

EdgeAssure 1000 SFP-NID

Carrier Ethernet Demarcation Device

Key Features

- Compliant to Ethernet 1 Gbps IEEE 802.3 Clause 38, 1000Base-LX single mode 1310 nm
- MEF service creation and mapping
- OAM and test functionality on both ports
 - 32 EVCs and 64 MEPs
 - ITU-T Y.1731 and IEEE 802.1ag
 - ITU-T Y.1731 Performance Monitoring (PM) using SLM/SLR and DMM/DMR packets
 - ITU Y.1564 Service Activation Test on eight channels
 - RFC2544 line rate test
 - Eight-hour statistics history for up to 128 loss; delay and jitter measurements stored and persisted in non-volatile memory
- Jumbo frame up to 9,600 bytes
- IP Source Address filtering for security
- NETCONF/YANG management interface
- Zero-touch provisioning
- Remote upgrade via NETCONF
- Remote access to DDM diagnostics via NETCONF
- Low-power operation - 1.2 W

Overview

Demarcation between a customer LAN and a service provider network is required to enforce Service Level Agreements (SLA) and guarantee Quality of Service (QoS). Microsemi EdgeAssure 1000 SFP-NID provides standards-based demarcation as defined by Metro Ethernet Forum (MEF) for services such as E-LINE (Ethernet point-to-point) and E-LAN (Ethernet multipoint-to-multipoint). It has two Gigabit Ethernet Ports (one facing the carrier network and another facing the customer LAN). It supports service creation and mapping, fault detection, address filtering, real time measurements of frame loss, frame delay, and frame delay variation on both ports. In addition, it supports Service Activation Tests that allows a network manager to remotely commission and validate the transport parameters of an end-end service.

All these functions are implemented in hardware using a cut-through architecture on a Microsemi low-power FPGA that guarantees low latency and minimum packet jitter while supporting wire-speed detection and filtering of OAM and data-packets. It provides IP source address filtering for security. EdgeAssure 1000 SFP-NID is offered in a standard size SFP enclosure that requires no additional floor space and no power above the optical interfaces it replaces. It has a minimal carbon footprint, with a typical and maximum power requirement of 1.2 W and 1.5 W respectively.

The EdgeAssure 1000 SFP-NID is designed to be deployed as a Zero-Touch Provisioning (ZTP) Network Interface Device (NID) and includes support for Link Layer Discovery Protocol (LLDP). Management uses the NETCONF protocol on either of the two ports. NETCONF runs over an SSH connection, thereby securing the configuration of the SFP. Diagnostics Monitoring (DDM) are fully accessible remotely via NETCONF in addition to I2C.

The main applications are Carrier Ethernet business services, cloud based services and mobile backhaul.



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Specifications

OAM Features
Fault Detection <ul style="list-style-type: none"> • IEEE 802.1ag Service Layer OAM - Connectivity Fault Management • ITU-T Y.1731 Ethernet Continuity Check Messages • 64 concurrent MEPs running CCMs at 3.3 ms, 10 ms, 100 ms, or 1 s • Cross Connect Error detection when a CFM Level mismatch occurs or when the received Maintenance Association ID (MAID) is not recognized • Remote MEP Error detection when the received MEPID is not recognized or when the received interval value is not valid • Sequence Error detection and logging • LinkTrace for fault isolation (standard OAM protocol for fault isolation) • SFF-8472 MSA defined DDM diagnostics accessible via in-band management including real-time stats at address 0xA2. Legacy I2C DDM access also supported
Performance Management and SLA Assurance <ul style="list-style-type: none"> • ITU-T Y.1731 Performance Management • 128 concurrent PM sessions, each measuring loss, delay, and jitter running at 100 ms sampling rate • Far- and near-end loss measurements per service using SLM/SLR • Delay and jitter measurements accurate to <1 μs using DMM/DMR • Loss, delay, and jitter thresholds configurable per monitored service • Max, min, and average values for delay and jitter per service • Four delay bins and four jitter bins per service
Service mapping <ul style="list-style-type: none"> • Supports creation of MEF E-LINE, E-LAN, E-TREE, and E-ACCESS Ethernet Virtual Services (EVS) based on Layer 2 packet fields. • VLAN push/pop/overwrite supported per service. Up to 2 VLAN tags supported for Q-in-Q/VLAN stacking applications. A third tunnel tag is also supported. • S-VLAN and C-VLAN tagging support (Q-in-Q) • CoS mapping based on DSCP/IP Precedence, VLAN, PCP, or drop eligibility • MEF 10.2-compliant L2CP processing.
Test Functionality
Loopback <ul style="list-style-type: none"> • In service Layer 2 loopback up to full line rate using LBM/LBR OAM packets • Hardware swaps MAC addresses
RFC2544 <ul style="list-style-type: none"> • Configurable packet size and rate • Burst mode supported • Reports throughput, frame loss, delay, and delay variation
Y.1564 Service Activation Testing <ul style="list-style-type: none"> • Up to eight flows tested simultaneously • Configurable packet size and rate • Measures throughput, frame loss, delay, and delay variation
Performance
<ul style="list-style-type: none"> • Ultra-low latency — independent of packet size; symmetric delay • Wire speed detection and filtering of OAM packets • Up to 64 MEPs simultaneously running CCMs at 3.3 ms and measuring packet loss, delay, and jitter @ 100 ms sampling interval • Line rate data packet throughput • Line rate test packet generation, loopback, and reception on all frame sizes up to jumbo frames • Delay and jitter measurements in hardware accurate to <1 μs

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Security
<ul style="list-style-type: none"> • Configurable IP SA filtering for 10 IP addresses/ranges • Configurable drop/forward • SSH encrypted management interface running NETCONF
Management
<ul style="list-style-type: none"> • In-band management on both ports using NETCONF • Zero-touch provisioning using LLDP-MED and DHCP • Remote upgrade • SSH for secure access
Power
<ul style="list-style-type: none"> • 1.2 W typical, 1.5 W maximum

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