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
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](http://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 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. Choose from other management options such as Cisco Industrial Network Director, purpose-built for managing industrial networks, or the included web management tool, which simplifies configuration and reduces time and cost of deployment.

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 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 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 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 up to 385W]
- 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

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 Integrated Services Routers

The Cisco IR Integrated Services Routers (ISRs) Rugged portfolio, including the next-generation, 5G-ready Cisco 1101 Industrial ISR, is a range of compact, ruggedized modular platforms on which you can build a highly secure, reliable, and scalable communications infrastructure. These products are certified to meet harsh environmental standards. They support a variety of communications interfaces, such as Ethernet, serial, fiber, cellular, Wi-Fi, and more.

**Cisco 1100 Series Industrial Integrated Services Routers Rugged (IR1101)**

**Modularity and investment protection**

The IR1101 has highly modular and expandable hardware designed to extend product lifetime. Internal and expansion modules give you the flexibility to add or upgrade WAN and storage components as technologies and your needs evolve.

**A 5G-ready, dual-WAN Gigabit router**

When provisioned with two cellular modules, the IR1101 enables concurrent connectivity to two cellular networks for WAN redundancy, enhanced data throughputs, load balancing, and differentiated services. The hardware is future-ready to handle 5G.

**Ruggedized and compact, with low power consumption**

With its small form-factor (less than 2RU) and low typical power consumption of 10W, the IR1101 is easy to install and integrate into space- and power-constrained cabinet installations.

**Cisco edge intelligence**

The IR1101 supports Cisco Edge Intelligence. Unlock business value by seamlessly extracting, transforming and sharing data from connected assets at the IoT edge to multi-cloud environments.

**Cisco IoT visibility and security built in**

Gain visibility into industrial assets connected to the IR1101 and detect abnormal behaviors to take action and keep your production going. The IR1101 integrates Cisco Cyber Vision Sensor software.

**Software-defined WAN on the IR1101**

Now you can leverage IT expertise to a broad, distributed network, operate at scale, and lower total cost of ownership. Cisco SD-WAN architecture delivers scale, simplicity, and unified management for extending enterprise networks to a distributed IoT deployment.
Open extensible platform with Cisco IOS XE at the edge
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, enabling you to qualify and deploy new services more quickly.

Cisco 829 Industrial Integrated Services Routers (IR829)
- Highly ruggedized and compact with IP40 rating (IP54 with kit)
- IR829 with dual-active LTE for redundant LTE WAN connectivity and load-balancing capabilities
- Integrated storage and compute with IR829M (field-replaceable industrial-grade 100-GB/50-GB SSD)
- 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 multicloud environments
- Dual-active Wi-Fi (2.4 GHz and stationary 5 GHz simultaneously active)
- GPS, accelerometer and gyroscope for transportation and location-based services such as asset tracking and geo-fencing
- 4x 1G RJ-45 with 30.8W PoE/PoE+ for up to 4 devices
- 2 asynchronous serial RJ-45 (1 RS-232, 1 RS-232/RS-485)
- SFP WAN for 100-Mbps and 1-Gbps copper and fiber options
- Edge application hosting capability to transform sensor data and perform control functions
- Cloud and on-premises management

Cisco 809 Industrial Integrated Services Routers (IR809)
- Very compact industrial routers for cabinet deployment with IP30 rating
- Integrated 9.6–60 VDC power input for industrial applications
- Utility-grade with IEEE 1613 and IEC61850-3 compliance and IEC 60870 T101/T104 industry protocol translations
- Integrated 9.6–60 VDC power input for industrial applications
- Multiple connectivity options – 4G/3G/2G cellular, 2 FE RJ-45, 2 asynchronous (1 RS-232, 1 RS-232/RS-485) to connect to sensors and remote terminal units
- GPS for asset tracking and geo-fencing
- Reliable and secure connectivity with enterprise-class services for remote asset monitoring and M2M use cases
- Edge application hosting capability to transform sensor data and perform control functions
- Cloud and on-premises management

Cisco 807 Industrial Integrated Services Routers (IR807)
- Low power (less than 7W), rugged, and highly compact with IP30 rating for power and space-constrained cabinet deployments
- Ideal for multiple M2M applications such as utility distribution automation, oil and gas, water, wastewater management, and roadside infrastructure monitoring
- Utility-grade with IEEE 1613 and IEC61850-3 compliance, and IEC 60870 T101/T104 industry protocol translations
- Integrated 9.6–60 VDC power input for industrial applications
- Multiple connectivity options – 4G/3G/2G cellular, 2 FE RJ-45, 2 asynchronous RS-232 to connect to sensors and remote terminal units
- GPS for asset tracking and geo-fencing
- Highly reliable and secure connectivity for mission-critical service
- Cloud and on-premises management

Next steps
Learn more about Cisco Industrial Integrated Services Routers
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](http://www.cisco.com/go/iw)

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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](http://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 interconnectivity 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](http://www.cisco.com/go/iw)
Cisco Utility and Field Area Networking Portfolio

Cisco 2000 Series Connected Grid Routers
• Rugged industrial design and utility substation compliance with IEC 61850-3 and IEEE 1613
• 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

Cisco 1000 Series Connected Grid Routers (CGR)
• 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
• Two models – CGR 1120 for indoor deployment and CGR 1240 with weatherproof enclosure for outdoor deployment
• Multiple communication options – 4G, dual LTE, GPS, WPAN, and 2-GE SFP with copper and fiber
• Edge computing with compute module (quad-core CPU, 4 GB memory and 50/100 MB data

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

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.

To find out more about Cisco’s LoRaWAN solution, visit [www.cisco.com/go/lorawan](http://www.cisco.com/go/lorawan)
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

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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

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Cisco Industrial Security Appliance 3000

Developed specifically to withstand the harshest industrial environments, the Cisco ISA 3000 industrial firewalls offer 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.

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.

Next steps
To find out more about Cisco Industrial Security Appliance 3000 visit [www.cisco.com/go/isa3000](http://www.cisco.com/go/isa3000)

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Connectivity management

Automated connectivity management platform
Cisco IoT Control Center

Scale a profitable IoT business globally with unparalleled flexibility

Cisco IoT Control Center is an industry-leading Software-as-a-Service (SaaS) platform that simply, automatically, and securely delivers the visibility and control enterprises need to launch, scale, and manage their IoT services worldwide. Connecting thousands or millions of devices to achieve meaningful business results can be complex and costly. For over a decade, more than 29,000 enterprises and 50+ service providers in 80+ countries have been using Control Center. The platform invests heavily in market-driven innovations, such as machine-learning powered automations, and thought leadership, like 5G use case incubation. Control Center helps customers:

- Scale rapidly to generate and grow IoT revenue globally
- Lower total cost of ownership and ongoing IoT operational costs
- Provide an exceptional customer experience through high service reliability
- Accommodate global supply chains and flexible business models
- Safeguard IoT deployments with multilayered security

Next steps
To learn more, visit: www.cisco.com/go/controlcenter
Cisco Industrial Network Director (IND)

Purpose built for managing industrial Ethernet networks, the Cisco Industrial Network Director (IND) is designed to help operations teams gain full visibility into the automation network for improved system availability and increase Overall Equipment Effectiveness (OEE).

**Design**
- Plug-and-Play server for zero-touch switch commissioning

**Operate**
- Industrial asset discovery
- Topology Maps
- Switch monitoring
- Alarms and Notification
- Role-based access control

**Maintain**
- Configuration backup
- Configuration restore
- Software update

**Integrate**
- Cisco Active Advisor
- REST API for 3rd party tools

**Delivering business outcomes through automation**
- Empower operations team with real-time maps of network and automation device connectivity for increased asset visibility using PROFINET, BACNET, MODBUS, NETBIOS, and CIP protocols
- Simplify troubleshooting for technicians by generating network information in the context of the automation process
- Map out VLAN flow across a set of switches and links
- Discover devices behind Rockwell ControlLogix PLC
- Monitor Supervisor node for Device Level Ring status and view topology changes
- View PTP timing distribution from GM to Slaves, monitor clock details for Master slave relationship, accuracy etc.
- Zero-Touch Commissioning and Replacement
- SMTP server integration for generating email notification when the system generates alarms
- Cisco Active Advisor integration to get security alerts that apply to your industrial switches
- Integrate with existing automation applications, tools, and processes through open APIs

**Next steps**
To find out more about Cisco’s IoT Industrial Network Director, visit [www.cisco.com/go/ind](http://www.cisco.com/go/ind)

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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
Cisco Vision

Only Cisco can provide the comprehensive solution you need for digital engagement.

Why Cisco for Digital Signage

Centralized management of all displays, media players, and external data integration

Synchronize and track content across all individual and video-wall screens

Multiple layers of hardware-accelerated video playback and rich media support

Cisco Vision Dynamic Signage Director

Coordinate, manage, and orchestrate digital engagement between consumers and all areas of your properties.

• Manage thousands of displays, digital media, and content delivery from a central control panel
• Direct promotions: Advertise to specific areas in the property for more sales, differentiating areas as needed

Cisco Vision Digital Media Player

Display static and dynamic content throughout your property.

• Place and deliver various types of media: targeted, synchronized video wall, or virtual ribbon displays
• Feature-rich and robust endpoint, powered by PoE

Learn more

Visit: www.cisco.com/go/ciscovision

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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 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](http://www.cisco.com/go/ic3000)
Cisco IOx
Edge compute application framework

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

3. Manageability tool

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

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 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.

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Cisco IoT Solutions

Cisco Industrial IoT Portfolio
Cisco IoT accelerates digital transformation, delivering insight and action from your data.
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Cisco Industrial IoT Portfolio


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