



Cisco 7200 Series Router

The Cisco 7200 Series Router delivers exceptional performance/price, modularity, and scalability in a compact form factor with a wide range of deployment options. With processing speeds up to 1 million packets per second, port adapters ranging from NxDS0 to OC-12, and an unparalleled number of high-touch IP services, the Cisco 7200 is the ideal WAN edge device for enterprises and service providers deploying any of the following solutions:

- *WAN edge*—Award-winning quality-of-service (QoS) feature performance
- *Broadband aggregation*—Up to 8,000 Point-to-Point Protocol (PPP) sessions per chassis
- *Multiprotocol Label Switching provider edge (MPLS PE)*—Number one choice for provider edge deployment today
- *Voice/video/data integration*— Time-division multiplexer (TDM)-enabled VXR chassis and voice port adapters
- *IP Security virtual private networking (IPSec VPN)*—Scalable to 5,000 tunnels per chassis
- High-end customer premises equipment (CPE)
- The Cisco 7200 addresses these solution requirements by integrating functions previously performed by separate devices into a single platform. Through this integration, the Cisco 7200 provides a single, cost-effective platform that supports:
 - High-density LAN and WAN interfaces
 - Broadband subscriber services aggregation, including PPP, RFC 1483 termination, and Layer 2 Tunneling Protocol (L2TP) tunneling
 - Digital T1/E1 TDM trunk termination for voice, video, and data
 - High-density multichannel T3/E3 and T1/E1 with integrated channel service unit/data service unit (CSU/DSU)
 - ATM, Packet over SONET (POS), and Dynamic Packet Transport (DPT) connectivity
 - Direct ATM Circuit Emulation Standard (CES) connectivity for voice, video, and data
 - Direct IBM mainframe channel connectivity
 - Light-density Layer 2 Ethernet switching

Figure 1
The Cisco 7200 Router Series



The Cisco 7200 Series offers a rich set of capabilities that address requirements for performance, density, high reliability, availability, serviceability, and manageability (Table 1).

Table 1 Cisco 7200 Features and Benefit

Features	Benefits
Up to 1 Mpps processing capability	Provides high-performance routing and processing performance
Maximum connectivity options	Meets a variety of topology requirements with the widest range of port densities and interface options
Breadth of services	Supports QoS, security, MPLS, broadband, multiservice, and management features for next-generation networks
Investment protection	Low initial investment with upgrade and redeployment capability

Applications

- *VPN gateways*—With the new VPN Acceleration Module (VAM), the Cisco 7200 provides high-performance, hardware-assisted encryption, key generation, and compression services suitable for site-to-site VPN applications.
- *Broadband subscriber aggregation services*—For small- and medium-density aggregation for network operators, competitive local exchange carriers (CLECs), Internet service providers (ISPs), post, telephone, and telegraph networks (PTTs), and enterprises worldwide, the Cisco 7200 offers differentiated, value-added service platform with hardware-accelerated Parallel Express Forwarding (PXF) services. Key features include:
 - Flexible, modular interfaces for traffic aggregation: OC-3, DS3, Fast Ethernet, Gigabit Ethernet, POS
 - IP and ATM QoS/class of service (CoS)
 - MPLS VPN and full L2TP support
 - Feature-rich IP services and PPP termination support
- *Multiservice capabilities*—The Cisco 7200 Series provides a scalable voice gateway solution, ranging from 2 to 20 T1s and E1s. The advanced QoS and multiservice features of the Cisco 7200 Series makes it an ideal platform in a large number of enterprise and service provider deployments as managed multiservice CPE or as a voice gateway.
- *Managed network services CPE*—The Cisco 7200 is a cost-effective CPE solution with a field upgradable modular platform. Key features for revenue-generating services include QoS, MPLS (MPLS VPN, MPLS QoS, MPLS TE), WAN edge services (VLAN support, NetFlow, NBAR), Security services (NAT, ACL, hardware encryption for VPNs), and voice/video/data integration.
- *Enterprise WAN aggregation*—The Cisco 7200 provides a flexible aggregation solution that accommodates a wide range of connectivity and service options, offers high quality and reliability, and can scale to meet future requirements. The Cisco 7200's performance per price ratio in the DS0 to OC-3/STM1 range makes it the ideal platform for aggregating multiple branch offices or remote locations.

Product Specifications

Cards, Ports, Slots

Table 2

	Cisco 7204VXR	Cisco 7206VXR
Configurable Slots	4	6
Ethernet (10BASE-T) Ports	32	48
Ethernet (10BASE-FL) Ports	20	30
Fast Ethernet (TX) Ports	4	Up to 6
Fast Ethernet (FX) Ports	4	Up to 6
EtherSwitch Port Adapters	2	2
100VG-AnyLAN Ports	4	Up to 6
FDDI (FDX, HDX) Ports	0	0
ATM Ports (T3, OC-3)	4, 4	Up to 6, 4
Packet over SONET	2	2
ATM-CES Port Adapters (Data, Voice, Video), Dual-Wide	1	1
Token Ring (FDX, HDX) Ports	16	24
Synchronous Serial Ports	32	48
ISDN BRI Ports (U, S/T)	16, 32	24, 48
ISDN PRI, Multichannel T1/E1 Ports	32	48
Multichannel T3 Ports	Up to 4	Up to 6
HSSI Ports	Up to 8	Up to 12
Packet over T3/E3 Ports (Integrated DSU)	Up to 8	Up to 12
IBM Channel Interface Ports (ESCON and Parallel)	6	6
VPN Acceleration Module	1	1

Components

Chassis

Table 3

Feature	Cisco 7204VXR	Cisco 7206VXR
Chassis/Rack	16 with side-to-side air flow 9 with RDS mounting system for front-to-back airflow	Same as Cisco 7204VXR
I/O Card slots	1	Same as Cisco 7204VXR
Port Adapter Slots	4	6
Midplane	2 independent 32-bit, 50-MHz PCI buses with an aggregate bandwidth of 1.6 Gbps when used with NPE-400 or above	Same as Cisco 7204VXR

Table 3

Feature	Cisco 7204VXR	Cisco 7206VXR
Online Insertion and Removal (OIR)	Yes	Same as Cisco 7204VXR
Field-Replaceable Components	Processor, memory, power supply, I/O card, and port adapters	Same as Cisco 7204VXR
Additional Standard Components	AC power supply, AC power cord	Same as Cisco 7204VXR

- The Cisco 7200 Series VXR chassis also include a Multiservice Interchange (MIX), which supports switching of DS0 time slots via MIX interconnects across the midplane to each port adapter slot.
- The midplane and the MIX also support distribution of clocking between channelized interfaces on the Cisco 7200 to support voice and other constant-bit-rate applications. The VXR midplane provides two full-duplex 8.192-Mbps TDM streams between each port adapter slot and the MIX, which is capable of switching DS0s on all 12 8.192-Mbps streams. Each stream can support up to 128 DS0 channels.
- The MIX in the Cisco 7200VXR provides the ability to switch DS0 time slots between multichannel T1 and E1 interfaces, much like TDM capabilities. This enables the Cisco 7200VXR to switch DS0 voice channels on a T1/E1 interface on one port adapter to and from separate voice-processing port adapters. It also enables DS0s to be switched through the Cisco 7200VXR without any processing, which is a requirement in certain voice configurations.

Processors

- The Cisco 7200 Series sets new standards in meeting requirements for high-performance Layer 3 services at an affordable price for both service providers and enterprises.
- The following processors are currently available for the Cisco 7200 Series:
 - NPE-225
 - NPE-400
 - NSE-1
 - NPE-G1
- The NPE processors offer exceptional price/performance for most applications, including enterprise WAN aggregation, CPE, multiservice, and VPN. These processors provide the greatest flexibility when deploying new features.
- The NSE-1 Network Services Engine takes advantage of PXF to offer services acceleration for “high-touch” edge services for applications such as broadband and leased-line aggregation.
- Key features supported by the Cisco 7200 Series processors include security, QoS, traffic management, and network management.
- More information on the Cisco 7200 processors is available at:

http://www.cisco.com/warp/public/cc/pd/rt/7200/prodlit/npe72_ds.htm

<http://www.cisco.com/warp/public/cc/pd/ifaa/prossor/nse1/>

http://www.cisco.com/warp/public/cc/pd/ifaa/prossor/prodlit/npeg1_ds.htm

Input/Output Controllers

- Each Cisco 7200 Series chassis has a dedicated slot for an I/O controller. The following types of I/O controllers are currently supported, including some with LAN ports for increased density without using a port adapter slot:
 - C7200-I/O, Cisco 7200 I/O Controller
 - C7200-I/O-2FE/E, Cisco 7200 I/O Controller with dual autosensing 10/100 Ethernet ports
 - C7200-I/O-GE+E, Cisco 7200 I/O Controller with 1 Gigabit Ethernet Interface Converter (GBIC) port and one Ethernet port

- More information on I/O controllers is available at: http://www.cisco.com/warp/public/cc/pd/rt/7200/prodlit/7200i_ds.htm

Environmental Conditions

Table 4

	Cisco 7204VXR	Cisco 7206VXR
Operating temperature	32 to 104 F (0 to 40 C)	Same as Cisco 7204VXR
Storage temperature	–4 to 149 F (–20 to 65 C)	Same as Cisco 7204VXR
Operating humidity	10 to 90% (noncondensing)	Same as Cisco 7204VXR

Interfaces

- The Cisco 7200 Series offers scalable density with the widest range of connectivity options including:
 - Ethernet 10BASE-T and 10BASE-FL
 - Fast Ethernet 100BASE-T (RJ-45 and MII)
 - Gigabit Ethernet
 - Token Ring (half and full duplex)
 - Synchronous serial ISDN BRI, PRI, HSSI, T3, E3
 - Multichannel T1, ISDN PRI
 - Multichannel E1, ISDN PRI
 - Multichannel T3, E3
 - Multichannel STM-1
 - Packet Over SONET (POS)
 - Dynamic Packet Transport (DPT)
 - ATM (single-mode and multimode)
 - ATM-CES
 - Digital Voice Port Adapter, Enhanced
 - Mix-enabled T1/E1
 - Integrated Service Adapter (ISA)
 - VPN Acceleration Module (VAM)
- The Cisco 7200 shares the same port adapters with the Cisco 7400, 7500, and 7600 FlexWAN module, protecting customer investment in interfaces, providing a clear migration path, and simplifying sparing
- More detailed information on specific port adapters is available at: <http://www.cisco.com/warp/public/cc/pd/ifaa/pa/index.shtml>

Options—Features

Key features supported by the Cisco 7200 include:

- Cisco Express Forwarding
- QoS
 - Low-Latency Queuing (LLQ)
 - Class-Based Weighted Fair Queuing (CBWFQ)
 - Class-Based Weighted Random Early Detection (CBWRED)

- Policing
- Marking
- Shaping
- Committed Access Rate (CAR)
- Generic Traffic Shaping (GTS)
- Frame Relay Traffic Shaping (FRTS)
- Modular QoS command-line interface (MQC) support
- MPLS
 - MPLS VPN
 - MPLS QoS
 - MPLS traffic engineering
- Broadband aggregation
 - PPPoX
 - RBE
 - PPP over X (PPPoX) with L2TP
 - MLPPP
- Multiservice/voice
 - cRTP
 - LFI
 - FRF11/12
 - MLPPP
 - MLFR
- Tunneling
 - GRE
 - L2TP
 - UTI
- Other
 - ACLs
 - NAT
 - NetFlow
 - Firewall
 - Multicast

Performance

- Up to 225 kpps with NPE-225 processor
- Up to 400 kpps with NPE-400 processor
- Up to 300 kpps with accelerated services with NSE-1 processor
- Up to 1 Mpps with NPE-G1 processor

Memory

Table 5

	Cisco 7204VXR	Cisco 7206VXR
Processor Memory	128 MB (default for NPE-225, NPE-400 and NSE-1) 256 MB (default for NPE-G1, max for NPE-225, NSE-1) 512 MB (max for NPE-400)	Same as Cisco 7204VXR
Flash disk memory card (optional, up to 2 slots available)	48 MB, expandable to 128 MB for I/O controllers 64 MB, expandable to 256 MB for NPE-G1	Same as Cisco 7204VXR

Network Management

Network Management Applications:

- Element Manager Software (EMS) for the Cisco 7200 and 7400 Series
- Cisco Secure Policy Manager
- Cisco VPN Device Manager (VDM)
- Cisco QoS Device Manager (QDM)
- Cisco Info Center
- CiscoWorks
- Secure command-line interface using Secure Shell (SSH) Protocol
- HTML-based management tool

Physical Specifications

Table 6

	Cisco 7204VXR	Cisco 7206VXR
Height	5.25 in. (13.34 cm)	5.25 in. (13.34 cm)
Width	16.8 in. (42.67 cm)	16.8 in. (42.67 cm)
Depth	17 in. (43.18 cm)	17 in. (43.18 cm)
Weight	Chassis is fully configured with a network processing engine, I/O controller, four port adapters, two power supplies, and a fan tray: ~50 lb (22.7 kg)	Chassis is fully configured with a network processing engine, I/O controller, six port adapters, two power supplies, and a fan tray: ~50 lb (22.7 kg)

Power

The Cisco 7200 is available with single and dual power supply options for both AC and DC.

Table 7

	Cisco 7204VXR	Cisco 7206VXR
AC-input power	370W max. (single or dual power supply configuration)	Same as Cisco 7204VXR
AC-input voltage rating	100–240 VAC wide input with power factor correction	Same as Cisco 7204VXR
AC-input current rating	Not to exceed 5A max. at 100 VAC and 2.5A max. at 240 VAC with the chassis fully configured	Same as Cisco 7204VXR
AC-input frequency rating	50/60 Hz	Same as Cisco 7204VXR

Table 7

	Cisco 7204VXR	Cisco 7206VXR
AC-input cable	18 AWG 3-wire cable, with 3-lead IEC-320 receptacle on the power supply end, and a country-dependent plug on the power source end	Same as Cisco 7204VXR
DC-output power	280W max. (single or dual power supply configuration)	Same as Cisco 7204VXR
DC-input power	370W max. (single or dual power supply configuration)	Same as Cisco 7204VXR
DC-input voltage rating	–24 to –60 VDC for global DC power requirements	Same as Cisco 7204VXR
DC-input current rating	Not to exceed 13A max. at –48 VDC (370W/–48 VDC = 7.7A typical draw) Not to exceed 8A max. at –60 VDC (370W/–60 VDC = 6.2A typical draw)	Same as Cisco 7204VXR
DC voltages supplied and maximum steady-state current ratings	+5.2V at 360A +12.2V at 9A –12.0V at 1.5A +3.5V at 13A	Same as Cisco 7204VXR
DC-input cable	14 AWG recommended minimum, with at least 3 conductors rated for at least 140 F (60 C)	Same as Cisco 7204VXR
Frequency	50/60 Hz	Same as Cisco 7204VXR
Airflow	~80 cfm	Same as Cisco 7204VXR
Power dissipation	~370W max. configuration	Same as Cisco 7204VXR
Heat dissipation	370W (1262 BTUs)	Same as Cisco 7204VXR
Noise level	Front (I/O Controller and PA side): 44.2 db Back (Power supply side): 43.7 db Left (Fan side): 47.2 db Right: 44.8 db	Same as Cisco 7204VXR

Protocols

The Cisco 7200 Series Router supports the following standard Internet protocols:

- *Layer 2 and Layer 3 protocols*—Address Resolution Protocol (ARP), IPCP, IP forwarding, IP host, IP Multicast, PPP-over-ATM, TCP, Telnet, Trivial File Transfer Protocol (TFTP), User Datagram Protocol (UDP), transparent bridging, virtual LAN (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
- *ARP*—Determines the destination MAC address of a host using its known IP address
- *BOOTP*—Uses connectionless transport layer (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
- *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
- *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)
- *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
- *Hot Standby Router Protocol (HSRP)*—Provides fast cut-over to a backup router in the event of a system or link failure

Product Regulatory Approvals and Compliance

Product Regulatory Compliance

The following table lists regulatory compliance standards for the Cisco 7204VXR and 7206VXR chassis.

Table 8

Compliance Standard	
Product Safety	UL 1950, CSA 22.2 No. 950, EN60950, EN41003, AUSTEL TS001, AS/NZ 3260, IEC 950
Emissions	FCC Class A, CSA Class A, EN55022 Class B, VCCI Class 2, AS/NRZ 3548 Class A
Immunity	IEC-1000-4-2, IEC-1000-4-3, IEC-1000-4-4, IEC-1000-4-5, IEC-1000-4-6, IEC-1000-4-11, IEC-1000-3-2
NEBS	Level 3

Product System Requirements

Hardware Requirements

Hardware for Cisco 7200 Series Router includes:

- 7204VXR or Cisco 7206VXR chassis
- Network Processing Engine or Network Services Engine
- Input/Output controller
- Processor memory
- Input/Output controller memory
- Power supply
- Console and auxiliary cables

- Second power supply, accessories
- Port adapters
- Service adapters

Note: You must order a network processing or services engine for the Cisco 7206VXR and Cisco 7204VXR. With the NPE-225, NPE-400, and NSE-1 processors, you must also order an input/output controller. With the NPE-G1 processor, the input/output controller is optional.

Software Requirements

To locate the minimum supported Cisco IOS Software Release by train for all Cisco 7200 Series products, use the Hardware/Software Compatibility Matrix at: <http://www.cisco.com/cgi-bin/front.x/Support/HWSWmatrix/hswsmatrix.cgi>.

In general, the minimum support Cisco IOS Software releases for the Cisco 7204VXR and Cisco 7206VXR are 11.1(16)CA or later; 11.2(11)P or later; or 11.3(1) or later. Consult the compatibility matrix above for more detailed information.

Product Ordering Details

Ordering Instructions

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

Product Part Number

To find part descriptions and part numbers for Cisco products, use the online Cisco Pricing Tool at: <http://www.cisco.com/cgi-bin/front.x/pricing>.

The base chassis product IDs are shown below. In addition, various bundles, spares, and options are available. To access part descriptions and part numbers use the online Cisco Pricing Tool at: <http://www.cisco.com/cgi-bin/front.x/pricing>.

Table 9

Part Number	Description
Cisco 7204VXR	Cisco 7204VXR, 4-slot chassis, 1 AC supply with IP software
Cisco 7206VXR	Cisco 7206VXR, 6-slot chassis, 1 AC supply with IP software

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 and competitors' products to receive a trade-in credit toward the purchase of any new Cisco product. The program underscores Cisco's commitment to its customers to provide end-to-end product solutions and effective migration options in the face of ever-changing network requirements.

For details about technology migration, go to 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 are available at: http://www.cisco.com/public/Support_root.shtml.

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