

Cisco 3200 Series Mobile Access Router

This compact, high-performance access solution offers seamless mobility and interoperability across multiple wireless networks in a size ideal for vehicles in the defense, public safety, homeland security, and transportation market.

Delivering seamless communication across multiple radio, cellular, satellite, and wireless LAN (WLAN) networks while in motion, the Cisco® 3200 Mobile Access Router (Figure 1) extends the IP frontier to networks in motion.

Primarily designed for use in moving vehicles, the Cisco 3200 Mobile Access Router enables wireless connectivity across multiple networks to support the deployment of mission-critical applications based on industry-standard IP. IP networking provides a foundation for sharing communications and applications among users regardless of transport medium. Cisco IOS® Software adds feature-rich services, management capabilities, and mobile networks functionality. The Cisco 3200 Mobile Access Router enables users to effectively communicate mission-critical data, voice, and video across a peer-to-peer,

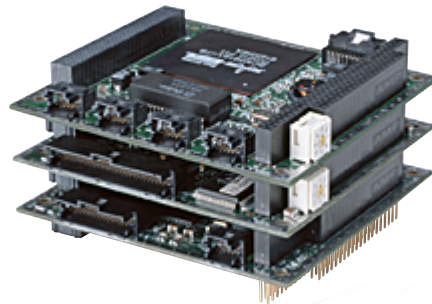
hierarchical, or meshed IP network. Users can make more informed decisions immediately, thereby increasing their productivity effectiveness in the field.

The Cisco 3200 Mobile Access Router offers users the following benefits:

- Secure data, voice, and video communications with seamless mobility independent of location or movement
- High performance in a compact, rugged design for use in vehicles
- Advanced IP services and interoperability with Cisco IOS Software

The Cisco 3200 Mobile Access Router is designed for incorporation into comprehensive, customized communications solutions built by systems integrators. This allows deployment into a diverse range of air, land, or sea vehicles, including those for military and public safety. The systems integrator provides the complete mobile solution, including the Cisco 3200 Mobile Access Router hardware, Cisco IOS Software, customized cabling, power supplies, and enclosure, along with additional components as required. These components could include Cisco Aironet® WLAN products, Cisco security hardware and software, Cisco routing and switching gear, and Cisco LAN and WAN management software.

Figure 1:
 Cisco 3200 Mobile
 Access Router





Two Models Available

The Cisco 3200 Series Mobile Access Router has two models. The Cisco 3250 Mobile Access Router is a configurable platform with a choice of hardware and software options. The Cisco 3220 Mobile Access Router is preconfigured and is suitable for mass deployments in commercial transportation and public safety markets.

Hardware Overview

The Cisco 3200 Mobile Access Router combines high performance with small size. Each card of the mobile access router is roughly the footprint of a 3.5-inch floppy disk, so it can be deployed in places where traditional networking equipment is inappropriate. The hardware of the Cisco 3200 Mobile Access Router is specially designed for the harsh operating environment typical of moving or stationary vehicles operating on land, in the air, or by sea.

The Cisco 3200 Mobile Access Router adheres to the PC/104-Plus electrical and mechanical standard. As a standards-based solution, the Cisco 3200 Mobile Access Router allows for easy and cost-effective integration with third-party PC/104-Plus products such as a hard disk drive, which would interface through industry-standard ports on the Cisco 3200 Mobile Access Router.

Cisco 3250 Mobile Access Router

The Cisco 3250 Mobile Access Router hardware is configurable through stackable interface cards, including:

- Cisco 3251 Mobile Access Router Card (MARC)—The routing engine of the router that includes the host processor and memory as well as one auxiliary/asynchronous port, one Fast Ethernet port, and one console port
- Cisco 3201 Serial Mobile Access Router Interface Cards (SMICs)—Provide four asynchronous and synchronous serial interfaces on the router that connect to wired and wireless LAN and WAN communication devices
- Cisco 3201 Fast Ethernet Switch Mobile Access Router Interface Card (FESMIC) —A 4-port, 10/100 autosensing Ethernet switch that supports 802.1q and 802.1p standards

The Cisco 3250 Mobile Access Router system comprises one MARC and various combinations of Cisco Mobile Interface Cards (MICs). This allows flexible configurations optimized for a wide range of applications and solutions. It also allows configuration changes to incorporate future applications and future wired or wireless technologies.

Cisco 3220 Mobile Access Router

The Cisco 3220 is a preconfigured model of the Cisco 3200 Series. It comprises a MARC with one auxiliary/asynchronous port, one Fast Ethernet port, and one console port, a 2-port SMIC, and a 2-port FESMIC.

The SMIC and FESMIC take advantage of external wireless communication devices such as the Cisco Aironet 802.11 product family and satellite or radio devices. This flexibility allows it to interoperate with most available wireless networks, both traditional wireless services and emerging wireless technologies.

Software Overview

The Cisco 3200 Mobile Access Router uses Cisco IOS Software. This enables organizations to take advantage of the proven power, flexibility, and reliability of Cisco IOS Software for their mobile networks. IT managers can, therefore, take advantage of their investment and training in Cisco IOS Software for their mobile networks.



The Mobile IP standard (IETF Standard-RFC 2002) within Cisco IOS Software provides the roaming architecture that allows a Cisco 3200 Mobile Access Router to connect to its home network. Traditional mobile IP allows client devices such as a laptop computer or personal digital assistant (PDA) to maintain a single IP address and roam among multiple networks without losing their connection to the home network. Mobile IP is a network layer functionality, eliminating the need to rewrite traditional applications.

The Cisco IOS Mobile Network feature allows mobile networks to scale, providing mobility management across the network. Cisco IOS Mobile Network is an enhanced, standards-based implementation of the Mobile IP standard that transforms a Cisco 3200 Mobile Access Router from a mobile IP node into a mobile IP router. All client devices connected to the mobile access router can use the router IP addresses for mobility. The router and its subnets maintain IP connectivity while the vehicle is in motion. Cisco IOS Mobile Network functionality makes connectivity transparent to all hosts connecting through the router, because client devices connected to the router require no client software. With Cisco IOS Mobile Network, mobility is scalable and easier to deploy and manage, and it requires fewer IP addresses.

A key requirement in both military and public safety deployments is secure communications. Cisco IOS Software includes a robust set of security features for identity management and confidentiality. Users authenticate themselves to RADIUS-based identity management servers. Powerful, software-based encryption protects communications from interception or spoofing. An integrated firewall provides stateful protection. Hardware encryption devices may also be added externally through the available Ethernet ports on the MARC or FESMIC.

Comparison of Models

Cisco 3250 Mobile Access Router	Cisco 3320 Mobile Access Router
<ul style="list-style-type: none"> • Targeted at Military and Command & Control Environments in public safety • Can provide higher density of Serial and/or Fast Ethernet ports than the Cisco 3220 model • Choices for configuration of Mobile Interface Cards • Use of four ports on each SMIC or FESMIC • Multiple SMICs supported • Can be upgraded to future interface cards such as future 802.11 card • Options for Cisco IOS Software images • Customers configure and order one or more SKUs for MARC, SMIC, FESMIC, and Cisco IOS software 	<ul style="list-style-type: none"> • Targeted at mass deployments in Commercial Transportation and Public Safety markets • Pre-configured model (MARC, 2 Port SMIC, 2 Port FESMIC) • Use of two ports on the single FESMIC or SMIC • No additional FESMICs or SMICs can be added to the model • Can be upgraded to future interface cards such as future 802.11 card • Cisco IP PLUS image loaded by default (supports 3DES) • Single SKU for customers to order

Features and Benefits

The Cisco 3200 Mobile Access Router offers three primary features and benefits, which are detailed as follows (refer also to Table 1):

- Seamless roaming IP availability, independent of location, movement, or infrastructure
- High performance in a compact, rugged design for use in vehicles or in remote field locations
- Advanced IP services and interoperability via Cisco IOS Software Mobile Networks



Seamless Roaming, Independent of Location, Movement, or Infrastructure

Mission-critical applications require always-on connection. The Cisco 3200 Mobile Access Router can exploit any standard wireless technology, including 802.11b, Cellular Digit Packet Data (CDPD), general packet radio service (GPRS), and satellite because IP traffic remains independent of transmission medium. Through multiple network interfaces, the router can communicate with today's wireless WANs and future wireless technologies. The mobile IP feature allows network nodes to roam across multiple wired or wireless networks and maintain a live connection to an IP network—a key requirement in mobile computing environments.

Cisco extends the benefits of mobile IP through the introduction of the Cisco IOS Mobile Networks feature in Cisco IOS Software. Cisco IOS Mobile Networks allows an entire network—not just a single client—to stay connected while in motion. With Cisco IOS Mobile Network, devices connected to the Cisco 3200 Mobile Access Router, such as laptops, PDAs, and cameras, can maintain continuous access to the IP network and also share the single or multiple WAN connections provided by the router.

Consider as an example of seamless mobility a police car equipped with a Cisco 3200 Mobile Access Router driving through a large metropolitan area. As the car begins in an area with 802.11b wireless Ethernet, for example, it is on a node on the police LAN. Devices in the car can access information such as a criminal database or streaming voice and video from a surveillance camera while moving through the city. When the vehicle moves beyond range of the wireless Ethernet network, the Cisco 3200 Mobile Access Router enables a seamless changeover to another wireless network—a radio access network, for example. The police officers in the car are unaware of this change because they retain constant connectivity to their mission-critical applications.

High Performance in a Compact, Rugged Design for Use in Vehicles

The Cisco 3200 Mobile Access Router addresses the harsh environment inflicted upon electronic devices in moving vehicles, ships, and aircraft. These environments often impose severe limitations on space and power, and the consequences of motion can disrupt gear not specifically hardened for such deployments.

The compact, rugged design of the Cisco 3200 Mobile Access Router addresses these limitations with an industry-standard PC/104-Plus architecture without sacrificing performance. The board layout and component placement allow systems integrators to build rugged systems for the most demanding environments. The high-speed processor, high-speed Personal Computer Interface (PCI) communications bus, and high-capacity memory enable the high performance required to support advanced IP applications.

Stacking multiple PC/104-Plus cards offers configuration flexibility of various LAN and WAN interfaces to meet specific connectivity requirements. Industrial-grade components and extended operating ranges meet the stringent requirements for extreme conditions encountered by military vehicles such as aircraft. The combination of the small size, rugged design, and high performance make the Cisco 3200 Mobile Access Router a unique solution for extending valuable IP applications and connectivity to mobile users operating in extreme conditions.

Advanced IP Services and Interoperability with Cisco IOS Software

Most enterprise and service provider networks throughout the world today run Cisco IOS Software because of its proven reliability, scalability, and manageability. Cisco extends this feature-rich and resilient software to the extreme mobile edge, where it provides rich, advanced IP services. Security features include firewall protection and encrypted virtual private networks (VPNs) to keep data secure over a public WAN infrastructure. Quality-of-service (QoS) features enable simultaneous access to several applications over a single WAN connection and protect delay-sensitive traffic such as video.



Cisco IOS Software has standards-based IP suites that assure interoperability between Cisco IOS devices and standards-based, third-party equipment and applications. This results in a system that is transparent to transmission technology and can support both traditional and future networks and applications. Such investment protection allows systems integrators to deploy the Cisco 3200 Mobile Access Router in their solutions with confidence, knowing that it can accommodate future applications and enhancements. Refer to Table 1 for a summary of features and benefits. Tables 2, 3, 4, 5 and 6 provide additional information about the Cisco 3200 Mobile Access Router.

Table 1 Cisco 3200 Mobile Access Router Features and Benefits

Features	Benefits
Seamless Roaming IP availability, independent of location, movement, or infrastructure	
Mobile IP and Mobile Networks in Cisco IOS Software	<ul style="list-style-type: none"> • Allows seamless roaming between multiple networks • Allows customers to use multiple wireless networks to achieve an optimized balance between bandwidth and coverage • Based on IETF industry standards • Supports multiple client OS's—works with any OS that supports IP protocols • Does not require any special software to be installed on client • Simplifies application development by supporting industry-standard TCP and UDP protocols • Reduces total cost of ownership by selecting the path based on configurable choices e.g. either bandwidth or cost • Ensures application availability by supporting multiple wireless interfaces
High performance in a compact, rugged design for use in vehicles	
Compact size, footprint approximately 3.5 in. by 3.8 in.	<ul style="list-style-type: none"> • Provides flexibility to be deployed in many different environments where space is a premium
Industry-standard PC/104-Plus form factor tested to be PC/104-Plus compliant	<ul style="list-style-type: none"> • Allows for easy and cost-effective integration with additional third-party PC/104-Plus products for a complete solution • Allows for physical integration into a ready-to-deploy enclosure • Allows for easy design of customized power supplies and enclosures
Rugged design	<ul style="list-style-type: none"> • Industrial-grade components • Board layout and component placement designed to meet harsh environments • Designed to be deployed in demanding environments that are typical of moving vehicles. • Assists the SI's integration efforts with a solution designed for a wide range of application environments in mind
Voice, video and data applications	<ul style="list-style-type: none"> • Supports voice, video and data applications over IP • Leverages QoS to facilitate low-latency routing of delay-sensitive applications such as Voice over IP
High performance	<ul style="list-style-type: none"> • High performance processor for real-time communications • High-speed PCI bus for inter card communications • High-capacity memory for advanced applications



Table 1 Cisco 3200 Mobile Access Router Features and Benefits (Continued)

Features	Benefits
Advanced IP services and interoperability with Cisco IOS Software	
Cisco IOS Software management	<ul style="list-style-type: none"> Enables remote management and monitoring via Simple Network Management Protocol (SNMP), Telnet, or Hypertext Transfer Protocol (HTTP) and local management via console port Supports intuitive network management tools such as CiscoWorks for Windows and HP OpenView
Cisco IOS Security features such as IP Security (IPSec), Triple Data Encryption Standard (3DES) and stateful firewalls and intrusion detection	<ul style="list-style-type: none"> Ensures data and system integrity when using public networks Dynamic packet inspection and real-time alerts to ensure perimeter security
IP multicast	<ul style="list-style-type: none"> Allows efficient broadcast of data or video for increased situational awareness, multi-user communications, or surveillance applications
RADIUS authentication services	<ul style="list-style-type: none"> Allows for control and configuration of secure access options by supporting per-user and per-session authentication
QoS features	<ul style="list-style-type: none"> QoS allows the intelligent management of bandwidth by allowing operators to define which applications or users are given priority over others
Multiple encapsulations	<ul style="list-style-type: none"> Flexibility to support traditional and emerging networks Allows secure tunnels to be established to ensure data integrity
Standards-based IP networking	<ul style="list-style-type: none"> Ensures interoperability between applications and IP-based networks Provides investment protection compared to proprietary communications systems

Table 2 Cisco 3250 Mobile Access Router Memory and Software Cisco IOS Software Image

Cisco 3250 Mobile Access Router Memory		
	Flash	DRAM
IP	32 MB	128 MB
IP PLUS	32 MB	128 MB

Table 3 Cisco 3220 Mobile Access Router Memory and Software Cisco IOS Software Image

Cisco 3220 Mobile Access Router Memory		
	Flash	DRAM
IP PLUS	32 MB	128 MB

Note: DRAM and FLASH are fixed on board the MARC; memory is not expandable



Table 4 Signals Supported on Cisco 3200 Mobile Interface Cards (MICs) Card

Signals	
MARC	1 10/100 Ethernet, 1 console, 1 aux/async with 5V power
SMIC	4 synch/asynch serial (two ports of Cisco 3220 model)
FESMIC (scheduled to be available December 2002)	1 10/100 Ethernet with 4-port switch with VLAN (2 ports on 3220 model)

Cisco 3250 Card Configurations

The Cisco 3250 Mobile Access Router is flexible in its configuration options. The following guidelines can assist you in determining the configurations of supported cards:

- One MARC per system is mandatory.
- Up to three Cisco MICs total per system are supported.
- One FESMIC maximum per system is supported.

Table 5 Configurations and Card Quantities by Card Type Cisco Card

Cisco 3250 Supported Configuration and Card Quantities							
	Config 1	Config 2	Config 3	Config 4	Config 5	Config 6	Config 7
Cisco 3251 MARC	1	1	1	1	1	1	1
Cisco 3201 SMIC	3	2	1	0	1	2	0
Cisco 3201 FESMIC	0	1	0	1	1	0	0
Total Cards	4	4	2	2	3	3	1

Card Description

Cisco 3251 and 3220 MARC

The MARC provides the host processor and memory, one set of 10/100 Fast Ethernet, one set of console, and one set of auxiliary/asynchronous signals. The MICs communicate with the MARC via the PCI bus. The MARC and the MICs are based on PC/104-Plus Version 1.2 electrical and mechanical specification standards.

Feature Summary

- Motorola MPC8250, running at 210 MHz CPU core, 150 MHz CPM core, and 60-MHz Motorola 60x bus
- 32-bit PCI bus Version 2.1 running at 25 MHz, connects to PCI MICs
- 128-MB, 64-bit, unbuffered, synchronous DRAM memory, fixed and nonexpandable
- 32-MB, 16-bit Flash memory, fixed and nonexpandable



- Single 10/100 Fast Ethernet, full-duplex 100BASE-T, with autonegotiation
- Single console, with modem flow control
- Single asynchronous, EIA/TIA-232 serial
- Integrated host-to-PCI bridge (PCI bus Version 2.1), with built-in PCI arbiter that supports three external bus masters/PCI agents

Signal Overview

10/100BASE-TX Ethernet

- Offers full compliance with IEEE 802.3
- Provides autonegotiation for 10/100BASE-TX connection
- Supports full/half-duplex modes
- Supports 802.1p and 802.1q
- Signals provided through 10-pin Ethernet header

Console

- Provides asynchronous serial data communications equipment (DCE)
- Offers configurable 300-to-115,000 baud rates
- Supports full modem control signals data terminal ready (DTR), data set ready (DSR), Request to Send (RTS), and Clear To Send (CTS)
- Supports EIA/TIA-232

Auxiliary/Asynchronous

- Supports asynchronous serial data terminal equipment (DTE)
- Offers configurable 300-to-115,000 baud rates
- Supports full modem control signals DSR, Carrier Detect (CD), RTS, and CTS
- Supports EIA/TIA-232

LED

- Supports LED signals

5V Power

- Offers 5V output power for GPS or other accessories
- Limits power drawn; cannot exceed 150 mA

Console, auxiliary/asynchronous, LED, and 5V power signals are provided through a single, 34-pin multifunction header.

Cisco 3201 Serial Mobile Access Router Interface Card

The SMIC is an asynchronous/synchronous serial mobile interface card. The SMIC supports four sets (only two sets on the Cisco 3220 model) of Cisco 12-in-1 serial signals. The SMIC communicates with the MARC through the PCI bus. The SMIC is based on PC/104-Plus Version 1.2 electrical and mechanical specification standards.



Feature Summary

- 32-bit PCI bus Version 2.1 running at 25 MHz
- Support for Cisco 12-in-1 serial standards EIA/TIA-232, EIA/TIA-449, EIA/TIA-530, EIA/TIA-530A, X.21, and V.35 in both DTE and DCE modes

Signal Overview

Cisco 12-in-1 Serial

- The supported protocols are EIA232, EIA449, EIA530, EIA530(A), X.21, and V.35 in both DTE and DCE modes.
- Configuration is selected by decoding the cable type bits.

Signals are provided through two 60-pin multifunction (two 12-in-1 and LED) headers.

Cisco 3201 Fast Ethernet Switch Mobile Access Router Interface Card

Scheduled to be available in December 2002, the FESMIC is a Fast Ethernet switch mobile interface card. The FESMIC provides four (only two on the Cisco 3220 model) 10/100 autosensing switch signals. The FESMIC is based on PC/104-Plus Version 1.2 electrical and mechanical specification standards.

Feature Summary

- Four 10/100 autosensing switch signals
- Auto-MDIX, which automatically detects and corrects Ethernet crossed cabling, eliminating the need for crossover cables
- Support for 802.1d standard bridging, 802.1Q trunking, and 802.1p class of service (CoS)
- Support for Layer 3 routing between distinct LANs or VLANs on the FESMIC and other LAN or VLAN routing interfaces within the Cisco 3200 Mobile Access Router

Signal Overview

The FESMIC has four Ethernet headers (the Cisco 3220 model has only two). Each Ethernet header consists of the following signals:

- One pair of differential signals for transmit
- One pair of differential signals for receive

One additional header provides signals for LEDs on the FESMIC.



Software Feature Set

Table 6 Cisco 3200 Mobile Access Router Software Feature Sets Protocols and Features Supported by Cisco 3200 Mobile Access Router

	IP	IP PLUS (default on Cisco 3220)
Routing/bridging		
<ul style="list-style-type: none"> Transparent Bridging, Spanning Tree Protocol, 802.1Q VLAN Up to 32 VLANs supported per system 	X	X
IPv4	X	X
IPv6	-	X
Point-to-Point Protocol (PPP), Frame Relay, X.25, XOT, High-Level Data Link Control (HDLC), Telnet, asynchronous tunneling, dial-on-demand routing (DDR), PPP over Frame Relay	X	X
Routing protocols		
Routing Information Protocol (RIP), RIPv2, Open Shortest Path First (OSPF), Enhanced Interior Gateway Routing Protocol (EIGRP)-IP	X	X
Cisco Discovery Protocol	X	X
IP policy routing	X	X
IP Multicast Protocol Independent Multicast (PIM) Version 1 and 2	X	X
Internet Group Management Protocol (IGMP) Version 1 and 2	X	X
Multicast Network Address Translation (NAT)	X	X
IP Multicast load splitting	X	X
Cisco Group Management Protocol (GMP)	X	X
Mobile networks		
Mobile IP	X	X
Cisco IOS Mobile Network	X	X
Home agent/mobile router redundancy	X	X
Mobile router preferred interfaces	X	X
Mobile router reverse tunneling	X	X
Mobile router asymmetric links	X	X
Mobile router static and dynamic networks	X	X
Static colocated care of address	X	X
Authentication, authorization, and accounting (AAA) server and Mobile IP	X	X



Table 6 Cisco 3200 Mobile Access Router Software Feature Sets Protocols and Features Supported by Cisco 3200 Mobile Access Router (Continued)

	IP	IP PLUS (default on Cisco 3220)
Security		
Route and router authentication	X	X
Password Authentication Protocol (PAP), Challenge Handshake Authentication Protocol (CHAP), MS-CHAP Local Password	X	X
IP Basic and extended access lists. Time-based access control lists	X	X
Stateful inspection firewall	-	X
Firewall intrusion detection system	-	X
Port to application mapping	-	X
Generic routing encapsulation (GRE)	X	X
IPSec	-	X
Tunnel endpoint discovery	-	X
Secure Shell client and server Version 1.5	X	X
Fast switching, Cisco Express Forwarding, process switching	X	X
STAC compression	X	X
Routing Update Protocol (RTP) header compression	X	X
Management		
SNMP Version 2 and Version 3, Telnet, console port	X	X
RADIUS, TACACS+	X	X
Cisco Service Assurance (SA) Agent	X	X
Syslog, response time reporter	X	X
NTP client	X	X
Trivial File Transfer Protocol (TFTP) client and server	X	X
Dynamic Host Configuration Protocol (DHCP) client and server	X	X
DHCP relay	X	X
Hot Standby Router Protocol (HSRP)	X	X
Address conservation		
NAT many to one (Port Address Translation [PAT])	X	X
NAT many to many (multi-NAT)	X	X
IP Control Protocol (IPCP) address negotiation	X	X
DHCP client address negotiation	X	X



Table 6 Cisco 3200 Mobile Access Router Software Feature Sets Protocols and Features Supported by Cisco 3200 Mobile Access Router (Continued)

	IP	IP PLUS (default on Cisco 3220)
Easy IP Phase I	X	X
QoS		
Generic traffic shaping	X	X
Class-Based Ethernet Matching and Mobile Access Routing (802.1p CoS)	X	X
Class-Based Weighted Fair Queuing	X	X
Committed Access Rate	-	X
Diffserv-compliant Weighted Random Early Detection (WRED)	X	X
Flow-based WRED	X	X
Low latency queuing	X	X
Priority queuing	X	X
Traffic Policing	-	X
Weighted Fair Queuing	X	X
Link Fragmentation and Interleaving (LFI)	X	X
Resource Reservation Protocol (RSVP)	-	X
Dial backup, dialer profiles, dialer idle time out	X	X
Dial on demand	X	X

Physical Specifications

Dimensions and Weight Specifications

Card dimensions:

- MARC, SMIC, and FESMIC height: 0.937 in
Dimension includes component side height, board height, and shroud height on solder side.
- MARC, SMIC, and FESMIC width: 3.775 in.
- MARC, SMIC, and FESMIC depth: 3.550 in.

Weight:

- MARC: 3.3 oz (94g)
- SMIC and FESMIC: 3.4 oz (96g)

Environmental Operating Ranges

- Nonoperating temperature: 85 to -40°C
- Nonoperating humidity: 95 +/-5% relative humidity (RH)
- Nonoperating altitude: 40,000 ft
- Operating temperature: 40 to -50°C
- Operating humidity: 80 to 90% RH10
- Operating altitude: 15,000 ft

Cables, Power Supply, and Enclosure

For information needed to design the cables, power supplies, and enclosure for the Cisco 3200 Mobile Access Router, contact your Cisco sales representative.

Support

Cisco Systems® support solutions are designed for one purpose: to put customers quickly in touch with the appropriate resources. The company's support network consists of Cisco Technical Assistance Center (TAC) engineers, development engineers, field engineers, parts warehouses, delivery services, and service providers. By including Cisco support with Cisco equipment purchases, customers immediately gain access to a wealth of support resources.



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