



Data Sheet

Cisco ONS 15454 CE 4-Port Gigabit Ethernet Card

The 4-port Gigabit Ethernet card for the Cisco® ONS 15454 Multiservice Provisioning Platform (MSPP) helps enable the delivery of true carrier-class, line-rate Gigabit Ethernet or subrate Gigabit Ethernet Private Line services.

Product Overview

Through its portfolio of Ethernet service cards, the Cisco ONS 15454 MSPP has helped enable service providers and enterprises to effectively and efficiently expand their network capability from transporting only time-division multiplexing (TDM) services to delivering multiple services over a single, converged architecture and eliminating the need for multiple overlay infrastructures. With the introduction of the Cisco ONS 15454 CE 4-Port Gigabit Ethernet Card (CE-1000), the Cisco CE-Series card portfolio – which includes 10/100 Mbps (CE-100) cards on the Cisco ONS 15454 and 15310 platforms – gives service providers the ability to scale from 1.5-Mbps to 1-Gigabit Ethernet Private Line services.

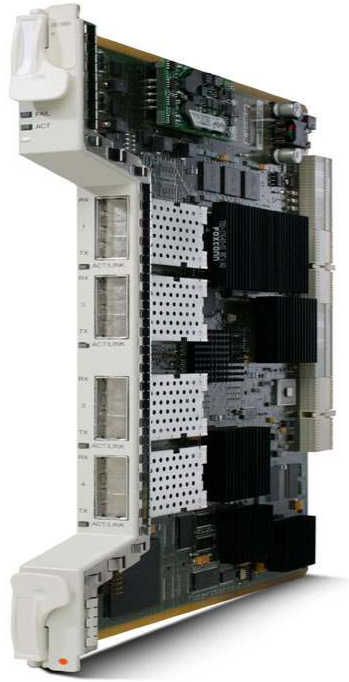
The CE-1000 (Figure 1) meets important requirements for an end-to-end Ethernet private-line application with features such as generic framing procedure (GFP), virtual concatenation (VCAT), software link capacity adjustment scheme (SW-LCAS), link integrity, and comprehensive Ethernet and SONET statistics – including bandwidth utilization statistics and flow control. The CE-1000, with GFP and VCAT, helps service providers and enterprises maximize bandwidth utilization and promote industry-wide interoperability for Ethernet Private Line services. With SW-LCAS, the CE-1000 gives service providers the flexibility to dynamically add and remove bandwidth on Ethernet Private Line services. Ethernet and SONET statistics provide service-monitoring capabilities. For example, bandwidth utilization statistics reveal the usage patterns of end customers – data that can be critical for operations personnel or for network and business planners. Features such as link integrity provide faster convergence capability to end customers' Layer 2 networks connected through Ethernet private lines.

The Cisco ONS 15454 MSPP is the optical industry's first metro optical transport platform. It combines supercharged SONET/SDH transport, integrated optical networking (ITU grid wavelengths and DWDM, for example), and unprecedented multiservice interfaces on demand (such as TDM, Ethernet/IP, and storage) to deliver enormous economic benefits. The Cisco ONS 15454 provides the functions of multiple network elements in a single platform. As a critical component of a complete, end-to-end, advanced service architecture from Cisco Systems®, the Cisco ONS 15454 delivers a scalable optical transport mechanism and the intelligent Ethernet/IP support to cost-effectively deliver next-generation voice and data services.

Cisco continues its tradition of converged network services leadership with the introduction of CE-1000 card to the CE-Series, helping enable the efficient delivery of Ethernet Private Line services without a major overhaul or redesign of existing transport infrastructure.

Figure 1

Cisco ONS 15454 CE-Series 4-Port 1000 Mbps Ethernet Card



The CE-1000 card includes the following features:

- Four gigabit interface converter (GBIC)-based Gigabit Ethernet ports
- Supports short-reach, long-reach, and extended-reach (SX, LX, ZX) GBICs
- 2.5-Gbps SONET/SDH transport bandwidth per card
- Each Gigabit Ethernet port mapped to SONET/SDH (POS) using GFP-F (ITU-T G.7041) or LAN Extension (LEX) High-Level Data Link Control (HDLC) encapsulation
- Each POS can consist of high-order (HO) VCAT (SONET: STS-1-nv where n=1 to 21, STS-3C-nv where n=1 to 7; SDH: VC-4-nv where n=1 to 7) or contiguous concatenation (CCAT) (SONET: STS-1, -3c, -6c, -9c, -12c, -18c, -24c, -48c; SDH: VC-4, -4-2c, -4-3c, -4-4c, -4-6c, -4-8c, -4-16c) circuits
- Dynamic capacity increment/decrement (SW-LCAS) to VCAT circuits
- Sub-50-millisecond (ms) SONET/SDH protection/restoration of transport circuits
- Transparent to Layer 2 bridging, switching, Ethernet MAC control protocols (Cisco EtherChannel® technology, 802.1x, Cisco Discovery Protocol, VLAN Trunking Protocol [VTP], Spanning Tree Protocol), and VLAN (802.1Q and QinQ)
- Ethernet link functions: autonegotiation, flow control (802.3x)
- Jumbo packet support (up to 10,000 bytes)
- A-to-Z provisioning (Cisco Transport Controller and Cisco Transport Manager), Transaction Layer 1 (TL1) provisioning
- Simple Network Management Protocol (SNMP) alarms and Remote Monitoring (RMON) performance monitoring
- Cisco Transport Controller, Cisco Transport Manager, and TL1 management

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Page 2 of 8

- Interoperation with (over SONET/SDH) CE-Series, G-Series, and ML-Series cards
- Back-pressure flow control
- Terminal and facility loopback
- Link integrity support

Applications

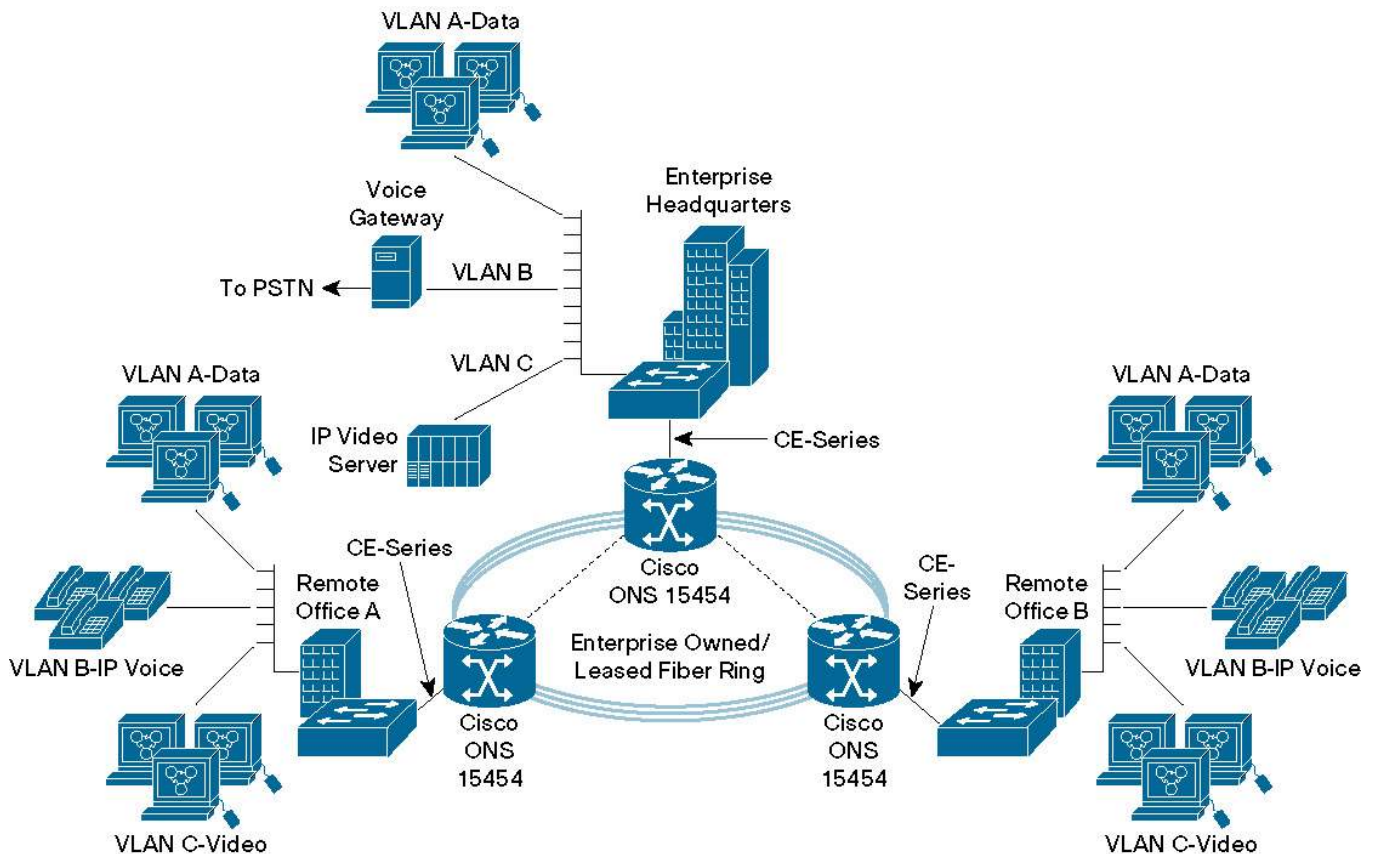
The CE-1000 provides the flexibility to meet the demands of a wide variety of Ethernet Private Line applications found within service provider and enterprise networks. Figures 2 and 3 outline a few of the applications that can be met using the CE-1000 cards.

Reliable Enterprise Networking

When the Cisco ONS 15454 MSPP is equipped with the CE-1000 card, enterprise users can build highly reliable multiservice networks to support data, voice, and video applications. Additionally, a network based on a Cisco ONS 15454 provides the flexibility to support traditional TDM-based services along with Ethernet services. The Cisco ONS 15454 provides transport scalability from 155 Mbps (OC-3/STM-1) up to 320 Gbps (thirty-two 10-Gbps wavelengths), positioning the enterprise network for future growth (Figure 2).

Figure 2

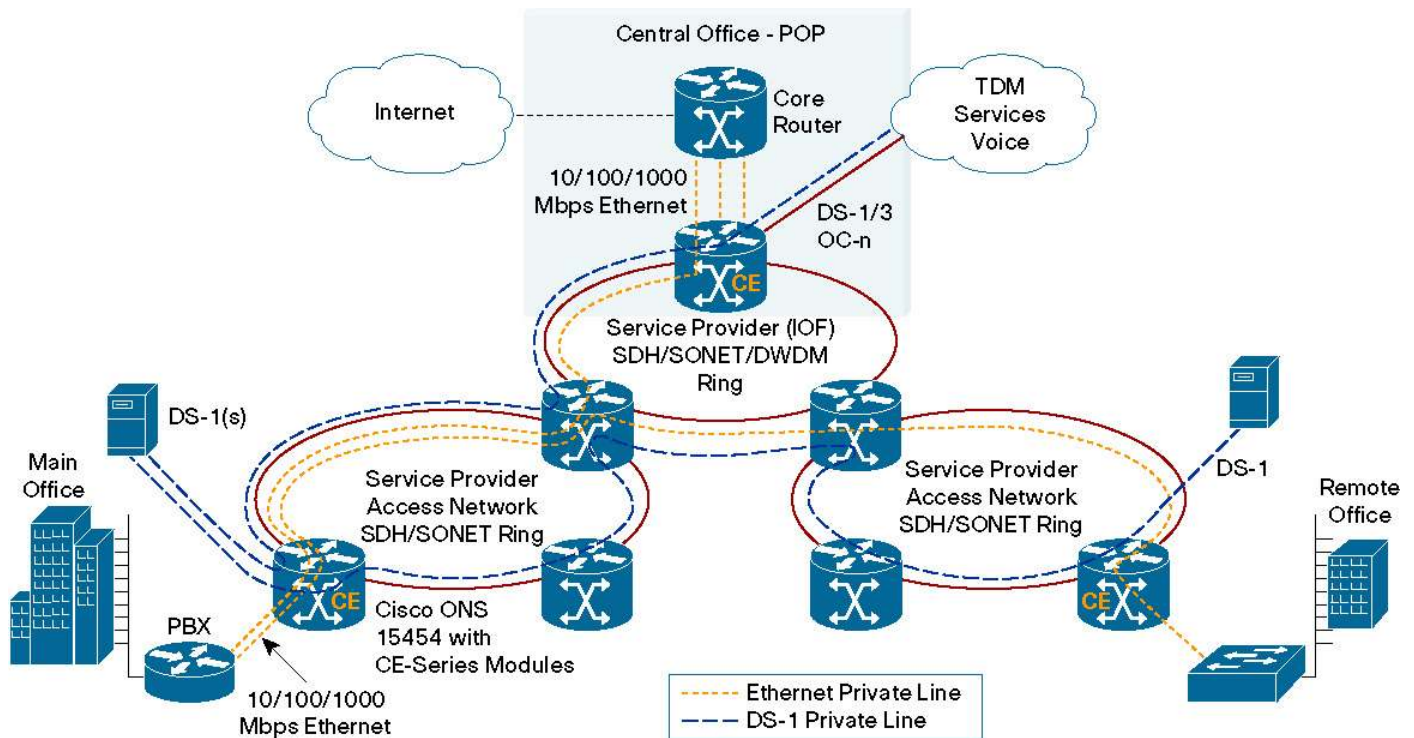
Reliable Enterprise Networking



Private Line Carrier Ethernet

A metropolitan network that supports a wide range of service capabilities allows service providers to offer a tariff mix to meet each customer's needs. The Cisco ONS 15454 provides the foundation for building an advanced multiservice network over an extremely reliable SONET/SDH infrastructure (Figure 3). The Cisco ONS 15454 with CE-1000 and CE-100 cards facilitates the delivery of data services such as transparent LAN services (TLS) or Internet access over a carrier-class optical infrastructure supporting traditional TDM services. The CE-1000 card, with VCAT and SW-LCAS functions, helps service providers offer a wide variety of Ethernet service-level agreements (SLAs). VCAT provides a more efficient use of the transport bandwidth for data user interfaces, and SW-LCAS provides an effective way for a service provider to change the allocated bandwidth to each customer. Additionally, provisioning an Ethernet circuit over a network equipped with a CE-1000 card is easily accomplished through the use of the Cisco ONS 15454's embedded A-to-Z circuit provisioning wizard. The CE-1000 card also supports TL1-based provisioning to simplify integration with many embedded service provider management systems.

Figure 3
Reliable Enterprise Network Using SDH/SONET Infrastructure



Product Specifications

Compact Design

- Single-width card slot design for increased shelf flexibility and scalability
- Up to 12 CE-Series cards per shelf assembly
- Up to 16 line-rate (or 32 sub-line-rate) Gigabit Ethernet circuits per shelf
- Up to 64 line-rate (or 128 sub-line-rate) Gigabit Ethernet circuits per 7-foot bay

Data Architecture Options

- Point-to-point
- Hub-and-spoke using multiple circuits

Optical Transport Options

- Unidirectional-path switched ring (UPSR) and subnetwork connection protection (SNCP)
- 2-fiber and 4-fiber bidirectional line switched ring (BLSR) and multiplex section-shared protection ring (MS-SPR)
- Automatic protection switching (APS) and subnetwork connection (SNC) (1+1 uni- or bidirectional)
- Path-protected mesh networking (PPMN)
- Unprotected (0+1)

Table 1 outlines valid SONET and SDH circuit combinations for the CE-1000 card according to service type. Table 2 lists various product specifications for the CE-1000 card.

Table 1. Valid SONET and SDH Circuit Combinations

	Service Type	SONET Circuit Type	SDH Circuit Type
1	Line-rate 1000 Mbps	STS-1-21v STS-3C-7v STS-24C STS-48c	VC4-7v VC4-8C VC-4-16c
2	Sub-rate 1000 Mbps	STS-1-nv , n = 1 to 20 STS-3C-nv, n = 1 to 6 STS-1, -3c, -6c, -9c, -12c	VC4-nv, n = 1 to 6 VC-4, -4-2c, -4-3c, -4-4c, -4-6c

Table 2. Product Specifications

Attributes	Description
Ports	4 GBIC ports (SX, LX, ZX)
Port speed	1000 Mbps
Duplex	Full and autonegotiation
Flow control	Supported
Transport	Up to 4 "Virtual" POS (VCG) ports supporting HO-VCAT
Transport bandwidth per card	2.5G
Transport bandwidth allocation on "virtual" POS (VCG) ports	SONET: STS-1-nv (n = 1–21), STS-3C-nv (n = 1–7), STS-1, -3c, -6c, -9c, -12c, -24c, -48c; SDH: VC-4-nv (n = 1–7), VC-4, -4-2c, -4-3c, -4-4c, -4-6c, -4-8c, -4-16v
Transport bandwidth adjustment	SW-LCAS (dynamic addition and removal of bandwidth)
Ethernet-over-SONET encapsulation	ITU-T G.7041 GFP-F, Cisco LEX, and Cisco HDLC options
Frame size	64 to 10,000 bytes
Link integrity	Yes
Service provisioning	A-to-Z service provisioning on Cisco Transport Controller, TL1-based service provisioning
Maximum power	65W
Operating temperature	23 to 131°F (–5 to 55°C)

Attributes	Description
Operating humidity	Noncondensing 5–95%
Dimensions (H x W x D)	12.65 x 0.72 x 9.99 in. (32.13 x 1.83 x 22.86 cm)

Regulatory Compliance

EMC (Class A)

- NEBS Bellcore GR-1089-CORE, Issue 3 (Level 3, Type 2, and Type 4)
- IC ICES-003 Issue 3, 1997
- FCC 47CFR15
- ETSI 300-386-TC
- EN55022, EN55024
- CISPR 22, CISPR 24
- VCCI V-3/2000.04
- EN61000-6-1
- Resolution 237 (Brazil)

Product Safety

- NEBS Bellcore GR-1089-CORE, Issue 3 (Level 3, Type 2, and Type 4)
- IEC 60950-1/EN 60950-1, First Edition (CB report/certificate with all country deviations)
- UL and cUL/CSA 60950-1 First Edition

Laser Safety

- EN or IEC-60825-2
- IEC 60825-1 Amendment 2 (2001-01)
- CSA60950-1 or IEC 60950-1/EN60950-1
- 21CFR1040 (Accession Letter and CDRH Report)

Environmental

- NEBS Bellcore GR-63-CORE, Level 3
- ETS 300 019-2-1 (Storage, Class 1.1)
- ETS 300 019-2-2 (Transportation, Class 2.3)
- ETS 300 019-2-3 (Operational, Class 3.1E)

System Requirements

Table 3 outlines the Cisco ONS 15454 system requirements for operation of the CE-1000 card.

Table 3. System Requirements

System Parameter	SONET	SDH
Shelf assembly	SA-ANSI, SA-HD	SA-ETSI
Electrical Interface Assembly (EIA) panels or FMECs	Not required	Not required
Processor	TCC2 or TCC2P	TCC2 or TCC2P
Cross-connect	XC-VT XC-10G XC-VXC-10G	XC-VXL-2.5 XC-VXL-10G XC-VXC-10G
System software	Release 7.0 or later (SONET)	Release 7.0 or later (SDH)
Slot compatibility	Slots 1 to 6, 12 to 17	Slots 1 to 6, 12 to 17

Ordering information

To place an order, visit the [Cisco Ordering Home Page](#). Table 4 outlines the ordering information for the Cisco ONS 15454 CE 4-Port Gigabit Ethernet Card.

Table 4. Ordering Information

Product Description	Part Number
CE Series 1000-Mbps Ethernet card, 4 ports, SONET/SDH system	15454-CE-1000-4=

Service and Support

Cisco Systems offers a wide range of services programs to accelerate customer success. These innovative services programs are delivered through a unique combination of people, processes, tools, and partners, resulting in high levels of customer satisfaction. Cisco services help you to protect your network investment, optimize network operations, and prepare the network for new applications to extend network intelligence and the power of your business. For more information about Cisco services, see [Cisco Technical Support Services](#) or [Cisco Advanced Services](#).

For More Information

For more information about the Cisco ONS 15454 MSPP, visit <http://cisco.com/en/US/products/hw/optical/ps2006/ps2010/index.html> or contact your local account representative.

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