Cisco 10000 Series Router

The Cisco® 10000 Series Router is the industry-leading edge router for service providers that require subscriber awareness for delivering triple-play (data, voice, and video), broadband, and wholesale access while migrating from ATM to Gigabit Ethernet. The Cisco 10000 Series is unique in that it offers a comprehensive, single solution for business services, Multiprotocol Label Switching (MPLS), and broadband aggregation. It is built to be carrier-class with Cisco IOS® Software and hardware features. Cisco used its experience working with the world's largest service providers to optimize the Cisco 10000 Series for scalable, high-performance IP and MPLS services with five-nines (99.999) reliability (Figure 1).

Figure 1.   Cisco 10000 Series Router

Key Features

The Cisco 10000 Series offers the following features:

- High-performance IP services:

  - The Cisco 10000 Series helps service providers deploy revenue-generating services with consistent platform performance.

  - The Cisco 10000 Series is the ideal broadband aggregation edge router for Ethernet and ATM architectures.

  - The Cisco 10000 Series supports Parallel Express Forwarding (PXF), patented by Cisco. PXF offers customers the ability to turn on multiple IP services while maintaining line-rate performance. PXF is software-based; customers can add new service functions without swapping out hardware. The next-generation Cisco 10000 Series Performance Routing Engine 3 (PRE-3) provides industry-leading, per-subscriber hierarchical quality of service (H-QoS) for granular bandwidth management that improves the user experience for data, voice, or video.

  - The Cisco 10000 Series supports many critical edge services and provides industry-leading feature richness with Cisco IOS Software, including H-QoS, MPLS, Multilink

Point-to-Point Protocol (MLPPP), Layer 2 Tunneling Protocol (L2TP), and Cisco Intelligent Services Gateway (ISG). Ethernet and ATM aggregation solutions are supported for TR-101 and TR-59 broadband architectures, making the Cisco 10000 Series Router an ideal transition platform to entertainment-grade networking.

- Carrier-class high availability:

  ◦ With its carrier-class high availability, the Cisco 10000 Series minimizes costly network outages and maximizes customer satisfaction.

  ◦ The Cisco 10000 Series is designed for nonstop performance. Features include: full hardware redundancy, online insertion and removal (OIR), Cisco Route Processor Redundancy Plus (RPR+), Cisco Stateful Switchover (SSO), Cisco Nonstop Forwarding (NSF), Nonstop Routing (NSR), In Service Software Upgrade (ISSU), and Automatic Protection Switching (APS). Support for MPLS high availability and broadband high availability makes the Cisco 10000 Series a premier carrier-class platform.

- Maximum scalability:

  ◦ With an 8-slot chassis that can hold as many as 16 line cards, the Cisco 10000 Series allows service providers to take full advantage of their current investments by enabling network growth while minimizing network complexity.

- Maximum flexibility:

  ◦ The Cisco 10000 Series supports thousands of DS-0, DS-1, and E1 connections in a single system, helping service providers increase their customer base. For broadband applications, the Cisco 10000 Series supports up to 61,500 subscribers in a single system. Because the Cisco 10000 Series supports Frame Relay, ATM, leased-line, and broadband aggregation in a single platform, customers can provision multiple types of services to the end user without having to maintain multiple edge devices.

- IP Next-Generation Network (NGN) subscriber management:

  ◦ The Cisco ISG software feature set is a next-generation policy and subscriber management solution that delivers dynamic session awareness. ISG supports IP, Ethernet, ATM, MPLS, and VPN architectures, whether the business model is for retail, wholesale, or business services. ISG helps enable zero-touch provisioning, and provides the per-flow granularity and dynamic control required for triple-play services. It is standards-based for multivendor deployments. With RADIUS Change of Authorization (RFC 3576), subscriber profiles can be changed dynamically based on user self-management (through a Web portal) or through an operations support system (OSS) process. It can act as a policy server imbedded in the network, or interact with centralized policy management systems.

Hardware Specifications

Table 1 provides specifications for the Cisco 10008 Router, an 8-slot chassis designed to meet the needs of large service providers.

Table 1. Cisco 10008 Chassis Specifications

Specifications	Cisco 10008
Modular slots	• 8 slots for line cards; 16 slots for half-height line cards • 2 slots for Cisco PRE modules (1 active, 1 redundant)
Hot-swappable	Yes
Backplane capacity	51.2 Gbps

Physical dimensions (H x W x D)	21.75 x 17.5 x 12 in. (55.2 x 44.5 x 30.5 cm)
Weight	130 lb (59.02 kg) fully configured chassis
Rack-mounting	19 to 23 in. (48.3 to 58.4 cm) (front, middle, or back)
Power	• DC input voltage: –48/–60 VDC • AC input voltage: 100–240 VAC, 50/60 Hz, single phase • Maximum power consumption: 1500 VA for AC PEM, 1280W for DC PEM

High-Availability Design

- Redundant AC or DC supplies

- Redundant cooling

- Redundant point-to-point backplane connections to each chassis (payload) slot

- OIR; full hot-swap for all system elements

- APS for all SONET modules

- Redundant Cisco 10000 Series PREs with advanced failover capabilities

- Error-Correcting Code (ECC) support on all PRE memory

- Engineered for 99.999-percent reliability

Product Regulatory Compliance

Environmental Conditions

- Storage temperature: –38 to 150°F (–40 to 70°C)

- Operating temperature, nominal: 41 to 104°F (5 to 40°C)

- Operating temperature, short term: –23 to 131°F (–5 to 55°C)

- Storage relative humidity: 5 to 95 percent

- Operating humidity, nominal: 5 to 85 percent relative humidity

- Operating humidity, short term: 5 to 90 percent relative humidity

- Operating altitude: 198 to 13,200 feet (60 to 4000 meters); conforms to IEC/EN/UL/CSA 60950 requirements up to 2000 meters

Product Regulatory Approvals

- UL60950/CAN/CSA-C22.2 No. 60950

- EN60950 with Amendments 1-4, for CE marking to the LVD directive

- IEC 60950

- AS/NZS 60950 72/73/EEC

- AS/NZS 3260-1993 with Amendments 1–4

- ACA TS001-1997

- NOM-019-SCFI-1998

Electromagnetic Emissions Certification

- AS/NZ 3548:1995 (including AMD I + II) Class B

- EN55022:1998 Class B

- CISPR 22:1997

- EN55022:1994 (including AMD I + II)

- 47 CFR Part 15:2005 (FCC) Class B
- VCCI V-3/01.4 Class 2
- CNS-13438:1997 Class B
- GR1089

Immunity

- EN300386:2003: Telecommunications Network Equipment (TNE) EMC requirements; product family standard; high priority of service; central office and non-central office locations
- EN50082-1:1992/1997
- EN50082-2:1995-Generic Immunity Standard, Heavy Industrial
- CISPR24:1997
- EN55024:1998-Generic ITE Immunity Standard
- EN61000-4-2:1995+AMD I + II-ESD, Level 4, 8-kV contact,15-kV air
- EN61000-4-3:2002-Radiated Immunity, 10 V/m
- EN61000-4-4:1995-Electrical Fast Transients, Level 4, 4 kV/B
- EN61000-4-5:1995+AMD 1-DC surge Class 3; AC surge Class 4
- EN61000-4-6:1996+AMD 1-RF Conducted Immunity, 10V rms
- EN61000-4-11:2004-Voltage Dips and Sags
- ETS300 132-2:1996+corregendum, December 1996
- GR1089:1997 (including Revision 1: 1999)

Network Equipment Building Standards

- Telcordia SR-3580 Criteria Levels, Level 3 compliant
- GR1089-Core
- GR63-Core
- SBC equipment requirements: SBC-TP-76200 and TP76400
- Verizon equipment requirements: SIT.NEBS.TE.NPI.2002.010

Product System Requirements and Compatibility

Hardware Requirements

- PREs: The Cisco 10008 chassis supports all PREs available on the Cisco 10000 Series.
- Line cards: The Cisco 10008 chassis supports all line cards available on the Cisco 10000 Series.

Ordering Information

Table 2 provides part numbers and descriptions of the Cisco 10000 Series Router.

Table 2. Ordering Information for the Cisco 10000 Series Router

Part Number	Description
10000-1P2-1DC	Cisco 10000 8-slot chassis, 1 PRE-2, 1 DC PEM
10000-1P2-1AC	Cisco 10000 8-slot chassis, 1 PRE-2, 1 AC PEM
10000-2P2-2DC	Cisco 10000 8-slot chassis, 2 PRE-2s, 2 DC PEMs

10000-2P2-2AC	Cisco 10000 8-slot chassis, 2 PRE-2s, 2 AC PEMs
10000-1P3-1DC	Cisco 10000 8-slot chassis, 1 PRE-3, 1 DC PEM
10000-1P3-1AC	Cisco 10000 8-slot chassis, 1 PRE-3, 1 AC PEM
10000-2P3-2DC	Cisco 10000 8-slot chassis, 2 PRE-3s, 2 DC PEMs
10000-2P3-2AC	Cisco 10000 8-slot chassis, 2 PRE-3s, 2 AC PEMs
ESR10008-CHASSIS=	Spare eight-slot Chassis

Migration Program

A Cisco Technology Migration Plan (TMP) has been established for this product. The Cisco TMP is a sales program that allows customers to trade in Cisco products to receive a trade-in credit toward the purchase of any new Cisco product. The program underscores the Cisco commitment to the customer for providing end-to-end product solutions and effective migration options to adapt to ever-changing network requirements. More details about this program are available at: http://www.cisco.com/go/tradein.

Service and Support

Cisco understands that the quality of your network directly affects your business profitability, employee productivity, and customer satisfaction. Cisco offers a wide range of service and support options for its customers.

The IP NGN Expertise Center has access to Cisco's global partner base as well as joint expertise in transforming service provider networks into highly profitable IP NGN service infrastructures. The center brings people, partners, processes, and tools together to accelerate customer success with IP NGN solutions.

Cisco Advanced Services offers a comprehensive suite of engineering support services that provide responsive, preventive, and consultative support of Cisco technologies for your specific networking needs. Cisco Advanced Services supports networking devices, applications, and complete infrastructures—allowing large organizations and service providers to realize the full potential of a high-performance multiservice network.

More information about Cisco service and support programs and benefits is available at: http://www.cisco.com/en/US/support/index.html.

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