

Cisco 3270 Rugged Integrated Services Routers (ISR)

The Cisco® 3200 Series Rugged ISRs are designed with a flexible, compact form factor. They are optimized for mobile and embedded networks that require IP routing. These routers provide access, mobility, and interoperability across multiple wireless technologies, including integrated 4.9 GHz, 802.11a/b/g, third-generation (3G) cellular, and satellite. Standards-based Mobile IP delivers transparent roaming for mobile applications. The Cisco 3200 Series Rugged ISRs use Cisco IOS® Software to provide highly secure data, voice, and video communications to stationary and mobile network nodes across wired and wireless links.

The Cisco 3270 Rugged ISR is a high-performance, ruggedized router designed to support multiple applications running concurrently over wired or wireless networks. With onboard hardware encryption, the Cisco 3270 offloads encryption processing from the router to provide highly secure yet scalable video, voice, and data services for mobile and embedded outdoor networks.

The Cisco 3270 Rugged ISR offers a wide range of network interfaces, such as fiber, Gigabit Ethernet copper, 10/100 Fast Ethernet, and universal serial bus (USB). The Cisco 3270 can support two stacks of PC/104-Plus cards. With higher scalability, increased port densities, and greater network module expansion, the Cisco 3270 delivers investment protection for customers deploying bandwidth-intensive applications in mobile or embedded outdoor networks in public safety, transportation, defense, and energy markets.

Cisco 3270 Standalone Router Card

The Cisco 3270 Rugged ISR is offered as a standalone (spare) router card or as a bundle of cards assembled in a rugged enclosure from Cisco. Cisco has a network of system integrator partners that embed Cisco 3200 Series Rugged ISR cards into custom enclosures tailored to the unique environments in which the Cisco 3200 Series is deployed. Like all Cisco 3200 Series components, the Cisco 3270 router card uses industrial-grade components and is optimized for harsh environments that require Cisco IOS® Software routing technology. Thermal plates surround the router card to provide a convenient heat sink for transferring heat away from the router. Figure 1 shows a Cisco 3270 Rugged ISR card.

Figure 1. Cisco 3270 Rugged ISR Card



Cisco 3270 Rugged Enclosure

Cisco has introduced a rugged enclosure for the Cisco 3270 Rugged ISR. The Cisco 3270 can be configured with other Cisco 3200 Series interface cards, such as the serial, Fast Ethernet, or wireless mobile interface cards. The rugged enclosure provides protection for the Cisco 3200 Series components in harsh environments, including high altitudes, locations subject to intense shock or vibration, and damp, wet, or dusty environments.

The rugged enclosure for the Cisco 3270 provides:

- A rugged enclosure designed to meet a wide range of environmental specifications, including NEMA 4, MIL-STD-810F, MIL-STD-461E, and SAE (J1211 and J1455) standards
- A sealed enclosure to lock out dust, water, and moisture from contact with networking components
- A conductive cooling mechanism that alleviates the need for moving parts such as internal fans
- A modular enclosure that system integrators can upgrade with new cards to meet unique customer requirements

Figure 2 shows the Cisco 3270 Rugged Enclosure.

Figure 2. Cisco 3270 Rugged Enclosure



The Cisco 3270 Rugged ISR is backward-compatible with all the PC/104-Plus cards available today in the Cisco 3200 Series. Each of the following cards is supported by the Cisco 3270:

- Fast Ethernet Switching Mobile Interface Card (FESMIC)
- Serial Mobile Interface Card (SMIC)
- Wireless Mobile Interface Cards (WMIC) (2.4 GHz, 4.9 GHz, and 5 GHz)
- Mobile Router Power Card (MRPC)

For more information about the Cisco 3200 interface cards, please refer to the Cisco 3230 data sheet:

http://www.cisco.com/en/US/prod/collateral/routers/ps272/product_data_sheet0900aecd800fe973.html

Applications

The Cisco 3270 Rugged ISR can be used in a variety of applications. The following are a few deployment scenarios.

Mobile Networks

The Cisco 3270 Rugged ISR establishes a mobile, broadband network in vehicles, helping public safety, transportation, and defense customers extend their corporate resources securely to employees in the field. The Cisco 3270 offers a scalable network platform, establishing a mobile network for first responder vehicles, armored vehicles, and commercial and freight rail trains.

To ensure transparent connectivity to the roaming vehicle network, Cisco has integrated standards-based Mobile IP software into the Cisco IOS Software running on the Cisco 3270. Mobile IP allows transparent roaming over multiple wireless networks. For example, cellular, satellite, or global-positioning-system (GPS) modems can be connected to the Cisco 3270 to provide multiple wireless network connections to the vehicle network.

Embedded Outdoor Networks

The Cisco 3270 Rugged ISR can be inserted into outdoor infrastructure to extend IP networks to outdoor locations. Qualified system integrators can embed the Cisco 3270 into existing outdoor infrastructure such as traffic signal control boxes, telephone booths, or utility substations to tie remote networks into a manageable, highly secure IP network. For example, the Cisco 3270 provides a high-performance router for aggregating peripheral devices onto an IP network, including video surveillance cameras and chemical sensors. In more remote areas, the Cisco 3270 can be embedded into utility substations and can integrate proprietary networks on to an IP network for greater operational efficiency.

On-Demand Network Connectivity

The Cisco 3270 Rugged ISR can be used to provide on-demand network connectivity for homeland security and emergency response applications. In disaster situations, regular network connectivity is often not available because of damaged network infrastructure or lack of network capacity. Federal response teams or tactical military teams must have a versatile network platform that has the following characteristics:

- Flexible form factor with high performance
- Portability

- Low power consumption
- Ability to handle harsh environments

The Cisco 3270 platform is versatile because it can be purchased as a standalone router card or as a fully enclosed rugged router preconfigured from Cisco. System integrators can also embed the Cisco 3270 into their own enclosures or travel kits. These on-demand kits are embedded in small transit cases, suitcases, or hardened enclosures for ease of portability.

Key Features and Benefits

Table 1 gives the features and benefits of the Cisco 3270 Rugged ISR.

Table 1. Features and Benefits of the Cisco 3270 Rugged ISR

Feature	Benefit
Breadth of interface support	<p>The Cisco 3270 provides greater choice and flexibility for connecting peripheral devices to the router.</p> <p>High-speed interfaces such as copper and fiber Gigabit Ethernet allow the Cisco 3270 to serve as an aggregation point for on-demand network connectivity in mobile or fixed deployments.</p> <p>Customers have a choice of two product configurations for the Cisco 3270 router card:</p> <ul style="list-style-type: none"> • Configuration 1 includes 2 Gigabit Ethernet copper interfaces (C3271MARC-TP=). • Configuration 2 includes 1 Gigabit Ethernet copper and 1 fiber-optic interface (C3271MARC-FO-TP=). • Each configuration comes standard with 2 Fast Ethernet ports, 2 USB (2.0) ports, 1 auxiliary port, and 1 console port.
Fiber interface support	<p>The extended-temperature-range Gigabit Ethernet Small Form-Factor Pluggable (SFP) module offers support for mobile or outdoor networks:</p> <ul style="list-style-type: none"> • 1000-Mbps LX single mode • 1000-Mbps SX multimode
Onboard hardware acceleration	<p>The onboard hardware encryption module offloads packet encryption from the router CPU to increase router performance.</p>
Cisco Unified CallManager Express (CUCME) support	<ul style="list-style-type: none"> • Supports up to 48 phones for remote IP telephony on vehicles or in outdoor locations • Provides primary or back up telephony services for command and control communications
Backward compatibility with existing mobile interface cards	<p>The 3270 router supports the following Cisco 3200 interface cards:</p> <ul style="list-style-type: none"> • FESMIC • SMIC • WMIC (802.11a/b/g, 4.9 GHz,) • MRPC
Application versatility	<p>The router is orderable as a standalone router card for embedded applications or as a system in a Cisco rugged enclosure.</p>
Cisco 3270 Rugged ISR systems	<ul style="list-style-type: none"> • Cisco offers rugged enclosure bundles for the Cisco 3270 Rugged ISR. The rugged enclosure is completely sealed and does not require the use of fans for thermal cooling. • The enclosure supports 2 card stacks for PC/104-Plus card expansion. (The second card stack supports PC/104-Plus- or PCI/104-compliant cards only.) PC/104-Plus card expansion allows for insertion of Cisco or third-party cards to provide various LAN or WAN functions, including video surveillance, computing, GPS, and cellular connectivity. • The rugged enclosure is designed to meet NEMA 4 standards. • Preconfigured bundles include the Cisco 3270 router card with other interface cards listed above. • Customers can also work with system integrators on custom enclosure designs.
Expanded Fast Ethernet port density	<ul style="list-style-type: none"> • Up to 8 Fast Ethernet ports are available on the Cisco 3270 Rugged Enclosure when no wireless cards are configured in the bundle. The C3270ENC-K9 bundle includes 4 Fast Ethernet ports on the router card (2 Fast Ethernet and 2 Gigabit Ethernet copper) and 4 Fast Ethernet ports on the FESMIC. • Note: Some Fast Ethernet ports on Cisco 3270 Rugged Enclosure bundles are factory configurable to be either Fast Ethernet ports or (RJ-45) WMIC console ports, depending on the presence of WMICs in the system.

Feature	Benefit
Standards-based Mobile IP in Cisco IOS Software	<ul style="list-style-type: none"> • These features offer always-on wireless access with transparent mobility regardless of location or movement. • Mission-critical applications stay connected even when roaming between networks. • The IP address assigned to the home network is maintained in private or public networks.
Industrial-grade components	The router can withstand extended temperature ranges of -40° to +185°F (-40° to +85°C); temperature ranges for completed solutions depend on hardware configuration variables, including enclosures and third-party components.

Product Specifications

Tables 2 through 4 give the specifications for the Cisco 3270 Rugged ISR.

Table 2. Hardware Specifications for the Cisco 3270 Rugged ISR

Cisco 3270 Features	Feature Description
Hardware encryption	Onboard hardware encryption processor supporting IP Security (IPsec), Secure Sockets Layer with transparent LAN services (SSL/TLS), Sequenced Routing Update Protocol (SRTP), 802.11i, Small Computer System Interface over IP (iSCSI), Triple Digital Encryption Standard (3DES), Advanced Encryption Standard (AES), and Internet Key Exchange (IKE) security protocols
Memory	
DRAM	256 MB of DRAM default
Flash memory	64 MB of flash memory default
Interface Support	
Fast Ethernet	2 10/100 Fast Ethernet ports supporting autonegotiation
Auxiliary port	<ul style="list-style-type: none"> • 1 auxiliary port supporting RS-232 signaling • Modem control signals Data Terminal Ready (DTR), Data Set Ready (DSR), Collision Detection (CD), Request to Send (RTS), and Clear to Send (CTS) supporting speeds up to 460 kbps
Router console port	<ul style="list-style-type: none"> • 1 console port supporting RS-232 signaling • Full modem control signals DTR, CD/DSR, RTS, and CTS supporting speeds up to 115 kbps
Gigabit Ethernet	
Gigabit Ethernet copper	<ul style="list-style-type: none"> • C3271MARC-FO-TP router card contains one 10-, 100-, or 1000-Mbps copper Ethernet port • C3271MARC-TP router card contains two 10-, 100-, or 1000-Mbps copper Ethernet ports
Fiber optic	<ul style="list-style-type: none"> • C3271MARC-FO-TP router card contains one Gigabit Ethernet fiber-optic interface • C3271MARC-TP router card does not contain any fiber-optic interfaces
SFP Module Support	
	1000-Mbps LX single-mode SFP module
	1000-Mbps SX multimode SFP module
USB	Dual USB 2.0 high-speed ports
PC/104-Plus-compliant interface	Supports up to 2 PC/104-Plus card stacks
Industrial-grade board component temperature	-40° to +185°F (-40° to +85°C) component local ambient temperature ranges; with fiber-optic model, the extended (device) temperature ranges for the SFPs are -40° to +185°F (-40° to +85°C)
Operating temperature	<p>Cisco 3270 Rugged Enclosure operating temperature range (enclosure with Cisco 3270 and the following cards: MRPC, SMIC, FESMIC, and 3 WMICs):</p> <ul style="list-style-type: none"> • -40° to +165°F (-40° to +74°C) • -40° to +149°F (-40° to +65°C) (for Cisco 3270 fiber-optic model)
Temperature sensor	Onboard temperature sensor that alerts administrator if router board falls outside the temperature range of -40° to +203°F (-40° to +95°C)

Table 3. Software Specifications for the Cisco 3270 Rugged ISR

Features	Feature Description	Cisco IOS Software Image Support	
		Enterprise Base	Advanced Enterprise
Routing protocols	Routing Information Protocol (RIP), RIPv2, Open Shortest Path First (OSPF), Enhanced Interior Gateway Routing Protocol (EIGRP)-IP, Border Gateway Protocol (BGP), Cisco Discovery Protocol, IP Policy Routing, IP Multicast Protocol Independent Multicast (PIM) Versions 1 and 2, Internet Group Management Protocol (IGMP) Versions 1 and 2, IP Multicast Load Splitting, and Cisco Group Management Protocol (GMP)	X	X
VLANs	Up to 32 VLANs supported per router	X	X
IPv4	IPv4 support	X	X
IPv6	IPv6 routing and Cisco Express Forwarding switching, IPv6 quality of service (QoS), and IPv6 tunneling support		X
Additional protocol support	Point-to-Point Protocol (PPP); PPP over Ethernet (PPPoE) client and server for Fast Ethernet, Gigabit Ethernet, and FESMIC switched virtual interfaces (SVIs); Frame Relay; X.25; X.25 over TCP (XOT); High-Level Data Link Control (HDLC); Telnet; asynchronous tunneling; dial-on-demand routing (DDR); PPP over Frame Relay; IP Unnumbered feature for FESMIC interfaces; and asynchronous serial traffic over User Datagram Protocol (UDP) or UDP Telnet (UDPTN)	X	X
Mobility			
	Mobile IP and Cisco Mobile Networks in Cisco IOS Software		X
	Cisco Mobile Networks Network Address Translation (NAT) Traversal over Mobile IP		X
	Home agent and mobile router redundancy; mobile router preferred interfaces; mobile router reverse tunneling; mobile router asymmetric links; mobile router static and dynamic networks; static colocated care-of address; authentication, authorization, and accounting (AAA) server; and Mobile IP		X
	Support for Mobile IP tunnel templates, allowing configuration of IP Multicast and IPsec on Mobile IP tunnels		X
	Mobile IP foreign agent local routing optimization		X
Security			
	Route and router authentication, Password Authentication Protocol (PAP), Challenge Handshake Authentication Protocol (CHAP), Microsoft CHAP (MS-CHAP) local password, IP basic and extended access lists, and time-based access control lists	X	X
	Stateful inspection firewall	X	X
	Firewall intrusion detection system		X
	Port-to-application mapping		X
	Generic routing encapsulation (GRE)	X	X
	Ipsec		X
	Easy VPN Version 4.1 for client and server	X	X
	Tunnel endpoint discovery		X
	Secure Shell (SSH) Protocol Client and Server Version 1.5		X
	Fast switching, Cisco Express Forwarding, process switching, STAC compression, Routing Table Protocol (RTP) header compression	X	X
QoS			
	Generic traffic shaping, class-based Ethernet matching and mobile access routing (802.1p class of service [CoS]), and committed access rate	X	X
	Flow-based weighted random early detection (WRED)	X	X
	Class-based weighted fair queuing, low-latency queuing, priority queuing, and weighted fair queuing	X	X
	Link fragmentation and interleaving (LFI)	X	X
	Dial backup, dialer profiles, dialer idle timeout, and dial on demand	X	X
	Traffic Policing Resource Reservation Protocol (RSVP)	X	X

Features	Feature Description	Cisco IOS Software Image Support	
	802.1q VLAN trunking support	X	X
Voice			
	Cisco Unified CallManager Express		X
Management			
	Simple Network Management Protocol (SNMP) Versions 2 and 3, Telnet, console port, RADIUS, TACACS+, Cisco Service Assurance Agent, syslog, Response Time Reporter, Network Time Protocol (NTP) Client, Trivial File Transfer Protocol (TFTP) Client and Server, Dynamic Host Configuration Protocol (DHCP) Client and Server, DHCP Relay, and Hot Standby Router Protocol (HSRP)	X	X
Tool Command Language (TCL) scripts	TCL script support	X	X
Address conservation	NAT Many-to-One (Port Address Translation [PAT]), NAT Many-to-Many (Multi-NAT), DHCP Client Address Negotiation, and Easy IP Phase I	X	X
Zeroization	Ability to connect a third-party device to the auxiliary port to trigger the removal of all user data or binary code from the router memory		X

Table 4. Dimensions of the Cisco 3270 Rugged ISR

Feature	Feature Description
Card dimensions	Dimensions and weight with thermal plates: <ul style="list-style-type: none"> • Height: 0.93 in. (23.6 mm) • Width: 5.8 in. (147.3 mm) • Depth: 10.23 in. (259.8 mm) • Weight: 2.0 lb (0.9 kg)
Rugged enclosure for the Cisco 3270	<ul style="list-style-type: none"> • Designed to store the Cisco 3270 router card and 2 stacks of PC/104-Plus-compliant cards • Height: 5.9 in. (149.8 mm) • Width: 6.8 in. (172.2 mm) • Depth: 16.4 in. (416.6 mm) (for Cisco 3270 fiber-optic model) • Weight: 18.9 lb (8.6 kg) (enclosure with Cisco 3270 router card, MRPC, SMIC, FESMIC, and 3 WMICs) <p>The Cisco 3270 Rugged Enclosure I/O end cap supports the following 7-card configuration: Cisco 3270 router card, SMIC, FESMIC, MRPC, and 3 WMICs. The 3270 rugged enclosure includes room for up to 2 PC/104-Plus card stacks. (The Cisco 3270 router card uses 2 slots). An additional MRPC card is required if PC/104-Plus cards are placed in the second stack.</p>

Ordering Information

To place an order, visit the Cisco Ordering Home Page. For more information about ordering the Cisco 3270 Rugged ISR, see the Cisco 3200 Series Ordering Guide at the following URL:

http://www.cisco.com/en/US/prod/collateral/routers/ps272/prod_brochure0900aecd803fabbf.html

Table 5 gives ordering information for the Cisco 3270 Rugged ISR.

Table 5. Ordering Information for the Cisco 3270 Rugged ISR

Product Name	Part Number
Cisco 3270 Rugged ISR Cards	
Cisco 3270 Rugged ISR card with 2 Gigabit Ethernet copper ports, 2 10/100 Fast Ethernet ports, 2 USB ports, 1 auxiliary port, and 1 console*	C3271MARC-TP=
Cisco 3270 Rugged ISR card with 1 fiber-optic port, 1 Gigabit Ethernet copper port, 2 10/100 Fast Ethernet ports, 2 USB ports, 1 auxiliary port, and 1 console*	C3271MARC-FO-TP=
Cisco 3270 Rugged ISR Bundles Containing Cisco 3270 Router Card with 2 Gigabit Ethernet Ports	C3271MARC-TP
Cisco 3270 bundle assembled in a rugged enclosure; includes 1 Cisco 3270 router card, 1 SMIC, 1 FESMIC, and 1 MRPC	C3270ENC-K9
Cisco 3270 bundle assembled in a rugged enclosure; includes 1 Cisco 3270 router card, 1 SMIC, 1 FESMIC, 1 MRPC, and 1 WMIC	C3270ENC-1W-K9

Product Name	Part Number
Cisco 3270 bundle assembled in a rugged enclosure; includes 1 Cisco 3270 router card, 1 SMIC, 1 FESMIC, 1 MRPC, and 2 WMICs	C3270ENC-2W-K9
Cisco 3270 bundle assembled in a rugged enclosure; includes 1 Cisco 3270 router card, 1 SMIC, 1 FESMIC, 1 MRPC, and 3 WMICs	C3270ENC-3W-K9
Cisco 3270 Rugged ISR Bundles Containing Cisco 3270 Router Card with Fiber Optic, 1 SFP, and 1 Gigabit Ethernet Port	C3271MARC-FO-TP
Cisco 3270 bundle assembled in a rugged enclosure; includes 1 Cisco 3270 router card with SFP, 1 SMIC, 1 FESMIC, and 1 MRPC	C3270ENC-FO-K9
Cisco 3270 bundle assembled in a rugged enclosure; includes 1 Cisco 3270 router card with SFP, 1 SMIC, 1 FESMIC, 1 MRPC, and 1 WMIC	C3270ENC-1W-FO-K9
Cisco 3270 bundle assembled in a rugged enclosure; includes 1 Cisco 3270 router card with SFP, 1 SMIC, 1 FESMIC, 1 MRPC, and 2 WMICs	C3270ENC-2W-FO-K9
Cisco 3270 bundle assembled in a rugged enclosure; includes 1 Cisco 3270 router card with SFP, 1 SMIC, 1 FESMIC, 1 MRPC, and 3 WMICs	C3270ENC-3W-FO-K9
SFP Devices	
1000-Mbps LX single-mode SFP module	GLC-LX-SM-RGD=
1000-Mbps SX multimode SFP module	GLC-SX-MM-RGD=

* Cisco 3270 cards sold as spare router cards ship with thermal plates preassembled.

To Download The Software

Visit the [Cisco Software Center](#) to download Cisco IOS Software. A Cisco.com account is required to access this Website. Table 6 lists the Cisco IOS Software images available for the Cisco 3270.

Table 6. Cisco IOS Software Images for Cisco 3270 Rugged ISR

Cisco IOS Software Image Name	Description
C3270-entbase-mz	Cisco 3270 Enterprise Base IOS Image
C3270-adventerprisek9-mz	Cisco 3270 Advanced Enterprise IOS Image

Service and Support

Cisco offers a wide range of service programs to accelerate customer success. These innovative service programs are delivered through a unique combination of people, processes, tools, and partners, resulting in high levels of customer satisfaction. Cisco services help you protect your network investment, optimize network operations, and prepare your network for new applications to extend network intelligence and the power of your business. For more information about Cisco services, refer to [Cisco Technical Support Services](#) or [Cisco Advanced Services](#).

For More Information

For more information about the Cisco 3270 Rugged ISR, visit <http://www.cisco.com/go/3200> or contact your local Cisco account representative.



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