S5648X-2Q4Z Routing Switches

48 Port 10Gb SFP+,6 40Gb QSFP+ and 4 100Gb SFP28 Uplinks,L3+ Managed Ethernet Switch

INTRODUCTION

System Design for Green and Energy Saving

The S5648X-2Q4Z Series supports the fans with speed control as well as power consumption adjustment which is based on the flow status of the ports (According to the temperature inside the box).Both can highly save the energy and go for green.

Customized Profile for Different Deployment Scenarios

The Flexible Table Management (FTMTM) technology employed by HOS S5648X-2Q4Z Series offers multiple table size configuration profiles as optimized choices for different network scenarios. S5648X-2Q4Z supports up to 128K MAC address table or 32K IP routing table. Besides these pre-defined profiles, application-specific profile is also applicable with HOS Advanced Service.

Data Center Features

S5648X-2Q4Z provides dedicated features for Data Center applications, such as NVGRE/VXLAN/GENEVE, Priority Flow Control (PFC),Enhanced Transmission Selection (ETS), Quantized Congestion Notification (QCN), and Data Center TCP. MLAG features are also good candidates for TOR switch in data center network.

Redundancy Design and Robust System

Hot swap power modules

AC 1+1 Power module redundancy

1+1 Fan redundancy

Real-time environment monitoring for chipset temperature, status of fan and power, etc

LACP, ECMP, VRRP, VARP, STP/RSTP/MSTP, Smart Link,BFD,ERPS and load-balancing

HOS-patented Sysmon for CPU status monitoring and protection upon unpredictable fault

Outstanding QoS Control with Flexible Classification and Queuing Mechanism

HOS S5648X-2Q4Z series routing switch provides 8 hardware queues per port to support multi-stage scheduling (WDRR, SP) and Tail Drop/WRED. 3-stage shaping (queue/group/port) can be applied for flow management.

Ingress and egress policer provide bandwidth monitoring with a granularity up to 64Kbps. Both SrTCM (Single Rate Three Color Marker) and TrTCM (Two Rate Three Color Marker) are supported.

Triple-play Service Support with Bandwidth Guaranty

The HOS S5648X-2Q4Z Series offers high bandwidth for Triple-Play services such as IPTV and video monitoring. The built-in QoS capabilities and flexible queuing technologies guarantee high quality of services.

Rich multicast protocol set (IGMP Snooping, IGMP v1/v2, PIM-SM) supports up to 16K multicast groups, 1K physical replications and 4K logical replications per group. With HOSOS software, IPTV service and multicast time-delay control is fully supported.

Comprehensive Network Security Policy

The HOS S5648X-2Q4Z Series supports subscriber-class, switch-class and network-class security control.

Basic IPv4/IPv6/MAC ACL is employed to filter IPv4/IPv6/Non-IP packet respectively and can be applied to both port and VLAN. Besides that, extended IPv4/IPv6 ACL is also available. In a single ACL rule, both IP and MAC ACE can take effect to filter IP and Non-IP packets simultaneously.

HOS ARP Inspection and IP Source Guard features prevent network from malicious ARP attack. CPU Traffic Protection and Storm Control features optimize CPU load. Centralized 802.1x authentication forbids illegal user access to the network.

CHARACTERISTICS

S5648X-2Q4Z Hardware Summary		
1. Basic		
Product Name		S5648X-2Q4Z
Product Positioning		Data Center TOR access, Enterprise & Metro network access or aggregation
Switching Method		Store and Forwarding/ Cut Through
CPU Frequency		533MHz
Flash		2GB (NAND)
Memory		1GB
Hardware Configuration	**Main Board Spec**	48x10GE SFP+ + 2x40GE QSFP+ + 4x100GE QSFP28
	Uplink Network Sub Card	Not Support
	Console Type	RJ45
	Outband Eth Management Port	1 RJ45 GE Eth port
	Inband Eth Management Port	Support
	USB Ports	Support
2. Performance Spec		
Switching Capacity		1.92Tbps (48x10GE + 2x40GE + 4x100GE)
3. Hardware and Software Description		
Hardware Architecure		• Standard 1U 19'' rack mountable • 48x10GE SFP+ Ethernet Port • 2x40GE QSFP+ Ethernet Port • 4x100GE QSFP28 Ethernet Port
If Uplink network card support hot plug		-
Software upgrade method		Through TFTP/FTP/WEB
Service interruption time when reboot system for software update		less than 120s

S5648X-2Q4Z Hardware Summary		
4. The Power Supply and Power Requirements		
Type of Power Supply	**AC**	Support
	DC	Support
Power supply range	**AC**	Operating Voltage: 100 ~ 240V; 50/60Hz Maximum Voltage: 90 ~ 264V; 47~63Hz
	DC	Operating Voltage: 36 ~ 75Vdc Input
Double Power Input		Support
The power supply module is pluggable		Support
Typical/Max Power Draw		160W / 200W
5. Overcurrent and overvoltage protection		
Whether the equipment installation overcurrent, overvoltage protector ?		Yes
Surge protection level		4 KV
6. Others		
Hardware Size (H×W×D) in.		4.36 x 44.0 x 47.0 cm (1.73 x 17.5 x 18.5 in.)
Weight (kg)		8.3kg (include One PSU)
Cooling Mode		Fan cooling (Front-to-Rear airflow)
Noise		< 50 dB
Quality of Fans		4 (3 + 1 Backup)
Whether to support the fan module pluggable?		Support
If the fan support intelligent speed control function ?		Support
Operating Temperature Range		Operating temperature: 0 to 45 ºC (Long term) -5 to 55 ºC (Short term)

SOFTWARE FEATURE LIST

Feature List			
Attribute		**Description**	**Support**
Ethernet basic features	**Ethernet**	Ethernet interface operating modes: full duplex, half duplex, and auto-negotiation	●
		Ethernet interface operating rates: 1Gbit/s, 10 Gbit/s, 40 Gbit/s, 100Gbit/s and auto-negotiation	●
		Flow control on (TX and RX direction)	●
		Jumbo frames (9600 Bytes)	●
		Link aggregation (Static/LACP)	●
		Static/Dynamic Load Balancing among the links of a Link aggregation	●
		EF-DLB(elephant flow based DLB)	●
		LAG self-healing	●
		LAG support RR	●
		Port Isolation	●
		L2 Protocol Tunnel	●
		Port-Block(unicast/broadcast/multicast)	●
		Storm Control (unicast/broadcast/multicast)	●
	VLAN	Vlan access modes: access, trunk, and QinQ	●
		MAC based VLAN Classification	●
		IP based VLAN Classification	●
		Protocol based VLAN Classification	●
		QinQ(Basic QinQ and Selective QinQ)	●
		VLAN Translation	●
		Default VLAN	●
		VLAN mapping	●
		Voice Vlan	●
		Guest VLAN	●

Feature List			
		Private VLAN	●
	MAC	Automatic learning and aging of MAC addresses (Support HW learning)	●
		Static, dynamic, and blackhole MAC address entries	●
		Packet filtering based on source MAC addresses	●
		Limitation on MAC address learning on interfaces (Port Security)	●
		Limitation on MAC address learning on Vlans VLAN Security	●
Ethernet loop protection	MSTP	STP	●
		RSTP	●
		MSTP	●
		BPDU filter	●
		BPDU guard	●
		Root guard	●
		Partitioned STP and BPDU tunnel	●
	ERPS	ERPS (Ethernet Ring Protection Switching)	●
		Single ERPS ring, tangent ERPS rings, and intersecting ERPS rings	●
		Hybrid networking of ERPS rings and other ring networks	●
Layer 2 multicast	Layer 2 multicast	IGMP snooping v1v2v3	●
		IGMP proxy	●
		Fast leave	●
		MAC based L2MC	●
		Layer 2 Static Multicast	●
		MVR(Inter-VLAN multicast replication)	●
IPv4	ARP	Static and dynamic ARP entries	●

Feature List			
Forwarding		Gratuitous ARP	●
		Aging of ARP entries	●
		ARP	●
		ARP Proxy	●
	Unicast routing	Static Routes	●
		RIPv1&v2	●
		OSPF	●
		BGP(Basic iBGP/eBGP)	●
		ECMP	●
		ECMP self-healing	●
		ECMP-DLB(Dynamic Load Balance ECMP)	●
		Route Map	●
		Policy-Based Route (PBR)	●
		uRPF check	●
		VRF	●
	Multicast routing	IGMPv1/v2/v3	●
		PIM-SM	●
		PIM-SSM	●
		PIM-DM	●
		Static Multicast	●
IPv6 Forwarding	**IPv6 basic**	ICMPv6	●
		NDP	●
		PMTU	●
	IPv6 Unicast routing	IPv6 Static Route	●
		RIPng	●
		OSPFv3	●
	IPv6 Multicast routing	MLD v1/v2	●
		MLD Snooping	●

Feature List			
		PIM-SMv6	●
	IPv6/IPv4 Tunnel	Static Tunnel / ISTAP Tunnel / 6to4 Tunnel	●
	IPv6 Application	DHCPv6 Server/Relay/Snooping	●
		IPv6 Prefix-list	●
QoS	**Traffic classification**	Traffic classification based on the combination of the MAC address, IPv4/IPv6 ddress, L2 protocol header, TCP, UTP, outgoing interface, and 802.1p field	●
	Traffic behaviors	Access control after traffic classification	●
		Traffic policing based on traffic classification (Policer)	●
		Re-marking based on traffic classification (COS, DSCP)	●
		Class-based packet queuing	●
	Queue scheduling	SP (8 Strict Priority)	●
		WDRR (Weighted Deficit Round Robin)	●
		SP + WDRR	●
	Congestion avoidance	Tail Drop, WRED (Weighted Random Early Detection)	●
	Shapping	Shapping based on Interfaces and queues	●
	Cloud Goodput	Explicit congestion notification(ECN)	●
		High bandwidth, Ultra Low Latency(HULL)(Virtual queuing to mark ECN)	●
Device reliability	**Smartlink**	SmartLink	●
		SmartLink multi-instance	●
		MonitorLink	●
	VRRP	VRRP	●
	BFD	BFD (for Static IPv4 Route/VRRP/OSPF/Track)	●
	M-LAG	Multi-Chassis Link Aggregation	●
		MLAG with Overlay(VXLAN, NVGRE, GENEVE)	●
STM	**Switch Table**	Switch Table Management (Flexible system profiles)	●

Feature List			
	Management		
Security	**System Security**	Hierarchical CLI protection to prevent unauthorized users from accessing Switch	●
		SSH v2.0	●
		RADIUS and TACACS+ authentication	●
		ACL filtering (Standard ACL and extend ACL)	●
		ACL filtering(Inner header filter)	●
		DHCP packet filtering (Option 82)	●
		ARP Inspection	●
		IP Source Guard	●
		CPU Traffic Limit	●
		Prevent DDOS attack (ICMP Flood/Smurf/Fraggle/LAND/SYN Flood)	●
		AAA	●
		802.1X	●
		Telnet/SSH ACL filtering	●
		RSA Key Generate	●
		BHM (Beat Heart Monitor)	●
Configuration and maintenance	**Terminal service**	Configurations through CLI (Command Line Interface)	●
		Help information	●
		Login through console and Telnet terminals	●
	File system	File system	●
		Directory and file management	●
		Upload and download files through FTP or TFTP	●
	IP Application	DHCP Server	●
		DHCP Relay	●
		DHCP Snooping	●
		DHCP Client	●

Feature List			
		DNS	●
		NTP	●
	Device Management	UDLD (Unidirectional Link Detection)	●
		VCT (Virtual Cable Test)	●
		LLDP	●
		802.3az EEE (Energy-Efficient Ethernet)	●
	Debugging and maintenance	Management of logs, alarms, and debugging information	●
		User operation logs	●
		Detailed debugging information for diagnosing network faults	●
		Network test tools (Such as traceroute and ping)	●
		Local Mirror(Port Mirror and VLAN Mirror)	●
		Remote Mirror	●
		Multi-destination Mirror	●
		L2 ping	●
		Port loopback	●
		Loopback Detection	●
		SmartConfig	●
	Network management	Ping and Traceroute (IPv4)	●
		SNMPv1/v2c/v3 (IPv4)	●
		Standard MIB	●
		WEB UI	●
		RMON	●
		s-Flow	●
	Version upgrade	Online upgrade software image	●
		Online upgrade of the BootROM	●
Data Center	**Extensibility**	Programmatic access to system state: Phython	●

Feature List			
		Open API	●
		OpenStack Neutron(cloud agent)	●
		OVSDB(configure VLAN/Tunnel)	●
	Virtualization Support	VARP	●
		VXLAN gateway	●
		VXLAN bridge	●
		VXLAN routing	●
		GENEVE	●
		NvGRE	●
	DCB	IEEE 802.1Qbb PFC (Priority Flow Control)	●

Tips : ● Support ○ Unsupport

Performance & Spec Table						
Class	**Feature**	**Sub Spec**	**Default Profile**	**Layer 2 Profile**	**Layer 3 Profile**	**IPv6 Profile**
Ethernet Basic	**Jumboframe**	Maximum Size	9600			
	Unicast MAC	MAC address Capacity	65536	131072	32768	32768
		MAC Learning Rate (SW)	3144 fps			
		MAC Learning Rate (HW)	6046093 fps			
		Blackhole MAC address capacity	128			
	Multicast MAC	MAC address Capacity	2048	2048	1024	1024
	VLAN	VLAN IDs	4094			
		Vlan Instances	4094			
	STP	Convergence time	30s			
	RSTP	Convergence time	775ms			

Performance & Spec Table						
	MSTP	Instance Num	64			
		Convergence time	774ms			
	Link Aggregation (Static&LACP)	Maximum Member Num	16			
		Maximum Group Num	55			
		Load balance key mode	destport/inner-destport/inner-ip-protocol/inner-ipda/inner-ipsa/inner-macda/inner-macsa/inner-sourceport/ip-protocol/ipda/ipsa/macda/macsa/nvgre-vsid//sourceport/vxlan-vni			
		Convergence time	< 20ms			
	Smart-Link	Maximum Groups Num	16			
		Maximum Protection Instance Num	64			
		Switchover time	< 25ms			
	VLAN Classification	Base MAC Capacity	512	1024	512	512
		Base IPv4 Capacity	512	512	1024	512
		Base IPv6 Capacity	N/A	N/A	N/A	256
IPv4 Unicast	**ARP**	ARP Capacity	4096	1024	20480	4096
	IPv4	FIB	8192			2048
		ECMP Group	240			
	VRRP	Management Groups Num	31			
		Switchover time	< 4*advt_interval (advt_interval=100ms or 1s)			
	PBR	Policy Route Map	32	N/A	32	32
		Policy Based Routing ACE	64	N/A	64	64

Performance & Spec Table						
	IPv4 BFD	Session Capacity	128	N/A	N/A	N/A
IPv4 Multicast	**IPMC**	Number of interfaces that support Multicast routing table	255			
		Multicast Routing Table	1023	0	1023	1023
	IGMP Snooping	Maximum Groups Num	2048			
	MVR	Maximum Entry Num	511			
IPv6 Unicast	**Host Route**	NDP Capacity	N/A	N/A	N/A	4096
	IPv6	FIB	N/A	N/A	N/A	1536
		ECMP Group	N/A	N/A	N/A	240
IPv6 Multicast	**IPMC**	Number of interfaces that support Multicast routing table	N/A	N/A	N/A	255
		Multicast Routing Table	N/A	N/A	N/A	255
	MLD Snooping	Maximum Groups Num	N/A	N/A	N/A	4096
	MVR V6	Maximum Entry Num	N/A	N/A	N/A	255
IP Tunnel	**IP Tunnel**	Tunnel Peer Capacity	8	N/A	8	32
QoS	**QoS**	Per-port Queue Num	8			
		System Packet Buffer Capacity	3M			
		Policer granularity	0-2Mbps : 16Kbps 2Mbps-100Mbps : 32Kbps 100Mbps-1Gbps : 64Kbps 1Gbps-2Gbps : 128Kbps 2Gbps-4Gbps : 256Kbps 4Gbps-10Gbps : 512Kbps 10Gbps-40Gbps : 1024Kbps 40Gbps-100Gbps : 2048Kbps			

Performance & Spec Table						
		Shape granularity	8Kbps			
		Ingress port qos ipv4 flow entries	2043	2043	2043	1019
		Ingress port qos ipv6 flow entries	N/A	N/A	N/A	507
ACL	IPv4 ACL	Ingress port acl for IPv4	2047	2047	2047	1023
		Ingress vlan acl for IPv4	255	255	255	127
		Egress port acl for IPv4	255	255	255	127
	IPv6 ACL	Ingress port acl for IPv6	N/A	N/A	N/A	511
		Ingress vlan acl for IPv6	N/A	N/A	N/A	63
		Egress port acl for IPv6	N/A	N/A	N/A	63
Security and Application	IP Source Guard	IPv4/IPv6 maximum rules Num	1024	1024	512	512
	802.1x base MAC	Maximum Entries	2048	512	512	512
	DHCP-Snooping	Maximum bound entry	4096			
Metro Ethernet	Vlan Mapping	Maximum mapping table	64			
		Maximum rules Num	1024	2048	1024	1024
	ERPS	Domain Num	16			
		Ring Num	3/domain			
		Protection instance Num per Ring	1			
		Switchover time	< 50 ms (optical port)			
Overlay	VXLAN	VXLAN tunnel	8192	8192	8192	3072
		VNI	2000			
		VTEP Peer	1024			
		VXLAN Gateway MAC for DVR	224	256	256	64

Performance & Spec Table						
IPFix	**IPFix**	IPfix Member	16384	N/A	16384	16384

ACCESSORIES

Product Name	Quantity
Console Cable	1PCS
Power Cords	2PCS
Rack Mount Brackets	2PCS
Bracket Screws	10PCS
Rubber Pads	4PCS
Cat5e Cable	1PCS
Grounding Cable	1PCS
Tieline Buckle	2PCS
User Manual	1PCS
SFP 28 Dust Plug	4PCS
QSFP+ Dust Plug	2PCS

ORDER INFORMATION

Product Name	**Description**
Software Linsence	HOS-EB, basic Layer3 software features,Pre installed
Software Linsence	HOS-MS, Full layer3 software license key
Software Linsence	HOS-MA, Metro features software license key