Cisco 7600 Series Route Switch Processor 720

Product Overview

The Cisco® 7600 Series Route Switch Processor 720 (RSP 720) is specifically designed to deliver high scalability, performance, and fast convergence required for today's and tomorrow's demanding voice, video, data, and mobility (quadruple-play) services. The Cisco 7600 RSP 720 offers service providers and enterprises true service convergence with the ability to manage a wide variety of applications over a range of access mediums using a single platform (Figure 1).

Figure 1. Cisco 7600 Route Switch Processor 720

The Cisco 7600 RSP 720 uses the same high-performance 720-Gbps crossbar switch fabric as that used by the Cisco Catalyst® 6500 Series Supervisor Engine 720 and combines it with a new, revised, and application-specific integrated circuit (ASIC)-based forwarding engine. This single module delivers 40 Gbps of switching fabric capacity per slot, supporting 4-port 10 Gigabit Ethernet and 48-port 10/100/1000 density line cards. With hardware-enabled forwarding for IPv4, IPv6 Unicast and Multicast, and Multiprotocol Label Switching (MPLS), the Cisco RSP 720 can provide high-speed central forwarding with rich packet processing features such as access control lists (ACLs), quality of service (QoS), MPLS VPNs, and more. Combining the Cisco 7600 RSP 720 with distributed forwarding cards (DFCs), the total system performance can scale up to 400 Mpps.

The Cisco 7600 RSP 720 delivers a rich set of IP features in hardware for applications such as subscriber aggregation, IP forwarding, Layer 2 and Layer 3 MPLS VPNs, and Ethernet over MPLS (EoMPLS) with quality of service (QoS) and security features.

The Cisco 7600 RSP 720 comes integrated with two new daughter cards:

- Policy Feature Card (PFC-3C or PFC-3CXL) - Performs Layer 2 and Layer 3 forwarding in hardware with constant performance, even with intensive features enabled such as ACLs, QoS, generic routing encapsulation (GRE), or Network Address Translation (NAT); the Policy Feature Card performs the following functions:
  - Performs Layer 2 and Layer 3 forwarding
  - Enforces ACL functions
  - Performs QoS policing and marking
  - Collects NetFlow statistics
  - Offers Control Plane Policing (CoPP)
- Multilayer Switch Feature Card (MSFC4) - Runs Layer 2 and Layer 3 protocols and performs all the control-plane functions

Features and Benefits

Table 1 lists the features and benefits of the Cisco 7600 RSP 720.

Table 1. Features and Benefits of Cisco 7600 RSP 720

Features	Benefits
Integrated 720-Gbps switch fabric	• Offers Layer 2 forwarding rates of up to 30 million packets per second (Mpps) • Provides bandwidth capacity of 40 Gbps per slot • Allows additional slots for increased port density
Hardware-based Cisco Express Forwarding	• Offers Layer 3 (IP and MPLS) forwarding rates of 30 Mpps
Faster CPU and added memory (over its predecessor Supervisor Engine 720)	• Performance improvements include: ◦ Faster protocol convergence times ◦ Improved Internet Group Management Protocol (IGMP) snooping times ◦ Improved router boot-up times ◦ Faster rates of establishing Dynamic ◦ Host Configuration Protocol (DHCP) server, Label Distribution Protocol (LDP) ◦ IP sessions, and traffic engineering
High-density residential subscribers aggregation	• Allows customers to support a combination of Layer 2 VPN (L2VPN) and L3VPN features for use in a quadruple-play network

Hardware Enhancements over Supervisor Engine 720

Table 2 lists the hardware enhancements over the Supervisor Engine 720.

Table 2. Hardware Enhancements

Features	Cisco Catalyst 6500 Series/7600 Series Supervisor Engine 720-3B	Cisco Catalyst 6500 Series/7600 Series Supervisor Engine 720-3BXL	Cisco 7600 RSP 720-3C	Cisco 7600 RSP 720-3CXL
CPU; speed	MIPS; 600 MHz	MIPS; 600 MHz	PowerPC; 1.2 GHz	PowerPC; 1.2 GHz
Memory (route processor/ switch processor)	512 MB/512 MB	1 GB/1 GB	1 GB/1 GB	2 GB/1 GB
Compact Flash memory	512 MB; 1 GB (post-FCS)	512 MB; 1 GB (post-FCS)	512 MB; 1 GB (post-FCS)	512 MB; 1 GB (post-FCS)
NVRAM	2 MB	2 MB	4 MB	4 MB
FAT 32 file system	Not supported	Not supported	Supported	Supported

Scalability Table

Table 3 gives scalability information for the Cisco 7600 RSP 720.

Table 3. Scalability Information for Cisco 7600 RSP 720

Name	RSP 720-3C	RSP 720-3CXL
IPv4 routing	In hardware Up to 400 Mpps*	In hardware Up to 400 Mpps*
IPv6 routing	In hardware Up to 200 Mpps*	In hardware Up to 200 Mpps*
Layer 2 bridging	In hardware Up to 400 Mpps*	In hardware Up to 400 Mpps*
MPLS	MPLS in hardware to enable use of Layer 3 VPNs and EoMPLS tunneling; up to 1024 Virtual Route Forwarding (VRF), with a total of up to 256,000 routes per system	MPLS in hardware to enable use of Layer 3 VPNs and EoMPLS tunneling; up to 1024 VRFs, with a total of up to 1M routes per system
GRE	In hardware	In hardware

Name	RSP 720-3C	RSP 720-3CXL
NAT	Hardware assisted	Hardware assisted
Routes	256,000 (IPv4); 128,000 (IPv6)	1M (IPv4); 512K (IPv6)
NetFlow entries	128,000	256,000

Features

Table 4 lists QoS features, Table 5 lists security features, Table 6 lists MPLS features, and Table 7 lists specifications of the Cisco 7600 RSP 720.

Table 4. QoS Features of Cisco 7600 RSP 720

Feature	RSP 720-3C	RSP 720-3CXL
Aggregate rate-limiting location	Ingress port or VLAN and egress VLAN or Layer 3 port	Ingress port or VLAN and egress VLAN or Layer 3 port
Rate-limiting level types: **Committed information rate (CIR) and peak information rate (PIR)**	CIR and PIR	CIR and PIR
Flow-based rate-limiting method; number of rates	Per source address, destination address, or full flow; 64 rates	Per source address, destination address, or full flow; 64 rates
MAC ACLs featuring per-port and per-VLAN granularity	Yes	Yes

Table 5. Security Features of Cisco 7600 RSP 720

Feature	RSP 720-3C	RSP 720-3CXL
Application-control-engine (ACE) counters	Yes	Yes
Port security	Yes	Yes
IEEE 802.1x and 802.1x extensions	Yes	Yes
VLAN and router ACLs and port ACLs	Yes	Yes
Reflexive ACLs	128,000	256,000
Unicast Reverse Path Forwarding (uRPF) check in hardware	Up to 6 paths	Up to 6 paths
CPU rate limiters (denial-of-service [DoS] protection)	10 special-case rate limiters plus CoPP	10 special-case rate limiters plus CoPP
Private VLANs	Yes	Yes
MAC ACLs on IP	Yes	Yes
TCP intercept hardware acceleration	Yes	Yes

Table 6. MPLS Features

Feature	RSP 720- 3C	RSP 720-3CXL
Interface support	LAN and WAN interface modules as applicable	LAN and WAN interface modules as applicable
Label imposition and disposition (MPLS-Provider Edge) and swapping (MPLS-Provider Core)	Yes	Yes
Label Distribution Protocol (LDP)	Yes	Yes
Tag Distribution Protocol (TDP) support	Yes	Yes
MPLS VPN	Yes	Yes
VRF Lite	Yes	Yes
QoS mechanisms using experimental (EXP) bits	Yes	Yes
MPLS with Resource Reservation Protocol Traffic Engineering (MPLS-RSVP-TE)	Yes	Yes
MPLS Differentiated Services (DiffServ)-Aware Traffic Engineering (MPLS-DS-TE)	Yes	Yes

Feature	RSP 720- 3C	RSP 720-3CXL
MPLS traceroute	Yes, refer to release notes for details	Yes, refer to release notes for details
EoMPLS	Yes	Yes

Table 7. Product Specifications

Description	Specification
Supported chassis and line cards	• Cisco 7604, 7606, 7606-S, 7609, 7609-S, and 7613 • SPA interface processors (SIPs) and shared port adapters (SPAs): ◦ Cisco 7600 Series SPA Interface Processor-600 (Cisco 7600 SIP 600) ◦ Cisco 7600 SIP 400 ◦ Cisco 7600 SIP 200 • Cisco 7600 Series/Catalyst 6500 Series Enhanced FlexWAN Module • Ethernet services modules (part numbers): ◦ 7600-ES20-GE3C ◦ 7600-ES20-GE3CXL ◦ 7600-ES20-10G3C ◦ 7600-ES20-10G3CXL ◦ All 7600-ES+ Variants since SRD ◦ All 76-ES+XT variants since SRE ◦ All 76-ES+XC variants since SRE ◦ All 76-ES+T variants since SRD4 • Distributed Forwarding Cards (part numbers): ◦ DFC3C ◦ DFC3CXL ◦ DFC3B ◦ DFC3BXL • High-Density Ethernet cards (part numbers): ◦ WS-X6700 ◦ WS-6500 ◦ WS-X6400 ◦ WS-X6100
Slot requirements	Occupies the switch fabric slots in the chassis: • 4-slot chassis: slots 1 and 2 • 6-slot chassis: slots 5 and 6 • 9-slot chassis: slots 5 and 6 • 13-slot chassis: slots 7 and 8
Software compatibility	Cisco 7600 Series • RSP 720 is introduced on Cisco IOS® Software Release 12.2.33SRB train
Protocols	• Layer 3 routing protocols, Border Gateway Protocol version 4 (BGPv4), Open Shortest Path First (OSPF), Intermediate System-to-Intermediate System (IS-IS), Routing Information Protocol (RIP), Distributed Forwarding Information Base (FIB) switching, Cisco Discovery Protocol, and Internet Control Message Protocol (ICMP) • Multicast forwarding, Protocol independent Multicast (PIM) (both sparse and dense mode), (S, G), (*, G), and Bidirectional PIM in hardware • Comprehensive MPLS support • Cisco Group Management Protocol and Internet Group Management Protocol (IGMP) snooping
Reliability and availability	• Fast software upgrade (FSU) • Route Processor Redundancy+ (RPR+) • Stateful Switchover + Nonstop Forwarding (SSO + NSF) • Online insertion and removal (OIR) hot-swap
MIBs	• MPLS LDP MIB, MPLS Label Switch Router (LSR) MIB, MPLS-TE MIB, and MPLS VPN MIB; refer to software release notes for additional information • Check the following MIB finder for more information: http://www.cisco.com/public/sw-center/netmgmt/cmtk/mibs.shtml.
Network management	• Cisco Works

Description	Specification
Physical specifications	• (H x W x D): 1.6 x 15.3 x 16.3 in. (4.0 x 37.9 x 40.3 cm) • Weight: 11.5 lb
Power consumption	• 310W
Environmental conditions	• Operating temperature: 32 to 104°F (0 to 40°C) • Storage temperature: -40 to 167°F (-40 to 75°C) • Relative humidity: 10 to 90%, noncondensing • Regulatory compliance
Compliance	CE Markings • Safety ◦ UL 60950 ◦ EN 60950 ◦ CSA-C22.2 No. 60950 ◦ IEC 60950 ◦ AS/NZS 3260 ◦ IEC 60825-1, -2 ◦ EN 60825 -1, -2 ◦ 21CFR1040-10 ◦ TS001 • EMC ◦ FCC Part 15 (CFR 47) Class A ◦ ICES-003 Class A ◦ EN 55022 Class A ◦ CISPR 22 Class A ◦ AS/NZS 3548 Class A ◦ VCCI Class A ◦ EN55024 ◦ ETS300 386 ◦ EN50082-1 ◦ EN61000-6-1 • Emission ◦ 47 CFR Part 15: 2005 ◦ CISPR22: 2005 ◦ EN300386: V1.3.3 : 2005 ◦ EN55022: 1994 [+ amd 1 & 2] ◦ EN55022: 1998 ◦ EN61000-3-2: 2000 ◦ EN61000-3-3: 1995 [+ amd 1: 2001] ◦ ICES-003 Issue 4 : 2004 ◦ KN 22: 2005 ◦ VCCI: V-3/2006.04 • Immunity ◦ CISPR24: 1997 [+ amd 1 & 2] ◦ EN300386: V1.3.3 : 2005 ◦ EN50082-1: 1992 ◦ EN50082-1: 1997 ◦ EN55024: 1998 [+ amd 1 & 2] ◦ EN61000-6-1: 2001

** Check software release for availability

Ordering Information

To place an order, visit the Cisco Ordering Home Page and refer to Table 8.

Table 8. Ordering Information for Cisco 7600 RSP 720

Product Number	Description
RSP720-3C-GE(=)	RSP 720 with PFC-3C includes: • Two Gigabit Ethernet ports (port 1 supports 1-Gbps Small Form-Factor Pluggable (SFP) module; port 2 is configurable for either SFP or 10/100/1000BASE-TX through a RJ-45 connector • Integrated 720-Gbps switch fabric • PFC-3C and MSFC4 • Route processor: 1- to 4-GB DRAM (1-GB default) • Switch processor: 1- to 2-GB DRAM (1-GB default) • Two external Compact Flash Type II slots • 4-MB nonvolatile RAM (NVRAM) • 512-MB internal boot memory (Compact Flash)
RSP720-3CXL-GE(=)	RSP 720 with PFC-3CXL includes: • Two Gigabit Ethernet ports (port 1 supports 1-Gbps SFP module; port 2 is configurable for either SFP module or 10/100/1000BASE-TX through a RJ-45 connector • Integrated 720-Gbps switch fabric • PFC-3CXL (high capacity) and MSFC4 • Route processor: 1- to 4-GB DRAM (2-GB default) • Switch processor: 1- to 2-GB DRAM (1-GB default) • Two external Compact Flash Type II slots • 4-MB NVRAM • 512-MB internal boot memory (Compact Flash)
MEM-RSP720-2G **MEM-RSP720-2G**	RSP 720 2-GB memory upgrade
MEM-RSP720-4G **MEM-RSP720-4G=**	RSP 720 4-GB memory upgrade
MEM-RS720-CF1G	1-GB Compact Flash memory
MEM-RS720-CF512M	512-MB Compact Flash memory

Service and Support

Cisco offers a wide range of services programs to accelerate customer success. These innovative services programs are delivered through a unique combination of people, processes, tools, and partners, resulting in high levels of customer satisfaction. Cisco services help you protect your network investment, optimize network operations, and prepare your network for new applications to extend network intelligence and the power of your business. For more information about Cisco Services, refer to Cisco Technical Support Services or Cisco Advanced Services.

For More Information

For more information about the Cisco 7600 Series and the Cisco 7600 RSP 720, visit: http://www.cisco.com/en/US/products/hw/routers/ps368/index.html.

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