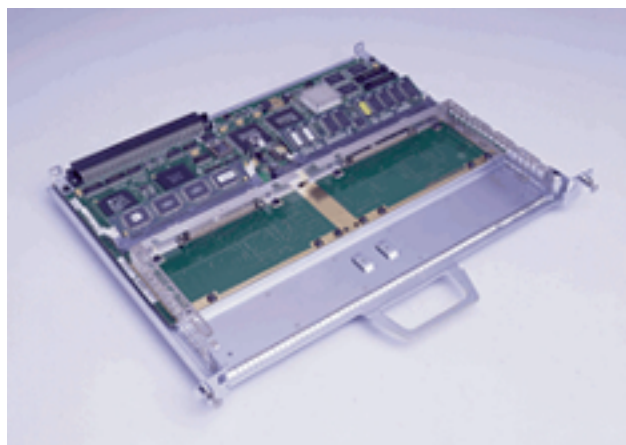


## Versatile Interface Processor 2 for Cisco 7500 Series Routers

The Versatile Interface Processor 2 (VIP2) is Cisco Systems' second-generation VIP that doubles the performance and port densities of the high-end Cisco 7500 series router and Cisco 7000 equipped with RSP7000 processor.

The VIP2 greatly increases the switching performance of the Cisco 7500 series routers and Cisco 7000 series routers equipped with the RSP7000 processor. It serves as an ideal platform for new, higher-speed, higher-density LAN and WAN interfaces. On the Cisco 7500 series, with support for distributed switching, performance scales to over one million packets per second (pps). In addition, because the VIP2 doubles the port density of earlier interface processors, customers who need to provide large numbers of LAN and WAN connections can enjoy greatly reduced total systems cost.

Versatile Interface Processor 2 for Cisco 7500 and RSP7000 Series Routers



The VIP2 is a highly configurable, RISC-based, intelligent interface processor. Up to two separate port adapters (PAs) can be configured on each VIP2, enabling the customer to optimize the VIP2 and system configurations in terms of price, performance, and density. PAs provide the media-specific interfaces for the VIPs, and can support specialized processing engines for high-bandwidth compression and encryption applications.

A key feature of the VIP2 is its ability to receive route information from the master Route Switch Processor (RSP)-the system's central processing engine) or RSP7000. Based on this route data, a VIP2 can make its own Layer 3 switching decisions, providing a scaleable, distributed switching architecture, called Distributed Switching and its scales packet processing throughput of a VIP2-equipped router. In addition, resources for route policy and administration are increased by off-loading the central processor of packet handling tasks.

### The VIP2 also supports the following features:

- *High port densities*—The VIP2 enables users to continue to grow their networks by adding VIP2s to existing systems, rather than deploying complete systems. Increased port densities can also result in a significantly lower price per port. With the VIP2 and port adapter technology, for example, users can increase 10-Mbps Ethernet density from 66 ports with the Ethernet Interface Processor (EIP) to 176 ports with the VIP2 in a single Cisco 7513 system.
- *Mixed media*—The modular VIP2 design enables users to pick and choose from a list of WAN, LAN and specialized network service adapters. By mixing different media types (Ethernet and serial, for example) on a single VIP2, users can maximize chassis slot utilization. The VIP2 is fully compatible with all Cisco 7500 PAs and service adapters.
- *Packet memory*—Each VIP2 contains its own packet memory for buffering packets, thus distributing and greatly increasing the amount of packet memory available in the system. This feature is particularly important in environments with large round-trip propagation delays, bursty traffic conditions, or where many high-speed media point to a small number of lower-speed media.

- *Distributed switching*—An advanced software feature, distributed switching (DSW) provides the scalable, multilayer switching function that enables the aggregate performance of the Cisco 7513 to scale to over one million pps. The creation and maintenance of the routing tables is managed by the RSP. Information within these tables is distributed to DSW-enabled VIP2's, allowing each VIP2 to make its own switching decisions based on the information contained in its local route cache. Each VIP2 that is added to the system incrementally adds to switching performance and off-loads the central RSP. The Distributed Switching services available on VIP2 include:
  - *Distributed Optimum/Fast Switching*—Each VIP2 provides incremental packet processing engines for optimum and fast switching methods—improving overall system IP switching performance
  - *Distributed IP NetFlow Switching and Data Export*—Facilities implemented via NetFlow, such as analysis of all traffic flows transiting the router and improved access list processing, scale to high system aggregate performance levels when implemented across multiple VIP2 engines.
- *Distributed Cisco Express Forwarding (CEF)*—Route table information and changes are proactively distributed to CEF-enabled VIP2s. VIPs never need to query the RSP for route information on new packet destinations, improving overall performance in networks whose topologies are dynamic and in constant change or are characterized by short-lived packet flows - like the Internet. Distributed CEF effectively separates the control function (the RSP) from the data function (IP packet switching within VIPs), improving system-wide performance of all services provided.
- *Distributed services*—Each VIP2 can run, in effect, a subset of the Cisco IOS™ software. This powerful feature enables the VIP2 to off-load some of the more complex and processor intensive functions from the RSP throughout the rest of the system. Distributed services (DS) delivers enhanced, network-layer IP Services such as distributed quality of service, and security services such as encryption and link-level compression.

#### VIP2 Models

Three different versions of the VIP2 motherboard; has VIP2-15, VIP2-40, and VIP2-50. Each version of the VIP2 supports the modular port and service adapters, but they differ significantly in terms of software features, performance, and memory. Table 1 below outlines the three VIP2 models.

Table 1 VIP2 Base Configurations

Product No.	Description	Distributed Switching/ Services	DSW Performance	Usage
VIP2-15	VIP2; Model 15	No	N/A	Basic network connectivity High port density requirements
VIP2-40	VIP2; Model 40	Yes	Moderate	Distributed switching Moderate link utilization
VIP2-50	VIP2; Model 50	Yes	High	Demanding applications with <ul style="list-style-type: none"> <li>• High DSW Performance</li> <li>• Multiple high-speed PAs with high link utilization</li> </ul> Large-scale implementation of Cisco Express Forwarding Extensive use of Distributed IP Services

**The VIP2-15**

The VIP2-15 operates in the same mode as existing interface processors (xIPs), passing data received from an input port to its onboard packet memory (SRAM), and then on to packet memory in the RSP; albeit at a significantly faster performance level with twice the bandwidth over most xIPs. The VIP2-15, powered by a 150-MHZ MIPS R5000 processor, offers the best price per port of any of the VIP2 models but does not support the advanced VIP2 software features of distributed switching and distributed services. Through separately ordered upgrades, the VIP2-15 can be upgraded to the feature set and memory of the VIP2 Model 40.

**The VIP2-40**

The VIP2-40 provides the same basic features as the VIP2-15 and offers support for Distributed Switching and Distributed Services. Powered by the same processor as the VIP2-15, it provides larger program memory (DRAM) to accommodate Layer 3 route information from the RSP for autonomous switching decisions, and larger packet memory (SRAM) capacity necessary for Distributed IP Services. In addition, the VIP2-40 runs a subset of Cisco IOS software to provide support for enhanced network services such as distributed queuing and software-based encryption and compression. This model also supports the specialized hardware assist engines for increased compression and encryption bandwidth applications.

**The VIP2-50**

The VIP2-50 is designed for the most demanding environments with increased processor performance and very large SDRAM and SRAM memory options. It offers 35-to 50 percent greater distributed switching performance over VIP2-40 due to its 200 MHZ MIPS R5000 processor. In addition, the enhanced-memory architecture of the VIP2-50 allows large packet memory (SRAM) options. This feature supports environments with long round-trip propagation delays for wide-area network links and environments that use distributed IP Services such as Distributed Weighted RED (D-WRED) and Distributed Committed Access Rate (D-CAR) queuing systems. Large program (DRAM) memory options enable support for new switching methodologies such as CEF that eliminate performance bottlenecks caused by random destination addressing typically found in the Internet and large enterprise networks.

## VIP2 Base Configurations

Switching and Services Support

Product No.	Description	Distributed Switching	Distributed Services
VIP2-15	VIP2; Model 15	No	No
VIP2-40	VIP2; Model 40	Yes	Yes
VIP2-50	VIP2; Model 50	Yes	Yes

Memory

Product No.	Packet Memory	Program Memory	Notes
VIP2-15	1MB SRAM	16MB DRAM	Fixed configuration
VIP2-40	2MB SRAM	32MB DRAM	Fixed configuration
VIP2-50	4MB SRAM	32MB SDRAM	Extensible memory options

## Specifications

### Hardware

Physical Dimensions

- The VIP2 occupies one chassis slot and can only be operated in a Cisco 7500 series or RSP7000 equipped Cisco 7000 series router
- Shipping Weight: 5 lbs (2.25 kg)

Environmental Ranges

- Operating Temperature: 32 to 104°F (0 to 40°C)
- Relative Humidity: 10 to 90 percent, noncondensing
- Storage Temperature: -4 to 149°F (-20 to 65°C)

Port and Service Adapters

- The VIP2 supports multiple LAN and WAN port adapter types including Ethernet, Fast Ethernet, Token Ring, Serial, Channelized Serial, ISDN, HSSI, FDDI, and ATM
- The VIP2-40 and VIP2-50 support hardware-based encryption and compression accelerators.

### Software

- VIP2-15 and VIP2-40 requires Cisco IOS version 11.1(5) minimum.
- VIP2-50 requires Cisco IOS version 11.1(14)CA minimum.

Management

- Simple Network Management Protocol (SNMP) agent V1 (RFC 1155-1157)
- Management Information Base (MIB) II (RFC 1213)

## Host Platform Requirements

### Hardware

- The VIP2 requires the RSP of the Cisco 7500 series, or the RSP7000 of the Cisco 7000 series to operate.

### Regulatory Approvals

- Electromagnetic Emissions Certifications
- FCC Class A
- CISPR-22 Class B
- EN55022A Class B
- VCCI Class 2

### Safety

- UL 950
- IEC 950
- EN60950
- CSA C22.2 No. 950-M29

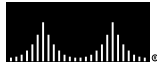
### CE Mark

- IEC 801-2, 3, 4, 5, 6, 11

## Ordering Information

Product No.	Product Description
VIP2-15 (=)	Versatile Interface Processor 2, Model 15
VIP2-40 (=)	Versatile Interface Processor 2, Model 40
VIP2-50 (=)	Versatile Interface Processor 2, Model 50
MEM-VIP250-8M-S (=)	8 Megabytes SRAM Option for VIP2-50 (Packet Memory)
MEM-VIP250-64M-D (=)	64 Megabytes SDRAM Option for VIP2-50 (Program Memory)
MEM-VIP250-128M-D (=)	128 Megabytes SDRAM Option for VIP2-50 (Program Memory)

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