industrial Security Appliance 3000 Series Models

Firepower Management Center (FMC) for Centralized multi-device management and Security Integrations

Key features:

- **Visibility and control of protocols**, including DNP3, CIP, Modbus, IEC 61850, IEC 104, and applications by Omron, Rockwell, GE, Schneider, and Siemens

- **Environmental hardening** for vibration, shock, surge, and electrical noise immunity

- **Compliance** with multi-industry specifications for industrial automation, ITS, and electrical substation environments

- **Multi-device management** across hundreds of devices using Firepower Management Center

- **Proven threat detection** with over than 25,000 rules powered Talos Threat Intelligence give the ISA 3000 the widest range of operational technology protection.

- **High availability** features such as hardware bypass, dual-power inputs, Quality of Service policies, and latency detection and mitigation functions ensure traffic continuity to keep operation on track

Use Cases:

Protect individual zones with network segmentation

Use the ISA 3000 to separate different parts of the network in your manufacturing cells, zones, or utility substations to ensure only authorized devices or connections have access, protecting the network from malicious or unwanted activities.

Network Address Translation (NAT) ensures more efficient operations

The ISA 3000 eliminates duplicate IP addresses by providing a unique IP address to each device, ensuring every device is visible on the network and able to receive commands.

Secure Remote Access

The ISA 3000 provides flexible, enterprise class remote access control via Cisco AnyConnect, Site to Site VPN, Remote Access VPN, and Clientless SSL VPN offerings.

Firepower Management Center (FMC) for centralized multi-device management and security integrations

Firepower Management Center (FMC) for on-box single-device management and rich API for programmability

Next steps

To find out more about Cisco Industrial Security Appliance 3000 visit www.cisco.com/go/isa3000

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CISCO

The bridge to possible

Connectivity management

Cisco DNA Center

Cisco DNA Center is a proven network management system deployed in the most complex and in the world's largest enterprises. Cisco DNA Center in industrial automation networks gives OT a curated view and set of functions to perform key network maintenance tasks, consistently and scalably, increasing Overall Equipment Effectiveness (OEE) and uptime, lowering operational costs, enhancing security, and helping ensure network performance.

Benefits

Network automation

- Discover existing network devices and topology
- Use network Plug and Play to provision new infrastructure
- Check for inconsistent configurations
- Deploying new images and patches at scale

Network assurance

- Collecting and analyzing network telemetry information
- Proactively identifying issues and root causes
- Helping step through remediation options

Industrial cybersecurity

- Detailed visibility into connected industrial assets and applications
- Segment communications
- Monitor and detect abnormal behaviors
- Contain malware and other attacks
- Integrate operational and enterprise security

Network health
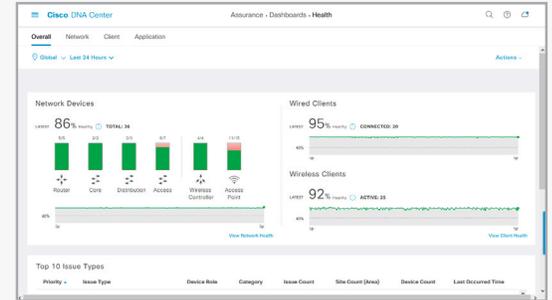
Network issues
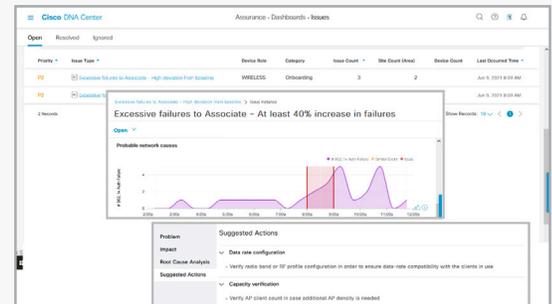
Network topology

Access policies for segmentation
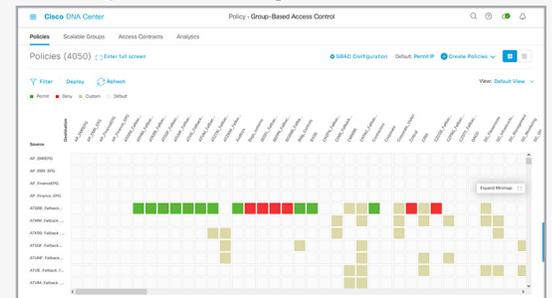
## Next steps

To find out more about Cisco DNA Center,
visit www.cisco.com/go/iotmanagement

GIS map
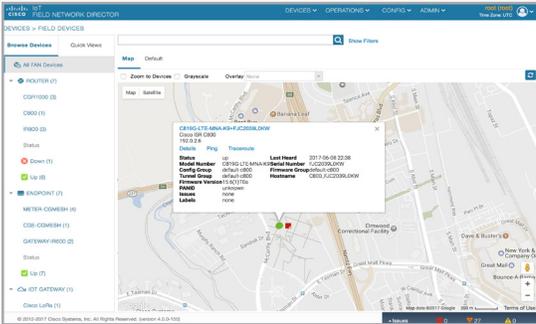
Dashboard
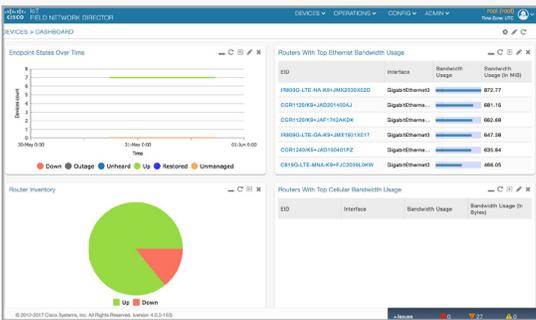
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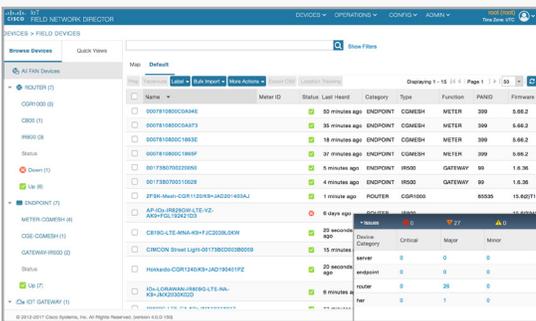
Device properties
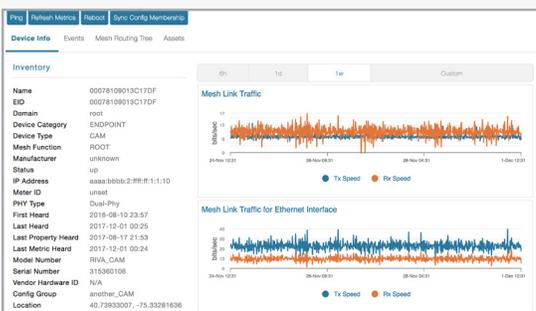
Cisco IoT Field Network Director (FND)

The Cisco IoT Field Network Director (FND), the operating system for the multiservice Field Area Network (FAN), is a software platform that manages multiservice networks of Cisco industrial products, connected grid routers, and endpoints. Features that distinguish the IoT FND include:

- Ease of deployment at scale with Zero-Touch Deployment (ZTD) of gateways and devices
- Secure and scalable end-to-end enrollment and management of these gateways and devices
- Optimized for operation in constrained bandwidth network
- Ease of use with an intuitive web interface and GIS map visualization and monitoring
- Rich set of northbound APIs for third-party integration
- Scales to manage up to tens of thousand of routers and millions of mesh endpoints

Benefits

- Comprehensive and customizable dashboard for fast, at-a-glance network health check
- Real-time GIS maps of connected devices for increased asset visibility
- Simplify troubleshooting for operators by providing customizable rules to generate custom events that matter the most
- Integrate with existing automation applications, tools, and processes through open APIs
- Supports Cisco 1000 Series Connected Grid Routers, Cisco 800 Series Industrial Integrated Service Routers, and LoRaWAN

Next steps

To find out more about Cisco's IoT Field Network Director, visit www.cisco.com/go/fnd

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The bridge to possible

Edge computing

Cisco Edge Intelligence

Unlocks business intelligence
by simplifying the edge to multi-cloud data flow

Extract	Transform	Govern	Deliver
From disparate sources	Into intelligent data	When and where data goes	Secure data to its destination

On a scalable, secure Cisco network

Unlock business value by simplifying the edge-to-multicloud data flow

The best decisions are made when the right people have access to the right information at the right time. The IoT has dramatically increased the volume and variety of data produced, opening the door to a wave of new possibilities. The key is to extract the data from its source, transform it so it is usable, and securely deliver the right data to the right applications to put it to work.

But most solutions today are so complicated that organizations often cannot reap the full rewards of their data-gathering projects. The most important data is often at the remote edge of the network, where the core business operates, such as in oil rigs, delivery trucks, and utility substations, and on roads. In addition, organizations lose insight into who has access to what data and often don't have the needed flexibility and simplicity to send the data everywhere it needs to go.

Cisco Edge Intelligence

Visit: www.cisco.com/go/edgeintelligence

Cisco Edge Intelligence delivers

Cisco Edge Intelligence is a new IoT software solution that securely delivers data from connected assets at the network edge to multicloud application destinations. The software is integrated into Cisco's industrial networking and compute devices for an out-of-the box experience to simplify deployment and lower costs. It provides full control over and governance of IoT data, from its extraction to its transformation to its secure delivery. And because Cisco Edge Intelligence has a network- integrated approach with centralized management across the network, applications, and data, it is easy to scale and secure.

Benefits

With Cisco® Edge Intelligence, you gain:

- The ability to seamlessly extract, transform, and share data from connected assets at the IoT edge to multicloud environments
- An all-in-one solution for easy deployment out of the box
- Full data ownership, control, and governance
- Cisco security

Cisco IC3000 Industrial Compute Gateway

Transforms businesses by capturing data from legacy assets and deriving business intelligence at the network edge

Key features:

- **Zero-touch provisioning** Reduces the cost of deploying the IoT edge infrastructure
- **Application development tools** Provides flexibility for developers to use any programming language or operating system, powered by Cisco IOx
- **Device and app lifecycle at scale** Enables IT and OT admins to easily manage, monitor, troubleshoot, and upgrade IoT applications centrally using Cisco IoT Field Network Director
- **Brings intelligence to the edge.** It has two Ethernet ports and two Small Form-Factor Pluggable (SFP) fiber ports in a DIN rail-mounted, ruggedized appliance that provides the widest range of applications for the harshest and most demanding industrial environments

- It enables smart roadway applications such as traffic pattern detection, hazardous weather warnings, and road condition detection. With built-in interfaces that support a wide range of industrial standards and a simple development toolkit
- Enables application developers to unleash their creativity in developing apps that harness the wealth of IoT data

Optional applications

- **Cisco Edge Intelligence**
  IoT software integrated with Cisco's industrial networking portfolio to securely and simply extract, transform, govern, and deliver data from the edge to multi-cloud environments
- **Cisco Cyber Vision Sensor** Gain visibility into your industrial control network so you can build security strategies to protect your assets and processes from cyber risks. The Cyber Vision Sensor software on the Cisco IC3000 works with the Cyber Vision Center to build detailed asset inventories, map application flows, detect malware, vulnerabilities and intrusions (IDS), and identify process anomalies so you can keep your production safe

Learn more

To find out more about the Cisco IC3000 Series, visit www.cisco.com/go/ic3000

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Cisco IOx

Edge compute application framework

Fast. Simple. Secure. Scalable.

Cisco IOx is a simple yet powerful infrastructure framework allowing developers and operators to securely onboard legacy and greenfield applications to their IoT edge infrastructure at massive scale, creating business value from previously untapped data.

1. IOx-enabled devices

2. Docker Developer tool EMU

- Execute **container** or **Virtual Machine concurrently**
- Run **Windows** or **Linux** applications
- Easily-consumable IOx **System Services**

3. Manageability tool
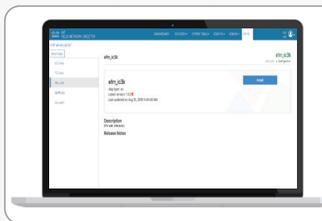
- Zero touch deployment of devices
- Centralized device and **application life-cycle** management at scale
- End-to-End **security**

Next steps

The Cisco IOx application framework offers consistent management and hosting across network infrastructure products. To find out more about Cisco IOx visit, www.cisco.com/go/iox and https://developer.cisco.com/docs/iox/

Cisco IOx components

1. **Cisco IOx enabled edge network devices:** the Cisco IOx edge application framework provides uniform and consistent hosting capabilities for applications across Cisco IoT network infrastructure. The Cisco IOx edge application environment brings together Cisco IOS software, the industry-leading and highly-secure networking operating system, and Linux, the leading open-source platform.

2. **Cisco IOx developer tools and documentation:** SDK's, Command line and Web-based UI tools and Cisco DevNet documentation on how to build, package and deploy edge applications to Cisco IOx enabled network devices.

3. **Cisco IOx edge application management:** deploy and manage IOx edge applications at scale from centralized device and edge application management software. Support for both on-premises and cloud based management. These edge applications may be supplied by an ecosystem partner and Cisco or developed with a range of common programming languages.

Benefits

- **Transformation of IoT data into new digital business value:** Build new business with the ability to process high volumes of data at the edge and deliver closed loop system control in real time
- **Rapid time to value:** Achieve business outcomes associated with IoT initiatives more rapidly with application execution at the edge and scale with the Cisco partner ecosystem
- **Broad scope of impact:** Reach production deployment rapidly with edge application management and execution at IoT scale

Cisco IOx ready

The following Cisco network infrastructure products currently support IOx:

- Cisco Catalyst IE3400
- Cisco 1100 Series Industrial Integrated Services Routers
- Cisco 829 Industrial Integrated Services Routers
- Cisco 809 Industrial Integrated Services Routers
- Cisco Catalyst IW6300 Heavy Duty Series Access Points
- Cisco 1000 Series Connected Grid Routers with compute module
- Cisco IC3000 Industrial Compute Gateway

The bridge to possible

Cisco IoT Validated Designs

We know our products have proven to be the industry's best "ingredients" for IoT networks. But we also know there can be complexity in designing, deploying, and managing those products into a "meal" – a complete solution to support all courses of a real-world use case.

That's why we have Cisco Validated Designs (CVDs). They are used to validate, architect, and configure next-generation technologies. Each is designed to help you accelerate digital transformation, innovate faster, and stay competitive.

Think of them as blueprints to your successful implementation. For every CVD, our engineers create detailed design and implementation guides that use Cisco and our partners' products to address critical business needs. We then engineer, test, and validate each design for our customers' industry-specific requirements, to guide their own deployments.

Learn more

To see how Cisco Validated Designs can help you, visit:
www.cisco.com/go/iotcvd

Featured Design Guides

Extended Enterprise

Securely extend your enterprise network to non-carpeted spaces with Cisco IoT networking and Cisco Digital Network Architecture (Cisco DNA)

Remote and Mobile Assets

Get your remote and mobile assets securely connected to your network.

Connected Communities

An intent-based network for cities, communities and roadways, supporting a broad range of use cases with simplified security and management.

Cisco Connected Communities Infrastructure

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The bridge to possible

Cisco IoT Solutions

Connected Factory

Factory Wireless

Factory Security

Connected Machine

Site Asset Management

Field Network Area (AMI)

Utility WAN

Connected Pipeline

Connected Refinery

Substation Automation

Connected Rail

Smart Cities

Connected Mass Transit

Connected Fleet

Industrial Multi-service Fleet

Cisco Industrial IoT Portfolio

Cisco IoT accelerates digital transformation, delivering insight and action from your data.
www.cisco.com/go/iot

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Cisco Industrial IoT Portfolio

Deploy. Accelerate. Innovate.

Cisco IoT is an end-to-end architecture that enables you to digitize your business and drive better business results. It offers rock-solid infrastructure, unprecedented visibility, security, and control, and trusted expertise to help ensure the success of your IoT deployment.

www.cisco.com/go/iot