S5048-4X2Q 系列 48 端口 2.5G 以太网交换机

简介

S5048-4X2Q 系列三层以太网交换机（以下简称"S5048"）是基于国产自主研发以太网交换芯片 CTC7132 构建的高性能 2.5G/ 10G/ 40G 交换机，旨在满足下一代企业网、数据中心、城域网和超融合等多种应用场合需求。

S5048 搭载自主研发系统软件，支持主流协议标准和应用程序，可方便快速的部署和管理。

产品特性

采用运营商级、高性能以太网核心交换芯片

S5048 系列路由交换机，采用国产自研高性能以太网核心交换芯片，可满足城域网、企业网、数据中心、超融合等应用的需求。

丰富的端口形态

支持 2.5G/ 10G/ 40G 等多种端口形态，可适应各种网络部署需求。

绿色节能的系统设计

采用智能的风扇调速方案，支持实时功耗检测，为客户降低运维成本，打造绿色节能数据中心。

可灵活配置的转发表项满足不同业务部署场景

灵活的表项管理技术 FTM，支持根据不同的应用场景需求，调整各类硬件转发表项的大小。

智能以太网 OAM:完整的故障管理和性能保证

基于 IEEE802.1ag 和 ITU-T Y.1731 协议的端到端 OAM，使得以太网服务供应商能够主动监控他们的业务，测量端到端的性能并保证客户得到符合签约 SLA 水平的业务。

故障管理包括 CCM / LTM / LBM，性能测量包括测量帧时延和帧时延的变化。

S5048 系列交换机支持基于 802.3ah 标准的 EFM，支持对端发现，链路监控，故障通告，远端环回，MIB 参数回传等功能。

数据中心 DCB 特性

支持前沿的数据中心功能：基于优先级的流量控制（PFC），显式拥塞通知（ECN），数据中心的 TCP 等。

支持 MLAG(Multi-Chassis Link Aggregation)，实现跨设备链路聚合，通过将两台聚合交换机上的接口进行跨设备链路聚合，从而把链路可靠性从单板级提高到了设备级，组成 Active-Active 系统. 在两台聚合交换机的中间通过一条 Peer-link 链路进行连接，使其在逻辑上如同一台设备。两台设备上的端口共同形成聚合端口，使得所有端口可以共同参与数据流量的转发。与堆叠相比，组成 MLAG 的设备在管理上仍然需要分别管理，但是 MLAG 配置相对简单，且配置完成后不需重启，同时转发决策都在本地，正常情况下流量不需要通过设备间互连路径转发，避免了互连路径带宽成为瓶颈，同时也降低了延时。

支持 Overlay 技术(包括 VXLAN / NVGRE / GENEVE 等隧道技术)，通过 VXLAN / NVGRE / GENEVE 等头部封装完整的内层以太网报文，使得二层报文可以跨越三层网络，解决传统二层网络中设备 MAC 表项规格对网络规模的限制、VLAN ID 数量对网络隔离能力的限制、以及传统网络中 VLAN / VPN 技术无法满足网络动态调整需求等问题。以 VXLAN 为例，24bit 的 VNI 标识符最多可支持 16777215 个逻辑网络，通过 VXLAN 构建的大二层网络，在虚拟机迁移时 IP / MAC 等地址参数可保持不变。

MLAG 和 Overlay 在数据中心网络交换机上都是理想的选择。

S5048 支持通过开放的 API 接口实现 SDN(软件定义网络 Software Defined Network)。SDN 是一种创新的网络架构体系， 通过将网络的控制层和数据转发层进行分离，大幅简化了网络的管理及维护难度。

高可靠性

现场可插拔模块化电源，支持 AC 或 DC 1+1 备份；风扇支持智能调速；支持对芯片组的温度、电源与风扇的状态进行实时监控。

支持 LACP / ECMP / VRRP / VARP / STP/RSTP/MSTP / Smart Link / BFD / ERPS / G.8031 / G.8032 / Load-Balancing 等特性，全面且高效的保护网络中的数据流量。

专利功能 Sysmon，可以检测 CPU 状态，并在软件出错的情况下采取保护措施。

出色的 QoS 管理

S5048 系列路由交换机为每个端口提供了 13 个（8 个单播队列+4 个组播队列+1 个镜像队列）硬件队列。支持多阶调度 WDRR（Weighted Deficit Round Robin） / SP(Strict Priority）和 TD(Tail Drop) / WRED(Weighted Random Early Detection） 等拥塞保护机制。并且运用了灵活的队列调度算法来实现针对队列或者针对端口的流量整形。

入口和出口方向的策略管理提供智能带宽监测功能，可根据端口的速率灵活调整监测的颗粒度。支持 srTCM(单速率三色标记)和 trTCM（双速率三色标记）。

三网合一服务支持与带宽保证的高品质应用

S5048 系列为三网合一服务（IPTV，视频监控等）提供了高带宽。内置的 QoS 功能和灵活的队列技术可保障高品质的服务。

丰富的组播协议集（IGMP snooping / IGMP v1/v2/v3 / PIM-SM），支持 2K 组播组，每组 4K 逻辑复制。完美支持 IPTV 业务，有效控制组播时延。

全面的网络安全策略

S5048 系列支持用户级、交换机级和网络级的安全控制。

基本的 IPv4 / IPv6 / MAC ACL 可以分别过滤 IPv4 / IPv6/non-IP 报文，并且，额外提供扩展的 IPv4 / IPv6 ACL 可以在一个规则内同时匹配报文的二、三、四层信息。以上 ACL 均可以应用到物理端口、VLAN、端口组和 VLAN 组上，端口组或 VLAN 组内的成员共享一套 ACL 规则，可以节省 TCAM 资源。

ARP 检测和 IP 源防护功能，防止网络遭受恶意 ARP 攻击。 提供 CPU 流量保护、风暴控制功能，优化 CPU 负载功能。集中式的 802.1x 认证，禁止非法用户访问网络。

出色的管理特性

支持丰富的管理接口，包括 Console、带内网口和带外网口；支持 SNMPv1/v2/v3，支持 CLI 命令行，

Web 网管，TELNET 及 FTP 配置，支持 OAM，使设备管理更方便，并且支持 SSH2.0、SSL 等加密方式，使得管理更加安全。

产品规格

产品型号	S5048-4X2Q-EI	S5048-4X2Q-SI
端口规格	48 个 2.5Gb RJ45 4 个 25Gb/10Gb SFP28 2 个 40Gb QSFP+	48 个 2.5Gb RJ45 4 个 25Gb/10Gb SFP28 2 个 40Gb QSFP+
管理口	1 个串口(RJ45) 1 个带外管理口（RJ45）	1 个串口(RJ45) 个带外管理口（RJ45）
电源	2 个 250W (1+1 可插拔冗余电源)	1 个 200W 内置固定电源
风扇	2 个可拔插风扇模块（高速率可调速）	4 个内置风扇
风道	前后风道设计	前后风道设计
Flash	8GB EMMC （OS） 4MB SPI Flash（Boot）	8GB EMMC （OS） 4MB SPI Flash (Boot)
系统内存	2GB	2GB
输入电压	额定电压范围: 100 ~ 240V; 50/60Hz	额定电压范围: 100 ~ 240V; 50/60Hz
尺寸	442mm*379mm*43.6mm	442mm*290mm*43.6mm

软件特性

Tips ： ● Support ○ Unsupport

Type	Feature	Description	license		
			EB	MS	MA
Ethernet	interface	Ethernet interface operating modes(full duplex, half duplex, and auto-negotiation)	●	●	●

Type	Feature	Description	license		
			EB	MS	MA
		Ethernet interface operating rates	●	●	●
		Jumbo Frame	●	●	●
		port-xconnect	●	●	●
	Flow-control	Flow-control tx/rx	●	●	●
	storm-control	Port based storm-control	●	●	●
	Port-block	Port-block(know-unicast/unknow-unicast/know-multicast/unknow-multicast/broadcast)	●	●	●
	Port-isolate	L2/L3/All Port-isolate	●	●	●
		Uni-direction isolate	●	●	●
	L2 Protocol Tunnel	L2 Protocol Tunnel(support CDP/CFM/DOT1X/LLDP/SLOW-PROTO/STP/VTP	●	●	●
	Forward mode	Store-and-forward	●	●	●
		Cut-through	●	●	●
VLAN	VLAN Access mode	Access/Trunk	●	●	●
		Default VLAN	●	●	●
	VLAN Classification	VLAN Classification(port based/mac based/ip based/protocal based)	●	●	●
	QinQ	Basic QinQ	●	●	●
		Selective QinQ	●	●	●
		VLAN Mapping（1:1 VLAN Translation）	●	●	●
	VLAN Statistics	VLAN Statistics	●	●	●
	Private VLAN	Private VLAN	●	●	●

Type	Feature	Description	license		
			EB	MS	MA
	Voice VLAN	Voice VLAN	●	●	●
	Guest VLAN	Guest VLAN	●	●	●
MAC	MAC Address Table	Automatic learning and aging of MAC addresses	●	●	●
		Hardware Learning	●	●	●
		Static and dynamic MAC address entries	●	●	●
		blackhole MAC	●	●	●
	MAC Flapping detect	MAC Flapping detect	●	●	●
	Port Bridge	Port Bridge	●	●	●
LAG	Link aggregation	Static-LAG & LACP	●	●	●
		LAG load balance（SLB）	●	●	●
		LAG load balance（DLB）	●	●	●
		LAG load balance（RR）	●	●	●
		LAG Self-healing	●	●	●
xSTP	STP	Spanning-Tree Protocol	●	●	●
	RSTP	Rapid Spanning-Tree Protocol	●	●	●
	MSTP	Multi-instance Spanning-Tree Protocol	●	●	●
	Spanning-Tree Protocol Protection	BPDU Filter/Guard	●	●	●
		Root Guard	●	●	●
		Loop Guard	●	●	●
		Anti TC-BPDU attack	●	●	●
ERPS	ERPS	Single ERPS ring	●	●	●
		tangent ERPS rings	●	●	●

Type	Feature	Description	license		
			EB	MS	MA
		intersecting ERPS rings	●	●	●
		compatible with RRPP	●	●	●
G.8031	G.8031	G.8031（Ethernet Linear Network Protection）	●	●	●
G.8032	G.8032	G.8032 V1 & V2	●	●	●
		Single Ring	●	●	●
		Sub Ring	●	●	●
Loopback Detect	Loopback Detect	Loopback-detection	●	●	●
Layer2 Multicast	IGMP Snooping	IGMPv1/v2/v3 Snooping	●	●	●
		Fast leave	●	●	●
		Static IGMP snooping group	●	●	●
	MVR	MVR（Multicast VLAN Registration）	●	●	●
ARP	ARP	Static and dynamic ARP entries	●	●	●
		Aging of ARP entries	●	●	●
		Gratuitous ARP	●	●	●
	ARP proxy	basic ARP-Proxy	●	●	●
		local ARP-Proxy	●	●	●
IPv4 Unicast Routing	IPv4 Static Routes	IPv4 Static Routes	●	●	●
		blackhole Routes	●	●	●
		co-work with IP SLA	●	●	●
		VRF（Virtual Routing and Forwarding）	●	●	●
		uRPF check	●	●	●
	RIP	RIPv1/v2	●	●	●
	OSPFv2	OSPFv2	○	●	●

Type	Feature	Description	license		
			EB	MS	MA
	IS-IS	IS-IS	○	●	●
	BGP	IBGP	○	●	●
		EBGP	○	●	●
	Route policy	Route-map	●	●	●
		IPv4 prefix-list	●	●	●
	PBR	PBR（Policy-based Routing）	●	●	●
	ICMP	ICMP redirect	●	●	●
		ICMP unreachables	●	●	●
	ECMP	ECMP(SLB)	●	●	●
		ECMP(DLB)	●	●	●
		ECMP(RR)	●	●	●
		ECMP Self-healing	●	●	●
IPv4 Multicast Routing	IGMP	IGMPv1/v2/v3	●	●	●
		IGMP-Proxy	●	●	●
		IGMP SSM Mapping	●	●	●
	PIM	PIM-SM	○	●	●
		PIM-SSM	○	●	●
		PIM-DM	○	●	●
IPv6 Basic Protocol	ICMPv6	ICMPv6	○	●	●
	NDP	NDP	○	●	●
	PMTU	PMTU	○	●	●
IPv6 Unicast Routing	IPv6 Static Routes	IPv6 Static Routes	○	●	●
	RIPng	RIPng	○	●	●
	OSPFv3	OSPFv3	○	●	●
IPv6 Multicast	MLD v1/v2	MLD v1/v2	○	●	●

Type	Feature	Description	license		
			EB	MS	MA
Routing	MLD v1/v2 Snooping	MLD v1/v2 Snooping	○	●	●
	MVR6	MVR6	○	●	●
	PIM-SM v6	PIM-SM v6	○	●	●
IP Tunnel	IPv6 over IPv4 Tunnel	IPv6 over IPv4 Tunnel	○	●	●
	6to4 Tunnel	6to4 Tunnel	○	●	●
	ISATAP Tunnel	ISATAP Tunnel	○	●	●
IPv6 Service	DHCPv6	DHCPv6 Relay	○	●	●
		DHCPv6 Snooping	○	●	●
	IPv6 Prefix List	IPv6 Prefix-list	○	●	●
BFD	BFD	BFD for Static route	○	●	●
		BFD for OSPFv2	○	●	●
		BFD for VRRP/Track	○	●	●
		BFD for PBR	○	●	●
VRRP	VRRP	VRRP	●	●	●
		Track for VRRP	●	●	●
Smart Link	Smart Link	multi-instance	●	●	●
		load balance	●	●	●
		Multi-Link	●	●	●
		Monitor-link	●	●	●
MLAG	MLAG	MLAG basic	●	●	●
		MLAG orphan Port	●	●	●
EFM	EFM (802.3ah)	Auto detection	○	●	●
		Network fault detetion	○	●	●
		Network fault handle	○	●	●

Type	Feature	Description	license		
			EB	MS	MA
		remote loopback	○	●	●
CFM	CFM (802.1ag)	Hardware CCM detect	○	●	●
		MAC Ping	○	●	●
		MAC Trace	○	●	●
Y.1731	Y.1731	Latency and jitter measure	○	●	●
QoS	Traffic classification	Traffic classification based on COS/DSCP (simple classification)	●	●	●
		Traffic classification based on ACL (complex classification)	●	●	●
		Traffic classification based on inner header of the tunnel packets	●	●	●
	Traffic behaviors	Queue scheduling	●	●	●
		Remark the priority fields(COS/DSCP) of the packet based on ACL	●	●	●
		Remark the priority fields(COS/DSCP) of the packet based on Table Map	●	●	●
		Flow redirection	●	●	●
		Flow mirror	●	●	●
	Traffic policing	Traffic policing based on direction(in/out) of Port	●	●	●
		Traffic policing based on direction(in/out) of VLAN	●	●	●
		Traffic policing based on direction(in/out) of flow	●	●	●

Type	Feature	Description	license		
			EB	MS	MA
		Traffic policing based on direction(in/out) of aggregated flow	●	●	●
	Traffic shaping	Queue based traffic shaping	●	●	●
		Port based traffic shaping	●	●	●
	Congestion management	SP（Strict Priority）scheduling	●	●	●
		WDRR（Weighted Deficit Round Robin）scheduling	●	●	●
		SP + WDRR mixed scheduling	●	●	●
	Congestion avoidance	TD（Tail Drop）	●	●	●
		WRED（Weighted Random Early Detection）	●	●	●
	Traffic statistics	Packet counts and bytes statistics based on traffic classification	●	●	●
		Packet counts and bytes statistics based on the color after traffic policing	●	●	●
		Forwarded and discarded packet counts and bytes statistics	●	●	●
	ECN (Explicit congestion notification)	ECN tags based on Tail Drop	●	●	●
		ECN tags based on WRED	●	●	●
VARP	Virtual gateway	VARP（Virtual-ARP）	●	●	●
		VARP subnet	●	●	●
Tunnel	VxLAN	Manual configure VxLAN tunnel	●	●	●
		VxLAN distributed gateway	●	●	●

Type	Feature	Description	license		
			EB	MS	MA
		VxLAN active-active access	●	●	●
		Interconnect across Datacenters based on VxLAN	●	●	●
		L2 Protocol packet passthrough	●	●	●
		Edit DSCP in VxLan outer header	●	●	●
		BGP EVPN	○	○	●
		Support to enable/disable overlay split horizon per-VNI	●	●	●
	GRE Tunnel	GRE Tunnel	●	●	●
	NVGRE Tunnel	NVGRE Tunnel	●	●	●
	GENEVE Tunnel	GENEVE Tunnel	●	●	●
DCB	DCBX	LLDP support DCBX TLV	●	●	●
	PFC	PFC	●	●	●
IPRAN	LDP	LDP	○	○	●
	MPLS Forwarding	MPLS Forwarding	○	○	●
	VPWS	VPWS	○	○	●
	VPLS	VPLS	○	○	●
	MPLS OAM	MPLS OAM	○	○	●
	MPLS Stats	MPLS Stats	○	○	●
	L3VPN	L3VPN	○	○	●
	ACL	MPLS ACL	○	○	●
	QoS	MPLS QoS	○	○	●
System Security	SSH	SSHv1/v2	●	●	●
		RSA Key generation	●	●	●
	RADIUS	RADIUS	●	●	●

Type	Feature	Description	license		
			EB	MS	MA
	TACAS+	TACAS+	●	●	●
	AAA	Authentication	●	●	●
		Authorization	●	●	●
		Accounting	●	●	●
	Dot1x	Port based dot1x	●	●	●
		MAC based dot1x	●	●	●
		Guest VLAN	●	●	●
	ACL	MAC/IP ACL	●	●	●
		Basic Mode ACL	●	●	●
		Port-group ACL	●	●	●
		VLAN-group ACL	●	●	●
		IPv6 ACL	●	●	●
		ACL UDF	●	●	●
		Time Range	●	●	●
	ARP Inspection	ARP Inspection	●	●	●
	IP Source Guard	IP Source Guard	●	●	●
	Port Security	Limitation on MAC address learning on interface	●	●	●
	VLAN Security	Limitation on MAC address learning on VLAN	●	●	●
	Control Plane Policy (COPP)	Black list/wihte list	●	●	●
		Rate limit	●	●	●
	CPU Traffic Limit	CPU Traffic Limit	●	●	●
	Prevent DDOS attack	Prevent DDOS attack (ICMP Flood/Smurf/Fraggle/LAND/SYN Flood)	●	●	●

Type	Feature	Description	license		
			EB	MS	MA
	Login filter	Telnet/SSH ACL filtering	●	●	●
		Telnet/SSH IPv6 ACL filtering	●	●	●
	MAC Security	MacSec(802.1AE)	●	●	●
	Link-Flapping detection	Link-Flapping detection	●	●	●
Network Management	DHCP	DHCP Server	●	●	●
		DHCP Relay	●	●	●
		DHCP Snooping	●	●	●
		DHCP Client	●	●	●
		DHCP Option82	●	●	●
		DHCP Option252	●	●	●
	RMON	RMON	●	●	●
	sFlow	sFlow v4/v5	●	●	●
	IP SLA	IP SLA	●	●	●
	Latency/Buffer Monitor	Latency Monitor	●	●	●
		Buffer Monitor	●	●	●
	EFD	Elephant Flow Detection	●	●	●
	NTP	NTP（Network Time Protocol）	●	●	●
	Errdisable	Errdisable detection and recovery	●	●	●
	DNS	Static DNS Client	●	●	●
	LLDP	LLDP	●	●	●
Terminal Services	Command Line Interface	Configurations through CLI (Command Line Interface)	●	●	●
	Help information	Banner configuration	●	●	●
		Help information in English	●	●	●
	Terminal service	Vty Terminal service	●	●	●

Type	Feature	Description	license		
			EB	MS	MA
		Console Terminal service	●	●	●
Configuration Management	Management interface	Inband management interface and configuration	●	●	●
		Outband management interface and configuration	●	●	●
	User privilege management	privileged user proirity and privileged commands	●	●	●
	SNMP	Network management based on SNMPv1/v2c/v3	●	●	●
		Public and private MIB	●	●	●
		Public and private Trap	●	●	●
	WEB	Configuration and management based on WEB UI	●	●	●
	RPC-API	Configuration and management based on RPC-API	●	●	●
	SmartConfig	SmartConfig（Automatically configuration when system start）	●	●	●
	OVSDB	Configuration and management based on OVSDB	●	●	●
	system profile configuration	change the system specifications by choose different STM Profiles	●	●	●
	License control	Feature configuration based on License	●	●	●
	Restore factory default configuration	Restore factory default configuration	●	●	●
File System	File system	File system(support directory and	●	●	●

Type	Feature	Description	license		
			EB	MS	MA
		file management)			
	Upload and download	Upload and download files through FTP or TFTP	●	●	●
		Upload and download files through Xmodem	●	●	●
Debugging And Maintenance	Debug	per-module Debug features	●	●	●
		ICMP Debug	●	●	●
	BHM	Software process monitor: BHM （Beat Heart Monitor）	●	●	●
		Hardware Watch Dog	●	●	●
	Log & alarm	CPU usage display and alarm	●	●	●
		Memory usage display and alarm	●	●	●
		Device temperature、PSU、FAN、status display and alarm	●	●	●
		User operation logs	●	●	●
		Management of logs, alarms, and debugging information	●	●	●
	VCT	VCT（Virtual Cable Test）	●	●	●
	system diagnostics	Detailed Diagnostic-information collection	●	●	●
	Reboot	Manual reboot	●	●	●
		Schedule Reboot	●	●	●
		Reboot Information logging	●	●	●
	network diagnostics	Ping	●	●	●
		IPv6 Ping	●	●	●

Type	Feature	Description	license		
			EB	MS	MA
		Traceroute	●	●	●
	mirror	Port mirror	●	●	●
		Flow mirror	●	●	●
		Remote mirror	●	●	●
		Multi-destination mirror（m:n）	●	●	●
		Use CPU as mirror source	●	●	●
		Use CPU as mirror destination and analyze packet	●	●	●
		ERSPAN	●	●	●
	CPU statistics	To CPU/From CPU packets statistics	●	●	●
	L2 Ping	layer2 network connectivity detection - L2Ping (MAC Ping/Trace)	●	●	●
	UDLD	UDLD（Unidirectional Link Detection）	●	●	●
	unidirectional	unidirectional forwarding of the fiber	●	●	●
	Loopback	port loopback	●	●	●
		hardware loopback （internal/external）	●	●	●
	System time	Time configuration	●	●	●
		Timezone	●	●	●
Version Upgrade	system soft ware upgrade	upgrade with the local image file	●	●	●
		upgrade with the remote TFTP server	●	●	●

Type	Feature	Description	license		
			EB	MS	MA
	Uboot upgrade	Online upgrade Uboot	●	●	●