

XTM SERIES

NETWORK INTERFACE DEVICE (NID)

Cost-efficient Ethernet Service Demarcation and Media Conversion

The **Network Interface Device (NID-GE)** and Temperature-Hardened Network Interface Device (NID-GEH) are part of a range of port devices used with Infinera packet-optical transport switches (EMXP Ile) to extend the EMXP Ile's capabilities to remote locations or to add functionality to specific ports. In this document we will use the generic term "NID" to describe these devices, and use "NID-GE" and "NID-GEH" only when the hardened temperature capability is being described. The NID's highly capable Ethernet Operations, Administration and Management (OAM) feature set provides carrier-class Gigabit Ethernet (GbE) demarcation and media conversion.

Through the use of small form-factor pluggable (SFP) transceivers, the NID supports a wide range of electrical and optical interfaces, including dense wavelength-division multiplexing (DWDM), coarse wavelength-division multiplexing (CWDM) and colorless self-tuning SFPs for use in the Infinera Intelligent wavelength-division multiplexing (iWDM®)-passive optical network (PON) solution.

Ideal in Large-scale Deployments

The NID is managed as an integral part of the EMXP62/Ile and EMXP48/Ile via Digital Network Administrator for XTM Series

(DNA-M), Infinera's multi-layer management suite, with the device acting as a remote port for the EMXP Ile.

All provisioning is performed on the EMXP Ile – the NID simply takes its configuration from that unit. This enables highly scalable management and allows operators to monitor alarms without the need for individual Simple Network Management Protocol (SNMP) agents per customer.

The port device management architecture allows automatic discovery of new devices as they are connected. All relevant parameters are downloaded from the connected EMXP Ile, providing fast and easy service commissioning.

Furthermore, feature growth is easily provided through remote software upgrade from the EMXP Ile without the need to replace the hardware.

Easy configuration, provisioning and commissioning make the NID ideal in large-scale deployments.



Key benefits:

- Allows large-scale deployments through "remote port" architecture
- Saves valuable Internet Protocol (IP) addresses as the NID doesn't need one
- Provides Carrier Ethernet 2.0 (CE 2.0)-compliant E-Line, E-LAN, E-Access and E-Tree services through EMXP Ile integration
- Features plug-and-play deployment through automatic discovery and configuration
- Provides superior synchronization – ideal for connecting mobile cell sites
- Offers client flexibility with optical and copper interfaces for smooth media conversion
- NID-GEH is a temperature-hardened version of the NID (see environmental specification below)

Saves Valuable IP Addresses

As the NID is managed as part of the EMXP Ile, the need to allocate separate management IP addresses per customer is eliminated. A single IP address is required for an XTM Series chassis containing one or more EMXP Ile units and all subtended NID units; hence, no additional management of IP addresses is needed.

Compact and Low-power

Thanks to its compact and fanless design as well as its low power consumption, the NID fits well in locations with space and dissipation restrictions. The base unit draws only 6 watts (W), resulting in a solution with very low power consumption.

Easy Monitoring of Service Level Agreements

The NID performs standards-based measurement of the performance monitoring parameters defined in Y.1731, including frame loss, frame delay and frame delay variation.

The measurement data from the NID is reported to DNA-M and made available to the DNA-M Portal for visibility of service quality by operators and their end customers.

The real-time service performance data provided by the NID is of significant value when monitoring service level agreements (SLAs).

The NID also supports the Institute of Electrical and Electronics Engineers' (IEEE) 802.1ag Connectivity Fault Management (CFM) OAM, allowing monitoring of service availability by end customers. Furthermore, digital diagnostics monitoring (DDM) is supported to enable remote verification of additional parameters, such as optical power levels.

Business Ethernet and Mobile Backhaul Applications

In combination with the EMXP Ile, the NID is ideal for business Ethernet and mobile backhaul applications with a single uplink. Services can be monitored at the customer premises, where either electrical or optical client ports can be used.

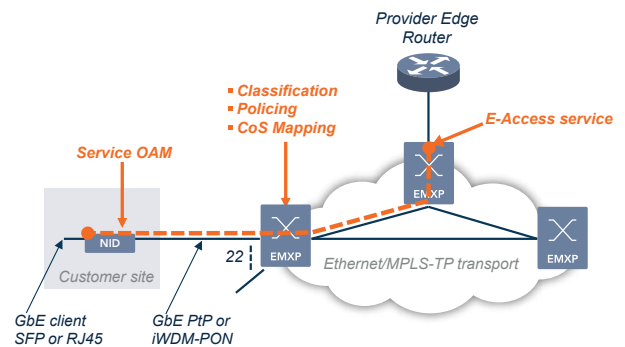


Figure 1: NID and EMXP Ile deliver E-Access service between Provider Edge (PE) router and customer site.

Part of the iAccess Solution

The NID is a key component of the Infinera iAccess solution at the 1 Gb/s data rate. An autotune capability already exists for this data rate, allowing simple installation for large-scale WDM-PON deployments. This capability is now being extended to the 10 Gb/s data rate using Infinera's Auto-Lambda technology.

Offers CE 2.0 Services

In combination with the EMXP Ile, the full MEF range of CE 2.0-compliant services can be delivered, including E-Line, E-Tree, E-LAN and E-Access. Service creation is done in the EMXP Ile, and the NID-GE acts as a remote port to that unit.

This allows the EMXP Ile to deliver CE 2.0 services both locally at the EMXP Ile site and at remote sites using the NID.



Specifications

| | |
|------------------|---|
| Interfaces | GbE network interface (SFP) GbE customer interface (SFP or RJ45) Supported SFP types: <ul style="list-style-type: none"> • Uncolored multi-mode or single-mode • CWDM or DWDM • Single-strand fiber solution • Colorless, self-tuning (used in iWDM-PON) |
| Ethernet and OAM | IEEE 802.1ag/MEF Ethernet Service OAM Client Signal Fail (CSF) service defect signaling (error propagation) Y.1731 loss, delay and delay variation measurements with SLA reporting Jumbo frames (up to 9600 bytes) Loopback responder for RFC2544 and Y.1564 tests Auto-negotiation and MDIX Two Port MAC Relay (TPMR) IEEE 802.1aj Link pass-through, a.k.a. link loss forwarding Dying gasp message Forwarding performance is full line rate according to RFC2544 Latency <3 microseconds |
| Synchronization | Transparent to Synchronous Ethernet ITU-T G.8261/G.8262/Y.1362 |
| Management | Remote management from EMXP62/11e or EMXP48/11e node using in-band communication (does not use own IP address) |
| Mechanical | Locking mechanism for all power connectors Height x width x depth: 20 x 124 x 153 mm/0.79 x 4.88 x 6.02 in Mounting bracket for up to three units in 19-inch width and 1 rack unit (1RU) height |
| Power | Redundant power input range 20 to 72 volts DC Two telecom-grade power connectors with locking mechanism One 5.5 mm DC barrel connector Power consumption: max 6 W excl. SFPs External AC adapter 100 to 240 volts AC |
| Environmental | NID-GE: Operating temperature: -5 °C to +55 °C / 23 °F to 131 °F NID-GEH: Hardened operating temperature: -40 °C to +65 °C / -40 °F to 149 °F Humidity: 5% to 95%, non-condensing NEBS level 3, type 2 compliance MTBF: 60 years |

Specifications and Features are Subject to Change

Global Headquarters
140 Caspian Court
Sunnyvale, CA 94089
USA
Tel: 1 408 572 5200
Fax: 1 408 572 5454
www.infinera.com

Asia and Pacific Rim
Infinera Asia Limited
8th floor
Samsung Hub
3 Church Street
Singapore 049483
Tel: +65 6408 3320

Europe, Middle East,
Africa
Infinera Limited
125 Finsbury Pavement
London EC2A 1NQ,
United Kingdom
Tel: +44 207 065 1340

Customer Service and
Technical Support
North America
Tel: 877 INF 5288
Outside North America
Tel: 1 408 572 5288

For more information
Contact Us
infinera.com/contact-us

