

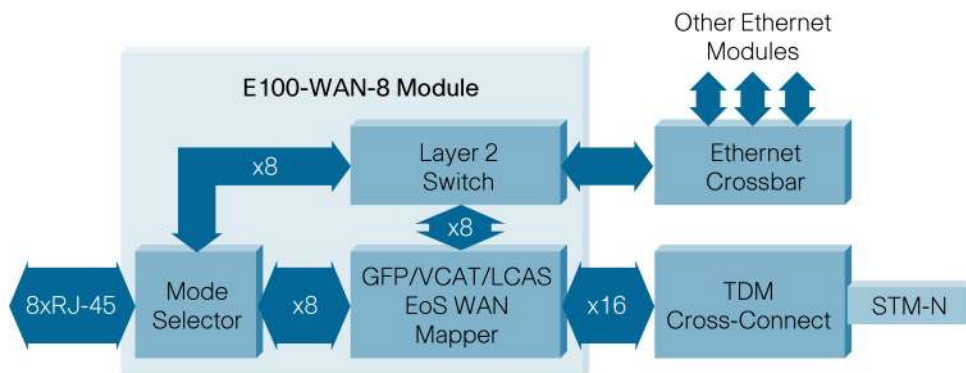
Cisco ONS 15305 8-Port 10/100 Ethernet Module

The Cisco® ONS 15305 8-Port 10/100 Ethernet module provides eight ports for Layer 1 or Layer 2 switched transport of Ethernet and Fast Ethernet traffic over SDH networks.

Product Overview

The Cisco ONS 15305 8-Port 10/100 Ethernet Module is a service module for the Cisco ONS 15305 Multiservice Provisioning Platform (MSPP) that supports up to eight 10/100BASE-T ports 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. Sixteen internal WAN mapper ports connect the 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 16 10/100 Ethernet ports and 2 Gigabit Ethernet ports. Depending on the mode of operation, the 10/100 Ethernet ports are connected either to the WAN mapper ports or to the RJ-45 LAN ports in the front of the module. The 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 8-Port 10/100 Ethernet Module Block Diagram

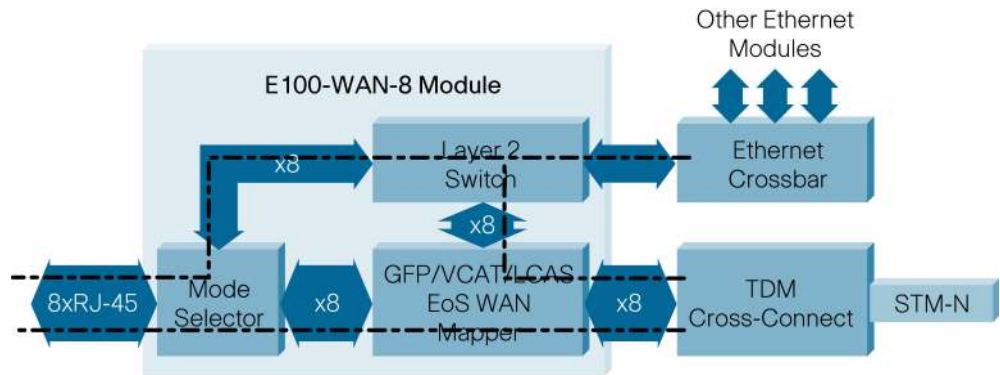


The Cisco ONS 15305 8-Port 10/100 Ethernet Module supports the following two modes of operation: 8 Fast Ethernet with 8 Ethernet-over-SDH WAN mapper ports; and 2 Fast Ethernet with 14 Ethernet-over-SDH WAN mapper ports.

Eight Fast Ethernet with Eight Ethernet-over-SDH WAN Mapper Ports

In this mode of operation, each LAN port can be optionally connected to a WAN mapper port either directly for a pure Layer 1 service, or through the Layer 2 switch for more advanced packet processing. Eight of the 16 ports on the Layer 2 switch are connected to WAN mapper ports, while the other 8 are available for connection to the LAN ports if a Layer 2 transport is desired. Similarly, eight WAN mapper ports are connected to the Layer 2 switch, while the remaining eight are available if pure Layer 1 transport is desired. Figure 2 shows a block diagram of the Ethernet traffic flow in this mode of operation.

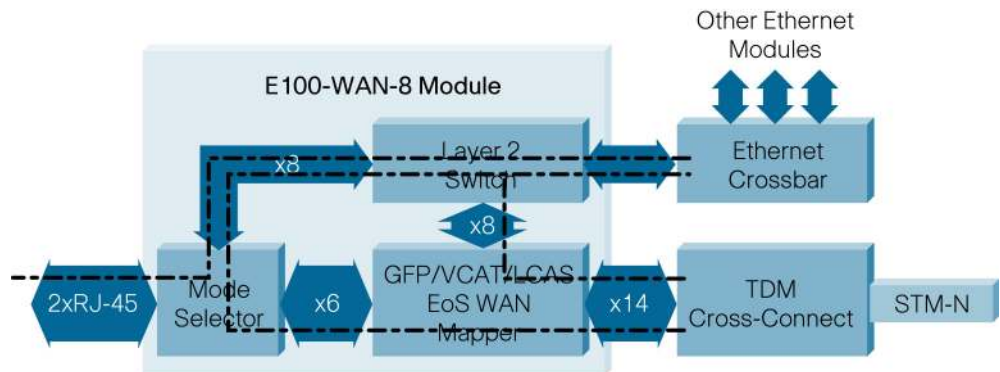
Figure 2. Ethernet Traffic Flow with Eight Fast Ethernet and Eight Ethernet-over-SDH WAN Mapper Ports. Each LAN Port Can be Individually Configured for Layer 1 or Layer 2 Transport



Two Fast Ethernet with 14 Ethernet-over-SDH WAN Mapper Ports

In this mode of operation, the first 2 RJ-45 LAN ports are connected to 2 of the 16 10/100 Ethernet ports in the Layer 2 switch, while the remaining 6 LAN ports are unused. The remaining 14 ports on the switch are connected to Ethernet-over-SDH WAN mapper ports. This allows the module to groom traffic from 14 different SDH virtual container groups (VCGs) proceeding from remotely located devices. Traffic aggregated at the Layer 2 switch fabric can then be terminated in the same module in one or both enabled LAN ports, or on a different module in the same chassis, such as a Gigabit Ethernet module, that is connected through the Ethernet crossbar. Figure 3 shows the Ethernet traffic flow when the module is configured in this mode of operation.

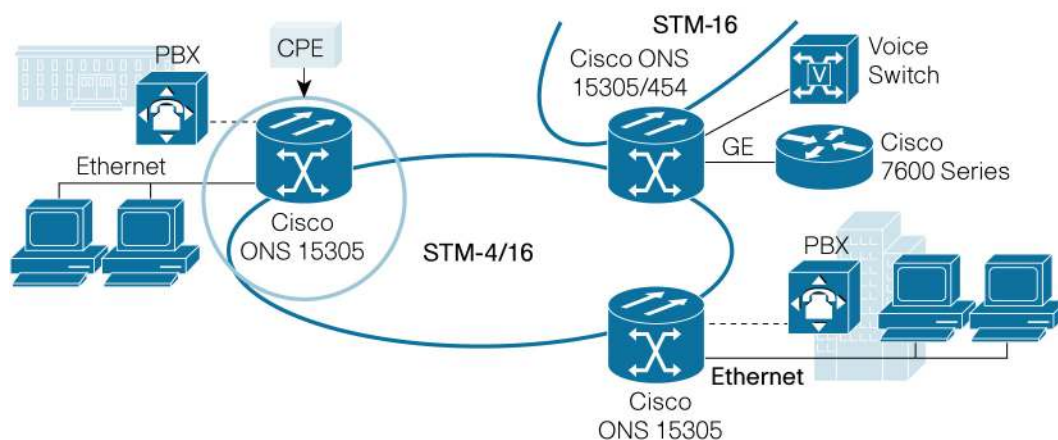
Figure 3. Ethernet Traffic Flow When Operating with Two LAN Ports and 14 WAN Mapper Ports



Applications

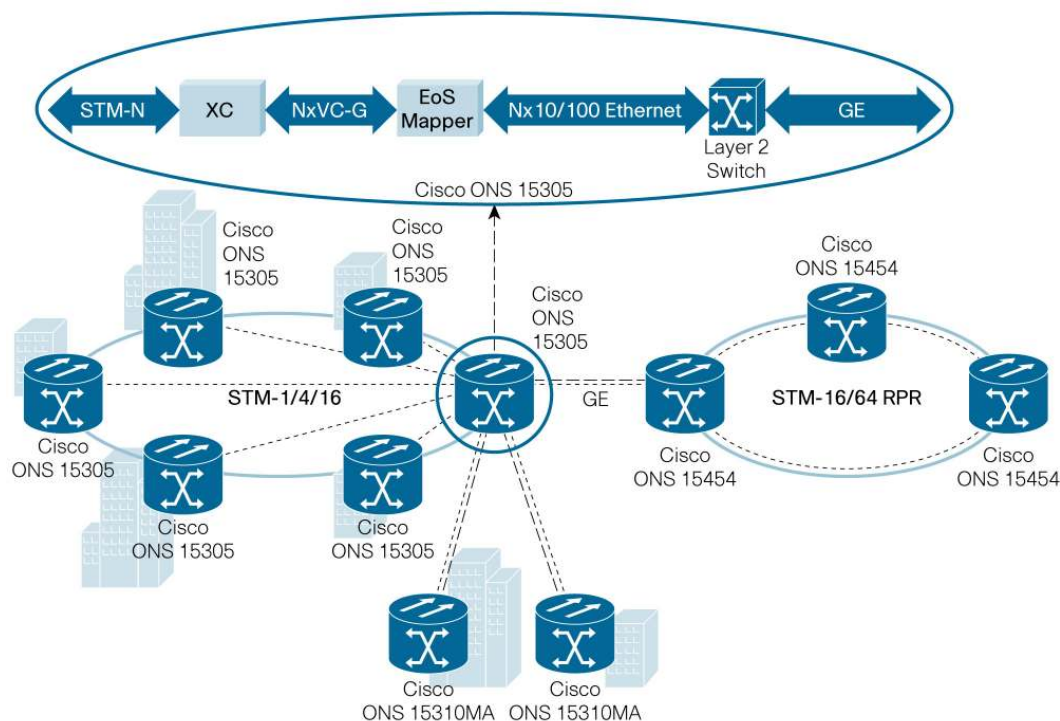
The Cisco ONS 15305 8-Port 10/100 Ethernet Module can be installed in any Cisco ONS 15305 MSPP slot as part of the Cisco multiservice-over-SDH solution. The Cisco ONS 15305 can be used as customer premises equipment (CPE) for medium-sized and large businesses to transport traffic over an STM-1, STM-4, 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 transporting Ethernet or Fast Ethernet traffic over the SDH network at up to the full line rates of the LAN-10 or 100 Mbps. Using standard virtual concatenation, SDH bandwidth may also be efficiently allocated at below line-rate speeds to meet each customer's needs.

Figure 4. The Cisco ONS 15305 with the 8-Port 10/100 Ethernet Module as CPE to provide Ethernet or Fast Ethernet over SDH Services



The Cisco ONS 15305 can also be deployed as a central office aggregator, consolidating traffic from other Cisco ONS 15305 CPE, as well as directly connected customer TDM or data traffic from electrical interfaces. The Cisco ONS 15305 8-Port 10/100 Ethernet Module can collect Ethernet traffic from up to 14 SDH virtual containers, and hand off the aggregated packets to the Cisco ONS 15305 2-Port Gigabit Ethernet Module to which it is connected through the centralized Ethernet crossbar. Traffic from different locations can be logically separated using IEEE 802.1Q-compliant VLANs. The 2-Port Gigabit Ethernet module can then hand off a Gigabit Ethernet stream, or VLAN trunk, to a colocated switch or router, to a Cisco ONS 15454 ML-Series, for increased packet-intelligent transport over the core network. Figure 5 shows a diagram of this application.

Figure 5. The Cisco ONS 15305 8-Port 10/100 Ethernet Module Enables Ethernet Services Aggregation on the Cisco ONS 15305



Key Features and Benefits

High-Density Ethernet over SDH Aggregation

The Cisco ONS 15305 8-Port 10/100 Ethernet Module allows the Cisco ONS 15305 to aggregate Ethernet traffic from multiple remote sites connected through the SDH network. A single module can collect Ethernet-over-SDH traffic from up to 14 VCGs, and 2 or 3 modules can be combined for even higher-density aggregation. The aggregated Ethernet traffic can be terminated in a 10-Mbps or 100-Mbps LAN port on the module, or in a Gigabit Ethernet port in the same chassis, connected through the centralized Ethernet crossbar. This powerful feature in a cost-effective, low-power, 1-rack-unit (RU) platform revolutionizes the concept of metropolitan-access aggregation and increases the efficiency – by allowing more services at lower costs – of multiservice networks.

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 product also uses ITU-T G.707-compliant low-order and high-order virtual concatenation and ITU-T G.7042-compliant Link Capacity Adjustment Scheme (LCAS), making it more effective for scalable, next-generation optical infrastructures.

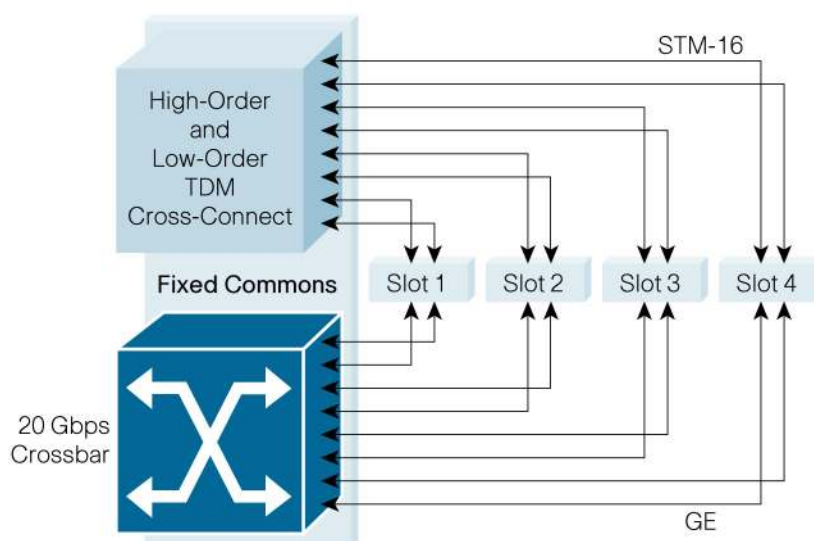
Integrated Layer 2 Switching

The Cisco ONS 15305 8-Port 10/100 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 6). 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 6. Each Slot in the Cisco ONS 15305 Has Access to the TDM Cross-Connect and to an Ethernet Crossbar



Summary

The Cisco ONS 15305 8-Port 10/100 Ethernet Module for the Cisco ONS 15305 MSPP helps enable Ethernet and Fast 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 8-Port 10/100 Ethernet Module makes Ethernet service delivery available to a broader range of customers. Together with the Cisco ONS 15305 2-Port Gigabit Ethernet Module the Cisco ONS 15305 8-Port Ethernet Module also supports a powerful Ethernet-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 designed for use in end-to-end, multiservice-over-SDH networks with the Cisco ONS 15310 Multiservice Access Platform and the Cisco ONS 15454 MSPP.

Product Specifications

Tables 1 and 2 list the specifications and system requirements for the Cisco ONS 15305 8-Port 10/100 Ethernet Module.

Table 1. Product Specifications

Description	Specification
Ethernet interface	10BASE-T and 100BASE-TX Ethernet interface according to the IEEE 802.3 specification
Software compatibility	The Cisco ONS 15305 8-Port 10/100 Ethernet Module is compatible with Cisco ONS 15305 systems running Release 2.0 software or greater
Ethernet-over-SDH transport	ITU-T G.7041 GFP ITU-T G.707 VCAT: VC-12-Xv, X=1-50; VC-3-Xv, X=1-3; VC-4 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	24W

System Requirements

Table 2. System Requirements

Description	Specification
Hardware	The 8-Port 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 Cisco ONS 15305 8-Port 10/100 Ethernet Module. Cisco Edge Craft Release 2.x is required to manage the Cisco ONS 15305 8-Port 10/100 Ethernet Module.

Ordering Information

To place an order, visit the [Cisco Ordering Home Page](#). Table 3 shows ordering information for the Cisco ONS 15305 8-Port 10/100 Ethernet Module.

Table 3. Ordering Information

Product Name	Part Number
Cisco ONS 15305 8-Port 10/100 Ethernet Module with WAN mapper	15305-E100-8-W=

Service and Support

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For More Information

For more information about the Cisco ONS 15305 and the Cisco ONS 15305 8-Port 10/100 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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