

Cisco MRP 300 Multiservice Route Processor for the Cisco ICS 7750: Flexible and Modular IP Router and Voice Gateway

The Cisco ICS 7750 Integrated Communications System (brings the benefits of converged IP services to midmarket businesses and enterprise branch offices. The Cisco ICS 7750 is a versatile IP telephony and services solution that helps businesses harness the power of the Internet through converged applications, enabling them to anticipate and respond to customer needs more efficiently. The Cisco ICS 7750 integrates call processing, voice applications, and multiservice IP routing within the system chassis to deliver true convergence while enhancing system manageability. The system's modular architecture enables expansion of call processing, routing capacity, IP services, and the power to deliver high availability and system scalability. The Cisco ICS 7750 gives customers the flexibility to choose the optimal configuration for their business environment and allows them to increase profitability through improved customer interactions.

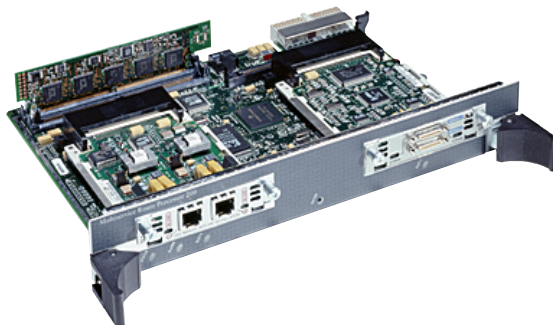
Today's businesses demand a communications platform that makes communications with customers and business partners easy and reliable. The Cisco ICS 7750 MRP 300 brings businesses a modular voice and data solution that lets them connect with customers, partners, or other employees through the Public Switch Telephone Network (PSTN) or the Internet. The Cisco ICS 7750 chassis design provides businesses with investment protection by allowing the flexibility to add multiple Cisco MRP 300 cards as their communications needs evolve.

Product Description

The Cisco MRP 300 is a multiservice router/voice gateway, built from industry-proven Cisco hardware and Cisco IOS® Software technology, that supports both digital and analog voice trunks and WAN routing interfaces—all on a single modular card. It contains onboard flash memory for storing Cisco IOS Software images locally on the card, allowing you to configure a unique voice and data feature image for each MRP card in the Cisco ICS 7750 system. It also offers a wide selection of data and voice interfaces and Cisco IOS Software images, allowing you to match data bandwidth, voice-trunk density, and communication services to the needs of your growing business.

The Cisco MRP 300 is built on the same proven IP routing and voice-over-IP (VoIP) technology used in Cisco 1700, 2600, and 3600 series multiservice routers. This technology delivers comprehensive, secure

Figure 1:
Cisco MRP 300
Multiservice Route
Processor





access solutions to support Internet, intranet, and extranet business network configurations. It also enables you to take advantage of all existing Cisco routing services, including virtual private networks (VPNs), firewall, IP security (IPsec), and WAN quality of service (QoS) to ensure quality voice and data transmission.

Each Cisco MRP 300 card has two slots that support the same Cisco voice interface cards (VICs) and WAN interface cards (WICs) available on Cisco 1750, 1751, 2600, and 3600 routers, allowing you to build upon current Cisco networks while maintaining interoperability and consistent end-to-end service between locations.

Data Connectivity

Cisco WICs support a wide range of services, including synchronous and asynchronous serial, ISDN Basic Rate Interface (BRI), and serial with digital service unit/channel service unit (DSU/CSU) options for primary and backup WAN connectivity. Bandwidth options range from 56 Kbps up to T1 data speeds per Cisco MRP 300 card.

Voice Connectivity

Cisco VICs support Foreign Exchange Office (FXO), for analog central-office trunks in North America, Asia, Europe, and Australia; Foreign Exchange Station (FXS), for analog station devices; ear and mouth (E&M), for analog tie-line support; analog direct inward dial (DID); T1 Channel Associated Signaling (CAS); and Primary Rate Interface (PRI), E1 PRI, and BRI, for digital central-office trunks. This support makes it simple to link your Cisco ICS 7750 system to the Public Switched Telephone Network (PSTN) and existing private branch exchanges (PBXs), as well as common analog devices like fax machines and teleconferencing stations.

Combined, these WIC and VIC interfaces support a comprehensive set of communication services, including IP telephony, multiservice data/voice/fax integration, Frame Relay, ISDN BRI, X.25, broadband services, VPNs, and more. Moreover, the modular design enables the Cisco MRP 300 card to deliver new voice and data interface support as these technologies become available in the marketplace.

Data Services

For WAN and Internet connections, the Cisco MRP 300 delivers enhanced security using hardware and software encryption technologies, including VPN and IPsec. By supporting the IEEE 802.1p/q standard, the Cisco MRP 300 can also be configured as a virtual LAN (VLAN) router for routing voice and data traffic over the LAN infrastructure. Cisco MRP 300 supports QoS to ensure your voice traffic receives the highest priority in your network.

Voice Services

For IP voice networks, the Cisco MRP 300 supports G.711, G.729a(b), G.723.1, G.726, and G.728 codecs, offering interoperability between different IP endpoints, such as analog devices and Cisco IP Phones. Configurable digital-signal-processing (DSP) resource modules, called packet voice/data modules (PVDMs), provide the codec compression and transcoding services to support different voice and data network traffic configurations, particularly for branch offices using VoIP.

Because the Cisco MRP 300 supports both voice and data, you can consolidate your disparate voice and data communication streams over a single digital interface. Cisco IOS Software voice compression technology integrates data and voice traffic to enable efficient use of data network connections.

The modular VIC/WIC design enables the Cisco MRP 300 to deliver new functionality without replacing your MRP hardware investment. It also provides critical multiservice data/voice communications network connectivity to the PSTN, Internet, intranets, and WAN to service your telephony and data needs—now and into the future.



Key Benefits

Versatile Voice/Data Connectivity and Cisco IOS Software Technology

The modular VIC/WIC design enables you to configure the Cisco MRP 300 to support specific voice and data communication needs today, with the ability to easily add bandwidth, voice trunk capacity, new Cisco IOS Software services, and redundancy as business needs change.

System Availability

Onboard flash memory allows local storage of Cisco IOS Software images, speeding system boot time. Cisco MRP 300 cards boot independent of other cards in the system, allowing the overall system to be brought up more quickly.

Scalable Expansion

Modular VIC/WIC support enables Cisco MRP 300 cards to add more data bandwidth and voice trunks when needed. With its six-slot chassis design, the Cisco ICS 7750 allows room for multiple Cisco MRP 300 cards to ensure investment protection.

Simplified Management

The Cisco MRP 300 card enables voice and data services to be consolidated in a single digital trunk, simplifying management and support. The Cisco MRP 300 is designed to function within the Cisco ICS 7750 system, and is monitored by the (SAP) system alarm processor card. In the rare event that the Cisco MRP 300 experiences downtime, technicians are notified through page alerts or e-mail notifications, so the issue can be resolved quickly.

Industry-Proven Cisco IOS Software Delivers Reliability

Cisco IOS Software technology delivers reliable, end-to-end connectivity over the PSTN and WAN for communication between your branch offices, customers, and partners. Field-replaceable VIC and WIC cards increase system connectivity uptime. QoS can also be configured through Cisco IOS Software, to ensure voice communications receive the highest priority in your network. VLANs help segregate your LAN voice and data traffic to ensure communications are secure and are delivered only to the intended audience.

Cisco IOS Software Technology

Internet and Intranet Access

Cisco IOS Software provides an extensive set of features that make the Cisco MRP 300 card ideal for flexible, high-performance communications across both intranets and the Internet:

- Multiprotocol routing (IP, IPX, and AppleTalk); IBM/SNA; and transparent bridging over ISDN, asynchronous serial, and synchronous serial such as leased lines, Frame Relay, SMDS, Switched 56, and X.25
- WAN optimization, including dial-on-demand routing (DDR), bandwidth-on-demand (BOD) and Open Shortest Path First (OSPF)-on-demand circuit, Snapshot routing, compression, filtering, and spoofing to reduce WAN costs



Security

Cisco IOS Software supports an extensive set of basic and advanced network security features, including access control lists (ACLs), user authentication, authorization, accounting (such as PAP/CHAP, TACACS+, and RADIUS), and data encryption. To increase security, the integrated Cisco IOS Firewall Feature Set protects internal LANs from attacks with context-based access control (CBAC), while IPsec tunneling with data-encryption-standard (DES) and triple-DES encryption provides standards-based data privacy, integrity, and authenticity as data travels through a public network.

For remote access VPNs, Layer 2 Forwarding (L2F) and Layer 2 Tunneling Protocol (L2TP) combine with IPsec encryption to provide a secure multiprotocol solution for IP, IPX, and AppleTalk traffic. Mobile users can dial in to a service provider's local point of presence (POP), where data is "tunneled" (or encapsulated inside a second protocol such as IPsec or L2TP) back to the Cisco MRP 300 card to securely access the corporate network via the Internet.

Cisco IOS Software QoS Features

Through Cisco IOS Software, the Cisco MRP 300 can support 802.1p/q inter-VLAN trunking and WAN QoS capabilities. WAN QoS features include Resource Reservation Protocol (RSVP), Weighted Fair Queuing (WFQ), Low-Latency Queuing (LLQ), Class-Based Weighted Fair Queuing (CBWFQ), traffic shaping, fragmentation interleaving, and IP Precedence. These features enable you to prioritize traffic on your networks by user, application, traffic type, and other parameters, to ensure that your business-critical data and delay-sensitive voice traffic receive the priority they need as they move across the network.

The Cisco MRP 300 also offers voice compression to allow for more efficient data performance and throughput. Cisco IOS Software technology enables more efficient use of a single digital trunk interface to support converged voice and data services.

High-Performance Architecture for VPNs and Broadband Service

A high-performance RISC architecture and Cisco IOS Software features enable the Cisco MRP 300 to support VPN applications with tunneling and security. A slot on the Cisco MRP 300 motherboard supports an optional VPN hardware module that provides IPsec DES and 3DES encryption at T1/E1 speeds in hardware.

Cisco MRP 300 Technical Specifications

Per Cisco MRP 300 Board:

- Inserts as a card into universal slot within the Cisco ICS 7750
- Onboard memory: 64 MB DRAM (max 128 MB)
- One memory upgrade slot (options): 16, 32, and 64 MB DRAM
- Onboard Flash memory: 16 MB Flash SIMM (max 80 MB)
- One Flash memory upgrade slot (options): 16, 32, and 64 MB flash SIMM
- Expansion slot for hardware VPN module
- Two modular VIC/WIC card slots per card
- Two PVDM expansion slots: supports 4-, 8-, 12-, 16-, and 20-channel PVDMs
- Advanced data networking feature support, including:
 - VPN, firewall, and IPsec 56 and 3DES
- Supports Fax Relay, Fax Pass-Through, and Modem Pass-Through
- Interoperable with Cisco MRP 200, ASI 81, and ASI 160 boards in same Cisco ICS 7750 chassis



Voice and WAN Interface Cards:

Table 1 Cisco WAN Interface Cards for Cisco MRP 300

WIC Module	Description
WIC-1T	One serial, async, and sync (T1/E1)
WIC-2T	Two serial, async, and sync (T1/E1)
WIC-2A/S	Two low-speed serial (up to 128 Kbps), async, and sync
WIC-1B-S/T	One ISDN BRI S/T
WIC-1B-U	One ISDN BRI U with integrated NT1
WIC-1DSU-56K4	One integrated 56/64 Kbps, four-wire DSU/CSU
WIC-1DSU-T1	One integrated T1/fractional T1 DSU/CSU

Table 2 Cisco MultiFlex Voice/WAN and Voice Interface Cards for Cisco MRP 300

VIC Module	Description
VIC-2FXS	Two-port FXS voice/fax interface card
VIC-4FXS/DID	Four-port FXS/DID voice/fax interface card (ports can be configured for either FXS or DID)
VIC-2FXO	Two-port FXO voice/fax interface card
VIC-2FXO-M1	Two-port FXO voice/fax interface card with battery reversal and caller ID (for North America)
VIC-2FXO-M2	Two-port FXO voice/fax interface card with battery reversal (for Europe)
VIC-2FXO-M3	Two-port FXO voice/fax interface card (for Australia)
VIC-4FXO-M1	Four-port FXO voice/fax interface card with battery reversal and caller ID (for North America)
VIC-2E/M	Two-port E&M voice/fax interface card
VIC-2DID	Two-port DID voice interface card
VIC-2BRI-NT/TE (NT & TE)	Two-port BRI voice interface card
VVIC-1MFT-T1	One-port T1/fractional T1 multiflex trunk with CSU/DSU (for CAS and PRI)
VVIC-2MFT-T1	Two-port T1/fractional T1 multiflex trunk with CSU/DSU (for CAS and PRI)
VVIC-1MFT-E1	One-port E1/fractional E1 multiflex trunk with CSU/DSU (for PRI)
VVIC-2MFT-E1	Two-port E1/fractional E1 multiflex trunk with CSU/DSU (for PRI)



Table 3 Cisco ICS 7750 Cisco IOS Software and Memory Requirements

Cisco IOS Software Data and Voice Feature Sets	DRAM
IP/Voice Plus	64 MB
IP/Voice Plus + Firewall + IPsec 56	64 MB
IP/Voice Plus + Firewall + 3DES	64 MB
IP/Voice Plus + IPX/AppleTalk/IBM	64 MB
IP/Voice Plus + IPX/AppleTalk/IBM + Firewall + IPsec 56	64 MB
IP/Voice Plus + IPX/AppleTalk/IBM + Firewall + 3DES	64 MB

Physical Specifications

Dimensions and Weight:

- Height: 10.5 in. (26.67 cm)
- Width: 1.6 in. (4.06 cm)
- Depth: 8.25 in. (20.96 cm) including ejector handle depth; 7.0 in. (17.78 cm) otherwise
- Weight: 1.04 lb (0.471 kg) with no WIC cards installed

Power Requirements:

All voltages are DC:

- 0.95A at +5V
- 0.55A at +3.3V
- 0.75A at +12V

negligible current at -12V

Power Dissipation:

14W

Environmental Range:

Operational

- Acoustic noise: 43 dB (under normal operating conditions)
- Temperature range: 32 to 104 F (0 to 40 C)
- Altitude: 10,000 ft (3,000 m)
- Relative humidity: 10 to 85%
- Shock: 54 in/s (1.37 m/s)
- Vibration: 0.35 g from 3 to 500 Hz

Nonoperational

- Temperature shock: -4 to 149 F (-20 to 65 C) at 41 F (5 C) per minute
- Temperature range: -4 to 149 F (-20 to 65 C)
- Altitude: 5,027 yds (4,570 m)
- Relative humidity: 5 to 95%

Safety:

- UL 1950, 3rd edition
- C-UL per CSA C22.2 1950
- TUV per EN 60950

EMC:

- EN 55022: 1998, EN 55024 1997
- CISPR22, 1997, class B
- CFR47, Part 15, Subpart B, 1995, class B
- VCCI V- 3/97.04, class B
- ICES003, issue 3:1998, class B
- BSMI CNS13438, class B

Table 4 EN 55024:1998

ITE Immunity Standard	
IEC 1000-4-2:1995	Immunity to Electrostatic Discharges
IEC 1000-4-3:1995	Immunity to Radio Frequency Electromagnetic Fields
IEC 1000-4-4:1995	Immunity to Electrical Fast Transients
IEC 1000-4-5:1995	Immunity to Power Line Transients (Surges)
IEC 1000-4-6:1996	Immunity to Radio Frequency Induced Conducted Disturbances
IEC 1000-4-8:1995	Immunity to Power Frequency Magnetic Fields
IEC 1000-4-11:1995	Immunity to Voltage Dips, Voltage Variations, and Short Voltage Interruptions

Telecom:

- FCC Part 68
- European RTTE Directive 99/05/EC
- Australia ACA TS-002, TS-003, TS-004, TS 031
- Industry Canada CS-03



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