DATA SHEET

CISCO 7500 SERIES ROUTER

High-density, highly available aggregation and intelligent distributed network services at the edge for service providers and enterprises.

Figure 1. Cisco 7500 Series Router

The Cisco® 7500 Series router is the premier Cisco distributed services, multiprotocol platform, now with twice the performance and enhanced high-availability (HA) features. The Cisco 7500 Series combines proven Cisco software technology with exceptional reliability, availability, serviceability, and performance features to meet the requirements of today's most mission-critical networks. The Cisco 7500 Series router provides service provider and enterprise networks with the flexibility they need to meet the constantly changing requirements of their networks. The three models of the Cisco 7500 Series allow users to choose the exact configuration needed to optimize installations and network designs for cost and functionality.

KEY FEATURES

- *High-performance distributed switching* - This feature delivers high performance for mission-critical applications by supporting high-speed media and high-density configurations. Using the processing capabilities of the Versatile Interface Processors (VIP) and distributed Cisco Express Forwarding (dCEF), the Cisco 7500 Series router system capacity can exceed two million packets per second (pps).
- *Full support for Cisco IOS® Software and enhancements for high-performance, feature-rich IP network services* - The Cisco 7500 Series router performs network services such as quality of service (QoS) at high speed. VIP technology extends the performance of these features through distributed IP services.
- *High port density and unmatched interface flexibility* - The Cisco 7500 Series router provides high port density and an extensive range of LAN and WAN interfaces (port adapters). These features dramatically reduce the cost per port and allow for a flexible configuration.
- *High availability* - Enhanced features and capabilities include redundant route processors and power supplies, software fault isolation, and failover capabilities.

Table 1. Feature and Benefits Overview

Features	Benefits
Chart_subhead Style Sheetc	Scales the performance linearly with a number of VIPs
Doubled switching and forwarding performance	Provides high-performance switching up to 2.2 Mpps
LAN/WAN interfaces	Lowers cost of ownership by consolidating interfaces in one platform
Most complete port adapter family	Increases customer's flexibility for various media access
Common port adapters with Cisco 7200 Router, Cisco 7400 Router, and FlexWAN	Protects customer's investment
High port density (two port adapters per VIP)	Reduces the cost per port and allows flexible configuration
Enhanced high-availability features	Reduces customer's downtime and increases customer loyalty
Advanced IP network services	Brings customer new revenue stream by value-added services
Broad customer base	Provides market-proven performance, stability, reliability, and serviceability

APPLICATIONS

- Content networking-Network-Based Application Recognition (NBAR) and QoS services, such as Distributed Weighted Random Early Detection (dWRED), Distributed Class-Based Weighted Fair Queuing (dCBWFQ), and distributed traffic shaping (dTS)
- Multiservice-Real-Time Transport Protocol (RTP) header compression, Multilink PPP (MLPPP) with link fragmentation and interleaving (LFI), Frame Relay Forum (FRF) 11 and 12 support for optimal digital voice transmission
- DS0 to DS1, DS3 and STM-1 WAN aggregation
- IBM mainframe connectivity

Table 2. Maximum Physical Ports/Slots

	Cisco 7505	Cisco 7507	Cisco 7513
Configurable interface slots	4	5	11
Ethernet (10BASE-T) ports	64	80	176
Ethernet (10BASE-FL) ports	40	50	110
Fast Ethernet (TX) ports	16	20	44
Fast Ethernet (FX) ports	16	20	44
Gigabit Ethernet ports	1	2	2
FDDI (FDX, HDX) ports	8	10	22
ATM ports	8	10	22
Packet over SONET OC3	8	10	22
Token Ring (FDX, HDX) ports	32	40	88
Synchronous serial ports	64	80	176
ISDN PRI, multichannel T1/E1 ports	64	80	176

Multichannel T3 ports	16	20	44
HSSI ports	8	10	22
IBM channel interface ports	8	10	22

Table 3. Chassis, Route Switch Processors (RSPs), and VIPs

Feature	Cisco 7505	Cisco 7507	Cisco 7513
Chassis/rack	5	3	2
IP/VIP slots	4	5	11
Bandwidth	1 Gbps	2 Gbps	2 Gbps
Maximum RSPs	1	2	2
Maximum power supplies	1	2	2

Table 4. Route Switch Processor (RSP) Specifications

Product	Cisco Express Forwarding Switching (pps)	Packet Memory (SRAM)	Program Memory (DRAM)	Boot Flash	PCMCIA Flash Card	Flash Disk Support	Support for Error Correction Code (ECC)
RSP16	530k	8 MB	128 MB (default) 256 MB 512 MB 1 GB (post FCS)	16 MB	N/A	48 MB (default) 64 MB 128 MB	Yes
RSP8	470+ k	8 MB	64 MB (default) 128 MB 256 MB	16 MB	16 MB 20 MB (default) 32 MB	48 MB 64 MB 128 MB	Yes
RSP4+	345k	2 MB	64 MB (default) 128 MB 256 MB	8 MB	16 MB (default) 20 MB 32 MB	64 MB 128 MB	Yes
RSP4	345k	2 MB	64 MB (default) 128 MB 256 MB	8 MB	16 MB (default) 32 MB 20 MB	No	No
RSP2	220k	2 MB	32 MB (default) 64 MB 128 MB	8 MB	16 MB (default) 20 MB 32 MB	No	No

Table 5. Versatile Interface Processor (VIP) Specifications

Product	Packet Forwarding (pps)	Bandwidth	Packet Memory	Program Memory
VIP6-80	140,000 to 220,000	750+ MB	64 MB (default)	64 MB (default)
				128 MB
				256 MB
VIP4-80	140,000 to 220,000	750+ MB	64 MB (default)	64 MB (default)
				128 MB
				256 MB
VIP4-50	90,000 to 140,000	750+ MB	64 MB (default)	64 MB (default)
				128 MB
				256 MB
VIP2-50	90,000 to 140,000	400 MB	4 MB (default)	32 MB (default)
			8 MB	64 MB
				128 MB
VIP2-40	60,000 to 95,000	400 MB	2 MB (default)	32 MB (default)
				64 MB

*Values in bold are options

With support for up to two port adapters, the VIP supports the following:

- *High port density* - Provides a high level of network consolidation; reduces overall inventory, logistics, and maintenance costs.
- *Mixed media* - Allows users to obtain better utilization of the slots available in the Cisco 7500. Mixed-media boards (for example, Fast Ethernet and serial) enable users to tailor the VIPs to specific media and density requirements.
- *Packet memory* - Each VIP ships with onboard packet memory, augmenting the total available system memory. This is particularly useful for applications where a large amount of buffering is required, such as in the presence of bursty traffic conditions, long round-trip propagation delays, or where there might be many high-bandwidth media vying for access to a smaller number of slower media.
- *Offload processing* - By operating a subset of the Cisco IOS Software, a VIP in a Cisco 7500 can offload some of the interface-specific functions that run in the central processor. This feature increases overall system performance.
- *Distributed switching* - Routing information is distributed from the RSP in the Cisco 7500 to one or more interfaces, enabling the VIP to make its own multilayer switching decisions. This feature enables an architecture that can gracefully scale to meet increasingly higher levels of system performance.

PRODUCT SPECIFICATIONS

Interfaces

The Cisco 7500 Series offers scalable density with a wide range of interfaces. These interfaces include:

- Ethernet, Fast Ethernet, Gigabit Ethernet
- Fiber Distributed Data Interface (FDDI), Token Ring
- ISDN Primary Rate Interface (PRI)

- High-Speed Serial Interface (HSSI)
- Packet over T3/E3
- Multichannel T1/E1/T3
- ATM
- Packet over SONET (POS)
- Spatial Reuse Protocol (SRP) [also known as Dynamic Packet Transport (DPT)]
- IBM
- Voice

High-Availability Features

- *High System Availability* - The RSP supports the HSA feature, which allows two RSPs to be used simultaneously with the HSA feature enabled and configured. With the HSA feature, one RSP operates as the active processor and the other RSP operates as the standby processor, which takes over and reboots the system if the active RSP fails. In addition, the Cisco 7500 supports redundancy of power supplies.
- *Cisco 7500 Single Line Card Reload* - The Single Line Card Reload (SLCR) feature isolates a fault in one VIP from the rest of the system. It allows the system to reload only the line card that has failed, without affecting the work of the other line cards. This feature dramatically reduces total outage time and impact.
- *Cisco 7500 Route Processor Redundancy+* - The RPR+ feature is an enhancement to the RPR feature. RPR+ further accelerates RSP switchover (down to only 30-40 seconds) compared to RPR. Also, it keeps the line cards from being reset and reloaded when an RSP switchover occurs.
- *Cisco 7500 Fast Software Upgrade* - The Fast Software Upgrade (FSU) feature reduces planned downtime; this feature is based on the same mechanism as RPR. It allows users to configure the system to switch over to a standby RSP, which is preloaded with a different image from that running on the active RSP.
- *Cisco 7500 stateful switchover* - This feature, which is based on RPR+, allows the active RSP to pass the necessary state information of key routing and interface protocols to the standby RSP upon switchover, thereby reducing the time for the standby RSP to learn and converge routes.
- *Cisco 7500 Non-stop forwarding* - Also based on RPR+, Non-Stop Forwarding allows routers with redundant RSPs to continue forwarding data to the standby RSP during a switchover. This feature uses the Forwarding Information Base (FIB) that was current at the time of the switchover. Once the routing protocols have converged, the FIB table is updated and stale route entries are deleted. This feature eliminates downtime during the switchover.

PHYSICAL SPECIFICATIONS

Table 6. Environmental Conditions

	Cisco 7505	Cisco 7507	Cisco 7513
Operating temperature	32°to 104℉ (0°to 40℃)	32°to 104℉ (0°to 40℃)	32°to 104℉ (0°to 40℃)
Storage temperature	–4°to 149℉ (–20°to 65℃)	–4°to 149℉ (–20°to 65℃)	–4°to 149℉ (–20°to 65℃)
Operating humidity	10 to 90% (noncondensing)	10 to 90% (noncondensing)	10 to 90% (noncondensing)

Table 7. Physical Specifications

	Cisco 7505	Cisco 7507	Cisco 7513
Height	10.5 in (26.67 cm)	19.3 in. (48.9 cm)	33.75 in. (85.73 cm)
Width	17.5 in. (44.45 cm)	17.5 in. (44.6 cm)	17.5 in. (44.45 cm)
Depth	17.0 in (43.18 cm)	25.1 in. (63.8 cm)	22.0 in. (55.88 cm)
Weight (max)	70 lb (31.75 kg)	145 lb (65.90 kg)	160 lb (72.58 kg)
Weight (installation/minimum)	46 lb (20.87 kg)	76 lb (34.60 kg)	62 lb (28.13 kg)

Table 8. Power

	Cisco 7505	Cisco 7507	Cisco 7513
Input VA Output watts Output watts	780 max	945 max	1600 max
	600 max	700 max	1200 max
	540 typical	650 typical	1050 typical
Heat dissipation	780W (2661 Btus/hr)	945W (3224 Btus/hr)	1600W (5461 Btus/hr)
AC input voltage	100 to 240 VAC	100 to 240 VAC	100 to 240 VAC
Frequency	50–60 Hz	50–60 Hz	50–60 Hz
AC input current	9A max @ 100 VAC	12A max @ 100 VAC	16A max @ 100 VAC
	4A max @ 240 VAC	6A max @ 240 VAC	7A max @ 240 VAC
DC input voltage	–48 to –60 VDC	–48 to –60 VDC	–48 to –60 VDC
DC input current	20A max @ –48 VDC		35A max @ –48 VDC
	16A max @ –60 VDC		28A max @ –60 VDC

Protocols

The Cisco 7500 Series supports the following standard Internet protocols:

- *Layer 2 and Layer 3 protocols* - ARP, IPCP, IP forwarding, IP host, IP multicast, PPP-over-ATM, TCP, Telnet, TFTP, UDP, HDLC, frame relay, IPX, AppleTalk, DecNet, transparent bridging, VLAN, MPLS, and IPv6
- *Layer 3 routing protocols* - EIGRP, IGRP, IS-IS, OSPF, BGP, PIM, and RIP
- *Network management and security* - AAA, CHAP, FTP, RADIUS, SNMP, PAP, and TACACS
- RFC 1483: Multiprotocol Encapsulation over ATM AAL 5
- RFC 1577: Classical IP and ARP over ATM AAL 5
- *Address Resolution Protocol (ARP)* - Determines the destination MAC address of a host using its known IP address
- *BOOTP* - Uses connectionless transport layer User Datagram Protocol (UDP); allows the switch (BOOTP client) to get its IP address from a BOOTP server
- *Internet Control Message Protocol (ICMP)* - Allows hosts to send error or control messages to other hosts; is a required part of IP; for example, the ping command uses ICMP echo requests to test if a destination is alive and reachable

- *IP or IP over ATM* - Suite used to send IP datagram packets between nodes on the Internet
- *TCP* - A reliable, full-duplex, connection-oriented end-to-end transport protocol running on top of IP; for example, the Telnet protocol uses the TCP/IP protocol suite
- *Packet Internet groper (ping*) - Tests the accessibility of a remote site by sending it an ICMP echo request and waiting for a reply
- *Trivial File Transfer Protocol (TFTP)* - Downloads network software updates and configuration files (Flashcode) to workgroup switch products
- *Reverse Address Resolution Protocol (RARP)* - Determines an IP address knowing only a MAC address; for example, BOOTP and RARP broadcast requests are used to get IP addresses from a BOOTP or RARPD server
- *Serial Line Internet Protocol (SLIP)* - A version of IP that runs over serial links, allowing IP communications over the administrative interface
- *Point-to-Point Protocol (PPP)* - Provides host-to-network and switch-to-switch connections over synchronous and asynchronous circuits
- *Simple Network Management Protocol (SNMP)* - Agents that process requests for network management stations and report exception conditions when they occur; requires access to information stored in a MIB
- *Telnet* - A terminal emulation protocol that allows remote access to the administrative interface of a switch over the network (in-band)
- *User Datagram Protocol (UDP*) - Enables an application (such as an SNMP agent) on one system to send a datagram to an application (a network management station using SNMP) on another system; uses IP to deliver datagrams; TFTP uses UDP/IP protocol suites
- *Dynamic Host Connection Protocol (DHCP)* - Lets a host automatically obtain their IP address, subnet mask, and default route from a pre-configured DHCP server on the network

PRODUCT REGULATORY APPROVALS AND COMPLIANCE

The Cisco 7500 Series router conforms to a number of different safety, EMI, immunity, and network homologation standards. Details of the regulatory specifications are available at: http://www.cisco.com/univercd/cc/td/doc/product/core/cis7505/4194pc75.htm

SOFTWARE REQUIREMENTS

The minimum supported Cisco IOS Software release(s) by train for all Cisco 7500 Series router products can be found by using the Hardware/Software Compatibility Matrix available at: http://www.cisco.com/pcgi-bin/front.x/Support/HWSWmatrix/hwswmatrix.cgi

Please visit: http://www.cisco.com/public/ordering_info.shtml to place an order.

Product Part Numbers

Table 9. Cisco 7500 Series Router Port Adapters, Interface Processors, and Service Adapters

Part Number	Description
LAN Port Adapters	
PA-4E	Four-port Ethernet 10BASE-T port adapter
PA-8E	Eight-port Ethernet 10BASE-T port adapter
PA-FE-FX	One-port Fast Ethernet 100BASE-FX port adapter
PA-FE-TX	One-port Fast Ethernet 100BASE-TX port adapter
PA-2FE-TX	Two-port Fast Ethernet 100BASE-FX port adapter
PA-2FE-FX	Two-port Fast Ethernet 100BASE-TX port adapter

Part Number	Description
PA-5EFL	Five-port Ethernet 10BASE-FL port adapter
PA-4R-DTR	Four-port dedicated Token Ring, 4/16 Mbps, HDX/FDX port adapter
PA-F/FD-MM	One-port FDDI full-duplex multimode port adapter
PA-F/FD-SM	One-port FDDI full-duplex single-mode port adapter
Serial Port Adapters	
PA-4T+	Four-port serial port adapter, enhanced
PA-8T-V35	Eight-port serial, V.35 port adapter
PA-8T-232	Eight-port serial, 232 port adapter
PA-8T-X21	Eight-port serial, X.21 port adapter
PA-4E1G/75	Four-port E1 G.703 serial port adapter (75ohm/unbalanced)
PA-4E1G/120	Four-port E1 G.703 serial port adapter (120ohm/balanced)
PA-T3	One-port T3 serial port adapter with T3 DSUs
PA-T3+	One-port T3 serial port adapter enhanced
PA-2T3	Two-port T3 serial port adapter with T3 DSUs
PA-2T3+	Two-port T3 serial port adapter enhanced
PA-E3	One-port E3 serial port adapter with E3 DSU
PA-2E3	Two-port E3 serial port adapter with E3 DSUs
HSSI Port Adapters	
PA-H	One-port HSSI port adapter
PA-2H	Two-port HSSI port adapter
Multichannel and ISDN Port Adapters	
PA-MC-2T1	Two-port multichannel T1 port adapter with integrated CSU/DSUs
PA-MC-4T1	Four-port multichannel T1 port adapter with integrated CSU/DSUs
PA-MC-8T1	Eight-port multichannel T1 port adapter with integrated CSU/DSUs
PA-MC-2E1/120	Two-port multichannel E1 port adapter with G.703 120ohm interface
PA-MC-8E1/120	Eight-port multichannel E1 port adapter with G.703 120ohm interface
PA-MC-8TE1+	Eight-port multichannel T1/E1 8PRI port adapter
PA-MC-STM-1SMI	One-port multichannel STM-1 single-mode port adapter
PA-MC-STM-1MM	One-port multichannel STM-1 multimode port adapter
PA-MC-T3	One-port multichannel T3 port adapter
PA-MC-2T3+	Two-port multichannel T3 port adapter, enhanced
PA-MC-E3	One-port multichannel E3 port adapter
ATM Port Adapters	
PA-A3-8E1IMA	Eight-port ATM inverse multiplexer E1 (120 ohm) port adapter
PA-A3-8T1IMA	Eight-port ATM inverse multiplexer T1 port adapter
PA-A3-E3	One-port ATM enhanced E3 port adapter
PA-A3-T3	One-port ATM enhanced DS3 port adapter
PA-A3-OC3MM	One-port ATM enhanced OC-3c/STM1 multimode port adapter
PA-A3-OC3SMI	One-port ATM enhanced OC-3c/STM1 single-mode (IR) port adapter

Part Number	Description
PA-A3-OC3SML	One-port ATM enhanced OC-3c/STM1 single-mode (LR) port adapter
PA-A3-OC12MM	One-port ATM enhanced OC12/STM4 multimode
PA-A3-OC12SMI	One-port ATM enhanced OC12/STM4 single-mode intermediate reach
SONET Port Adapters	
PA-POS-OC3MM	One-port Packet/SONET OC-3c/STM1 multimode port adapter
PA-POS-OC3SMI	One-port Packet/SONET OC-3c/STM1 single-mode (IR) port adapter
PA-POS-OC3SML	One-port Packet/SONET OC-3c/STM1 single-mode (LR) port adapter
Digital Voice Trunk Port Adapters	
PA-VXB-2TE1+	Two-port T1/E1 moderate capacity enhanced voice port adapter
PA-VXC-2TE1+	Two-port T1/E1 high-capacity enhanced voice port adapter
PA-VXA-1TE1-30+	One-port T1/E1 Digital Voice Port Adapter with 30 channels
PA-VXA-1TE1-24+	One-port T1/E1 Digital Voice Port Adapter with 24 channels
DPT Interface Processors	
SRPIP-OC12MM	Dynamic Packet Transport Interface Processor, multimode
SRPIP-OC12SMI	Dynamic Packet Transport Interface Processor, single-mode, intermediate reach
SRPIP-OC12SML	Dynamic Packet Transport Interface Processor, single-mode, long reach
SRPIP-OC12SMX	Dynamic Packet Transport Interface Processor, single-mode, extended reach
GEIP Interface Processor	
GEIP	Gigabit Ethernet Interface Processor
GEIP+	Gigabit Ethernet Interface Processor, enhanced
Service Adapter	
SA-ENCRYPT	Encryption Service Adapter
IBM Interface Processors	
CX-CIP2-ECA1	Channel IP2 with single ESCON channel interface
CX-CIP2-ECA2	Channel IP2 with dual ESCON channel interface

Migration Program

A Technology Migration Plan has been established for this product.

The Technology Migration Plan is an innovative, industry first, sales program that allows customers to trade in Cisco products to receive a trade-in credit towards the purchase of any new Cisco product. The program underscores Cisco's commitment to its customers for end-to-end product solutions and emphasizes Cisco's commitment to provide effective migration options in the face of ever-changing network requirements.

More specifics about this program are available at: http://www.cisco.com/offer/tic/TMP_PA.html

SERVICE AND SUPPORT

Cisco Systems® offers a wide range of service and support options for its customers. More information on Cisco service and support programs and benefits is available at: http://www.cisco.com/en/US/support/

Corporate Headquarters
Cisco Systems, Inc.
170 West Tasman Drive
San Jose, CA 95134-1706
USA
www.cisco.com
Tel: 408 526-4000
800 553-NETS (6387)
Fax: 408 526-4100

European Headquarters
Cisco Systems International BV
Haarlerbergpark
Haarlerbergweg 13-19
1101 CH Amsterdam
The Netherlands
www-europe.cisco.com
Tel: 31 0 20 357 1000
Fax: 31 0 20 357 1100

Americas Headquarters
Cisco Systems, Inc.
170 West Tasman Drive
San Jose, CA 95134-1706
USA
www.cisco.com
Tel: 408 526-7660
Fax: 408 527-0883

Asia Pacific Headquarters
Cisco Systems, Inc.
168 Robinson Road
#28-01 Capital Tower
Singapore 068912
www.cisco.com
Tel: +65 6317 7777
Fax: +65 6317 7799

Cisco Systems has more than 200 offices in the following countries and regions. Addresses, phone numbers, and fax numbers are listed on the

Cisco Website at www.cisco.com/go/offices.

Argentina • Australia • Austria • Belgium • Brazil • Bulgaria • Canada • Chile • China PRC • Colombia • Costa Rica
Croatia • Cyprus • Czech Republic • Denmark • Dubai, UAE • Finland • France • Germany • Greece • Hong Kong SAR
Hungary • India • Indonesia • Ireland • Israel • Italy • Japan • Korea • Luxembourg • Malaysia • Mexico
The Netherlands • New Zealand • Norway • Peru • Philippines • Poland • Portugal • Puerto Rico • Romania • Russia
Saudi Arabia • Scotland • Singapore • Slovakia • Slovenia • South Africa • Spain • Sweden • Switzerland • Taiwan
Thailand • Turkey • Ukraine • United Kingdom • United States • Venezuela • Vietnam • Zimbabwe