DH-S7606

High-end Multiservice Routing Switches

Product Overview

The DH S7600 series switches are designed based on a large platform, and support a variety of Ethernet interfaces, including 1000M optical interfaces, 1000M electrical interfaces, 10G optical interfaces, which meet multi-level link bandwidth requirements of users. The DH S7600 series comply with the "Restriction of Hazardous Substances (RoHS)", and therefore, are green and environment-friendly routing switches.

The DH S7600 series includes two models: S7606 (with eight slots) and S7602 (with four slots), and supports main controller redundancy. The DH S7600 series can be widely applied in multiple network environments, including the core layer and convergence layer of metropolitan networks, data centers, and campus networks, providing users with industry solutions that integrate security and switching components, integrate wired and wireless components, and integrate active and passive components.

Features

· Using the Intelligent Resilient Framework 2 (IRF2) as the system foundation of the virtualization software system

· Supporting technologies required by cloud data centers, for example, TRILL, EVB, and FCoE

· Integrating multiple network services such as IPv6, network security, wireless control, and passive optical networks

· Providing multiple high availability technologies such as non-stop forwarding, non-stop upgrade, graceful restart, and ring network protection. This improves production efficiency of users and ensures a maximum normal operation time of the network, thereby lowering the total costs of ownership (TCOs) for customers

Key Features
· Rich Services, Adaptive to the Development Trend of Converged Service Networks

IRF2 (Horizontal Virtualization)
To meet the evolution of data center technologies, the DH S7600 series switches use software virtualization technologies, of which, the IRF2is a typical technology. This technology allows two to four hosts to work collaboratively, be managed together, and be maintained in a non-stop manner. The IRF2 is not only a key technology for ensuring high performance and virtualization of data center switching devices, and also provides high availability, seamless upgrade and expansion capabilities to conventional enterprise network applications, becoming an important part of value-added services of users. In addition, the IRF2 virtualization technology may further support stacking of common Ethernet 10G optical fibers over a long distance (80 km).

High-performance IPv4/IPv6 Service Capabilities
The DH S7600 series supports the IPv4/IPv6 dual-protocol stack, multiple tunneling technologies, and IPv4/IPv6 multicast technologies, to provide users with complete IPv4/IPv6 solutions. The DH S7600 series uses distributed system architecture, to implement non-blocking line rate forwarding of IPv4/IPv6 services. The DH S7600 series has passed the IPv6 network entry certification and IPv6 Ready stage two certification of the Information Industry Ministry, and therefore, is a mature commercial IPv6 product.

Integration of Wired and Wireless Components, and Integration of Active and Passive Components
The wireless control module integrated in the DH S7600 series provides a variety of service capabilities, including fine-grained user control and management, complete RF management and security mechanisms, rapid roaming, powerful QoS, and support for IPv6. The wireless control module is associated with the security policy server, to implement endpoint admission defense (EAD) for wireless access users, thereby improving security of the entire network.
The DH S7600 series uses chips supporting the AC function, which can expand on-board AC functions, to provide more options for customers in establishing networks that integrate wired and wireless components.
The DH S7600 series is an Ethernet passive optical network (EPON) device with high density in the industry, and provides a highly reliably EPON system. The EPON system uses distributed system architecture, modular design, hot backup of main control boards, passive backplanes, and dual-input redundant power sources, thereby achieving carrier-grade reliability.

EAD Technology
The DH S7600 series supports the large-capacity portal authentication function, and can be used as:
●EAD gateway devices in local area networks with thousands of users, to provide an EAD security authentication function for users on the networks;
●Convergence/Core devices in large- and medium-sized campus networks, to provide the portal authentication function for authentication and charging in the college dormitory area.

Basic Network Architecture for BYOD
The DH S7600 series support a variety of access authentication manners and can be used as:
●Authentication gateway devices in local area networks with thousands of users, to provide users with the security authentication function;
●Convergence/Core devices and VPN authentication gateways, in collaboration with SSL VPN cards, in large- and medium-sized campus networks.
The DH S7600 provides basic network architecture for bring your own device (BYOD), to facilitate expansion of BYOD applications, such as mobile ERP, OA, and UC&C.

· Technologies Oriented to Cloud Data Centers
As enterprise-grade network core devices, the DH S7600 series products provide users with technologies and solutions required in establishing cloud data centers:
●TRILL
Propelled by the increase of server and switch scales, data center networks develop toward the flattened network architecture, to facilitate maintenance and management. This requires a large-scale Layer-two network. The DH S7600 series products use the TRansparent Interconnection of Lots of Links (TRILL) and vertical virtualization technologies to support the construction of large-scale Layer-two data center networks. The data center large Layer-two TRILL protocol introduces the Layer-three routing technology Intermediate System-to-Intermediate System (IS-IS) to the Layer-two network, and amends the IS-IS technology as required. This smoothly integrates the simplicity and flexibility of Layer two and stability, scalability, and high performance of Layer 3.
●EVB
The DH S7600 series products support Edge Virtual Bridging (EVB). A Virtual Ethernet Port Aggregator (VEPA) technology is used to upload network traffic of virtual machines to physical switches connected to the servers. This implements traffic forwarding between virtual machines, and also solves problems such as virtual machine traffic monitoring and access control policy deployment.
●FCoE
The DH S7600 series products support the FCoE technology. The FCoE technology addresses the issue that the LAN and storage network in the cloud data center are heterogeneous. The FCoE and CEE technologies can be used in deployment, to converge the front-end network and back-end network architecture of the data center. This cracks the technical hard nut that data, computing, and storage networks are split, thereby greatly reducing the device purchasing and expansion costs of the data center.

· Comprehensive Security Assurance, Defending Against Multiple Network Security Threats

Three-plane Security Assurance Mechanisms

The DH S7600 series provides complete security defense mechanisms from the control, management, and forwarding planes, to comprehensive ensure network security:

●On the control plane, a protocol packet attack recognition module is embedded, to prevent packet attacks of protocols such as TCN and ARP; and OSPF, BGP, and IS-IS routing protocols use MD5 verification, to prevent networks from breaking down due to illegal route update packets.

●On the management plane, SNMPv3 network management protocols, SSH V2, user identity authentication based on 802.1x, AAA, or Radius, and level-based user rights management ensure device management security.

●On the forwarding plane, IP addresses, VLANs, MAC addresses, and ports can be bond in multiple combinations; unicast reverse path forwarding (URPF) is supported, to prevent illegal traffic from accessing the network; and the longest match packet-by-packet forwarding mechanism is used, to effectively prevent virus attacks.

The DH S7600 series further supports embedded high-performance firewalls, abnormal-traffic cleaning modules, and other modules. In this way, professional security mechanisms are integrated in the switches.

EAD Fully Supported on Wired and Wireless Devices

The DH S7600 series is an important part of the EAD solution. The DH S7600 series can dynamically receive control policies from the security policy server and grant corresponding access permissions to terminals according to security statuses of the terminals. The DH 7600 series supports EAD for wired terminals and wireless terminals, to comprehensively ensure terminal security.

Enhanced ACL Features

The DH S7600 series supports powerful ACL capabilities, including:
●Standard and extended ACLs
●VLAN-based ACLs, facilitating user configuration and saving ACL resources
●Egress and ingress ACLs, meet requirements of industries such as the financial industry on restrict access permission control

· Carrier-grade High Availability, Ensuring Long-term Stable Operation of User Services

Carrier-grade High Availability Design

The DH S7600 uses a design free from single points of failure. All key parts, such as the main control boards, power sources, and fans, use redundancy design. The passive backplanes avoid single points of failure of the chassis. All the boards and power modules support the hot swap function. The DH S7600 series can operate stably for a long time in harsh environments, and reach a carrier-grade reliability of 99.999%.

Multiservice High-Availability Operation

The DH S7600 series supports the following features:
●Non-stop forwarding and graceful restart, providing a millisecond-level switching time
●Equivalent routes, helping users establish multiple equal-cost path, to implement load balancing and redundancy back of traffic
●Rapid Ring Protection Protocol (RRPP)
●Smart-Link protocol, ensuring millisecond-level rapid service switching in a dual-uplink network topology

By using the technologies above, the DH S7600 series can operate continuously when carrying multiple services, implementing service continuity.

HA Based on the IRF2

The IRF2 technology can be used to virtualize multiple DH S7600 switches into one "union device", which can be used and configured as one machine and has more ports and expanded switching capabilities. In addition, mutual backup between the multiple devices enhances device reliability, providing millisecond-level link convergence capabilities. This simplifies a management process, reduces management costs, and can implement smooth network capacity expansion as required. The DH S7600 series supports a variety of hardware-based OAM fault detection mechanisms, to implement millisecond-level link fault detection.

· Hardware-level Encryption Technology

The DH S7600 series supports the MACsec technology (802.1ae), which is a hardware-level encryption technology. Different from conventional end-to-end soft encryption technologies for protecting the basic application layer, MACsec uses a password technology that identifies data sources to protect and manage control protocols of bridge networks and other data, protecting information integrity and providing protection and privacy services. By confirming the station that sends a frame, Layer-two protocols can be protected against attacks from the origin.

Technical Specification

Model	DH-S7606
Switching capacity	15.36 Tbit/s or 25.6 Tbit/s
IPv4 packet forwarding rate	2880 Mpps/12000 Mpps
Number of slots	8
Number of service slots	6
Redundancy design	Redundancy of power sources and main control boards
Layer-two features	Supports the following Layer-two features: ●IEEE 802.1P (CoS priority) ●IEEE 802.1Q (VLAN) ●802.1d (STP)/802.1w (RSTP)/802.1s (MSTP) ●IEEE 802.1ad (QinQ), flexible QinQ, and VLAN mapping ●IEEE 802.3x (full duplex flow control) and backpressure flow control (half duplex) ●IEEE 802.3ad (link aggregation) and cross-board link aggregation ●IEEE 802.3 (10Base-T)/802.3u (100Base-T) ●IEEE 802.3z (1000BASE-X)/802.3ab (1000BaseT) ●IEEE 802.3ae (10Gbase) ●RRPP ●Cross-board port/flow mirroring ●Suppression of port broadcast/multicast/unknown unicast storms ●Jumbo frames ●VLAN division based on ports, protocols, subnets, and MAC addresses ●SuperVLANs ●PVLANs ●Multicast VLAN+ ●Point-to-point single-VLAN cross connection and dual-VLAN cross connection ●Forwarding dependent on VLAN IDs only, without MAC address learning ●Maximum VLAN mapping/Full support of VLAN mapping by flexible QinQ entries ●GVRP ●LLDP
IPv4 routing	Supports the following IPv4 routing features: ●ARP Proxy ●DHCP Relay ●DHCP Server ●Static routing ●RIPv1/v2 ●OSPFv2 ●IS-IS ●BGPv4 ●OSPF/IS-IS/BGP GR (Graceful Restart) ●Equivalent routing ●Policy-based routing ●Routing policies
IPv6 routing	Supports the following IPv6 routing features: ●ICMPv6 ●ICMPv6 redirection ●DHCPv6 ●ACLv6 ●OSPFv3 ●RIPng ●BGP4+ ●IS-ISv6 ●ISATAP ●6to4 tunnels ●IPv6/IPv4 dual-protocol stack
Multicast	Supports the following multicast routing features: ●IGMPv1/v2/v3 ●IGMPv1/v2/v3 Snooping ●IGMP Filter ●IGMP fast leave ●PIM-SM/PIM-DM/PIM-SSM ●MSDP ●AnyCast-RP ●MLDv2/MLDv2 Snooping ●PIM-SMv6, PIM-DMv6, and PIM-SSMv6
ACL/QoS	Supports the following ACL/QoS features: ●Standard and extended ACLs ●VLAN-based ACLs ●Ingress and egress ACLs ●Ingress and Egress CARs (with granularities reaching 8 Kbit/s) ●Two-level metering capability ●VLAN-based aggregated CAR, and MAC address–based CAR ●Traffic shaping ●802.1P/DSCP priority marking and remarking ●Hierarchical QoS (H-QoS) ●Three-level queue scheduling ●Queue scheduling mechanisms (SP, WRR, SP+WRR, and CBWFQ) ●Congestion avoidance mechanisms (including Tail-Drop and WRED) ●Mirroring
Security mechanism	Supports the following system management features: ●FTP, TFTP, and Xmodem ●SNMP v1/v2/v3 ●sFlow traffic statistics ●RMON ●NTP clock ●NetStream traffic statistics function ●Smart power source management ●802.3az efficient energy-saving Ethernet ●Device online status monitoring mechanism, detecting key components such as main control engines, backplanes, chips, and storage components
Reliability	Supports the following reliability features: ●1+1 redundant backup of main control boards ●1+1 redundant backup of power sources ●Passive backup design ●Hot swap of all boards ●CPU protection ●VRRP ●Ethernet OAM (802.1ag) ●MAC Tracert ●RPR ●RRPP and ERPS ●Graceful Restart for OSPF/BGP/IS-IS ●DLDP ●VCT ●Smart-Link ●Hot patches
Environment requirements	●Temperature range: 0ºC (32°F)–45ºC (113°F) ●Relative humidity: 10%–95% (non condensing)
Security standards and EMC certification	Passed CE, FCC PART 15, TUV-GS, UL-CUL, ICES003, and VCCI certification
Power source	DC:–48 V to–60V AC: 100 V to 290 V
Dimensions (Width x Height x Depth) (mm)	436 x 575 x 420
Weight (full configuration)	≤ 77 kg