

CISCO CATALYST 6500 SERIES SWITCH SUPERVISOR ENGINE 720

The Cisco® Catalyst® 6500 Series Supervisor Engine 720 is designed to scale and deliver a rich set of hardware features enabling scalability with performance.

The hardware-based feature set can enable applications, such as Layer 2 and Layer 3 Multiprotocol Label Switching (MPLS) VPNs and Ethernet over MPLS (EoMPLS), with quality of service (QoS) and security. The Supervisor Engine 720 integrates a high-performance 720 Gbps crossbar switch fabric with a new forwarding engine in a single module, delivering 40 Gbps of switching capacity per slot (enabling 4-port 10 Gigabit Ethernet and 48-port 10/100/1000 density line cards). With hardware-enabled forwarding for IPv4, IPv6, and MPLS, the performance delivered is 400 million packets per second (mpps) of IPv4, 200 mpps of IPv6 traffic with features, and 1000 VPN Routing/Forwarding instance (VRF) with up to 700 routes/VRF for MPLS.

Security features are another strong point of the Supervisor Engine 720. With support to features such as port security, CPU rate limiters, multipath Unicast Reverse Path Forwarding (uRPF) and IEEE 802.1x with VLAN, security concerns are well addressed.

With enhanced security and gigabit and 10-gigabit scalability, the Supervisor Engine 720 is ideal for enterprise core and distribution, data centers, WAN edge, and service provider edge network deployments.

The Supervisor Engine 720 integrates the high-performance 720 Gbps switch fabric with a new routing and forwarding engine, the policy feature card 3 (PFC3) in a single module. The Supervisor Engine 720 builds on the proven Cisco Express Forwarding architecture by supporting centralized forwarding and distributed forwarding. The variants of PFC3 distinguish the Supervisor Engine 720. Currently there are two types—PFC3A and PFC3BXL—corresponding to supervisor engine part numbers WS-SUP720 and WS-SUP720-3BXL. The Supervisor Engine 720 is supported on the Cisco Catalyst Operating System and Cisco IOS® Software.



The Supervisor Engine 720 delivers scalable performance, intelligence, and a set of features to address the needs of demanding service providers and enterprise deployment requirements for building modular, resilient, scalable, and secure Layer 2 or Layer 3 solutions by:

- Delivering scalable forwarding performance—Up to 400 mpps IPv4 and 200 mpps IPv6
- 1024 VRFs with 700 routes/VRF
- Delivering up to 40 Gbps per slot of switching capacity
- Providing support for new high-performance advanced gigabit and 10 gigabit interfaces
- Protecting customer investment—Supporting all three generations of Cisco Catalyst 6500 Series interfaces and service module configurations
- Enabling an increase in Cisco Catalyst 6500 chassis interface port-density and services-module configurations

The Supervisor Engine 720 PFC3 and Multilayer Switch Feature Card 3 (MSFC3) provide the following functions:

- MSFC3—Performs Layer 3 control plane functions, including address resolution and routing protocols
- PFC3—Performs hardware-based Layer 2 to 4 packet forwarding as well as packet classification, traffic management, and policy enforcement

MSFC3

The MSFC3 is an integral part of Supervisor Engine 720, providing high performance, multilayer switching, and routing intelligence. Equipped with a high-performance processor, the MSFC runs Layer 2 protocols on one CPU and Layer 3 protocols on the second CPU. These include routing protocol support, Layer 2 protocols (shielded twisted pair, VLAN Trunking Protocol, etc.), multimedia services, and security services.

The MSFC builds the Cisco Express Forwarding Information Base table in software and downloads this table to the hardware (application-specific integrated circuits [ASICs]) on the PFC and Distributed Forwarding Card (if present) that make the forwarding decisions for IP Unicast and IP Multicast traffic.

PFC3

The Supervisor Engine 720 features a field-upgradable PFC. The PFC3 is equipped with a high-performance ASIC complex supporting a range of hardware-based features. The PFC3 supports routing and bridging functions, QoS, and multicast packet replication. The PFC also processes security policies such as access control lists (ACLs).

Table 1 Scalability

Name	Supervisor Engine 720	Supervisor Engine 720-3BXL
IPv4 Routing	In hardware 400 mpps	In hardware 400 mpps
IPv6	In hardware 200 mpps	In hardware 200 mpps
MPLS	Baseline features in hardware	Baseline and extended in hardware (EoMPLS, IP options) 1024 VRFs with 700 routes/VRF
Generic Routing Encapsulation (GRE)	In hardware	In hardware

Table 1 Scalability (Continued)

Name	Supervisor Engine 720	Supervisor Engine 720-3BXL
Network Address Translation	Hardware assisted	Hardware assisted
Routes	256 K	1 million (IPv4), 500 K (IPv6)
NetFlow Entries	128,000	256,000

Table 2 QoS Features

Feature	Supervisor Engine 720	Supervisor Engine 720-3BXL
Layer-3 Classification and Marking Access Control Entries	32 K dedicated for QoS	32 K dedicated for QoS
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), Peak Information Rate (PIR)	CIR, PIR	CIR, PIR
Aggregate Traffic Rate-limiting Policers	1023	1023
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
QoS Match on VLAN/Class of Service	No	Yes

Table 3 Security Features

Feature	Supervisor Engine 720 (PFC3A)	Supervisor Engine 720-3BXL
ACE Counters	No	Yes
Port Security	Yes	Yes
TCP Intercept Hardware Acceleration	Yes	Yes
IEEE 802.1x and 802.1x Extensions	Yes	Yes
VLAN and Router ACLs	Yes	Yes
Security ACL Entries	32 K	32 K
Reflexive ACLs	128 K	256 K
uRPF Check in Hardware	Up to six paths	Up to six paths
Multipath uRPF Checking Hardware	Yes	Yes

Table 3 Security Features (Continued)

Feature	Supervisor Engine 720 (PFC3A)	Supervisor Engine 720-3BXL
CPU Rate Limiters (Denial of Service Protection)	Several special case rate limiters	12 special case rate limiters
Private VLANs	Yes	Yes
Number of ACL Labels	512	4000
Layer 2 ACLs on IP	No	Yes

Table 4 MPLS Feature

MPLS Feature	Supervisor Engine 720 (PFC3A)1	Supervisor Engine 720-3BXL
Interface Support	LAN and WAN interface modules, as applicable	LAN and WAN interface modules, as applicable
Label Imposition/Disposition (MPLS-PE), Swapping (MPLS-P) [EXPAND "PE" AND "P"]	Yes	Yes
Label Distribution Protocol (LDP)	Yes	Yes
Tag Distribution Protocol Support (TDP)	Yes	Yes
MPLS VPN	Yes	Yes
Inter-Switch Linking and 802.1Q to VRF Mappings	Yes	Yes
VRF-select	Yes	Yes
QoS Mechanisms Using EXP [EXPAND "EXP"] bits	Yes	Yes
MPLS-Resource Reservation Protocol-Traffic Engineering	Yes	Yes
MPLS-DS-TE (Differentiated Services Aware Traffic Engineering)	Yes	Yes
MPLS over GRE (Provider Edge to Provider Edge)	No	No
MPLS Traceroute	Yes, see release notes for details	Yes, see release notes for details
IP Options in MPLS	No	Yes, see release notes for details
Any Transport Over MPLS, Including EoMPLS	No	Yes

By sharing a common set of interfaces, operating system, and management tools, the Cisco Catalyst 6500 Series supervisor engines provide operational consistency, enabling common sparing and minimizing training requirements. All modules feature predictable performance and an array of capabilities.

PRODUCT SPECIFICATIONS

Chassis Compatibility	6503, 6506, 6509, 6509-NE, 6509-NEB-A, 6513
Fan Tray and Minimum Power Supply Requirements	High-speed Fan Tray2 and 2500-Watt (W) power supply
Slot Requirements	Occupies the switch fabric slots in the chassis: 3-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	WS-SUP720 supports Cisco IOS, Cisco IOS and Catalyst OS (hybrid) for MSFC. WS-SUP720-3BXL supports Cisco IOS, Cisco IOS and Catalyst OS (hybrid) for MSFC. Requires Cisco IOS Software Release 12.2(17b)SXA and later
Protocols	<ul style="list-style-type: none"> • 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) IP Switching, Cisco Discovery Protocol, Internet Control Message Protocol (ICMP) • Traditional protocols such as IPX, AppleTalk, DECnet, VINES, Connectionless Network Service • Multicast forwarding—Protocol independent Multicast (PIM) (both sparse and dense mode), (S,G), (*,G), Bidirectional PIM in hardware • Comprehensive MPLS support • CGMP and IGMP snooping
Memory	WS-SUP720 supports 512 MB DRAM for the route processor and 512 MB for the switch processor WS-SUP720-3BXL supports 1 GB DRAM for the route processor and 1 GB DRAM for the switch processor 64 MB Boot Flash for the switch processor and 64 MB Boot Flash for the route processor
Options	Removable storage—128 MB, 256 MB, 512 MB
Uplink Ports	Two Gigabit Ethernet ports, one SFP, one selectable SFP or 10/100/100 RJ-45
Console Ports	One
Reliability and Availability	Fast software upgrade Route processor redundancy + Online insertion and removal
MIBS	MPLS LDP MIB, MPLS LSR MIB, MPLS TE MIB, MPLS VPN MIB. See software release note for additional information.
Network Management	Cisco Works
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 lbs
Power Consumption	AC—394W DC—315W Heat dissipation—1345 BTU

Chassis Compatibility	6503, 6506, 6509, 6509-NE, 6509-NEB-A, 6513
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

a.Check software release for availability

ORDERING INFORMATION

Product Number	Description
WS-SUP720	Cisco Catalyst 6500 Series Supervisor Engine, Integrated Fabric, PFC3A, MSFC3
WS-SUP720-3BXL	Cisco 6500 Series Supervisor Engine, Integrated Fabric, PFC3BXL, MSFC3
MEM-MSFC2-512MB	Cisco 6500 MSFC2 memory, 512 MB DRAM option
MEM-MSFC2-1GB	Catalyst 6000 MSFC2 memory, 1 GB DRAM option
GLC-SX-MM=	Gigabit Ethernet SFP modular multimode fiber optics, LC connector SX transceiver
GLC-LH-SM=	Gigabit Ethernet SFP modular single-mode fiber optics, LC connector LX/LH transceiver
MEM-C6K-CPTFL128M	Catalyst 6500 Supervisor Engine 720 Compact Flash memory card, 128 MB
MEM-C6K-CPTFL256M	Catalyst 6500 Supervisor Engine 720 Compact Flash memory card, 256 MB
MEM-C6K-CPTFL512M	Catalyst 6500 Supervisor Engine 720 Compact Flash memory card, 512 MB

Product Number	Description
WS-F6K-PFC3BXL	Catalyst 6500 field upgradable part to upgrade from PFC3A to PFC3BXL
WS-C6K-9SLOT-FAN2 or WS-C6K-6SLOT-FAN2 or WS-C6K-13SLT-FAN2	

SERVICE SUPPORT

Cisco offers a range of service support offerings for its customers. Whether the goal is speed to market, maximizing network availability, or enhancing customer satisfaction and retention, Cisco is committed to the success of its customers.

ADDITIONAL INFORMATION

For more information about Cisco service and support programs and benefits, go to http://www.cisco.com/public/Support_root.shtml.

For more information about the Cisco 6500 Series Switches visit <http://www.cisco.com> or call Cisco 1-800-250-4800.



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