

S7700 Series Smart Routing Switches





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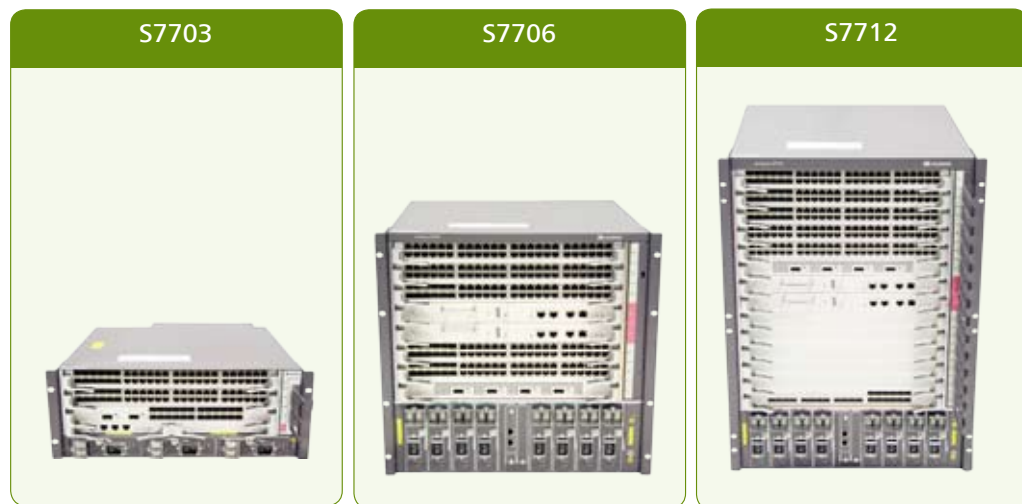
Product Overview

The S7700 series switches (S7700 for short) are high-end smart routing switches designed for next-generation enterprise networks. The S7700 design is based on Huawei's intelligent multi-layer switching technology to provide intelligent service optimization methods, such as MPLS VPN, traffic analysis, comprehensive QoS policies, controllable multicast, load balancing, and security, in addition to high-performance Layer 2 to Layer 4 switching services. The S7700 also features superb scalability and reliability.

The S7700 can function either as an aggregation or core node on a campus network or in a data center to provide integrated wireless access. The S7700 also offers voice, video, and data services, helping enterprises build an integrated cost-effective end-to-end network.

Product Appearance

The S7700 series is available in three models: S7703, S7706, and S7712. The switching capacity and port density of all three models is expandable. The S7700 is based on a new hardware platform, which adopts a left-to-rear ventilation channel to achieve better energy efficiency. Key components work in redundancy mode to minimize risks of system breakdown and service interruption. Using innovative energy-saving chips, the S7700 provides an industry-leading solution for a sustainable energy-saving network.



Product Features

Powerful service processing capabilities

- Huawei's advanced switching architecture permits rapid bandwidth expansion. The highly expandable backplane enables ports to be upgraded to a rate of 40 Gbit/s or 100 Gbit/s, and is compatible with the currently used cards, helping enterprises maximize their ROI.
- Each 7700 supports 480 10GE ports. The high density of 10GE ports brings enterprise campus networks and data centers into the era of the all-10GE core network.
- The S7700's multi-service routing and switching platform meets requirements for service bearing at the access layer, aggregation layer, and core layer of enterprise networks. The S7700 provides wireless access along with voice, video, and data services, helping enterprises build integrated full-service networks with high availability and low latency.
- The S7700 supports distributed Layer 2/Layer 3 MPLS VPN functions, including MPLS, VPLS, HVPLS, and VLL, implementing VPN access for enterprise users.
- The S7700 supports various Layer 2 and Layer 3 multicast protocols such as PIM SM, PIM DM, PIM SSM, MLD, and IGMP snooping. It can provide enterprises with multi-terminal high definition video surveillance and video conferencing services.

Carrier-class reliability and visual fault diagnosis

- Huawei's high reliability design ensures that the S7700 is 99.999% reliable. The S7700 provides redundant backup for key components, including MPUs, power supply units, and fans, all of which are hot swappable.
- The S7700 innovatively implements the CSS function through switch fabrics, and packets are only switched once when they are forwarded between chassis. This addresses the problem of low switching efficiency caused by multiple switching processes during inter-chassis forwarding in clusters established using line cards. The cluster provides the industry's highest cluster bandwidth 256 Gbit/s. In addition, inter-chassis link aggregation can be used to improve link use efficiency and prevent single-point failures.
- The S7700 can use service ports as cluster ports, so that cluster members can be connected through optical fibers. This substantially expands the clustering distance.
- The S7700 has a dedicated fault detection subcard that provides hardware-based OAM function conforming to IEEE 802.3ah, 802.1ag, and ITU-Y.1731. Hardware-based OAM implements 3.3 ms fault detection and can check session connectivity of all terminals in real time when a network fault occurs. The S7700 can also work with an NMS. The NMS provides a graphical fault diagnosis interface and traverses all network elements and links automatically to help users detect and locate faults quickly.
- The S7700 implements seamless switchover between the master and slave MPUs and supports graceful restart to ensure nonstop forwarding. The in-service software upgrade (ISSU) function of the S7700 prevents interruption of key services during software upgrading.

Enhanced QoS mechanism, improving the voice and video experience

- The S7700's QoS control mechanisms classify traffic based on information from the link layer to the application layer. With advanced queue scheduling and congestion control algorithms, the S7700 performs accurate multi-level scheduling for data flows, satisfying enterprises' QoS requirements for a variety of services and user terminals.
- The S7700 supports hardware-based low delay queues for multicast packets so that the video service can be processed with high priority and low delay. This feature guarantees the high quality of key services in an

enterprise, such as video conference and surveillance.

- The S7700 uses innovative priority scheduling algorithms to optimize the QoS queue scheduling mechanism for voice and video services. The improved scheduling mechanism shortens the delay of the VoIP service and eliminates the pixelation effect in the video service, improving user experience.

High-performance IPv6 service processing, resulting in a smooth transition from IPv4 to IPv6

- Both the hardware platform and software platform of the S7700 support IPv6. The S7700 has earned the IPv6 Ready Phase 2 (Gold) designation.
- The S7700 supports IPv4/IPv6 dual stack, various tunneling technologies, IPv6 static routing, RIPng, OSPFv3, BGP+, IS-ISv6, and IPv6 multicast. These features meet the demand for IPv6 networking and combined IPv4 and IPv6 networking.

Intelligent traffic load balancing, improving enterprises' network efficiency

- The S7700's load balancer supports multiple load balancing algorithms, including the weighted round robin (WRR) algorithm, least connection algorithm, hash algorithm based on the IP address, and hash algorithm based on the URL in HTTP packets.
- The S7700's load balancer supports the multiplexing of TCP and HTTP connections to reduce the workloads for establishing and closing TCP connections, therefore increasing the access rate of Web portal servers.
- The S7700's load balancer supports dynamic traffic locking to implement load balancing for online shopping on e-commerce websites.

Superb traffic analysis capability, resulting in real-time network performance monitoring

- The S7700 supports NetStream for the real-time collection and analysis of network traffic statistics.
- The S7700 supports the V5, V8, and V9 Netstream formats and provides aggregation traffic templates to reduce the burden on the network collector system. In addition, the S7700 supports real-time traffic collection, dynamic report generation, traffic attribute analysis, and traffic exception trap.
- NetStream monitors network traffic in real time and analyzes the device's throughput, providing data for network structure optimization and capacity expansion.

Comprehensive security mechanisms, protecting enterprises from internal and external security threats

- The S7700 comes equipped with an integrated firewall card and supports virtual firewalls and NAT multi-instance, allowing multiple VPN customers to share the same firewall. Its application-layer packet filtering technology detects and filters application layer packets according to preset rules.
- The S7700 provides comprehensive NAC solutions for enterprise networks. It supports MAC address authentication, Portal authentication, 802.1x authentication, and DHCP snooping-triggered authentication. These authentication methods ensure the security of various access modes, such as dumb terminal access, mobile access, and centralized IP address allocation.
- The S7700 is the industry leader in integrated security solutions. It supports 1K CPU queues and uses a 2-level CPU protection mechanism, separating the data plane from the control plane. Additionally, the S7700 defends against DoS attacks, prevents unauthorized access, and prevents control plane overloading.

Wireless AC boards, meeting mobile office requirements

- The S7700 can use an access controller (AC) board to provide radio frequency management functions. The AC board allows access points (APs) to automatically select their radio channels and power. In an AP region, APs automatically adjust radio channels and power in the event of signal interference, enabling the receive signal strength indicator (RSSI) and signal-to-noise ratio (SNR) to be continuously updated. The system can then monitor the electromagnetic environment of every wireless user to improve network availability.
- The S7700's AC board supports multiple authentication methods, including 802.1x authentication, MAC address authentication, Portal authentication, and WAPI authentication. These authentication methods meet the requirements of users who use different types of STAs and require different security levels.
- The S7700's AC board supports Layer 2 roaming, allowing STAs to rapidly switch between APs. The S7700 supports 1+1 and N+1 cold backup between ACs and load balancing among ACs, improving network reliability.

Innovative energy-saving chips, allowing for intelligent power consumption control

- The S7700 uses innovative energy-saving chips, which can dynamically adjust power on all ports based on traffic volume. An idle port enters a sleep mode to reduce power consumption.
- The S7700 supports Power over Ethernet (PoE) and uses different energy management modes according to the powered device (PD) type, ensuring flexible energy management.
- The S7700 supports IEEE 802.3az Energy Efficient Ethernet and provides the low power idle mode for the PHY line card. If the link utilization is low, the S7700 switches to a lower speed or power PHY to reduce power consumption.

Product Specifications

Item	S7703	S7706	S7712
Backplane capacity	3 Tbps	6 Tbps	12 Tbps
Switching capacity	768 G/1.92 T	2 T/5.12 T	2 T/5.12 T
Forwarding performance	576 Mpps/1440 Mpps	1152 Mpps/ 2880Mpps	1344 Mpps/3360 Mpps
Service Slot	3	6	12
VLAN	Three types of interfaces: access, trunk, and hybrid		
	Default VLAN		
	VLAN switching		
	QinQ and selective QinQ		
	MAC address-based VLAN assignment		
MAC address	MAC address learning and aging		
	Static, dynamic, and blackhole MAC address entries		
	Packet filtering based on source MAC addresses		
	Limit on the number of MAC addresses learned on ports and VLANs		
STP	STP(IEEE 802.1d), RSTP(IEEE 802.1w), and MSTP(IEEE 802.1s)		
	BPDU protection, root protection, and loop protection		
	BPDU tunnel		

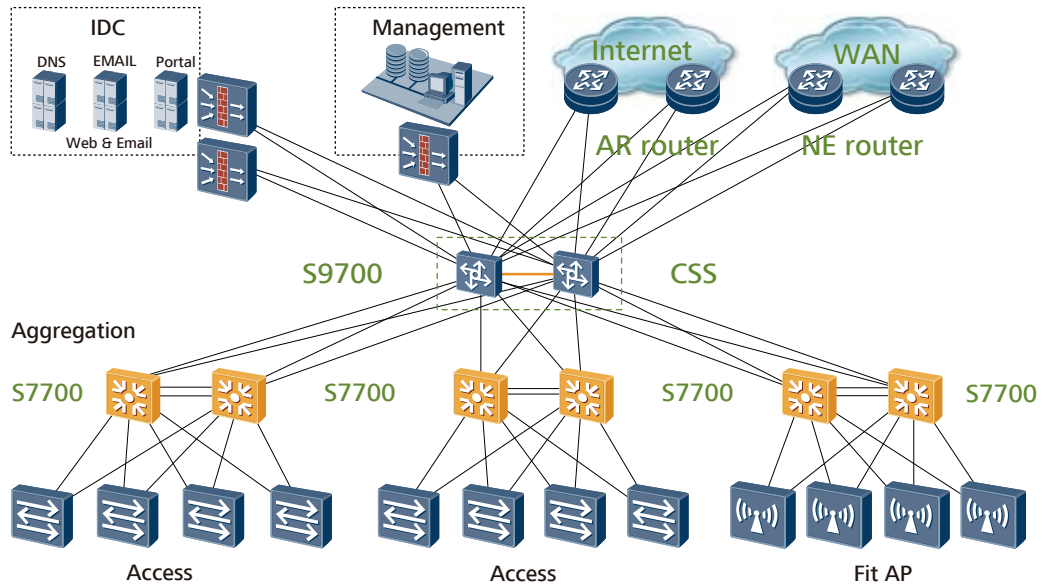
Item	S7703	S7706	S7712
IP routing	IPv4 routing protocols, such as RIP, OSPF, BGP, and IS-IS		
	IPv6 dynamic routing protocols, such as RIPng, OSPFv3, ISISv6, and BGP4+		
Multicast	IGMPv1/v2/v3 and IGMP v1/v2/v3 snooping		
	PIM-DM, PIM-SM, and PIM-SSM		
	MSDP and MBGP		
	Fast leave		
	Multicast traffic control		
	Multicast querier		
	Multicast packet suppression		
	Multicast CAC		
MPLS	Multicast ACL		
	Basic MPLS functions		
	MPLS OAM		
	MPLS-TE		
Reliability	MPLS VPN/VLL/VPLS		
	LACP and E-Trunk between devices		
	VRRP and BFD for VRRP		
	BFD for BGP/IS-IS/OSPF/static route		
	NSF and GR for BGP/IS-IS/OSPF/LDP		
	TE FRR and IP FRR		
	Ethernet OAM (IEEE 802.3ah and 802.1ag)		
	ITU-Y.1731		
	DLDP		
	ISSU		
QoS	CSS		
	Traffic classification based on Layer 2 protocol packet header, Layer 3 protocol information, Layer 4 protocol information, and 802.1p priority		
	ACL, CAR, re-mark, and scheduling		
	Queue scheduling algorithms including PQ, WRR, DRR, PQ+WRR, and PQ+DRR		
	Congestion avoidance mechanisms, such as WRED and tail drop		
	Traffic shaping		

Item	S7703	S7706	S7712
Configuration and maintenance	Console, Telnet, and SSH terminals		
	Network management protocols, such as SNMPv1/v2/v3		
	File uploading and downloading using FTP and TFTP		
	BootROM upgrade and remote upgrade		
	Hot patches		
	User operation logs		
Security and management	802.1x authentication and portal authentication		
	NAC		
	RADIUS and HWTACACS authentication		
	Different user levels for commands, preventing unauthorized users from using certain commands		
	Defense against DoS attacks, TCP SYN Flood attacks, UDP Flood attacks, broadcast storms, and heavy traffic attacks		
	1K CPU queues		
	Ping and traceroute		
	RMON		
Value-added service	Firewall		
	NAT		
	Netstream		
	IPSec		
	Load balancing		
	AC		
Energy conservation	IEEE 802.3az: Energy Efficient Ethernet (EEE)		
Dimensions (W x D x H)	442 mm x 476 mm x 175 mm	442 mm x 476 mm x 442 mm	442 mm x 476 mm x 664 mm
Chassis weight (empty)	< 15 kg	<30 kg	< 45 kg
Working voltage	DC: -38.4 V to -72 V AC: 90 V to 290 V		
Maximum power (excluding PoE power)	800 W	1600 W	1600 W
Maximum PoE power	2200 W	8800 W	8800 W

Applications

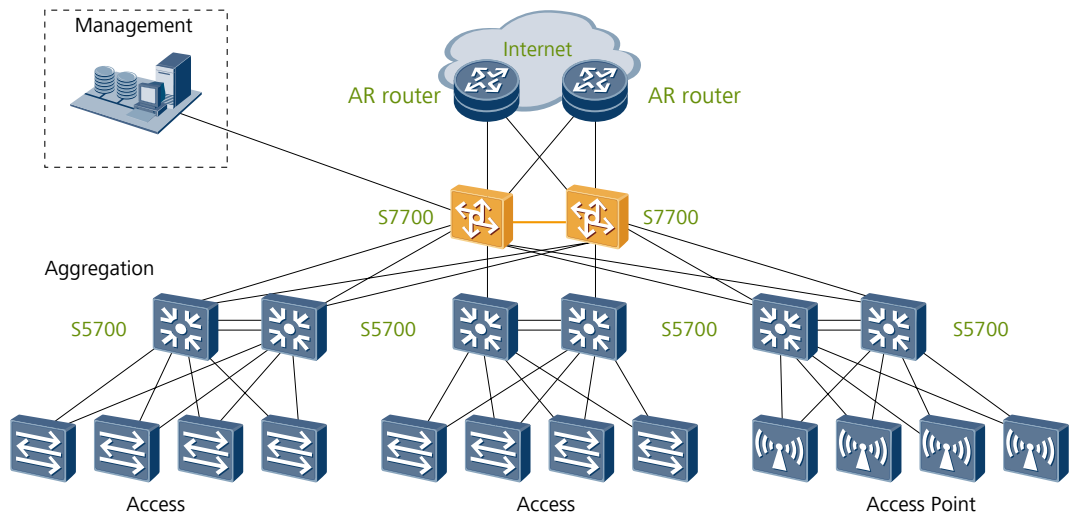
Large-scale Campus Networks

The S7700 provides a switching capacity of 2 Tbit/s and high-density 10GE ports. The S7700 can be used as an aggregation switch on a large-scale campus network, helping to build a highly reliable, scalable, and manageable enterprise network. With hardware-based CPU queue scheduling and firewall modules, the S7700 enhances security at the aggregation layer and protects the enterprise's core network from DDoS attacks and other security threats.



Small - and Medium-sized Campus Networks

The S7700 implements the line-speed forwarding of OSPF, BGP, and MPLS packets. With its 2 Tbit/s switching capacity, firewall module, and IPSec module, the S7700 can work at the core layer of small- and medium-sized campus networks. It provides a cost-effective, reliable, and easy-to-deploy network solution for small- and medium-sized enterprises.



Product List

Basic Configuration	
LE0BN66EDC	DC Assembly Rack (600X600X2200mm)
LE0BN66EAC	AC Assembly Rack (600X600X2200mm)
ES0B00770300	S7703 Assembly Chassis
ES0B00770600	S7706 Assembly Chassis
ES0B00771200	S7712 Assembly Chassis
ES0B017706P0	S7706 POE Assembly Chassis
ES0B017712P0	S7712 POE Assembly Chassis
LE0M00FBXB00	Wide Voltage Fan Box
LE0MACPJXB01	APD32-2-4 Distribution Box
Monitoring Board	
LE0DCMUA0000	Centralized Monitoring Board
Main Control Unit	
ES0D00MCUA00	S7703 Main Control Unit A
ES0D00SRUA00	S7706/S7712 Main Control Unit A
ES0D00SRUB00	S7706/S7712 Main Control Unit B, Clock
SRU Service Card	
ES0D00FSUA00	Enhanced Flexible Service Unit
LE0D0VSTSA00	Cluster Switching System Service Unit
10/100BASE-T Interface Card	
ES0D0F48TA00	48-Port 10/100BASE-T Interface Card (EA, RJ45)
ES0DF48TFA00	48-Port 10/100BASE-T Interface Card (FA, RJ45)
ES0D0F48TC00	48-Port 10/100BASE-T Interface Card (EC, RJ45)

10/100/1000BASE-T Interface Card	
ES0DG24TFA00	24-Port 10/100/1000BASE-T Interface Card (FA, RJ45)
ES0D0G48TA00	48-Port 10/100/1000BASE-T Interface Card (EA, RJ45)
ES0DG48TFA00	48-Port 10/100/1000BASE-T Interface Card (FA, RJ45)
ES0D0G48TC00	48-Port 10/100/1000BASE-T Interface Card (EC, RJ45)
ES0D0T24XA00	24-Port 10/100/1000BASE-T and 2-Port 10GBASE-X Interface Card (EA,RJ45/XFP)
100/1000BASE-X Interface Card	
ES0D0G24SA00	24-Port 100/1000BASE-X Interface Card (SA, SFP)
ES0D0G24SC00	24-Port 100/1000BASE-X Interface Card (EC, SFP)
ES0D0G24CA00	24-Port 100/1000BASE-X and 8-Port 10/100/1000BASE-T Combo Interface Card (SA, SFP/RJ45)
ES0D0S24XA00	24-Port 100/1000BASE-X and 2-Port 10GBASE-X Interface Card (EA, SFP/XFP)
ES0D0G48SA00	48-Port 100/1000BASE-X Interface Card (EA, SFP)
ES0D0G48SC00	48-Port 100/1000BASE-X Interface Card (EC, SFP)
ES1D2G48SFA0	48-Port 100/1000BASE-X Interface Card (FA, SFP)
ES1D2G48SED0	48-Port 100/1000BASE-X Interface Card (ED, SFP)
100/1000BASE-X Interface Card	
ES0DG48CEAT0	36-Port 10/100/1000BASE-T and 12-Port 100/1000BASE-X Interface Card (EA, RJ45/SFP)
10GBASE-X Interface Card	
ES0D0X2UXA00	2-Port 10GBASE-X Interface Card (EA, XFP)
ES0D0X2UXC00	2-Port 10GBASE-X Interface Card (EC, XFP)
ES0D0X4UXA00	4-Port 10GBASE-X Interface Card (EA, XFP)
ES0D0X4UXC00	4-Port 10GBASE-X Interface Card (EC, XFP)
ES1D2X04XED0	4-Port 10GBASE-X Interface Card (ED, XFP)
ES0DX12XSA00	12-Port 10GBASE-X Interface Card (SA, SFP+)

ES1D2X16SFC0	16-Port 10GBASE-X Interface Card (FC, SFP+)
ES1D2X40SFC0	40-Port 10GBASE-X Interface Card (FC, SFP+)
POE Interface Card	
ES0D0G48VA00	48-Port 10/100/1000BASE-T POE Interface Card (EA, RJ45, POE)
Service Processing Unit	
LE0D0VAMPA00	Value-added Service Unit*
Optical transceiver	
FE-SFP optical transceiver	
S-SFP-FE-LH40-SM1310	Optical Transceiver-eSFP-FE-Single-mode Module (1310nm,40km,LC)
S-SFP-FE-LH80-SM1550	Optical Transceiver-eSFP-FE-Single-mode Module (1550nm,80km,LC)
GE-SFP module	
SFP-1000BaseT	Electrical transceiver-SFP-GE-Electrical Interface Module (100m,RJ45)
eSFP-GE-SX-MM850	Optical Transceiver-ESFP-GE-Multi-mode Module (850nm,0.5km,LC)
SFP-GE-LX-SM1310	Optical Transceiver-SFP-GE-Single-mode Module (1310nm,10km,LC)
S-SFP-GE-LH40-SM1310	Optical Transceiver-eSFP-GE-Single-mode Module (1310nm,40km,LC)
S-SFP-GE-LH40-SM1550	Optical Transceiver-eSFP-GE-Single-mode Module (1550nm,40km,LC)
S-SFP-GE-LH80-SM1550	Optical Transceiver-eSFP-GE-Single-mode Module (1550nm,80km,LC)
eSFP-GE-ZX100-SM1550	Optical Transceiver-ESFP-GE-Single-mode Module (1550nm,100km,LC)
10GE-XFP optical transceiver	
XFP-SX-MM850	Optical Transceiver-XFP-10G-Multi-mode Module (850nm,0.3km,LC)

XFP-STM64-LX-SM1310	Optical Transceiver-XFP-10G-Single-mode Module (1310nm,10km,LC)
XFP-STM64-LH40-SM1550	Optical Transceiver-XFP-10G-Single-mode Module (1550nm,40km,LC)
XFP-STM64-SM1550-80km	Optical Transceiver-XFP-10G-Single-mode Module (1550nm,80km,LC)
10GE-SFP+ optical transceiver	
OMXD30000	Optical Transceiver-SFP+-10G-Multi-mode Module (850nm,0.3km,LC)
OSX010000	Optical Transceiver-SFP+-10G-Single-mode Module (1310nm,10km,LC)
OSX040N01	Optical Transceiver-SFP+-10G-Single-mode Module (1550nm,40km,LC)
BIDI-SFP optical transceiver	
SFP-FE-LX-SM1310-BIDI	Optical Transceiver-eSFP-FE-BIDI Single-mode Module (TX1310/RX1550,15km,LC)
SFP-FE-LX-SM1550-BIDI	Optical Transceiver-eSFP-FE-BIDI Single-mode Module (TX1550/RX1310,15km,LC)
SFP-GE-LX-SM1310-BIDI	Optical Transceiver-eSFP-GE-BIDI Single-mode Module (TX1310/RX1490,10km,LC)
SFP-GE-LX-SM1490-BIDI	Optical Transceiver-eSFP-GE-BIDI Single-mode Module (TX1490/RX1310,10km,LC)
Power module	
LE0MPSD16	DC Power Module
LE0MPSA08	800 W AC Power Module
W0PSA2200	2200 W AC Power Module
LE0MDCPDBX00	Front-access-maintained Cabinet Power Distribution Box
LE0MACPJBX00	Intelligent Value Added Special Service Power Junction Box,8-Channel Output
Software	
ES0SMS137700	Quidway S7700 Basic SW, V100R003
ES0SMS167700	Quidway S7700 Basic SW, V100R006
ES0SMS217700	Quidway S7700 Basic SW, V200R001

ES0SMPLS7700	MPLS Function License
ES0SNQAF7700	NQA Function License
ES0SIPV67700	IPV6 Function License
ES0S0SSP7700	Service Splitting Platform Function License
ES1SWLAN64AP	WLAN Access Controller AP Resource License-64AP
ES0SWLAN7700	WLAN Access Controller AP Resource License-128AP
Documentation	
ES0I000DOC00	S7700 Smart Routing Switch Documentation

In the preceding table, *indicates a value-added board that supports the firewall/NAT, IPSec, Netstream, wireless AC and load balancing functions.

For more information, visit <http://enterprise.huawei.com> or contact the Huawei local sales office.







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