

DATA SHEET

CISCO ONS 15305 2-PORT GIGABIT ETHERNET MODULE

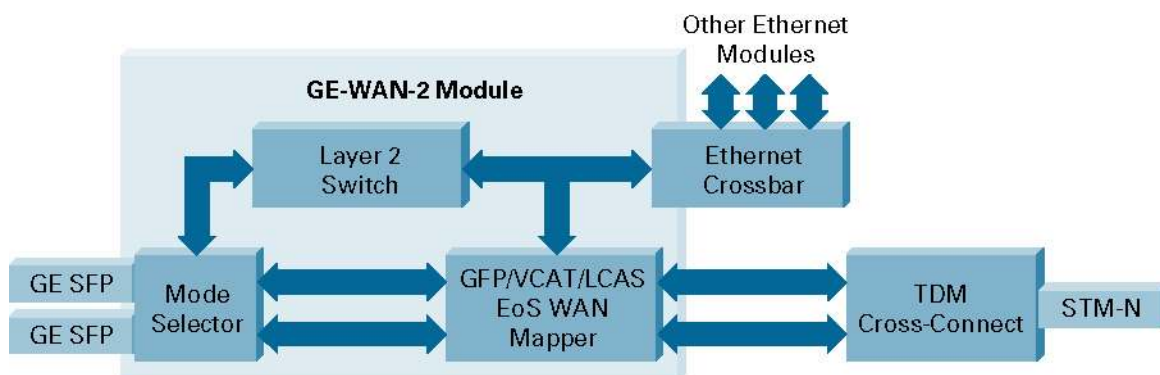
The Cisco® ONS 15305 2-Port Gigabit Ethernet Module provides two ports for Layer 1 or Layer 2 switched transport of Gigabit Ethernet traffic over SDH networks.

PRODUCT OVERVIEW

The Cisco ONS 15305 2-Port Gigabit Ethernet Module is a service module for the Cisco ONS 15305 Multiservice Provisioning Platform (MSPP) that supports up to two Small Form-Factor Pluggable (SFP) optics to interface with LANs. The module uses ITU-T G.7041 standard Generic Framing Procedure (GFP) and ITU-T G.707 virtual concatenation (VCAT) to encapsulate and map packets onto the SDH frame. Two internal WAN mapper ports connect the Gigabit Ethernet-over-SDH traffic streams to the TDM fabric on the Cisco ONS 15305, allowing cross-connections to optical STM-n ports. SDH capacity can be individually configured for each WAN mapper port using standard VCAT, allowing Ethernet-over-SDH transport at line-rate or below line-rate speeds. Additionally, the module has an internal Layer 2 switch fabric with four Gigabit Ethernet ports. Depending on the mode of operation, two of the Gigabit Ethernet ports on the Layer 2 switch are connected either to the WAN mapper ports or to the LAN ports in the front of the module. The two remaining Gigabit Ethernet ports are connected to a centralized crossbar that allows packet connectivity between other Ethernet modules in the same system. Figure 1 shows a block diagram of the module architecture.

Figure 1

Cisco ONS 15305 2-Port Gigabit Ethernet Module Block Diagram



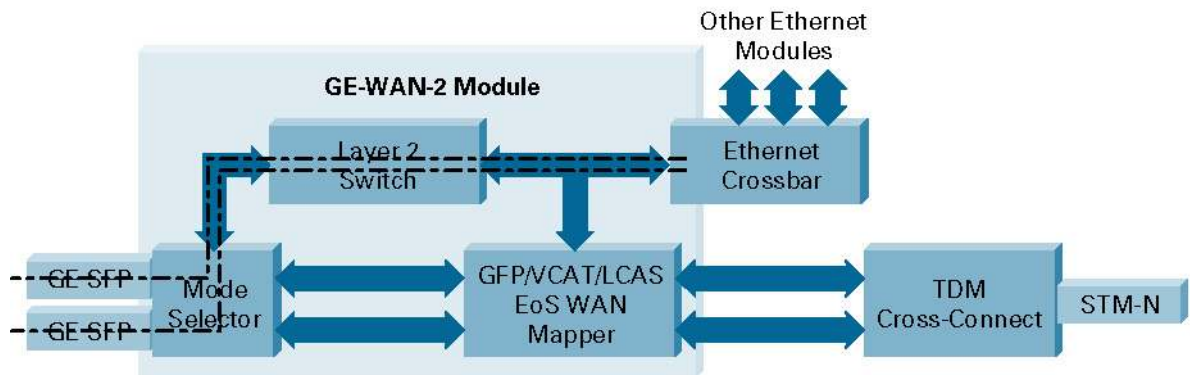
The Cisco ONS 15305 2-Port Gigabit Ethernet Module supports the following two modes of operation: Two Gigabit Ethernet ports without mapper circuits and two Gigabit Ethernet ports with mapper circuits.

Two Gigabit Ethernet Ports Without Mapper Circuits

In this mode of operation, the two physical input ports are connected directly to the Layer 2 switch fabric and to the centralized Ethernet crossbar for connectivity to other Ethernet modules in the Cisco ONS 15305 system. In this configuration, none of the WAN mapper circuits are available for access to the SDH network (Figure 2).

Figure 2

Ethernet Traffic Flow when Operating Without Mapper Circuits



Two Gigabit Ethernet Ports with Mapper Circuits

In this mode of operation, one physical LAN port will not have access to the Layer 2 switch fabric and instead will be connected directly to an internal WAN mapper port for pure Layer 1 transport over the SDH network. The other physical port can be configured to either connect to a WAN mapper port directly for pure Layer 1 transport (Figure 3), or through the Layer 2 switch fabric for access to the Ethernet crossbar or to take advantage of the module's Layer 2 features (Figure 4).

Figure 3

Ethernet Traffic Flow with Both Ports Directly Connected to the WAN Mapper Ports for Pure Layer 1 Transport

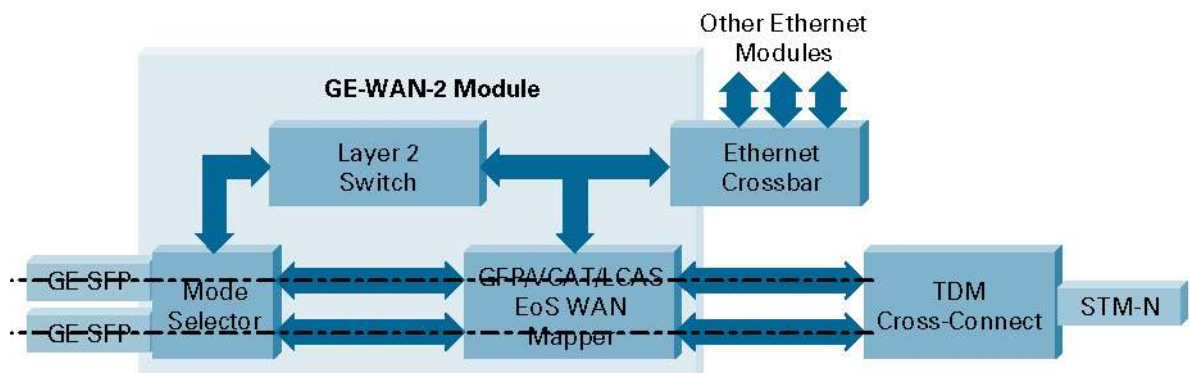
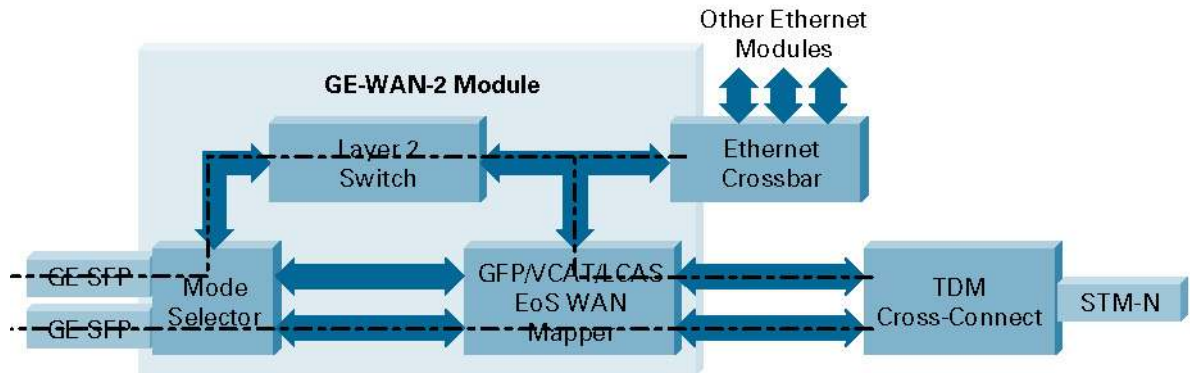


Figure 4

Ethernet Traffic Flow with One Port Directly Connected to the WAN Port and Another Connected Through the Layer 2 Switch to the WAN Port

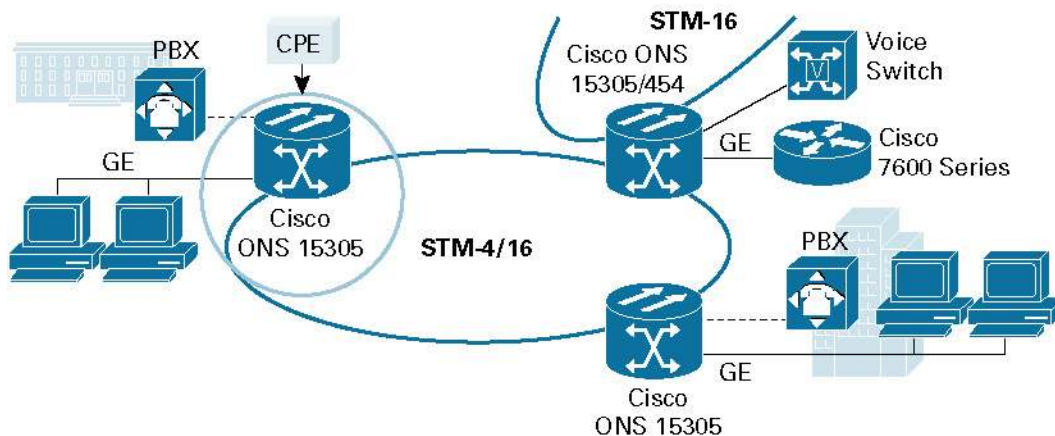


APPLICATIONS

The Cisco ONS 15305 2-Port Gigabit Ethernet Module can be installed in any Cisco ONS 15305 MSPP slot as part of the Cisco Multiservice-over-SDH solution. The Cisco ONS 15305 can be used as customer premises equipment (CPE) for medium-sized and large businesses to transport traffic over an STM-1, STM-4, or STM-16 SDH uplink to the central office. In this use, the module collects voice and data traffic from each site for switched voiced and data services, Layer 1 and Layer 2 VPNs, and Internet access. The module gives the Cisco ONS 15305 the possibility of transporting Gigabit Ethernet traffic over the SDH network at up to the full line rate of 1 Gbps (Figure 5). Using standard VCAT, SDH bandwidth may be efficiently assigned to each WAN mapper port at below line-rate speeds to meet each customer's needs.

Figure 5

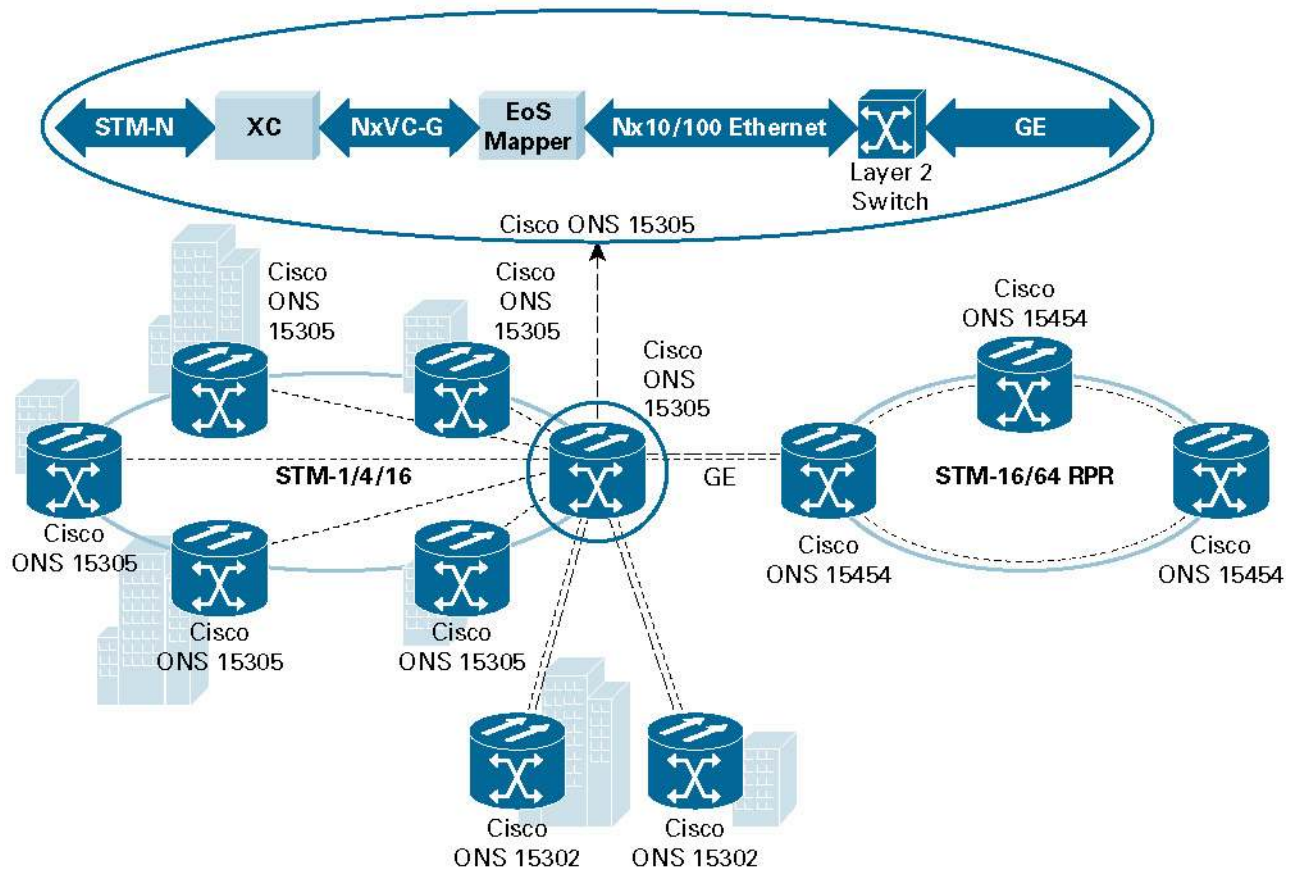
The Cisco ONS 15305 as a CPE with the 2-Port Gigabit Ethernet Module to Provide Gigabit Ethernet-over-SDH Services



The Cisco ONS 15305 can also be deployed as a central-office aggregator, consolidating traffic from Cisco ONS 15302 multiservice provisioning platforms or other Cisco ONS 15305 CPE, as well as directly connected customer TDM or data traffic from electrical interfaces. The Cisco ONS 15305 2-Port Gigabit Ethernet Module can aggregate Ethernet traffic from multiple Ethernet-over-SDH WAN mapper ports from an 8-Port 10/100 Ethernet module to which it is connected through the centralized Ethernet crossbar. Ethernet packets from multiple sources are aggregated using the Layer 2 switch fabric of the Cisco ONS 15305 modules. Unrelated traffic can be logically separated through IEEE 802.1Q-compliant VLANs. The module can then hand off a Gigabit Ethernet stream, or VLAN trunk, to a colocated switch or router, or Cisco ONS 15454 ML-Series card, for increased packet-intelligent transport over the core network. A diagram of this application is shown in Figure 6.

Figure 6

The Cisco ONS 15305 2-Port Gigabit Ethernet Module Facilitates Ethernet Services Aggregation on the Cisco ONS 15305



KEY FEATURES AND BENEFITS

Line-Rate Gigabit Ethernet in a CPE Form Factor

The Cisco ONS 15305 2-Port Gigabit Ethernet Module allows the Cisco ONS 15305 to deliver full line-rate (1 Gbps) and below line-rate Gigabit Ethernet services in a small one-rack-unit (1-RU) form factor. This allows flexible and efficient delivery of high-revenue Gigabit Ethernet services over more reliable SDH networks, and with minimized capital and operational expenditures.

Ethernet-over-SDH Standards Compliance

The Cisco ONS 15305 offers ITU-T G.7041-compliant GFP encapsulation of Ethernet traffic for easy integration with existing SDH infrastructures. The platform also uses ITU-T G.707-compliant low-order and high-order VCAT and ITU-T G.7042-compliant Link Capacity Adjustment Scheme (LCAS), making it more effective for scalable, next-generation optical infrastructures.

Integrated Layer 2 Switching

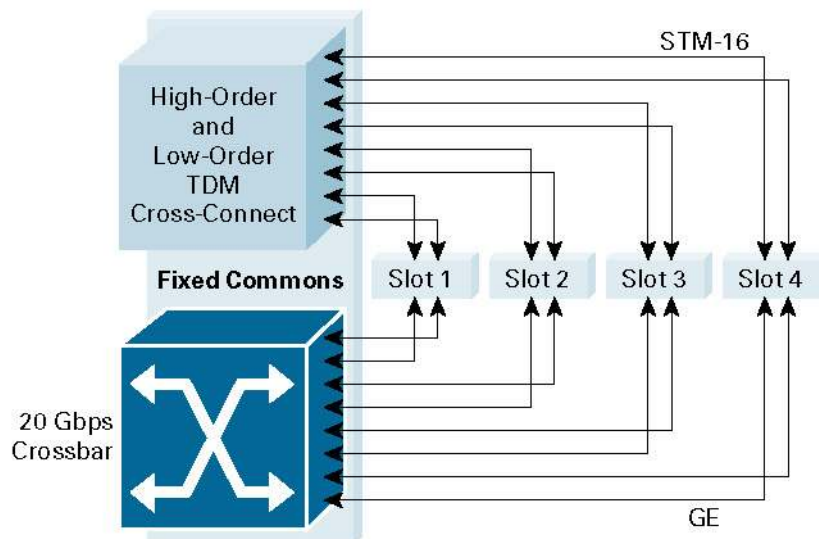
The Cisco ONS 15305 2-Port Gigabit Ethernet Module has an integrated Layer 2 switching architecture that permits advanced management of packets for various applications and network configurations, such as data-traffic aggregation and multipoint connections. The Layer 2 switch also enables intelligent features, such as transparent bridging and statistical multiplexing, which permit more efficient utilization of valuable SDH network bandwidth.

Integrated TDM and Data Planes

Each slot in the Cisco ONS 15305 has 2.5-Gbps bidirectional connections to a fully nonblocking VC-4/VC-3/VC-12, 10-Gbps cross-connect. This allows any-to-any connectivity of SDH virtual containers between slots, typically used to aggregate Plesiochronous Digital Hierarchy (PDH) or Ethernet-over-SDH traffic onto the optical SDH interfaces. Additionally, each slot in the Cisco ONS 15305 has two bidirectional, 1-Gbps connections to an Ethernet crossbar in the main chassis that allows data packets to flow between Ethernet modules in all slots (Figure 7). The TDM and data planes of the Cisco ONS 15305 allow flexible architectures for multiservice networks that result in the ability to deliver more services at reduced operational and capital expenditures.

Figure 7

Each Slot in the Cisco ONS 15305 Has Access to the TDM Cross-Connect and to an Ethernet Crossbar



SUMMARY

The Cisco ONS 15305 2-Port Gigabit Ethernet Module is an SFP optics-based module for the Cisco ONS 15305 MSPP that facilitates Gigabit Ethernet service delivery over SDH networks. The module uses ITU-T standards-compliant GFP, VCAT, and LCAS to encapsulate and map Ethernet traffic onto a G.707 SDH frame. With the small form factor, low-power consumption, standard SDH compliance, and low acquisition and operation costs of the Cisco ONS 15305, the module makes Gigabit Ethernet service delivery available to a broader range of customers. Together with the Cisco ONS 15305 8-Port 10/100 Ethernet Module, the Cisco ONS 15305 2-Port Gigabit Ethernet Module also supports a powerful Ethernet service-aggregation solution using Layer 2 switching to collect traffic from multiple remote locations, and IEEE 802.1Q VLANs to separate unrelated traffic (for example, from different customers) when required by the application. The Cisco ONS 15305 is used in end-to-end, multiservice-over-SDH networks with the Cisco ONS 15302 and the Cisco ONS 15454 MSPP.

PRODUCT SPECIFICATIONS

Tables 1 and 2 list the specifications and system requirements for the Cisco ONS 15305 2-Port Gigabit Ethernet Module.

Table 1. Product Specifications

Gigabit Ethernet interface	IEEE 802.3-compliant Gigabit Ethernet interface Connector compliant with Cisco qualified IEEE 802.3z SFP optics
Software compatibility	The Cisco ONS 15305 2-Port Gigabit Ethernet Module is compatible with Cisco ONS 15305 systems running Release 2.0 or greater
Ethernet-over-SDH transport	ITU-T G.7041 GFP ITU-T G.707 VCAT: VC-3-Xv, X=1-21; VC-4-Xv, X=1-7 ITU-T G.7042 LCAS
Ethernet Layer 2 switching	MAC switching Self-learning MAC addresses Static MAC entries Support for up to 24,000 MAC addresses Automatic aging for MAC addresses MAC multicast Support for up to 6000 byte frames Support for up to 9000 byte frames in Layer 1 mode Transparent bridging IEEE 802.1Q VLAN tagging 802.1Q in 802.1Q Layer 2 Control Protocol tunneling Head-of-line blocking prevention Back pressure and flow-control management Internet Group Management Protocol (IGMP) support Spanning Tree Protocol according to IEEE 802.1D Rapid Spanning Tree Protocol (RSTP) according to IEEE 802.1w Mirroring port IEEE 802.1p priorities IEEE 802.3ad Link Aggregation
Power consumption	23W

SYSTEM REQUIREMENTS

Table 2. System Requirements

Hardware	The Cisco ONS 15305 2-Port Gigabit Ethernet Module works on any slot of the Cisco ONS 15305 chassis.
Software	Cisco ONS 15305 Release 2.0 Software is required to operate the module. Cisco Edge Craft Release 2.0 is required to manage the module.

ORDERING INFORMATION

To place an order, visit the [Cisco Ordering Home Page](#). Table 3 lists ordering information for the Cisco 15305 2-Port Gigabit Ethernet Module.

Table 3. Ordering Information

Product Name	Part Number
Cisco ONS 15305 2-Port Gigabit Ethernet Module with WAN Mapper, SFP connectors	15305-GE-2-W=

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FOR MORE INFORMATION

For more information about the Cisco ONS 15305 and the Cisco ONS 15305 2-Port Gigabit Ethernet Module, visit <http://www.cisco.com/en/US/products/hw/optical/ps2001/ps5381/index.html> or contact your local account representative.

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