

Cisco Catalyst 6800 Series Supervisor Engine 6T

The next-generation Cisco Catalyst 6800 Supervisor Engine 6T unlocks high performance on the Cisco Catalyst 6807-XL modular switching platform.

Product overview

The Cisco® Catalyst® 6800 Supervisor Engine 6T (Figure 1) is the newest addition to the family of supervisor engines. The Supervisor Engine 6T is designed to deliver higher performance, better scalability, and enhanced hardware-enabled features. Supervisor Engine 6T integrates a 6-Terabit crossbar switch fabric that enables high performance on the Cisco Catalyst 6807-XL Chassis in active-standby mode. The forwarding engine on Supervisor Engine 6T is capable of delivering high-performance forwarding for Layer 2 and Layer 3 services. The rich feature set of Supervisor Engine 6T supports existing applications such as traditional IP forwarding, Layer 2 and Layer 3 Multiprotocol Label Switching (MPLS) VPNs, VPLS, MACSEC while supporting new features such as Instant Access, SGT, Hardware-Enabled BFD Offload and In-band Span. The Cisco Catalyst 6800 Supervisor Engine 6T and all the features and the technical advancements establish product leadership in next-generation enterprise campus deployments.

Figure 1. Supervisor Engine 6T



Features and benefits

This section provides scalability and performance capabilities of the Supervisor Engine 6T and the functions it supports. Tables 1 through 4 show the scalability, virtualization, and security features for Supervisor Engine 6T. Tables 5 and 6 highlight the NetFlow and Multicast features.

Table 1. Base system scalability

Attribute	C6800-SUP6T	C6800-SUP6T-XL
MAC entries	128K	128K
Routes	256K (IPv4) 128K (IPv6)	Up to 1024K (IPv4) Up to 512K (IPv6)
ACL entries	64K shared for QoS and security	256K shared for QoS and security
NetFlow entries	512K per PFC4/4XL	1024K per PFC4/4XL
Multicast routes	Up to 128K (IPv4) Up to 128K (IPv6)	Up to 128K (IPv4) Up to 128K (IPv6)
IPv4 routing	In hardware Up to 780 Mpps [*]	In hardware Up to 780 Mpps [*]
IPv6 routing	In hardware Up to 390 Mpps [*]	In hardware Up to 390 Mpps [*]
Layer 2 bridging	In hardware	In hardware

Attribute	C6800-SUP6T	C6800-SUP6T-XL
	Up to 780 Mpps	Up to 780 Mpps
Jumbo frame support	Up to 9216 bytes (for bridged and routed packets)	Up to 9216 bytes (for bridged and routed packets)
VLAN	4K	4K
Bridge domains	16K	16K
MPLS	MPLS in hardware to support use of Layer 3 VPNs and Ethernet over (EoMPLS) tunneling Up to 8192 VRFs, with a total of up to 256K forwarding entries per system	MPLS in hardware to support use of Layer 3 VPNs and EoMPLS tunneling Up to 8192 VRFs, with a total of up to 1024K forwarding entries per system
Logical interfaces	128K	128K
EtherChannel hash	8 bits	8 bits
VPLS	In hardware (up to 390 Mpps)	In hardware (up to 390 Mpps)
Generic Routing Encapsulation (GRE)	In hardware (up to 390 Mpps)	In hardware (up to 390 Mpps)
Network Address Translation (NAT)	Hardware assisted	Hardware assisted
Onboard memory	4 GB	4 GB
Ingress buffers	1.25 MB per 10-Gb port in 2:1 mode 2.5 MB per 10-Gb port in 1:1 mode (10 MB per port ASIC)	1.25 MB per 10-Gb port in 2:1 mode 2.5 MB per 10-Gb port in 1:1 mode (10 MB per port ASIC)
Egress buffers	250 MB per 10-Gb port in 2:1 mode 1 GB per 40-Gb port in 2:1 mode 500 MB per 10-Gb port in 1:1 mode 2 GB per 40-Gb port in 1:1 mode (2 GB per fabric interface and replication engine (FIRE) ASIC)	250 MB per 10-Gb port in 2:1 mode 1 GB per 40-Gb port in 2:1 mode 500 MB per 10-Gb port in 1:1 mode 2 GB per 40-Gb port in 1:1 mode (2 GB per fabric interface and replication engine (FIRE) ASIC)

* Requires a fully populated 6513-E chassis with Distributed Forwarding Card₄ (DFC₄) and DFC₄XL

Table 2. QoS features and scalability

Feature	C6800-SUP6T	C6800-SUP6T-XL
Layer 3 classification and marking access control entries (ACEs)	64K shared for QoS and security	256K shared for QoS and security
Aggregate traffic rate-limiting policers	16,348	16,348
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
Layer 2 rate limiters	20 ingress, 6 egress	20 ingress, 6 egress
MAC access control lists (ACLs) featuring per-port and per-VLAN granularity	Yes	Yes
Distributed policers	Yes	Yes
Shared uFlow policers	Yes	Yes
Egress uFlow policers	Yes	Yes
Packet or byte policers	Yes	Yes
Per port per VLAN	Yes	Yes
Class of service (CoS) and differentiated services code point (DSCP)-based queue mapping	Yes	Yes
Deficit Weighted Round Robin Scheduler (DWRR) and Weighted Random Early Detection Scheduler (WRED)	Yes	Yes
Traffic shaping	Yes	Yes
Hierarchical QoS	2-level	2-level

Feature	C6800-SUP6T	C6800-SUP6T-XL
Receive and transmit queues	Default: 1p7q4t Configurable: 2p6q4t	Default: 1p7q4t Configurable: 2p6q4t

Table 3. Security features and scalability

Feature	C6800-SUP6T	C6800-SUP6T-XL
Port security	Yes	Yes
IEEE 802.1x and 802.1x extensions	Yes	Yes
VLAN and router ACLs and port ACLs	Yes	Yes
1:1 mask ratio to ACE values	Yes	Yes
Security ACL entries	64K shared for QoS and security	256K shared for QoS and security
CPU rate limiters (DoS protection)	57	57
Unicast Reverse Path Forwarding (uRPF) check (IPv4/IPv6)	Up to 16	Up to 16
Number of interfaces with a unique ACL	16K	16K
RPF interfaces	16	16
Private VLANs	Yes	Yes
MAC ACLs on IP	Yes	Yes
Layer 2 and Layer 3 Cisco TrustSec [®] (Security Group Tagging and Security Group Access Control List)	Yes	Yes
IEEE 802.1ae (MACsec) Layer 2 encryption in hardware	Yes	Yes
CPU hardware rate limiters by PPS or BPS	Yes	Yes
Control Plane Policing (CoPP) for multicast	Layer 2 and 3 support	Layer 2 and 3 support
CoPP for exceptions (MTU, TTL)	Yes	Yes
CoPP exceptions NetFlow support	Yes	Yes
ACL labels	16K	16K
Port ACL	8K	8K
ACL dry run	Yes	Yes
Hitless ACL changes	Yes	Yes

Table 4. MPLS and virtualization features

Feature	C6800-SUP6T	C6800-SUP6T-XL
Virtual Switching System (VSS)	Yes	Yes
Instant access	Yes	Yes
Label imposition and disposition (MPLS-PE), swapping (MPLS-P)	Yes	Yes
Label Distribution Protocol (LDP)	Yes	Yes
MPLS VPN	Yes	Yes
Virtual Route Forwarding (VRF) Lite	Yes	Yes
Easy Virtual Network (EVN)	Yes	Yes
QoS mechanisms using experimental (EXP) bits	Yes	Yes
MPLS-RSVP-TE	Yes	Yes
MPLS TE tunnels	1K	1K
MPLS differentiated services (diffserv)-aware traffic engineering (MPLS-DS-TE)	Yes	Yes
MPLS traceroute	Yes	Yes

Feature	C6800-SUP6T	C6800-SUP6T-XL
EoMPLS	Yes	Yes
EoMPLS tunnels	16K	16K
IPv4 and IPv6 in IPv6 tunneling	Yes	Yes
IPv6 in IPv4 tunneling (Intra-Site Automatic Tunnel Addressing Protocol [ISATAP], 6to4, GRE)	Yes	Yes
QoS support for uniform, short pipe, and pipe mode tunnel	Yes	Yes
Native virtual private LAN services (VPLS) in hardware	Yes	Yes
Hierarchical VPLS	Yes	Yes
VPLS pseudo-wire	4K	4K
Native Layer 2-over-multipoint GRE	Yes	Yes
VRF-aware operational contexts	Yes	Yes
VPN NetFlow support	Yes	Yes
VPN-aware NAT	Yes	Yes
VRF-lite scalability	VLAN reuse per subinterface	VLAN reuse per subinterface
Per-VPN interface statistics	Yes	Yes

Table 5. NetFlow features

Feature	C6800-SUP6T	C6800-SUP6T-XL
NetFlow support in hardware	Yes	Yes
Flexible NetFlow	Yes	Yes
Sampled NetFlow	Yes	Yes
Ingress and egress NetFlow	Yes	Yes
L2 NetFlow	Yes	Yes
MPLS ingress and egress NetFlow	Yes	Yes
Copy-based sampling	Yes	Yes
Yielding NDE	Yes	Yes
Per-VRF NetFlow	Yes	Yes
Multiple exporters	Yes	Yes
IPFIX	Yes	Yes

Table 6. Multicast features

Feature	C6800-SUP6T	C6800-SUP6T-XL
IGMPv3 snooping in hardware	Yes	Yes
IPv6 MLDv2 snooping in hardware	Yes	Yes
PIM registers in hardware	Yes	Yes
Label Switched Multicast (LSM)	Yes	Yes
Ingress and egress replication in hardware	Yes	Yes

Platform support and compatibility

Table 7 shows the product compatibility and specifications. Table 8 outlines optics support.

Table 7. Product compatibility and specifications

Product	Specifications
Chassis compatibility	<ul style="list-style-type: none"> 6500 E-Series*: Cisco Catalyst 6503-E, 6504-E, 6506-E, 6509-E, 6509-V-E, 6513-E

Product	Specifications
Switch fabric	<ul style="list-style-type: none"> 6800 Series: Cisco Catalyst 6807-XL 6-Tbps crossbar switch fabric with 28 fabric channels
Line card compatibility	<ul style="list-style-type: none"> C6800-8P40G, C6800-8P40G-XL C6800-8P10G, C6800-8P10G-XL C6800-16P10G, C6800-16P10G-XL C6800-32P10G, C6800-32P10G-XL C6800-48P-SFP, C6800-48P-SFP-XL C6800-48P-TX, C6800-48P-TX-XL WS-X6904-40G-2T, WS-X6904-40G-2TXL WS-X6908-10G-2T, WS-X6908-10G-2TXL WS-X6824-SFP-2T, WS-X6824-SFP-2TXL WS-X6848-SFP-2T, WS-X6848-SFP-2TXL WS-X6848-TX-2T, WS-X6848-TX-2TXL WS-X6816-10T-2T, WS-X6816-10T-2TXL WS-X6816-10G-2T, WS-X6816-10G-2TXL With a DFC4 or DFC4XL upgrade (WS-F6k-DFC4-A, WS-F6k-DFC4-AXL) WS-X6704-10GE WS-X6724-SFP WS-X6748-SFP WS-X6748-GE-TX With a DFC4 or DFC4XL upgrade (WS-F6k-DFC4-E, WS-F6k-DFC4-EXL) WS-X6716-10GE WS-X6716-10T
Service Modules	No Service Modules are supported
Supported IA clients	<ul style="list-style-type: none"> C6800A-48TD – 48-port data-only IA C6800A-48FPD – 48-port PoE/PoE+ C6800A-48FPDR – 48-port PoE/PoE+ WS-C3560CX-12PD-S – 12-port PoE, 8-port PoE+ WS-C3560CX-8XPD-S – 8-port PoE
Slot requirements	<p>Occupies the Supervisor slots as follows:</p> <ul style="list-style-type: none"> 3-slot E-chassis – slots 1 and 2 4-slot E-chassis – slots 1 and 2 6-slot E-chassis – slots 5 and 6 7-slot 6807-XL chassis – slots 3 and 4 9-slot V-E chassis – slots 5 and 6 9-slot E-chassis – slots 5 and 6 13-slot E-chassis – slots 7 and 8
Software compatibility	<ul style="list-style-type: none"> Cisco IOS[®] Software Release 15.3(1)SY and future releases
Software packages	<ul style="list-style-type: none"> IP Services Advanced Enterprise
Mgmto	<ul style="list-style-type: none"> RJ45/SFP replaces the connectivity management processor (CMP)
DRAM	<ul style="list-style-type: none"> 4-GB DDR3 for Standard and XL
NVRAM	<ul style="list-style-type: none"> 4 MB
Bootdisk	<ul style="list-style-type: none"> 4 GB (eUSB)
Disk o	<ul style="list-style-type: none"> USB type A host drive
USB console port	<ul style="list-style-type: none"> USB type B mini
Management LED	<ul style="list-style-type: none"> Blue Beacon LED
Uplink ports	<ul style="list-style-type: none"> 8 x 1-Gb/10-Gb Small Form Factor Pluggable Plus (SFP+) ports 2 x 40-Gb QSFP ports
Console ports	<ul style="list-style-type: none"> RJ-45 serial USB mini B USB console RJ-45 management Ethernet port SFP fiber management port

Product	Specifications
Reliability and availability	<ul style="list-style-type: none"> Stateful Switchover + Nonstop Forwarding (SSO+NSF) Fast Software Upgrade (FSU) Enhanced Fast Software Upgrade (EFSU) – (Single Box, 2 Supervisors) In-Service Software Upgrade (ISSU) – (VSS, VS4O) Online insertion and removal (OIR) hot swap of power supplies, modules, fan trays, supervisors
MIBs	<ul style="list-style-type: none"> Check the Cisco MIB finder for more information: http://www.cisco.com/public/sw-center/netmqmt/cmtk/mibs.shtml
Network management	<ul style="list-style-type: none"> Cisco Prime™ Infrastructure Cisco Application Policy Infrastructure Controller – Enterprise Module (APIC-EM) Simple Network Management Protocol (SNMP), Remote Monitoring (RMON)
Physical specifications	<ul style="list-style-type: none"> (H x W x D): 1.73 x 14.4 x 16 in (4.4 x 36.6 x 40.6 cm) Weight: 11.64 lbs, 11.73 lbs (XL)
Power consumption	<ul style="list-style-type: none"> Standard: 341 W maximum XL: 354 W maximum
ECC	<ul style="list-style-type: none"> ECC protection support
Environmental conditions	<ul style="list-style-type: none"> 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 percent, noncondensing

* SW Support for the Sup6T on the 6500-E chassis will be available in 2H 2016 and will not be available at FCS

Table 8. Optics support

Transceiver	Type and details
GLC-GE-100FX	100 Mbps SFP
GLC-T	1-Gb SFP
GLC-SX-MM	1-Gb SFP
GLC-LH-SM	1-Gb SFP
GLC-SX-MMD	1-Gb SFP
GLC-LH-SMD	1-Gb SFP
GLC-EX-SMD	1-Gb SFP
GLC-ZX-SMD	1-Gb SFP
GLC-BX-U	1-Gb SFP
GLC-BX-D	1-Gb SFP
SFP-10G-SR	10-Gb SFP+
SFP-10G-LR	10-Gb SFP+
SFP-10G-LRM	10-Gb SFP+
SFP-10G-ER	10-Gb SFP+
SFP-10G-ZR	10-Gb SFP+
SFP-10G-SR-S	10-Gb S-Class SFP+
SFP-10G-LR-S	10-Gb S-Class SFP+
SFP-10G-ER-S	10-Gb S-Class SFP+
SFP-10G-ZR-S	10-Gb S-Class SFP+
SFP-10G-BX40D-I	10-Gb BiDi SFP+
SFP-10G-BX40U-I	10-Gb BiDi SFP+
CWDM-SFP10G-1590	10-Gb CWDM SFP+
DWDM-SFP10G	10-Gb DWDM SFP+
SFP-H10GB-CU1M	10-Gb passive copper cable
SFP-H10GB-CU1-5M	10-Gb passive copper cable
SFP-H10GB-CU2M	10-Gb passive copper cable

Transceiver	Type and details
SFP-H10GB-CU2-5M	10-Gb passive copper cable
SFP-H10GB-CU3M	10-Gb passive copper cable
SFP-H10GB-CU5M	10-Gb passive copper cable
SFP-H10GB-ACU7M	10-Gb active copper cable
SFP-H10GB-ACU10M	10-Gb active copper cable
SFP-10G-AOC1M	10-Gb active optical cable
SFP-10G-AOC2M	10-Gb active optical cable
SFP-10G-AOC3M	10-Gb active optical cable
SFP-10G-AOC5M	10-Gb active optical cable
SFP-10G-AOC7M	10-Gb active optical cable
SFP-10G-AOC10M	10-Gb active optical cable
QSFP-40G-SR4	40-Gb QSFP
QSFP-40G-CSR4	40-Gb QSFP
QSFP-40G-LR4	40-Gb QSFP
QSFP-40G-SR-BD	40-Gb QSFP
QSFP-H40G-CU1M	40-Gb passive copper cable
QSFP-H40G-CU3M	40-Gb passive copper cable
QSFP-H40G-CU5M	40-Gb passive copper cable
QSFP-H40G-ACU7M	40-Gb active copper cable
QSFP-H40G-ACU10M	40-Gb active copper cable
QSFP-H40G-AOC1M	40-Gb active copper cable
QSFP-H40G-AOC2M	40-Gb active copper cable
QSFP-H40G-AOC3M	40-Gb active copper cable
QSFP-H40G-AOC5M	40-Gb active copper cable
QSFP-H40G-AOC7M	40-Gb active copper cable
QSFP-H40G-AOC10M	40-Gb active copper cable
QSFP-H40G-AOC15M	40-Gb active copper cable
QSFP-4SFP10G-CU1M	40-Gb to 4x10-Gb passive copper breakout cable
QSFP-4SFP10G-CU3M	40-Gb to 4x10-Gb passive copper breakout cable
QSFP-4SFP10G-CU5M	40-Gb to 4x10-Gb passive copper breakout cable
QSFP-4X10G-AC7M	40-Gb to 4x10-Gb active copper breakout cable
QSFP-4X10G-AC10M	40-Gb to 4x10-Gb active copper breakout cable
QSFP-4X10G-AOC1M	40-Gb to 4x10-Gb active optical breakout cable
QSFP-4X10G-AOC2M	40-Gb to 4x10-Gb active optical breakout cable
QSFP-4X10G-AOC3M	40-Gb to 4x10-Gb active optical breakout cable
QSFP-4X10G-AOC5M	40-Gb to 4x10-Gb active optical breakout cable
QSFP-4X10G-AOC7M	40-Gb to 4x10-Gb active optical breakout cable
QSFP-4X10G-AOC10M	40-Gb to 4x10-Gb active optical breakout cable

Product compliance

Table 9 shows compliance standards.

Table 9. Product compliance

Regulatory Compliance	
Safety	<ul style="list-style-type: none"> • UL 60950-1 • CAN/CSA-C22.2 No. 60950-1 • EN 60950-1 • IEC 60950-1 • AS/NZS 60950-1 • GB4943
EMC: Emissions	<ul style="list-style-type: none"> • 47CFR Part 15 (CFR 47) Class A • AS/NZS CISPR22 Class A • CISPR22 Class A • EN55022 Class A • ICES003 Class A • VCCI Class A • EN61000-3-2 • EN61000-3-3 • KN22 Class A • CNS13438 Class A
EMC: Immunity	<ul style="list-style-type: none"> • EN50082-1 • EN61000-6-1 • EN55024 • CISPR24 • EN300386 • KN 61000-4 Series

Ordering information

To place an order, visit the [Cisco Ordering Home Page](#). Tables 10 and 11 provide part numbers for the Supervisor Engine models and software.

Table 10. Supervisor Engine and memory part number

Part Number	Description
C6800-SUP6T	Cisco Catalyst 6800 Series Supervisor Engine 6T
C6800-SUP6T-XL	Cisco Catalyst 6800 Series Supervisor Engine 6T XL
C6800-SUP6T=	Cisco Catalyst 6800 Series Supervisor Engine 6T Spare
C6800-SUP6T-XL=	Cisco Catalyst 6800 Series Supervisor Engine 6T XL Spare

Table 11. Software part numbers

Software Part Number	Description
SP6TAEK9-15301SY	Cisco CAT6800-S6T IOS ADV ENT SERV FULL ENCRYPT
SP6TAEK9N-15301SY	Cisco CAT6800-S6T IOS ADVANCED ENTERPRISE SERVICES NPE
SP6TISK9-15301SY	CAT6800-S6T IOS IP SERV LAN ONLY FULL ENCRYPT
SP6TISK9N-15301SY	CAT6800-S6T IOS IP SERV LAN ONLY NPE

Warranty information and technical service options

The Cisco Catalyst 6500 C4 System comes with a Cisco 90-day hardware warranty. Adding a contract for a technical service offering such as Cisco SMARTnet™ Service to your device coverage provides access to the Cisco Technical Assistance Center (TAC) and can provide a variety of hardware replacement options to meet critical business needs, updates for licensed OS software, and registered access to the extensive Cisco.com knowledge base and support tools.

For more information about Cisco warranties, visit <http://www.cisco.com/go/warranty>.

For information about Cisco Technical Services, visit <http://www.cisco.com/go/ts>.

Table 12 shows the Cisco technical services available for the Cisco Catalyst 6500 C4 System.

Table 12. Cisco technical services for Cisco Catalyst 6500 C4 System

Technical Services
<p>Cisco SMARTnet® Service</p> <ul style="list-style-type: none"> • 24-hour global access to the Cisco TAC • Unrestricted access to the extensive Cisco.com resources, communities, and tools • Next-business-day, 8x5x4, 24x7x4, and 24x7x2 advance hardware replacement² and onsite parts replacement and installation available • Ongoing operating system software updates within the licensed feature set¹ • Proactive diagnostics and real-time alerts on Cisco Smart Call Home enabled devices <p>Cisco Focused Technical Support Services</p> <p>Three levels of premium, high-touch services are available:</p> <ul style="list-style-type: none"> • Cisco High-Touch Operations Management Service • Cisco High-Touch Technical Support Service • Cisco High-Touch Engineering Service <p>Valid Cisco SMARTnet or SP Base contracts on all network equipment are required.</p>

Footnotes:

¹ Cisco operating system updates include maintenance releases, minor updates, and major updates within the licensed feature set.

² Advance hardware replacement is available in various service-level combinations. For example, 8x5xNBD indicates that shipment will be initiated during the standard 8-hour business day, 5 days a week (the generally accepted business days within the relevant region), with next-business-day (NBD) delivery. Where NBD is not available, same-day shipping is provided. Restrictions apply; review the appropriate service descriptions for details.

Cisco and partner services

Get innovative, highly secure, intelligent services in your Cisco Enterprise Networks Architecture using personalized services from Cisco and our partners. Through a discovery process that begins with understanding your business objectives, we help you integrate the new Cisco Catalyst 6500-C4 System into your architecture and incorporate network services onto that platform.

Sharing knowledge and leading practices, we support your success every step of the way as you deploy, absorb, manage, and scale new technology. Choose from a flexible suite of support services designed to meet your business needs and help you maintain high-quality network performance while controlling operational costs. For additional information about Cisco services, visit

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For more information

For more information about Cisco Catalyst 6800 Series Switches, visit <http://www.cisco.com/c/en/us/products/switches/catalyst-6800-series-switches/index.html>.

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