OSM8510

Overview

The high performance, scalable and feature rich OSM8510 is a 10G switching platform designed for a wide variety of applications. From Enterprise switching and routing with both IPv4 / IPv6 to Carrier Layer 2 Services concentrator with Power Over Ethernet (POE)and MPLS* features, the OSM8510 provides a flexible and resilient solution. In one platform, the OSM8510 satisfies the needs of the enterprise and data centers while addressing service provider needs in carrier networks.

With a chassis based modular design, Service Modules and Fabric/ Management Modules can be plugged to provide various configuration and flexible network deployment.

Standards based hardware / software features along with practical propriety extensions allow easier deployment of network services. The OSM8510 is a safe investment when future protocols and features need to be deployed.

The intelligent core multi-layer OSM8510 10Gigabit switch has advanced routing capabilities and intelligent Quality Of Service (QoS) features. The OSM8510 is a routing switch that combines the speed of a Layer 2 switch with the ability to route at a Layer 3 level and provides comprehensive network management functions such as Spanning Tree protocol for standard bridging, GVRP for VLAN configuration IPv4/IPv6 Management IPv4/IPv6 Policy-maps,

IPv4/IPv6 ACLs, IPv4/IPv6 QoS, QinQ ,RIP, OSPF, ISIS*, BGP, SNMP and RMON are all standard features.

With hardware-based IPv4/IPv6 routing and the Enhanced Multilayer Software, the Core intelligent multi-layer switch OSM8510 delivers high performance dynamic IPv4/IPv6 routing. The routing architecture allows for increased scalability and performance. This chassis based modular design architecture allows for very high-speed lookups while also ensuring the stability and scalability necessary to meet the needs of future requirements. In addition to static IPv4/IPv6 unicast routing, Routing Information Protocol (RIP) , Open Shortest Path First (OSPF) protocol, ISIS* and BGP are supported. The OSM8510 is perfectly equipped for networks requiring multicast support. Protocol Independent Multicast (PIM) and Internet Group Management Protocol (IGMP) snooping make the OSM8510 ideal for intensive multicast environments.

The OSM8510 delivers LAN-edge QoS based on the IEEE 802.1p standard. It honors the class-of-service (CoS) value at the ingress point and assigns the packet to the appropriate queue, or the packets can be reclassified based on a default CoS value assigned to the ingress port by the network administrator. CoS classification and reclassification can be based on criteria as specific as the source/destination IPv4/IPv6 address, source/

destination Media Access Control (MAC) address or the Layer 4 Transmission Control Protocol (TCP)/User Datagram Protocol (UDP) port.

The OSM8510 supports comprehensive layer 2/4 features such as Private VLAN, IEEE 802.3ad trunking and Link aggregation; Access Control Lists, SSH security features and L4 QoS features include 802.1p and DiffServ, rate-limiting, WRR, strict scheduling, 8-level priority in switching to ensure the steadiness of data communication.

OSM8510 Feature Highlights:

- Complete layer 3 standard features including:
    - IPv4/IPv6 routing at wire speed
    - Provides RIP I (RFC1058) and RIP II (RFC2453)
    - Provides OSPF (RFC2328) routing
    - Provides ISIS* routing
    - Provides BGP
    - Provides IP Multicast Routing: IGMP v1/v2/v3 , PIM-SM, PIM-DM and DVMRP
    - IP Redundancy - VRRP (RFC 2338) supported
    - ARP (RFC 826) supported
    - Provides Supernetting (CIDR)
    - Up to 200K IP address entries
    - Static Equal/ Weight Cost Multipath Protocol (ECMP,WCMP)
    - OSPF Equal Cost Multipath Protocol (ECMP)
    - Policy based routing
    - Provides Multi-netting
    - Provides DHCP/BOOTP (RFC 951) relay
    - Provides DHCP server (RFC 2131)
- L4 features: Bandwidth Management, Class of Service (802.1p) mapping to Type of Service, DiffServ, priority queuing algorithm including Weighted Round Robin and Strict
    - Complete layer 2 standard features including:
    - QinQ
    - RERP (Rapid Ethernet Ring Protocol)
    - IEEE 802.1q and 802.1p (Class of Service) with 8 hardware queues per port enabling prioritization of mission-critical applications
    - Supports up to 16K MAC address entries per interface module and up to 128K MAC addresses per chassis
    - Port-based VLAN
    - Spanning Tree IEEE 802.1D, 802.1W, 802.1S
    - IEEE 802.3ad for automatic link aggregation
    - Support for Generic VLAN Registration Protocol (GVRP)
- Power Over Ethernet (POE)
    - IEEE 802.3af Power Over Ethernet compliant, provides power over unused Category 5 cable pairs.
    - Provides 15.4 Watts of power to each port
    - Automatically detects POE devices and provides power to detected devices.
    - Leading power management features including per port short circuit protection.
    - Enables remote RESET of hard to reach Wireless access points, for easy troubleshooting.
- IPv4/IPv6 Management – L2/L3/L4 control list, Cisco look alike CLI interface, SNMP v1/v2 /v3, RMON, Telnet console interface, Syslog.
- Security- IEEE 802.1X, RADIUS, TACACS+*, Port Security, SSH, IPv4/IPv6 ACL

* future

High Availability and Redundancy

Network resiliency is a critical part of network availability. The OSM8510 provides extensive support including advanced IPv4/IPv6 routing redundancy protocols, load sharing and mechanisms for fast reconfiguration of links between switches, routers and servers.

The OSM8510 hot-swappable modular design and passive backplane greatly reduces network downtime.
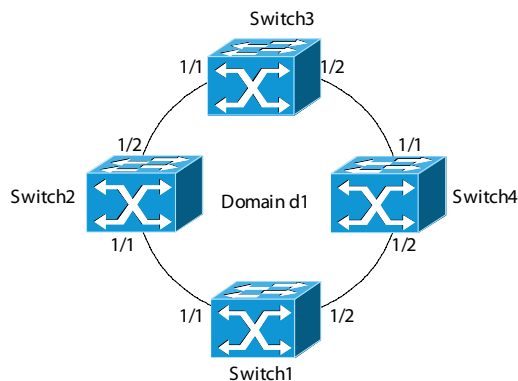
All modules (Service and Fabric/Management), power supplies, fans and optics (SFP and XFP) are all hot-swappable. Extra Power Supplies, CPUs, Extended Service Modules and Fabric/Management Modules provide for redundancy. Standard protocols such as RSTP, VRRP and OSPF, as well as SNS's RERP (Rapid Ethernet Ring Protocol) are used to build redundant networks.

RERP provides a loop-free network when a ring topology is used. RERP solves the slow RSTP / OSPF cut-over times when links fail. RERP fail-over times are less than 100 ms.

Enhanced Security Features

The OSM8510 Series switches offer enhanced data security through a wide range of security features that protect network management and administrative traffic, secure the network from unauthorized users, provide granular levels of network access to users, and track where users are located.

Secure Shell (SSH), Secure Telnet, port based security secures the network, thereby protecting it from tampering or eavesdropping. Remote Access Dial-In User Service (RADIUS) authentication enables centralized access control of switches and restricts unauthorized users from altering the configurations. Alternatively, a local username and password database can be configured on the switch itself. Multi levels of authorization on the switch console provide the ability to give different levels of configuration capabilities to different administrators.

ACLs restrict access to sensitive portions of the network by denying packets based on source and destination MAC addresses, IPv4/IPv6 addresses, or TCP/UDP ports. ACL lookups are done in hardware; therefore, forwarding and routing performance is not compromised when implementing ACL-based security in the network.

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Network Control through Advanced QOS and Policing

The OSM8510 Series switches prioritize each packet based on the required level of service, using eight priority queues with strict or Weighted Round Robin Queuing. It uses IEEE 802.1p and 802.1Q tags to prioritize incoming traffic based on input from the end-station application. These functions can be used to provide independent priorities for delay-sensitive data and best-effort data.

The OSM8510 Series also supports several common methods of prioritizing layer 3/4 traffic to meet application requirements. Traffic can be prioritized based on the priority bits in the IPv4/IPv6

frame's Type of Service (ToS) octet. When these services are enabled, the priorities are mapped to a Class of Service value by the switch, and the traffic is sent to the corresponding output queue.

The policing feature controls the maximum rate for traffic received on an interface. Policing is configured on interfaces at the edge of a network to limit traffic into or out of the network. Traffic that falls within the rate limit is transmitted, while packets that exceed the acceptable amount of traffic are dropped.

Interface Options using Advanced GE/10G Pluggable Optics Connectivity

The OSM8510 Series offers Advanced GE/10G pluggable optic interfaces for fiber-optic hookup. The SFP interface supports both single mode and multi mode Gigabit fiber-optic communication, allowing network managers the flexibility to upgrade their networks connecting the distribution back to the enterprise backbone using SX, LX, or EZX optics as well as single-mode and single fiber CWDM and DWDM interfaces. Fiber-optic transmission enables distances of 300m, 5Km,or up to 120Km, respectively. This solution delivers a cost-effective and efficient aggregation of wiring closets within an enterprise network.

10G Uplink Capability / Flexibility

Effective for future expansion convenience and investment savings, the OSM8510 provides 10G modules to fulfill any bandwidth-eager customer requirements. The benefits that 10 Gigabit Ethernet interface can provide for the core and metro application are:

- Improved performance
- Future fiber cost savings—Fiber optic Ethernet link utilization is improved by a factor of 10G uplink to fulfill any bandwidth-eager customer requirements
- Simplified operations — reduced number of Links simplifies fiber cross connect management

IEEE 802.3af Compliance

The OSM8510 switch is IEEE 802.3af compliant. It can provide Power over Ethernet to any IEEE 802.3af compliant device such as IP phones, wireless access points, network cameras, security and lighting devices, and access control devices. The benefits of being interoperable with standard-based equipment, means that customers are not forced to tie themselves to any one vendor, as the switch has the flexibility to power multiple vendors' devices. It can supply power up to 15.4 Watts per port, which meets the IEEE 802.3af standard. This is more than sufficient to power most devices.

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L2 and L3 Switching

Many standard L2 / L3 features are supported to deploy L2, L3 or a mix of L2/L3 services in most network environments.

- VLANs, Link Aggregation, GVRP, RSTP, MSTP and IGMP Snooping
- VRRP, RIP, OSPF, ISIS* and BGP
- DHCP Relay and Server
- IGMP and PIM
- ACLs

Specifications

Ethernet

- 802.3 10Base-T
- 802.3u 100Base-TX
- 802.3ab 1000Base-T
- 802.3ae 10 Gigabit Ethernet
- 802.3x flow control

L2 Features

- Learning table size: 16k
- Link Aggregation
- VLANs: 4k
- 802.1q
- 802.1p
- GVRP
- Port-based VLAN
- Protocol Based VLAN (IP, IPX, Appletalk, IPv6)
- 802.1w (RSTP)
- 802.1s (MSTP)
- Bpdufilter
- bpduguard
- IGMP Snooping
- Port mirroring
- Q-in-Q

Storm Control

- Broadcast
- Multicast
- Unknown

RERP - Rapid Ethernet Ring Protocol

- Ethernet Ring Redundancy with <100ms failover time

L3 Features

Route table size: 200,000

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ARP
- Static ARP
- Gratuitous ARP
- Proxy ARP

IP Interfaces
- Port based IP Interfaces
- VLAN based IP Interfaces
- Loopback Interfaces
- SuperVLAN IP Interface - RFC 3069
- Sub-interfaces

Static routes
- Static Equal Cost Multipath Protocol ECMP up to 32 next hops
- Static Weight Cost Multipath Protocol (WCMP)
- 1000 static routes

Policy Base Routing

RIP
- RIPv1 - RFC 1058
- RIPv2 - RFC 1723
- RIP MD5 Auth - RFC 2082

OSPF
- OSPF - RFC 2328
- OSPF NSSA - RFC 3101
- OSPF Database overflow - RFC 1765
- OSPF area filter list
- OSPF ECMP up to 8 next hops

ISIS*
- ISIS Intra-domain Routing Protocol – RFC 1142 / ISO 10589
- ISIS for Routing in TCP/IP - RFC 1195
- ISIS Cryptographic Authentication – RFC 3567
- ISIS ECMP up to 8 next hops

BGP
- BGP - RFC 1771
- BGP Route Reflector - RFC 1966
- BGP Confederations - RFC 3065
- BGP Route Dampening - RFC 2439
- BGP Communities - RFC 1997

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- BGP ExtCommunties
- BGP distribute-list
- BGP filter-list
- BGP route-map
- BGP TCP signature - RFC 2385
- BGP peer group

Route Redistribution
- Route maps
- Distribute-list

VRRP - RFC 3768
- VRRP Port track
- VRRP VLAN track
- VRRP Ping track

IP Multicast routing
- 1000 multicast routes

IGMP
- IGMPv1 - RFC 1112
- IGMPv2 - RFC 2236
- IGMPv3 – RFC3376

PIM
- PIM-SM/DM
- PIM-BSR
- PIM neighbor-filter

DHCP
- DHCP Server
- DHCP Relay option 82
- IP Helper

Security
ACLs
- L2 ACLs
- L3 ACLs
- L4 ACLs
- Time-of-day ACLs
- Policy Routing
TACACS+*
RADIUS
802.1x
* future

QoS
- Strict Priority Queuing
- Weighted Round Robin Queuing
- Policing per IPv4/IPv6 classification (Src/Dest IP, TCP/UDP sockets, etc...)
- Multiple classifications per port
- Marking of 802.1P field in packet
- Marking of DSCP field in packet

MPLS
- MPLS *– RFC 3031 / 3032
- LDP – RFC 3036
- L2VPN*
- L3 BGP-VPNs*

Management
- SNMP v1/v2/v3
- SNMP Traps
- RMON
- TELNET server
- TELNET client
- SSHv2
- ACL for management
- Radius login authentication
- SNTP client
- SNTP server
- Traceroute
- Ping
- DNS
- Debug messages
- syslog
- power status
- fan status
- Memory usage
- CPU usage

System Summary:
- System switching architecture 3.2 T
- Performance per system L2: 571 Mpps
- Performance per system L3: 571 Mpps
- Switching capacity per 7' rack 6.4 T
- Performance per 7' rack L2: 1142 Mpps
- Performance per 7' rack L3: 1142 Mpps
- Max 10-GbE ports per system 32

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- Max 10-GbE ports 7' rack 64
- Max 1 Gig E. ports per system 384
- Max 1 Gig E. ports 7' rack 768
- Max 100 FX ports per system 192
- Max 100 FX ports 7' rack 384
- Fans: 6

Power Redundancy:

AC/DC Version: 1+1

Environmental

Temperature: 0 ºC to 40 ºC
Storage temperature: -40 ºC – 70 ºC

Humidity: 10% to 90%
Storage humidity: 5% - 90%

Power: 100 to 240 VAC , -40 to -57 VDC
Power Consumption: < 1200 W

Safety and Compliance
- TUV/GS
- FCC Class A
- CE mark

Mechanical

Weight: 67.5 kg

Dimensions: 436.8x448x1045 (L x W x Hmm)

* future

Ordering Info

OSM8510	Core intelligent multi-layer IPv6 switch, 10-Slot chassis
OSM8510-FM	Fabric & Management - Main Control Module
OSM8500-24GT/12SFP	12-ports Gigabit BASE-T +12 port combo Gigabit
OSM8500-24GT/12SFP-POE	12-ports Gigabit BASE-T +12 combo Gigabit
OSM8500-24SFP	24-ports 100/1000 SFP
OSM8500-24GTSFP/12GT	12-ports G SFP +12 port combo Gigabit
OSM8500-48GT/4SFP	44-ports Gigabit BASE-T +4port combo Gigabit
OSM8500-48GT/4SFP-POE	44-ports Gigabit BASE-T +4port combo Gigabit
OSM8500-2X10G-XFP	2-ports XFP 10G Line Card
OSM8500-4X10G-XFP	4-ports XFP 10G Line Card
OSM8500-MPLS	10 Gigabit MPLS Service Module
OSM8500-1200-PA	1200 Watt AC power for OSM8500
OSM8500-1200-PD	1200 Watt DC power for OSM8500
OSM8500-2000-PA-POE	2000 Watt AC power for OSM8500-POE Line Card
OSM8500-2000-PD-POE	2000 Watt DC power for OSM8500-POE Line Card

10 Gigabit Ethernet SFP Ordering Information

XFP-10GD-SX	XFP 10-GbE, or 10GFC, MM, 850nm, .3km
XFP-10GD-MMX	XFP 10-GbE, or 10GFC, Extended MM, 1310nm, .5km
XFP-10GD-LR	XFP OC192/STM-64, 10GE or 10G FC, SM, 1310nm, 10km
XFP-10GD-IR2	OC192/STM-64, 10GE or 10G FC, SM, 1550nm, 40km

Gigabit Ethernet SFP Ordering Information

SFP-GD-LX	SFP 1000Base-LX, SM, 1310nm, 0-25km. with digital diagnostics
SFP-G-MMX	SFP 1000Base-SX, Extended MM, 1310nm, 0-2km.
SFP-G-LX	SFP 1000Base-LX, SM, 1310nm, 10km.
SFP-GD-ELX	SFP 1000Base-ELX, SM, 1310nm, 25km
SFP-GD-XD	SFP 1000Base-XD, SM, 1550nm, 50km
SFP-GD-ZX	SFP 1000Base-ZX, SM, 1550nm, 80km
SFP-GD-EZX	SFP 1000Base-EZX, SM 1550nm, 120km