

## Cisco 3200 Series Rugged Integrated Services Routers

This Q&A document covers the following topics:

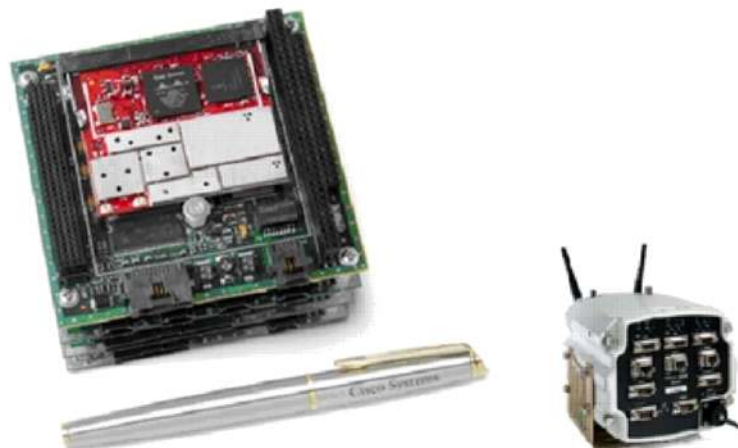
- Product overview
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### Product Overview

#### **Q. What are Cisco® 3200 Series Rugged Integrated Services Routers?**

**A.** The Cisco 3200 Series Rugged Integrated Services Routers (Figure 1) are ruggedized, high-performance Cisco IOS® Software routers with embedded 802.11b/g and 4.9-GHz wireless functionality. With a flexible, compact form factor, they are ideally suited for integration into vehicles or as an embedded rugged router for use in outdoor cabinets such as traffic signal controllers and utility substations. They offer secure data, voice, and video communications across a wide range of wireless and wired networks. Standards-based mobile IP delivers transparent roaming for mobile applications, and Cisco IOS Software provides security, manageability, and scalability with interoperability between networks, while allowing for future network expansions and upgrades.

**Figure 1.** Cisco 3200 Series Rugged Integrated Services Router



The Cisco 3200 Series Rugged Integrated Services Routers offer public safety, transportation and other government agencies the following important solution benefits:

- A ruggedized router in a flexible and compact design, ideally suited to create mobile networks in and around vehicles
- Standards-based connectivity for a wide range of LAN and WAN wired or wireless links, including integrated 802.11b/g and 4.9-GHz wireless capabilities, and upgradable to future wireless technologies
- Always-on wireless access for vehicle networks with transparent mobility through mobile IP regardless of location or movement
- Advanced IP services through standards-based Cisco IOS Software, offering robust network security, reliability, quality of service, and remote management functionality

**Q. Are there any enclosures available manufactured by Cisco?**

**A.** Cisco offers a rugged enclosure for the Cisco 3230 and 3270 Integrated Services Routers. This rugged, sealed enclosure is designed for in-vehicle use and to withstand harsh environments, including high temperature variations; high altitude; intense shock/vibration; and exposure to damp, wet, or dusty environments. Outdoor deployments might require some additional customization based on the environment and deployment scenarios. Systems integrators can provide this additional customization.

The Cisco 3200 Series Rugged Integrated Services Router enclosure provides:

- A rugged design meeting a wide range of environmental specifications, including NEMA-4, MIL-STD-810F, MIL-STD-461E, and SAE standards
- Sealed enclosure that uses conductive cooling without the use of internal fans
- Systems integrators with the ability to customize and upgrade the solution to meet unique customer requirements

For mobile or outdoor solutions that have specific requirements, customers can work with systems integrators to customize an enclosure for the Cisco 3200 Series components.

For more information about the Cisco 3200 Series Rugged Integrated Services Router enclosure, visit

[http://www.cisco.com/en/US/prod/collateral/routers/ps272/product\\_data\\_sheet0900aecd8028e3a7.html](http://www.cisco.com/en/US/prod/collateral/routers/ps272/product_data_sheet0900aecd8028e3a7.html).

For information about third-party enclosures, visit

[http://www.cisco.com/en/US/prod/collateral/routers/ps272/prod\\_brochure0900aecd80371571.html](http://www.cisco.com/en/US/prod/collateral/routers/ps272/prod_brochure0900aecd80371571.html).

## **Ordering the Cisco 3200 Series Rugged Integrated Services Routers and Third-Party Components**

**Q. How do I order the Cisco 3200 Series Rugged Integrated Services Routers?**

**A.** The first option is to order Cisco 3200 Series bundles assembled in a Cisco rugged enclosure. These rugged enclosure bundles provide multiple configurations of router and mobile interface cards fully assembled in the Cisco rugged enclosure. The second option is to order Cisco 3200 Series card bundles. Many systems integrators want to purchase the Cisco 3200 Series router and interface cards and embed them in custom mobile and outdoor enclosures. The Cisco 3200 Series card bundles offer a convenient way to order a predetermined set of router and mobile interface cards. The third ordering option for the Cisco 3200 Series is to order

individual or spare cards and components. For detailed information, see the Cisco 3200 Series Rugged Integrated Services Routers ordering brochure at [http://www.cisco.com/en/US/prod/collateral/routers/ps272/prod\\_brochure0900aecd803fabbf.html](http://www.cisco.com/en/US/prod/collateral/routers/ps272/prod_brochure0900aecd803fabbf.html).

Customers looking for a qualified Cisco partner that can provide mobile networking solutions with the Cisco 3200 Series (ATP-3200-Hardware Design Integrator [HDI] Partner) can access the Cisco Partner Locator at [http://tools.cisco.com/WWChannels/LOCATR/jsp/partner\\_locator.jsp](http://tools.cisco.com/WWChannels/LOCATR/jsp/partner_locator.jsp).

**Q. What is included when ordering a Cisco 3200 Series card bundle?**

- A.** These standalone card bundles ship as a set of cards with a single Mobile Access Router Card (MARC), serial mobile interface card (SMIC), and Fast Ethernet switching mobile interface card (FESMIC), and an optional number of wireless mobile interface cards (WMICs). The standalone card bundles do not include the Cisco enclosure, mobile router power card (MRPC), or internal or external cabling. The Cisco 3200 Series card stacks are powered by a DC-to-DC power converter card available through Datel Corporation. You can order Datel power cards through the following Website: <http://www.cd4power.com/>.

Spare power cards with thermal plates are available for order from Cisco. Power cards with thermal plates (part number C3201MRPC-TP=) can be inserted inside a Cisco 3200 Series rugged enclosure.

Internal and external cables can be ordered separately. For more information about antennas, modems, power adapters, and cabling, see the following questions.

**Q. Which type of antennas is needed in the deployment of the Cisco 3200 Series Rugged Integrated Services Routers?**

- A.** Based on the function of the WMIC and its deployment, different antenna types can be used to optimize wireless signals and provide flexibility in antenna placement. For additional information about selecting and installing antennas with the Cisco 3200 Series, visit [http://www.cisco.com/en/US/prod/collateral/routers/ps272/prod\\_brochure0900aecd80371218.html](http://www.cisco.com/en/US/prod/collateral/routers/ps272/prod_brochure0900aecd80371218.html).

**Q. Which third-party modems are available with the Cisco 3200 Series Rugged Integrated Services Routers?**

- A.** For more information, visit the modem brochure at [http://www.cisco.com/en/US/prod/collateral/routers/ps272/prod\\_brochure0900aecd80374174.html](http://www.cisco.com/en/US/prod/collateral/routers/ps272/prod_brochure0900aecd80374174.html).

**Q. Where can I find power cables and adapters for the Cisco 3200 Series Rugged Integrated Services Routers?**

- A.** The Cisco 3200 Series rugged enclosure uses reference power cables from third-party cable manufacturers. For additional information, visit [http://www.cisco.com/en/US/prod/collateral/routers/ps272/prod\\_brochure0900aecd8028f6f8.html](http://www.cisco.com/en/US/prod/collateral/routers/ps272/prod_brochure0900aecd8028f6f8.html).

**Q. Besides the Cisco rugged enclosure, are there any other third-party enclosures available?**

- A.** Cisco 3200 Series ATP-HDI partners are developing specialized enclosures for the Cisco 3200 Series. For an overview, see the document at [http://www.cisco.com/en/US/prod/collateral/routers/ps272/prod\\_brochure0900aecd80371571.html](http://www.cisco.com/en/US/prod/collateral/routers/ps272/prod_brochure0900aecd80371571.html).

**Q. What are the mounting options for the Cisco 3200 Series Rugged Integrated Services Routers?**

- A.** The Cisco 3200 Series Rugged Integrated Services Routers can be deployed in mobile environments including vehicles, aircraft, trains, and ships. The Cisco 3200 Series can also be deployed in outdoor environments as an embedded rugged router.

**Wireless Features**

**Q. What wireless standards are supported on the Cisco 3200 Series Rugged Integrated Services Routers?**

- A.** The 2.4-GHz 802.11b/g standards and the licensed 4.9-GHz frequency band for public safety applications are supported.

**Q. What WLAN security features are available on the Cisco 3200 Series Rugged Integrated Services Routers?**

- A.** Network security features include authorization, authentication, intrusion detection, stateful firewall, and Triple Data Encryption Standard (3DES) and Advanced Encryption Standard (AES) encryption for secure VPNs. The following protocols are supported by the Cisco 3200 Series WMIC in AP, RB, and NRB configurations: Extensible Authentication Protocol Tunneled Transport Layer Security (EAP TTLS), Extensible Authentication Protocol Transport Layer (EAP TLS), Protected Extensible Authentication Protocol (PEAP), and Temporal Key Integrity Protocol per-packet keying (TKIP PPK).

**Q. Do the Cisco 3200 Series Rugged Integrated Services Routers work with the Cisco Aironet® 1500 Series?**

- A.** Yes, Universal Workgroup Bridge allows the Cisco 3200 Series Rugged Integrated Services Routers to connect to standard-based 802.11b/g access points (such as the Cisco Aironet 1500 Series [Figure 2]) with the ability to utilize multiple profiles for various authentication types.

**Figure 2.** Cisco Aironet 1500 Series



For additional information about the Cisco Aironet 1500 Series lightweight outdoor mesh access points, visit <http://www.cisco.com/en/US/products/ps6548/index.html>.

For additional information about the Cisco 3200 Series Rugged Integrated Services Routers, visit <http://www.cisco.com/en/US/products/ps6548/index.html>.

**Figure 3.** Cisco 3200 Series Rugged Integrated Services Router



**Q. What is 4.9 GHz?**

- A.** In 2003 the Federal Communications Commission (FCC) allocated 50 MHz of spectrum in the 4.9-GHz band to public safety agencies in the United States. Public safety agencies can use this 4.9-GHz band to implement wireless networks with advanced services for the transmission of mission-critical information such as streaming video, data access, transfer of maps, missing person images, and so on. The FCC intended to accommodate a variety of new broadband applications such as high-speed digital technologies and wireless local area networks for incident scene management, dispatch operations, and vehicular operations. For more information, visit the 4.9-GHz brochure at [http://www.cisco.com/en/US/prod/collateral/routers/ps272/prod\\_brochure0900aecd802d816e.html](http://www.cisco.com/en/US/prod/collateral/routers/ps272/prod_brochure0900aecd802d816e.html).

**Q. Does the Cisco 3200 Series support 4.9-GHz bandwidth?**

- A.** Yes, the 4.9-GHz WMIC provides this connectivity. Cisco offers the 4.9-GHz WMIC in addition to the 802.11b/g WMIC for the Cisco 3200 Series Rugged Integrated Services Routers. For more information about the Cisco 3200 Series WMIC, see the 4.9-GHz data sheet at [http://www.cisco.com/en/US/products/hw/routers/ps272/products\\_data\\_sheets\\_list.html](http://www.cisco.com/en/US/products/hw/routers/ps272/products_data_sheets_list.html).

**Q. Is 4.9 GHz appropriate for any other countries outside the United States?**

- A.** In its current release the 4.9-GHz technology is customized for the U.S. public safety market only. If you see that this technology might be a good fit in other countries, contact our marketing team.

**Q. How does 4.9 GHz compare to 802.11?**

- A.** For a technical comparison between 802.11 and 4.9 GHz, see Table 1. Beyond the technology comparison, the primary difference is that 4.9 GHz is licensed by the FCC and dedicated to public safety and public services applications. This eliminates the in-band interference from unauthorized users and improves overall network performance in outdoor environments.

**Table 1.** Comparison of 802.11 and 4.9 GHz

Wireless Technology	802.11a	802.11b/g	4.9 GHz
<b>Band</b>	5 GHz/U-NII	2.4 GHz/ISM	4.9 GHz/FCC licensed
<b>Total bandwidth</b>	Lower/middle U-NII: 200 MHz Upper U-NII: 100 MHz	FCC: 84 MHz ETSI: 84 MHz	FCC: 50 MHz
<b>Channel width</b>	20 MHz	22 MHz	5, 10, 20 MHz
<b>Nonoverlapping channels</b>	Lower/middle U-NII: 8 ch. Upper U-NII: 4 ch.	FCC: 3 ch. ETSI: 3 ch.	10 5 MHz ch. 4 10 MHz ch. 2 20 MHz ch.
<b>Spectral mask</b>	DSRC-A	DSRC-A	DSRC-M
<b>EIRP</b>	Lower U-NII: 22 dBm Middle U-NII: 29 dBm Upper U-NII: 35 dBm	FCC: 36 dBm ETSI: 30 dBm	5 MHz ch.–36 dBm 10 MHz ch.–39 dBm 20 MHz ch.–42 dBm

**Q. Are there 4.9-GHz client adapters for laptops and handhelds?**

**A.** Yes. When configured in access point mode, the Cisco 3200 Series 4.9-GHz WMIC supports client devices using 4.9-GHz PCMCIA client cards from Wi4Net and Ubiquiti.

**Q. Is 4.9 GHz part of the 802.11 standards (a/b/g/j and so on)?**

**A.** No. 4.9 GHz is independent of the 802.11 standards. Since the FCC rulings for 4.9-GHz technology do not define the modulation and media access protocols, some vendors are using Orthogonal Frequency Division Multiplexing (OFDM) and carrier sense multiple access with collision avoidance (CSMA/CA) protocols from 802.11 standards. Two of the primary differences between the two technologies worth mentioning are Direct Short Range Communications (DSRC) masks and channel width. The DSRC defined for the 4.9-GHz technology is Mask M, above 20dBm power output levels. This DSRC is a more stringent and higher fidelity mask than Mask A, used in 802.11 technologies. This results in superior rejection of cross-channel interference. Another noticeable difference is that the FCC defines different channel widths for the 4.9-GHz technology, including 1-, 5-, 10-, and 20-MHz channels. This facilitates a higher level of flexibility in designing outdoor networks. The Cisco 4.9-GHz WMIC and the Cisco 3200 Series offer the high-fidelity Mask M across all levels of power output and serve as the basic building block of the highly scalable Cisco 4.9-GHz-based network.

**Q. Can I use both 4.9 GHz and 802.11 in the same network? Can I have a 4.9-GHz WAN link (bridge) and an 802.11 access point in the vehicle?**

**A.** Yes. The Cisco 3200 Series facilitates full flexibility in mixing 4.9-GHz and 802.11b/g WMICs, up to a maximum of five radios, all of them fully configurable as access point, root bridge, non root bridge, or work group bridge. To reduce cross-channel interference it is recommended not to exceed three 802.11b/g WMICs or four 4.9-GHz WMICs in a single Cisco 3200 Series.

**Q. Is 4.9 GHz more secure than 802.11?**

**A.** Both technologies offer a similar high level of security, including 802.1x framework for authentication, TKIP PPK, and 802.11i advanced encryption protocol (AES).

**Q. What are the range and performance of 4.9 GHz, and how fast is it?**

**A.** For additional specifications, refer to the 4.9-GHz WMIC data sheet at [http://www.cisco.com/en/US/prod/collateral/routers/ps272/product\\_data\\_sheet0900aecd802d81bb.html](http://www.cisco.com/en/US/prod/collateral/routers/ps272/product_data_sheet0900aecd802d81bb.html).

Throughput will be based on channel bandwidth and the range with the maximum rate of 54 Mbps supported.

**Security****Q. How does the Cisco 3200 Series Rugged Integrated Services Router provide for secure data, voice, and video communications?**

**A.** The Cisco 3200 Series was designed for environments in which security is often a major concern when using wireless technologies for communication. The Cisco 3200 Series is equipped with the same high level of enterprise security common to all Cisco routers. Security features in Cisco IOS Software provide security services such as authentication, authorization, and encryption to maintain the organization's security policy across wireless networks. The Cisco IOS Firewall and intrusion detection are also supported.

**Q. How do I keep hackers from accessing the wireless network?**

- A.** Cisco addresses concerns about security of wireless networks through the layers of network security embedded in the Cisco 3200 Series and the Cisco network infrastructure to which the router connects. With 3DES IP Security (IPSec) or AES encryption in the router, all devices and applications share a single, secure VPN tunnel over public or private networks. Firewall protection, which is also part of the router, keeps the mobile network secure from unauthorized access when connected to multiple wireless networks. For 802.11 networks, Cisco security features, including the Cisco Extensible Authentication Protocol (LEAP) and TKIP PPK, provide an extensive and trusted set of WLAN security functions.

**Q. What security features are specifically available for the Cisco 3200 Series wireless mobile interface card?**

- A.** The Cisco Wireless Security Suite includes:

**Authentication:**

- 802.1X support, including LEAP, PEAP, EAP-TLS, EAP-TTLS, and EAP-SIM to yield mutual authentication and dynamic, per-user, per-session WEP keys
- MAC address and by standard 802.11 authentication mechanisms

**Encryption:**

- Support for static and dynamic IEEE 802.11 WEP keys of 40 bits and 128 bits
- Prestandard TKIP WEP enhancements: key hashing (per-packet keying), message integrity check (MIC), and broadcast key rotation

**Target Markets****Q. What are the main target markets of the Cisco 3200 Series Rugged Integrated Services Routers?**

- A.** The Cisco 3200 Series Rugged Integrated Services Routers are designed for public safety and transportation agencies. City, state, and federal public safety and other governmental agencies seek to dramatically improve communications among users, applications, and organizations. Security concerns and general organizational productivity are influencing demand for comprehensive networked communications strategies that take advantage of new choices in wireless technologies. Wireless data networking can have a dramatic effect on local, state, and federal agencies, providing greater citizen safety, collaboration, and productivity for groups investing in these new technologies.

**Mobility (Mobile IP)****Q. How do Cisco 3200 Series Rugged Integrated Services Routers enable a moving vehicle to communicate transparently across wireless and wired networks regardless of location or movement?**

- A.** To provide mobility as clients or networks roam across different wireless networks or technologies, mobile IP features in Cisco IOS Software provide transparent roaming regardless of location or movement. In IP networks, routing is based on stationary IP addresses, in a similar way to how a postal letter is delivered to the fixed address on the envelope. A network device can be reached through normal IP routing by the IP address it is assigned on the network.



A problem occurs when a device roams away from its home network and is no longer reachable using normal IP routing. This results in the active sessions of the device being terminated. Mobile IP was created to enable users to keep the same IP address while traveling to a different network (which might even be on a different wireless operator), thus helping to ensure that a roaming individual could continue communication without dropping sessions or connections.

Mobile IP is an open standard, defined by the Internet Engineering Task Force (IETF) RFC 3220. By using mobile IP, you can keep the same IP address, stay connected, and maintain ongoing applications while roaming between IP networks. Mobile IP is scalable for the Internet because it is based on IP: any media that can support IP can support mobile IP.

**Q. Can Cisco 3200 Series Rugged Integrated Services Routers be deployed in vehicles that operate under the harshest conditions?**

**A.** Cisco 3200 Series Rugged Integrated Services Routers offer high performance in a compact, rugged design for use in vehicles. Cisco 3200 Series routers address the harsh environment inflicted on electronic devices in moving vehicles, ships, and aircraft:

- Small footprint for limited space
- Rugged design for the most demanding environments
- High performance required to support advanced IP applications
- Flexibility and modularity to meet requirements of custom solutions
- DC power

**Partners**

**Q. Who is authorized to resell the Cisco 3200 Series Rugged Integrated Services Routers?**

**A.** The Cisco 3200 Series Rugged Integrated Services Routers in the Cisco rugged enclosure is available through any Cisco channel partner. For Cisco 3200 Series solutions that require custom configurations, where the Cisco 3200 Series is embedded with third-party enclosures, customers will need to work with an approved Cisco 3200 Series HDI Advanced Technology Partner (ATP). To find an authorized Cisco partner, use the Cisco Partner Locator. To learn more about the HDI ATP program and requirements, see how to become a Cisco 3200 Series HDI ATP

Third-party components such as modems, cables, and antennas are highlighted at [http://www.cisco.com/web/partners/sell/technology/wireless/product/3200/partner\\_solutions.html](http://www.cisco.com/web/partners/sell/technology/wireless/product/3200/partner_solutions.html) (partner login required).

**Q. Why do I have to be a Cisco 3200 Series HDI ATP to purchase Cisco 3200 Series cards and card bundles?**

**A.** The Cisco 3200 Series card bundles are purchased without an enclosure and need to be integrated into a complete wireless custom solution. Cisco 3200 Series HDI ATPs have received Cisco 3200 Series training and have demonstrated their expertise in creating wireless solutions around the Cisco 3200 Series Rugged Integrated Services Routers. Cisco works with Cisco 3200 Series HDI ATPs to assure that partners creating wireless solutions with the Cisco 3200 Series have sufficient design expertise and a clear vision of how the resulting solutions are marketed and sold. In exchange, Cisco provides greater access to technical information and roadmaps.

**Q. Are there any product discounts associated with the Cisco 3200 Series HDI ATP status?**

**A.** No, the Cisco 3200 Series HDI ATP status allows for access to the restricted Cisco 3200 Series bundles and cards. Product discounting is associated with Cisco channel partner



status, including specializations and certifications. Also, solution technology integrators have access to a higher discount.

For additional information about Cisco channel partner programs, visit <http://www.cisco.com/web/partners/pr11/index.html>.

**Q. Does Cisco make recommendations for systems integration partners to work with?**

**Who is eligible to join this program?**

- A.** Cisco maintains a list of preferred systems integrators for the Cisco 3200 Series of partners who have demonstrated expertise and experience in implementing Cisco wireless and mobile routing solutions. Interested integrators should contact [cisco3200-partner-marketing@cisco.com](mailto:cisco3200-partner-marketing@cisco.com) for further information.

**Q. How can I integrate information about the Cisco 3200 Series Rugged Integrated Services Routers and a Cisco logo in my marketing material or embedded solution with the Cisco 3200 Series?**

- A.** If you are a Cisco 3200 Series partner and have developed a solution with the Cisco 3200 Series and would like to start marketing around this product solution, contact us by e-mail at [cisco3200-partner-marketing@cisco.com](mailto:cisco3200-partner-marketing@cisco.com) with a detailed description of what you are planning to create.

**For More Information**

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



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