



OpenCon Systems, Inc.

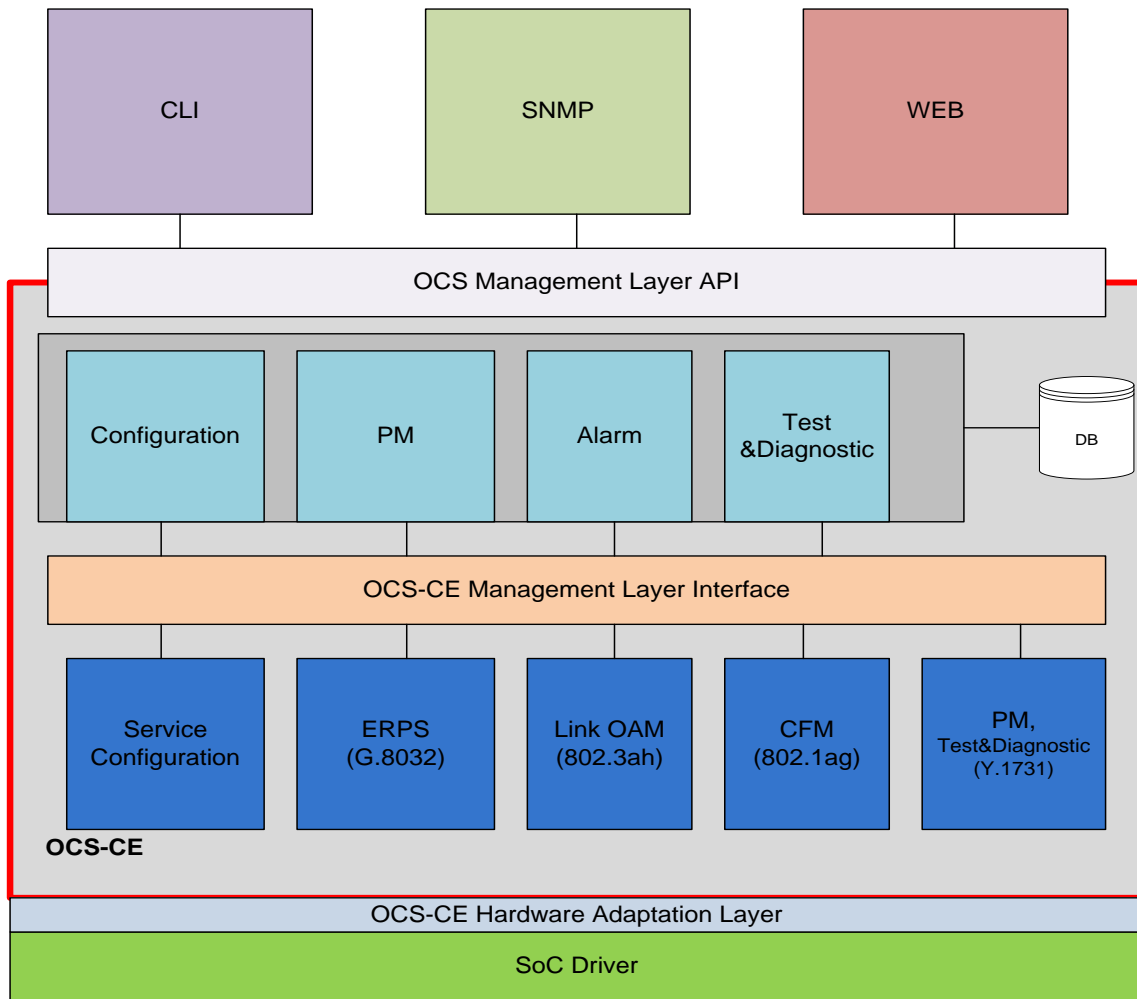
WORLDWIDE COMMUNICATION SOLUTIONS



With the explosion of bandwidth hungry internet applications such as Web 2.0, Real-time streaming video, High-definition IPTV and Video Games, service providers have to constantly upgrade their network to provide the same quality of service that their customers have been accustomed to. Traditional transport technologies such as SONET/SDH, ATM and MPLS are inefficient to carry the packet-oriented Ethernet traffic generated by these applications and too expensive to deploy and operate. Carrier Ethernet transport provides a cost-effective alternative to the legacy transport technologies without compromising carrier-class requirements in terms of reliability and service management.

MEF defines Carrier Ethernet transport as a network that provides E-LAN, E-LINE and E-TREE services with the five attributes: standardized service, scalability, QoS, service management and reliability. Among the five attributes mentioned above, the service management and reliability have a direct impact on the operating expense of a network. To minimize the OPEX, Carrier Ethernet transport elements must support OAM protocols such as Connectivity Fault Management (802.1ag), Performance Management (Y.1731) and Link Management (802.3ah). To improve the reliability of the network and quick recovery from failures, Ethernet Protection Switching Ring (ERPS) protocol as defined by ITU G.8032 must also be supported by Carrier Ethernet network elements.

OCS Carrier Ethernet (OCS-CE) Solution includes Ethernet Service configuration and OAM software modules that are compliant with requirements specified in MEF10.1, MEF11, MEF12 and MEF17. OCS-CE solution also includes ERPS module that can be deployed in ring configurations to support recovery from single point of failures in under 50 milliseconds. Hardware dependencies are isolated through OCS-CE Hardware Adaptation Layer. By mapping the APIs in the OCS-CE HAL layer to appropriate SoC driver API, the OCS-CE solution can be integrated with SoCs such as Broadcom 56xxx and Marvell's 98DX2100. The following diagram illustrates the various software modules (inside the redlined box) that are part of the OCS-CE solution.



OCS Carrier Ethernet Solution

Key Features

Service Configuration <ul style="list-style-type: none"> Traffic Classification Queuing/Scheduling TrTCM and WRED Q-in-Q 	ERPS <ul style="list-style-type: none"> Compliant with ITU G.8032 and Y.1731 Under 50ms failure recovery Multiple ERPS Ring Instances Interconnected Rings with shared nodes and shared links Forced protection switching
Link OAM <ul style="list-style-type: none"> Compliant with 802.3ah Support Auto-discovery of link partner's capabilities Link Event Remote-loopback 	Connectivity Fault Management (802.1ag) <ul style="list-style-type: none"> MEP, MIP Support CFM MIB Support Continuity Check Message (CCM), Loopback Message (LBM) Link Trace Message (LTM)
Performance Monitoring , Test & Diagnostic (Y.1731)	Network Interfaces <ul style="list-style-type: none"> Fast Ethernet Ports (Copper)

<ul style="list-style-type: none"> • Frame Loss Measurement • Frame Delay and Frame Delay Variation • Ethernet AIS, RDI and Test (Future) 	<ul style="list-style-type: none"> • and Fiber) • 1Gigabit/10Gigabit Ethernet Interfaces
<p>Management Functions</p> <ul style="list-style-type: none"> • Configuration, PM, Alarm, Test& Diagnostic software integrated with Low level protocol modules • OCS Management Layer API for easy Integration with CLI, SNMP and WEB interfaces 	<p>Timer Protocol Support</p> <ul style="list-style-type: none"> • SNTP • IEE1588 Precision Time Protocol for better accuracy in Frame Delay/ delay variation measurement