SDN Managed Multi-Giga PoE Switch

PS2440GTM 24p x UTP, 4p x 10G SFP+

Product Overview

Yoda PS2440GTM series Routing Switches are high performance Ethernet switches to meet next generation Metro, Data Center and Enterprise network requirements. The PS2440GTM is designed based on Centec's third generation high-end scalable chipset CTC5160, which support OAM operations and integrated 1588/SyncE Timing Synchronization. The PS2440GTM comes with complete system software with comprehensive protocols and applications to facilitate rapid service deployment and management for both traditional L2/L3/DC/IPv6 networks. It has open API interfaces to achieve SDN.

The PS2440GTM Series are cost-effective Ethernet access and aggregation platform to Enterprise, Data Center and Metro application. It provides 24 GE Base-T ports with 4 x 10GE SFP+ ports, with IEEE 802.3af/at PoE supported of upto 360w internal power source.

Product Features

Specification	Benefit
Triple-Play Services	• Advanced QoS functionalities provide differentiated class of service treatment to support triple-play service. • Multicast VLAN Registration (MVR) continuously sends multicast streams in a multicast VLAN while isolating the streams from subscriber VLANs to reduce overall bandwidth requirement for multicast distribution in ring based network. • Comprehensive security solution to provide protection of subscribers, switch,

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Specification	Benefit
	and network at the network edge.
MEF9 Services	• Up to 4K EVC are supported • QinQ based EPL/EVPL, ELAN/EVLAN service support
MEF14 Services	• Per port egress shaping and minimum 1Mbps increments up to port speed • Ingress and egress per port policing and minimum 64Kbps increments up to port speed. • CIR/PIR, srTCM / trTCM • Classification criteria , COS, Vlan • Ingress / Egress PBIT remarking – 802.1q VLAN • Ingress / Egress PBIT remarking – 802.1ad SVLAN • PBIT Transparency – 802.1q VLAN • PBIT Transparency – 802.1ad VLAN
G.8031&8032	• G.8031 (Linear network protection) (11/2009)1:1 protection • G.8032 (Ring network protection) (06/2008) ring and sub-ring
Intelligent Ethernet OAM	• Industry standard OAM 802.1ag (CFM) feature supports end-to-end network monitoring and troubleshooting. This greatly reduces OPEX for customers by reducing the numbers of site visits needed to troubleshoot network problems. • Industry standard OAM 802.3ah (EFM) feature allows continuous standard Ethernet network across the globe, eliminating non-native transport such as Ethernet over ATM from the access networks, which eases OAM and provides compatibility with new transport media types, eg. PON.
Layer 2 VPN Service	• Selective QinQ feature strictly conforms to 802.1Q and 802.1ad and provides more flexibility to customers while classifying VLAN based on port, original VLAN or L2/L3 information for the purpose of segregating subscriber traffic in the network. • VLAN translation in both ingress and egress translates VLAN IDs carried in the data packets between different virtual LANs or between VLAN and non-VLAN encapsulating interfaces at Layer 2.

Specification	Benefit
Data Center	• MLAG for multiple chassis link redundancy • Open API interfaces to achieve SDN • NVGRE
Availability and Reliability	
Superior Redundancy for Fault Backup	• IEEE 802.1d Spanning Tree Protocol (STP) support for redundant backbone connections and loop-free networks simplifies network configuration and improves fault tolerance. • IEEE 802.1s Multiple Spanning Tree Protocol (MSTP) allows a spanning-tree instance per VLAN, for Layer 2 load sharing on redundant links. • IEEE 802.1w Rapid Spanning Tree Protocol (RSTP) provides rapid spanning-tree convergence independent of spanning-tree timers and also offers the benefit of distributed processing. • Link Aggregation Control Protocol (LACP) allows the creation of Ethernet channeling with devices that conform to IEEE 802.3ad. • Equal-Cost MultiPath (ECMP) works for routing packets along multiple paths of equal cost for load balancing and redundancy. • Virtual Router Redundancy Protocol (VRRP) is supported to create redundant, failsafe routing topologies. • Centec-patented Sysmon mechanism monitors real-time CPU status and pauses switch work while unexpected fault happens. • ERPS (Ethernet Ring Protection Switching) is used to create a fault tolerant topology by configuring a primary and secondary path for each VLAN. • SmartLink is a fault tolerant topology for two uplink application, can provide < 50ms protection time. • Virtual-ARP(VARP) allows multiple switches to simultaneously route packets from a common IP address in an active-active router configuration. • Multi-Chassis Link Aggregation(MLAG) is supported to logically aggregate ports across two switches.
High-Performance IP	• Basic IP unicast routing protocols (static, Routing Information Protocol Version

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Routing	1 [RIPv1], and RIPv2) are supported for small-network routing applications. • Advanced IP unicast routing protocols (Open Shortest Path First [OSPF] and Border Gateway Protocol Version 4 [BGPv4]) is supported for load balancing and constructing scalable LANs. • Protocol Independent Multicast sparse mode (PIM-SM), Dense Mode and Specify Source Mode for IP multicast routing is supported. • Up to 256 switch virtual interfaces (SVIs) are supported; all physical ports can be routed port. • Proxy Address Resolution Protocol (ARP) allows to answer the ARP queries from a network host. • Gratuitous Address Resolution Protocol (ARP) assists in the updating of other machines' ARP tables and helps detect IP conflicts and ensure load balancing on incoming traffic in some cases. • IPv6 routing support in hardware for maximum performance. • VRRP provides dynamic load balancing and failover for routed links.
Robust Multicast Control	• Internet Group Management Protocol (IGMP) snooping provides fast client joins and leaves of multicast streams and limits bandwidth-intensive video traffic to only the requestors. • IGMP Snooping TCN provides quick response capability to topology changes so that the service provider's multicast service will not be paused even the topology is altered temporarily. • IGMP immediate leave overrides the normal checks to see if there are other hosts or proxy devices on the local segment interested in the multicast group and shorten the time of changing channels for IPTV services. • IGMP filtering provides multicast authentication by filtering out nonsubscribers and limits the number of concurrent multicast streams available per port. • IGMP proxy enables the system to issue IGMP host messages on behalf of hosts that the system discovered through standard IGMP interfaces to allow users on any downstream network to join an upstream sourced multicast

Specification	Benefit
	group. • Multicast VLAN Registration (MVR) allows one single multicast VLAN to be shared among different subscriber VLANs on the network which improves bandwidth utilization by reducing multicast traffic in the subscriber VLANs and simplifies multicast group management.
Bandwidth Optimization	• Per-port broadcast, multicast, and unicast storm control prevents faulty end stations from degrading overall systems performance. • Equal-cost routing facilitates Layer 3 load balancing and redundancy across the stack. • Switch-port auto-recovery automatically attempts to reactivate a link that is disabled because of a network error. • Up to 55 Link Aggregation groups are supported with 16 member ports per group.
IPv6 Support	
ASIC Chipset Based IPv6 Support	• Fully distributed handling and forwarding IPv6 packets at wire speed. • Chipset supports most of IPv6 routing protocol and tunneling protocol. • Support chipset based native tunneling. • Support chipset based IPv6 ACL and QoS. • Advanced chipset based IPv6 multicast
QoS and Control	
Advanced QoS	• QoS queuing mechanism differentiates flows according to any L2/L3/L4 identity and enqueues flexibly; meanwhile modifies CoS/DSCP and limits throughput. • Ingress and egress policer is provided based on 802.1p Class of Service (CoS), Differentiated Services Code Point (DSCP), VLAN ID and QoS ACLs (IP ACLs or MAC ACLs), which can include source and destination IP address, source and destination MAC address, Layer 4 TCP/UDP information, or any combination of these fields. • Ingress and egress aggregate policer reinforces traffic policing across all of the

Specification	Benefit
	applied ports. QoS applies the bandwidth limits specified in an aggregate policer cumulatively to all the flows matching the criteria. • Weighted Random Early Detection (WRED) generally drops packets selectively based on IP precedence and packets with a higher IP precedence are less likely to be dropped than packets with a lower precedence; WRED ensures higher priority traffic to be delivered with a higher probability than lower priority traffic. • In contrast to WRED, Tail Drop provides per QoS class congestion avoidance at the queues before a disruption occurs. • Queue, service and port based three-level traffic shaping contributes to up to 64Kbps granularity. • Weighted Deficit Round Robin (WDRR) extends the quantum idea from the DRR to provide weighted throughput for each queue. Different queues have different weights and the quantum assigned to each queue in its round is proportional to the relative weight of the queue among all the queues serviced by that scheduler. • Strict Priority queue (SP) provides strict-priority queuing for a traffic class that enables delay-sensitive data, such as voice, to be sent before packets in other queues are sent. The priority queue is serviced first until it is empty. • Strict priority queuing helps ensure that the highest-priority packets are serviced ahead of all other traffic. • 8 egress queues per port help enable differentiated management of up to 8 traffic types across the stack. • Support 8 differ-service domain, could provide flexible differ service for the ports. • There is no performance loss when using advanced QoS functionalities.
Network Security	
Comprehensive Security Solutions	• Subscriber Security – IEEE 802.1x allows dynamic, port-based security by providing user authentication.

Specification	Benefit
	- IEEE 802.1x and port security are provided to authenticate the port and manage network access for all MAC addresses, including that of the client. - DHCP Snooping prevents malicious users from spoofing a DHCP server and sending out bogus addresses. This feature is used by other primary security features to prevent a number of other attacks such as Address Resolution Protocol (ARP) poisoning. - DHCP Snooping helps administrators with consistent mapping of IP to MAC addresses. This can be used to prevent attacks that attempt to poison the DHCP binding database and to rate-limit the amount of DHCP traffic that enters a switch port. - Dynamic ARP Inspection helps ensure user integrity by preventing malicious users from exploiting the insecure nature of the ARP protocol. - IP Source Guard prevents a malicious user from spoofing or taking over another user's IP address by creating a binding table between client's IP and MAC address, port, and VLAN. • Switch Security - Secure Shell (SSH) Protocol, Kerberos, and Simple Network Management Protocol Version 3 (SNMPv3) provide network security by encrypting administrator traffic during Telnet and SNMP sessions. - Multilevel security on console access prevents unauthorized users from altering the switch configuration. - RADIUS authentication facilitates centralized control of the switch and restricts unauthorized users from altering the configuration. - Three MAC based security mechanisms are offered to control access: ▪ MAC filtering ▪ MAC port binding ▪ MAC number limitation per port ▪ CPU traffic protection refuses abnormal data flow to avoid

Specification	Benefit
	malicious attack. • Network Security – ACLs allows for multiple layer rules coexistence such L2 with L3, or even with L4. – Security VLAN ACLs on all VLANs prevent unauthorized data flows from being bridged within VLANs. – Port-based ACLs for Layer 2 interfaces allow security policies to be applied on individual switch ports. – Three different mechanisms are supported to protect the STP topology from loops or undesired topology changes caused by addition of switches, mis-configuration of devices or even malicious attempts to override the current Spanning Tree Root Bridge. – Bridge Protocol Data Unit (BPDU) Guard – Bridge Protocol Data Unit (BPDU) Filtering – Root Guard – BPDU Guard and BPDU Filtering protect against possible loops created by switches added on ports configured with the STP Port Fast feature. – Root Guard protect against added switches attempting to become the Root Bridge.
Manageability	
Superior Manageability	• CLI support provides common user interface and command set with all routing switches. • IEEE 802.1ag Connectivity Fault Management (CFM) provides standard support for transport fault management. It allows for discovery and verification of path for Layer 2 services. • IEEE 802.1ah Ethernet in the First Mile (EFM) allows detection of faults on an EFM link and enable service providers to fully monitor a customer's end-to-end Ethernet service. • Layer 2 traceroute eases troubleshooting by identifying the physical path that

Specification	Benefit
	a packet takes from source to destination. • Network Timing Protocol (NTP) client guarantees accurate and consistent time synchronization with the whole network. • File Transfer Protocol (FTP) / Trivial File Transfer Protocol (TFTP) reduce the cost of administering software upgrades by downloading from a centralized location. • Dynamic Host Configuration Protocol (DHCP) Relay allows a DHCP relay agent to broadcast DHCP requests to the network DHCP server. • Multifunction LEDs per port for port status; half-duplex and full-duplex mode; and 10BASE-T, 100BASE-TX, 1000BASE-T, 10GBASE-LR indication as well as switch-level status LEDs for system, redundant-power supply, and bandwidth utilization provide a comprehensive and convenient visual management system.

Hardware Platform Specification		
1. Basic		
Product Name		PS2440GTM
Product Positioning		Data Center TOR access, Enterprise & Metro network access or aggregation
Switching Method		Store and Forwarding
CPU Model/ Frequency		PowerPC P1010 533MHz
Flash		2GB (NAND)
Memory		1GB
Hardware Configuration	**Main Board Spec**	24x1GE RJ45 ports + 4x10GE SFP+
	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	Not Support
2. Performance Spec		
Switching Capacity		128Gbps (24x1GE + 4x10GE)
3. Hardware and Software Description		

Hardware Architecure		• Standard 1U 19'' rack mountable • 24x10/100/1000 Base-T Ethernet Port • 4x10GE SFP+ Ethernet Port (Fixed)
PoE standard IEEE 802.3at/af		Support with different power capacity upto 360W
Software upgrade method		Through TFTP/FTP/WEB
Service interruption time when reboot system for software update		less than 120s
4. The Power Supply and Power Requirements		
Power Supply	**AC**	Support
Power supply range	**AC Input**	Operating Voltage: 100 ~ 240V; 50/60Hz
	DC Output	Operating Voltage: 56VDC
Maximum power consumption		< 65W for System
Maximum PoE Budget		< 360W
5. Over current and over voltage protection		
Whether the equipment installation over current, over voltage protector?		Yes
Surge protection level		6 KV
6. Others		
Hardware Size (H×W×D) in.		4.36 x 44.0 x 39.5cm
Weight (kg)		5.3kg (include PSU of 360w)
Cooling Mode		Fan cooling (Front-to-Rear airflow)
Noise		< 50 dB
Quantity of Fans		Side fan of 4 + Rear fan of 4 (adjustable air flow)
Operating Temperature Range		Operating temperature: 0 to 40ºC

Performance & Spec Table

Class	Feature	Sub Spec	Default Profile	VLAN Profile	IPv4 Profile	IPv6 Profile
Ethernet Basic	**Jumbo frame**	Maximum Size	9600			
	Unicast MAC	MAC address Capacity	32768	65536	32768	16384
		MAC Learning Rate (SW)	3144fps			
		MAC Learning Rate (HW)	40013fps			
		Blackhole MAC address capacity	64			
	Multicast MAC	MAC address Capacity	2048	1024	1024	2048
	VLAN	VLAN IDs	4094			

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		Total VLANs	4094			
	STP	Convergence time	30s			
	RSTP	Convergence time	775ms			
	MSTP	Instance Num	64			
		Convergence time	774ms			
	Link Aggregation (Static&LACP)	Maximum Member Num	16			
		Maximum Group Num	55			
		Load balance mode	dst-ip/dst-mac/src-dst-ip/ src-dst-mac/src-ip/src-mac			
		Convergence time	375ms			
	Smart-Link	Maximum Groups Num	16			
		Maximum Protection Instance Num	64			
		Switchover time	Copper port : 775ms / Optical port : 35ms			
	VLAN Classification	Base MAC Capacity	512	3072	512	512
		Base IPv4 Capacity	512	1024	512	256
		Base IPv6 Capacity	256	N/A	N/A	640
IPv4 Unicast	**ARP**	ARP Capacity	3072	1024	6144	2048
	IPv4	FIB	6144	2048	8192	4096
		ECMP Group	16	16	30	16
	VRRP	Management Groups Num	255			
		Switchover time	< 4*advt_interval (advt_interval=100ms or 1s)			
	PBR	Maximum Groups Num	32	N/A	64	64
	IPv4 BFD	Session Capacity	8	N/A	N/A	N/A
IPv4 Multicast	**IPMC**	Number of interfaces that support Multicast routing table	255			
		Multicast Routing Table	511	255	511	255
	IGMP Snooping	Maximum Groups Num	8K			
IPv6 Unicast	**Host Route**	NDP Capacity	1024	N/A	N/A	6144
	IPv6	FIB	2048	N/A	N/A	12288
		ECMP Group	14	N/A	N/A	14
IPv6 Multicast	**IPMC**	Number of interfaces that support Multicast routing table	31	N/A	N/A	31
		Multicast Routing Table	127	N/A	N/A	383
	MLD Snooping	Maximum Groups Num	4096	N/A	N/A	4096
IP Tunnel	**IP Tunnel**	Tunnel Capacity	8	N/A	N/A	32

QoS	**QoS**	Per-port Queue Num	8			
		System Packet Buffer Capacity	3			
		Policer granularity	8Kbps (0 < rate < 2Mbps) 32Kbps (2M < rate < 100Mbps) 64Kbps (100M< rate <= 1Gbps) 128Kbps (1G< rate <= 2Gbps) 256Kbps (2G< rate <= 4Gbps) 512Kbps (1Gbps < rate <= 10Gbps)			
		Shape granularity	64Kbps			
ACL	**ACL**	MAC ACL Num	2048			
		IP ACL Num				
		Extend ACL Num				
		IPv4 Rules Num(MAC ACL/IP ACL/Extend ACL)	863	1535	1535	255
		IPv6 Rules Num(IPv6 ACL/Extend IPv6 ACL)	1024	N/A	N/A	383
Security and Application	**IP Source Guard**	IPv4 maximum rules Num	1024	1024	512	256
		IPv6 maximum rules Num	N/A	N/A		384
	DHCP-Snooping	Maximum bound entry	4096			
Metro Ethernet	**Vlan Mapping**	Maximum mapping table	64			
		Maximum rules Num	1024	2048	1536	1024
	ERPS	Domain Num	16			
		Ring Num	3/domain			
		Protection instance Num per Ring	1			
		Switchover time	< 50 ms (optical port)			
	CFM	Maximum Session Num	500		N/A	
		Maximum Domain Num	7		N/A	
		Num of CCM Interval types	7		N/A	
		CCM minimum Interval	3.3ms		N/A	
		Maximum Num of LMEP&RMEP	1000		N/A	
	G.8031	Maximum Group Num	64		N/A	
		Switchover time	< 50 ms		N/A	
	G.8032	Maximum Ring Num	32		N/A	

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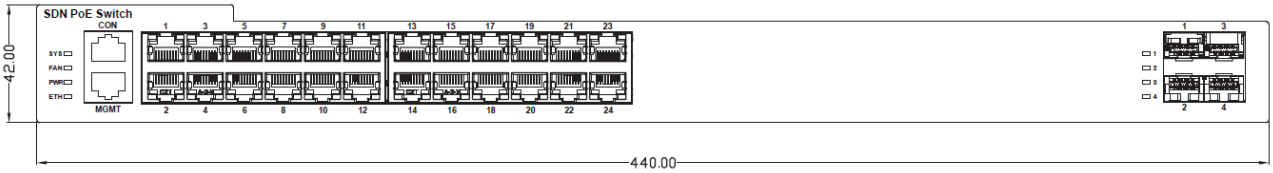
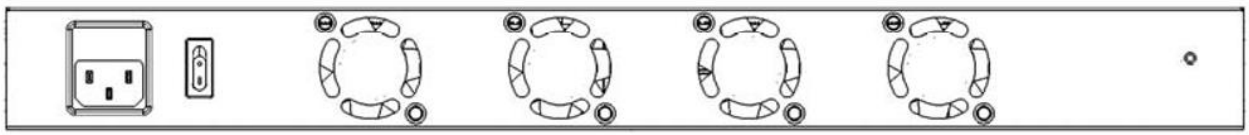
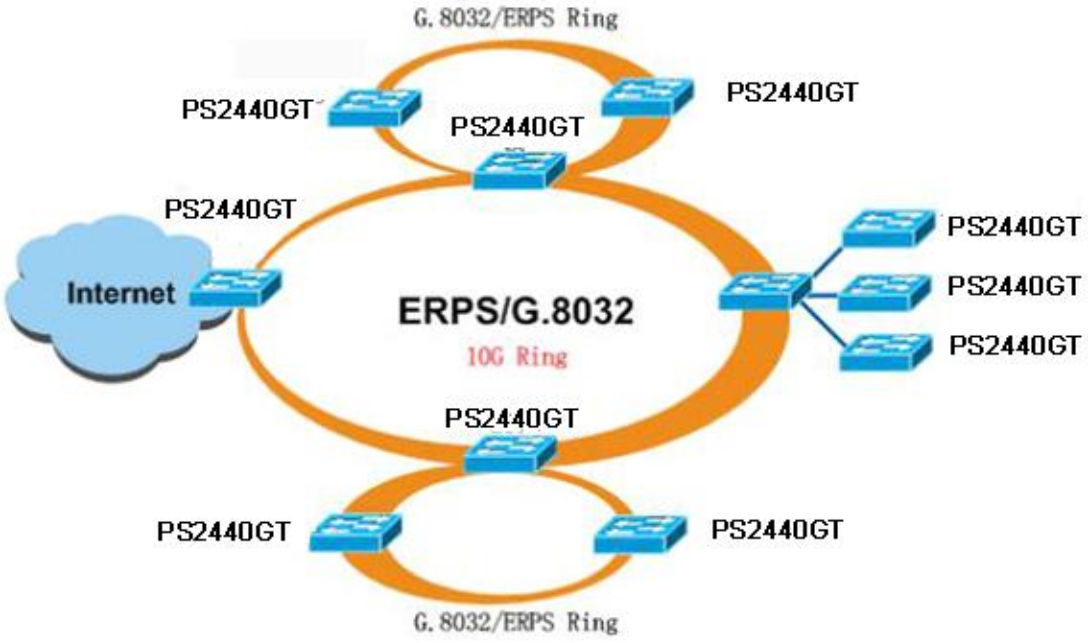
		Switchover time	< 50 ms	N/A

Front/ Rear Panel





Application



Ordering Information

Model/Specification	
PS2440GTM-xxx	Lite L3 Managed PoE Switch, 24p UTP + 4p 10G SFP+ with power of xxx: 250w, 360w
PS2440GTM-SDN-xxx	SDN Managed PoE Switch, 24p UTP + 4p 10G SFP+ with power of xxx: 250w, 360w

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