Cisco 7200 VXR Series Routers Overview

The Cisco 7200 VXR Series Router delivers exceptional performance/price, modularity, and scalability in a compact form factor with a wide range of deployment options.

Cisco 7200 VXR Series Router

With processing speeds up to 2 million packets per second, port- and service adapters ranging from NxDS0 to Gigabit Ethernet, and OC-3 as well as an unparalleled number of high-touch IP services, the Cisco 7200 VXR series is the ideal Services Aggregation WAN/MAN 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 16,000 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-to-IP Gateway Support**—Direct IP-interconnections
- **IP Security virtual private networking (IPSec VPN)**—Scalable to 5,000 tunnels per chassis
- **High-End Customer Premises Equipment (CPE)**—For managed WAN services saving equipment, transport and administrative cost

The Cisco 7200 VXR addresses these solution requirements by integrating functions previously performed by separate devices into a single platform. Through this integration, the Cisco 7200 VXR 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 and Packet over SONET (POS) connectivity
- ATM IMA (Inverse Multiplexing over ATM) for voice, video, and data
- Light-density Layer 2 Ethernet switching

Figure 1. The Cisco 7200 VXR Router Series with Network Processing Engine NPE-G2

The Cisco 7200 VXR 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 VXR Features and Benefit

Features	Benefits
Up to 2 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, voice, IP-to-IP Gateway and management features for next-generation networks
Investment Protection	Low initial investment with upgrade and redeployment capability

Applications

VPN Gateways-With the new VPN Service Acceleration Module (VSA), the Cisco 7200 VXR 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. Key features include:
  - Flexible, modular interfaces for traffic aggregation: OC-3, Gigabit Ethernet, DS3, Fast Ethernet, 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 VXR 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 VXR 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 VXR 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 VXR 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 VXR'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.

- **IP-to-IP Gateway Support—**Direct IP-interconnections between VoIP networks lower costs, lower latency, improve voice quality, and offer greater flexibility to support emerging services when compared with public-switched telephone network (PSTN) or time-division multiplexing (TDM) interconnections.

    The Cisco Multiservice IP-to-IP Gateway provides a network-to-network interface point for:

    ◦ Signaling interworking (H.323, SIP)

    ◦ Media interworking (DTMF, fax, and modem)

    ◦ Address and port translations (privacy and topology hiding)

    ◦ Billing and CDR normalization

    ◦ QoS and bandwidth management (QoS marking using TOS)

Product Specifications

Table 2.   Cards, Ports, Slots

	Cisco 7204 VXR	Cisco 7206 VXR
Configurable Slots without Port Adapter Jacket Card	4	6
Configurable Slots with Port Adapter Jacket Card	5	7
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	4	6
Token Ring (FDX, HDX) Ports	16	24
Synchronous Serial Ports	32	48
ISDN BRI Ports (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 10	Up to 14
VPN Acceleration Module	1	1

Components

Table 3.   Chassis

Feature	Cisco 7204 VXR	Cisco 7206 VXR
Chassis/Rack	• 16 with side-to-side air flow • 9 with RDS mounting system for front-to-back airflow	Same as Cisco 7204 VXR
I/O Card Slots	1	Same as Cisco 7204 VXR
Port Adapter Slots	4	6
Midplane	2 independent 32-bit, 50-MHz PCI buses with an aggregate bandwidth of 1.2 Gbps when used with NPE-400. 3 independent 32-bit, 50-MHz PCI buses with an aggregate bandwidth of 1.8 Gbps when used with NPE-G1 or NPE-G2	Same as Cisco 7204 VXR
Online Insertion and Removal (OIR)	Yes	Same as Cisco 7204 VXR
Field-Replaceable Components	Processor, memory, power supply, I/O card, and port adapters	Same as Cisco 7204 VXR
Additional Standard Components	AC power supply, AC power cord	Same as Cisco 7204 VXR

Table 4.   Environmental Conditions

	Cisco 7204 VXR	Cisco 7206 VXR
Operating Temperature	32 to 104°F (0 to 40°C)	Same as Cisco 7204 VXR
Storage Temperature	-4 to 149°F (-20 to 65°C)	Same as Cisco 7204 VXR
Operating Humidity	10 to 90% (noncondensing)	Same as Cisco 7204 VXR

The Cisco 7200 VXR Series 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 VXR 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 7200 VXR provides the ability to switch DS0 time slots between multichannel T1 and E1 interfaces, much like TDM capabilities. This enables the Cisco 7200 VXR 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 7200 VXR without any processing, which is a requirement in certain voice configurations.

Processors

The Cisco 7200 VXR 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 VXR Series:

- NPE-G2
- NPE-G1
- NPE-400

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.

Key features supported by the Cisco 7200 VXR Series processors include security, QoS, traffic management, and network management.

More information on the Cisco 7200 VXR processors is available at:

- http://www.cisco.com/en/US/products/hw/routers/ps341/products_data_sheets_list.html
- http://www.cisco.com/en/US/products/hw/modules/ps3931/products_data_sheet09186a008 00c6bd6.html
- http://www.cisco.com/en/US/products/hw/routers/ps341/products_data_sheet09186a00800 ae715.html

Input/Output Controllers

Each Cisco 7200 VXR 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 VXR-I/O, Cisco 7200 VXR I/O Controller
- C7200 VXR-I/O-2FE/E, Cisco 7200 VXR I/O Controller with dual autosensing 10/100 Ethernet ports
- C7200 VXR-I/O-GE+E, Cisco 7200 VXR 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/en/US/products/hw/routers/ps341/products_data_sheet09186a0080088724.h tml

Port Adapter Jacket Card

Cisco 7204 VXR and 7206 VXR chassis has a dedicated slot for an I/O controller slot that can be used to install a Port Adapter Jacket Card. The Port Adapter Jacket Card can hold single (selected) Port or Service Adapter for easy port and slot expansion.

The Cisco 7200 VXR Series Port Adapter Jacket Card supports the following port adapters:

- Cisco VPN Acceleration Module 2 (SA-VAM2)—Supported only in combination with NPE-G1
- AES wide key crypto card (SA-VAM2+)
- VPN Services Adapter (C7200-VSA) – Supported only in combination with NPE-G2
- ATM Port Adapters (PA-A6-T3, PA-A6-E3, PA-A6-OC3MM, PA-A6-OC3SMI, PA-A6-OC3SML)
- 2-Port Packet/SONET OC3c/STM1 Port Adapter (PA-POS-2OC3)
- 2 Port T3 Serial Port Adapter Enhanced (PA-2T3+)
- 1 port multichannel STM-1multi- and single mode port adapter (PA-MC-STM-1MM, PA-MC-STM-1SMI)
- 1-port Enhanced Port Adapter Series (PA-T3/E3-EC, PA-2T3/2E3-EC, PA-MC-2T3-EC, PA-

MC-T3-EC)

Note: The Cisco Mix-Enabled T1/E1 Port Adapters for the Cisco 7200 VXR Series router are not compatible with the Port Adapter Jacket Card.

Software

The Cisco 7200 VXR Series Port Adapter Jacket Card is supported on a variety of Cisco IOS® Software versions.

Interfaces

The Cisco 7200 VXR 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)
- ATM (single-mode and multimode)
- Digital Voice Port Adapter, Enhanced
- Mix-enabled T1/E1
- VPN Acceleration Module (VAM)
- VPN Service Adapter (VSA)

The Cisco 7200 VXR 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/en/US/products/hw/modules/ps2033/prod_module_series_home.html

Options—Features

Key features supported by the Cisco 7200 VXR 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
- ◦ Network-Based Application Recognition
- MPLS
  - ◦ MPLS VPN
  - ◦ MPLS QoS
  - ◦ MPLS traffic engineering
  - ◦ Any Transport over MPLS
- Broadband aggregation
  - ◦ PPPoX
  - ◦ RBE
  - ◦ PPP over X (PPPoX) with L2TP
  - ◦ Multiservice/voice
  - ◦ cRTP
  - ◦ LFI
  - ◦ FRF11/12
  - ◦ MLPPP
  - ◦ MLFR
  - ◦ IP-to-IP Voice Gateway
  - ◦ SRST
- Tunneling
  - ◦ GRE
  - ◦ L2TP
  - ◦ UTI
  - ◦ L2TPv3
  - ◦ 6to4
  - ◦ Other
  - ◦ ACLs
  - ◦ NAT
  - ◦ NetFlow
  - ◦ Firewall
  - ◦ Multicast
  - ◦ Flexible Packet Matching
  - ◦ IPSec VPN
  - ◦ Secure Multicast

○ IPv6

Performance

- Up to 2 Mpps with NPE-G2 processor
- Up to 1 Mpps with NPE-G1 processor
- Up to 400 kpps with NPE-400 processor

Table 5. Memory

	Cisco 7204 VXR	Cisco 7206 VXR
Processor Memory	• 256 MB (default for NPE-400 and NPE-G1) • 512 MB (max for NPE-400) • 1 GB (max for NPE-G1 and default for NPE-G2) • 2 GB option for NPE-G2	Same as Cisco 7204 VXR
PCMCIA 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 and NPE-G2	Same as Cisco 7204 VXR
Compact Flash Disk Memory Card (optional for NPE-G1 and NPE-G2)	• 64 MB, expandable to 256 MB for NPE-G1 • 256 MB for NPE-G2	Same as Cisco 7204 VXR

Network Management

Network Management Applications

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

Table 6. Physical Specifications

	Cisco 7204 VXR	Cisco 7206 VXR
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)

Table 7. Power (The Cisco 7200 VXR is available with single and dual power supply options for both AC and DC.)

	Cisco 7204 VXR	Cisco 7206 VXR
AC-Input Power	370W max. (single or dual power supply configuration)	Same as Cisco 7204 VXR
AC-Input Voltage Rating	100-240 VAC wide input with power factor correction	Same as Cisco 7204 VXR

	Cisco 7204 VXR	Cisco 7206 VXR
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 7204 VXR
AC-Input Frequency Rating	50/60 Hz	Same as Cisco 7204 VXR
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 7204 VXR
DC-Output Power	280W max. (single or dual power supply configuration)	Same as Cisco 7204 VXR
DC-Input Power	370W max. (single or dual power supply configuration)	Same as Cisco 7204 VXR
DC-Input Voltage Rating	-24 to -60 VDC for global DC power requirements	Same as Cisco 7204 VXR
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 7204 VXR
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 7204 VXR
DC-Input Cable	14 AWG recommended minimum, with at least 3 conductors rated for at least 140°F (60°C)	Same as Cisco 7204 VXR
Frequency	50/60 Hz	Same as Cisco 7204 VXR
Airflow	~80 cfm	Same as Cisco 7204 VXR
Power Dissipation	~370W max. configuration	Same as Cisco 7204 VXR
Heat Dissipation	370W (1262 BTUs)	Same as Cisco 7204 VXR
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 7204 VXR

Protocols

The Cisco 7200 VXR 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

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

Table 8.   Product Regulatory Compliance

	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 VXR Series Router includes:

- 7204 VXR or Cisco 7206 VXR chassis
- Network Processing 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 engine for the Cisco 7206 VXR and Cisco 7204 VXR. With the NPE-400, you must also order an input/output controller. With the NPE-G1 and NPE-G2 processor, the input/output controller is optional.

Software Requirements

To locate the minimum supported Cisco IOS Software Release by Cisco IOS release for all Cisco 7200 VXR Series products, use the Software Advisor Tool at http://tools.cisco.com/Support/Fusion/FusionHome.do.

In general, the minimum support Cisco IOS Software releases for the Cisco 7204 VXR and Cisco 7206 VXR chassis are 11.1(16)CA or later; 11.2(11)P or later; or 11.3(1) or later. Consult the Software Advisor Tool above for more detailed information since the minimum Cisco IOS release support varies, for example, depending on the Network Processing Engine, the IO Controller Cards and the Port/Service Adapters The Cisco 7200 VXR chassis is configured with.

Product Ordering Details

Ordering Instructions

Please visit https://www.cisco.com/c/en/us/services/order-services.html 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.　　Product Part Number

Part Number	Description
CISCO7204VXR	Cisco 7204 VXR, 4-slot chassis, 1 AC supply with IP software
CISCO7206VXR	Cisco 7206 VXR, 6-slot chassis, 1 AC supply with IP software

Migration Program

A Cisco Technology Migration Program (CTMP) is in place for the Cisco 7200 VXR series routers.

The Cisco Technology Migration Program is an innovative, industry-first sales program that allows customers to trade in Cisco as well as 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/web/partners/pr11/incentive/tmp/.

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 https://www.cisco.com/c/en/us/services/order-services.html.