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Data Sheet

Cisco ONS 15454 60G/5G High-Order/Low-Order XC-VXC Cross-Connect Card

The Cisco® ONS 15454 60G/5G High-Order/Low-Order XC-VXC Cross-Connect Card expands the low-order bandwidth management capabilities of the Cisco ONS 15454 SONET and SDH multiservice provisioning platforms (MSPPs).

Product Overview

The Cisco ONS 15454 60G/5G High-Order/Low-Order XC-VXC Cross-Connect Card (XC-VXC) increases the Cisco ONS 15454's virtual tributary (VT)1.5 and VC-12 switching matrixes by a factor of four, facilitating greater support for grooming DS-1 and E1 services and low-order members of virtual concatenation (VCAT) groups. The XC-VXC card (Figure 1) operates in a protected 1:1 configuration, helping enable carrier-class high availability and supporting errorless side switching. The card operates in either the Cisco ONS 15454 SONET or SDH systems. In SONET systems, the card supports cross-connections at the VT-1.5, VT-2, STS-1, and STS-Xc (where X = 3, 6, 9, 12, 24, 48, and 192) granularities and in SDH systems (AU-4) at VC-12, VC-11, VC-3, VC-4, and VC-4-Xc (where X = 2, 3, 4, 8, 16, and 64) granularities.

Figure 1
Cisco ONS 15454 XC-VXC-10G Card

The card provides 60 Gbps of nonblocking, high-order switch capacity, 1152 x 1152 STS-1s or 384 x 384 VC-4s unidirectional ports and 5 Gbps of low-order switch capacity, 2688 x 2688 VT1.5/VC-11, or 2016 x 2016 VT-2/VC-12 unidirectional ports. The XC-VXC card is installed in slots 8 and 10 as identified by the green cross (+) icon at the bottom of the faceplate and below the shelf slot. The platform's eight multiservice card slots (1 to 4 and 14 to 17) receive 2.5 Gbps of capacity and the high-speed card slots (5, 6, 12, 13) receive 10 Gbps of capacity. The timing, communications, and control (TCC) card works with the XC-VXC card to provision, set up circuits, and maintain connections within the system. The XC-VXC card provides in-service upgrade capabilities, given shelf assembly support, from other cross-connect cards, including the XC, XC-VT, XC-10G, XC-VXL-2.5G, and XC-VXL-10G.

The XC-VXC card can be commissioned to support multiple network and circuit-protection schemes including unidirectional path switched ring/subnetwork connection protection (UPSR/SNCP) per Telcordia Technologies GR-1400-CORE/ITU G.841; 2-fiber and 4-fiber bidirectional line switched ring/multiplex section-shared protection ring (BLSR/MS-SPR) per GR-1230/ITU G.841; 1+1 automatic protection switching/line multiplex section protection (APS/LMSP) per GR-253-CORE/ITU G.841; path-protected mesh network (PPMN) GR-1400-CORE; or unprotected architectures, providing the flexibility to build the type of networks required to meet service demands, traffic patterns, and user needs. This provisioning flexibility also helps to reduce the cost of inventory and simplifies engineering and deployment.

The XC-VXC card incorporates faceplate-mounted LEDs to provide a quick visual check of the operational status at the card. The card is supported by the integrated Cisco Transport Controller craft manager for the Cisco ONS 15454 MSPP. The controller provides the user with access to operations, administration, maintenance, and provisioning (OAM&P) for the system.
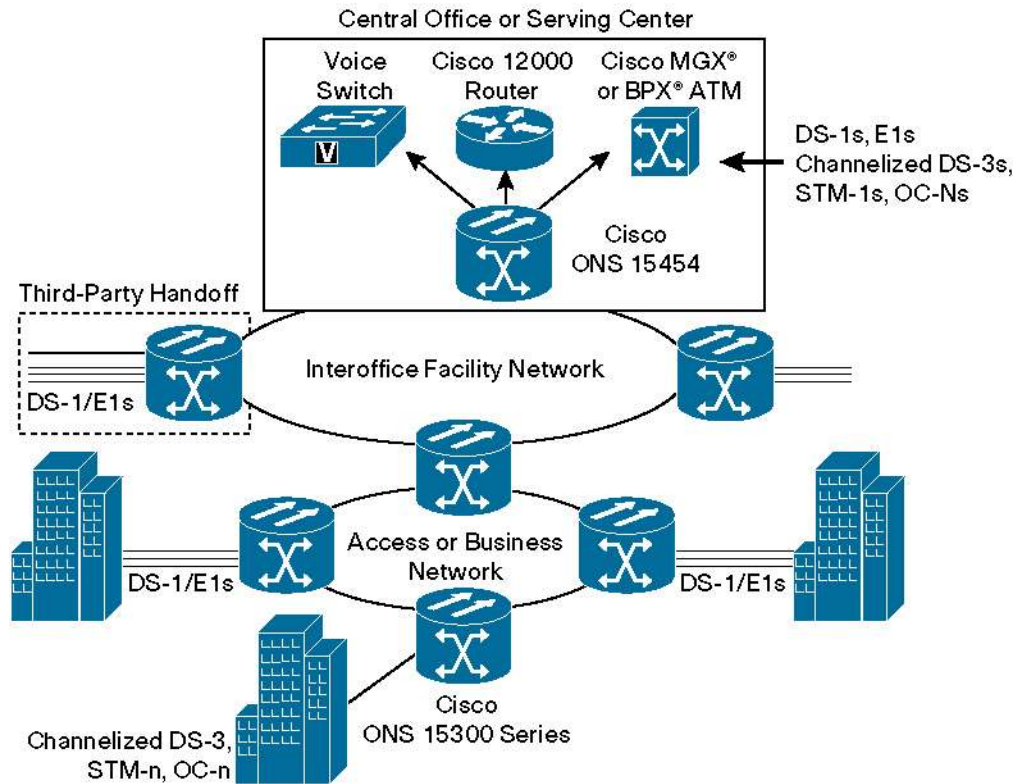
Applications

A Cisco ONS 15454 MSPP equipped with the XC-VXC cross-connect card with increased low-order grooming provides the core capabilities to support the following applications:

Application Solution Number 1: DS-1 or E1 Service Aggregation to Terminal Equipment

As a result of the growing need for converged data, video, and video capabilities, the demand for T1 and E1 services is robust. Furthermore, with the migration to Ethernet over SONET/SDH solutions, many of which use low-order virtual concatenation (VT-1.5/VT-2/VC-11/VC-12), additional low-order grooming demands are placed on both the service provider and enterprise customer transport networks. The Cisco ONS 15454 MSPP equipment with the XC-VXC cross-connect card provides a solution to groom and transport the low-order traffic demands (Figure 2) while positioning the network to transition to higher-speed terminations (Ethernet, E3, DS-3, Fast Ethernet, Fibre Channel, etc.) with network scalability from OC-3/STM-1 to OC-192/STM-64 and multiwavelength DWDM.

Figure 2

DS-1/E1 Service Aggregation to Terminal Equipment

Application Solution Number 2: Wireless Network Aggregation and Grooming

With the continued growth in cell phone usage, there remains a growing need to aggregate and groom the large volume of traffic and interfaces in the Mobile Telephone Switching Office (MTSO). The Cisco ONS 15454 MSPP equipped with XC-VXC cross-connect cards provides the grooming capabilities to manage the T1/DS-1 bandwidth received from the cell sites and incumbent service providers (Figure 3).

Figure 3

Typical Network Design
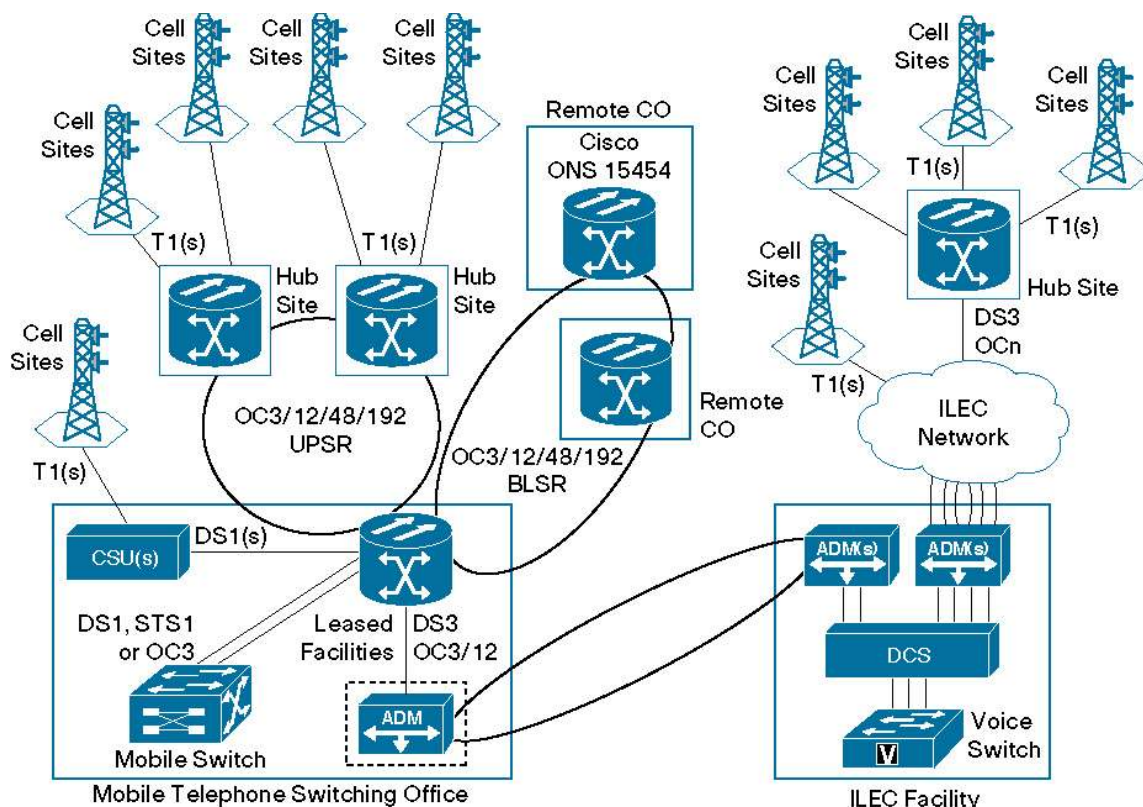
In addition, the Cisco ONS 15454 MSPP data capabilities, including native 10/100/1000 Mpbs Ethernet interfaces with Resilient Packet Ring and Layer 3 service awareness, support efficient packet grooming and transport with a smooth transition to next-generation data-based wireless infrastructures.

Key Features and Benefits

Table 1 outlines some of the key features and benefits of the Cisco ONS 15454 XC-VXC card.

Table 1.   Features and Benefits

Features	Benefits
High-capacity, non-blocking STS-1/VC-4 switch matrix	Helps users to scale their network to meet increasing service-related bandwidth demands. Provides sufficient bandwidth to support multiple-topology networking through a hub node. Allows support for networks with multiple rings and linear chains terminated on a single network element.
Large low-order switch matrix	Enables low-order bandwidth management down to 1.5 or 2.0 Mbps to support DS-1 and E1 services, as well as growing low-order virtual concatenation demands from Ethernet over SONET/SDH implementations.
Drop and Continue support	Supports unidirectional Drop and Continue for broadcast video applications and bidirectional Drop and Continue cross-connections for dual-ring interconnection protection architectures.
Cross-connect loopbacks	Enables user to loop back subrate circuits within an optical signal. Allows testing along the circuit's route without impacting other circuits within the optical signal.
Test access support	Allows interworking with third-party test head products.

Summary/Conclusion

The Cisco ONS 15454 60G/5G High-Order/Low-Order XC-VXC Cross-Connect Card further enhances the feature-rich capabilities and flexibility of the Cisco ONS 15454 SONET and SDH MSPPs.

Regulatory Compliance

Table 2 outlines the regulatory compliance specifications for the XC-VXC-series card.

Table 2. Regulatory Compliance

Regulatory Compliance	
Homologation	
SONET/ANSI System	**SDH/ETSI Systems**
Canada	Australia
European Union (EU)	China
Japan	EU
Korea	Hong Kong
Mexico	Korea
United States	Mexico
Hong Kong	New Zealand
Taiwan	Singapore
Electromagnetic Compliance	
EN300-386-TC	
NEBS Telcordia Technologies GR-1089-CORE, Issue 3 (Level 3, Type 2 and Type 4)	
IEC CISPR 22 class A	
IEC CISPR 24	
ICES-003, Issue 3, 1997	
FCC 47CFR15 class A	
EN55022 class A	
EN55024	
EN61000-3-2, EN61000-3-3 (AC products)	
EN61000-6-1	
VCCI V-3/2000.04 (Japan)	
Resolution 237 (Brazil)	
Safety	
NEBS Telcodia Technologies GR-1089-CORE, Issue 3 (Level 3, Type 2 and Type 4)	
IEC 60950-1 /EN 60950-1, 1st Ed. (CB Report / Certificate with all country deviations)	
UL and cUL / CSA 60950-1 1st Ed.	
Environmental	
NEBS Telcordia Technologies 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 extended to −40℃ to 65℃)	
Other	

Regulatory Compliance
AT&T Network Equipment Development Standards (NEDS) Generic Requirements
SBC TP76200MP
Verizon TCG Checklist
WorldCom ESD

Product Specifications

Table 3 outlines the XC-VXC product specifications.

Table 3. Product Specifications

Parameter	Value
Cross-Connect Matrix	
SONET	STS: 1152 x 1152 bidirectional ports
	VT1.5: 2688 x 2688 bidirectional ports (via 96 STS-1 bidirectional ports)
	VT2: 2016 x 2016 bidirectional ports (via 96 STS-1 bidirectional ports)
SDH	VC-4: 384 x 384 bidirectional ports
	VC-3: 384 x 384 bidirectional ports (via 128 VC-4 bidirectional ports)
	VC-12: 2016 x 2016 bidirectional ports (via 96 VC-3 bidirectional ports)
	VC-11: 2688 x 2688 bidirectional ports (via 96 VC-3 bidirectional ports)
Supported Cross-Connect Sizes	
SONET	VT1.5, VT2, STS-1, -3c, -6c, -9c, -12c, -24c, -48c, -192c
SDH	VC-11, VC-12, VC-3, VC-4, VC-4-Xc; where X = 2, 3, 4, 8, 16, and 64)
Bandwidth per Slot	
Multiservice (slots 1–4 and 14–17)	2.5 Gbps
High-speed (slots 5, 6, 12, 13)	10 Gbps
Management	
Card LEDs	
Failure (FAIL)	Red
Active/standby (ACT/STBY)	Green/Amber
Card Power Draw, Maximum	67W
Operating Environment	
Temperature	
Industrial temperature rating (I-Temp)	–40 to 149°F (–40 to 65°C)
Humidity	5 to 95% noncondensing
Storage Environment	
Temperature	–40 to 185°F (–40 to 85°C)
Humidity	5 to 95% noncondensing
Physical Dimensions	
Size	1 card slot
Weight	1.92 lbs. (0.87 kg)

System Requirements

Table 4 outlines the minimum requirements to operate the XC-VXC card.

Table 4.   System Requirements

Parameter	Cisco ONS 15454 SONET/ANSI System	Cisco ONS 15454 SDH/ETSI System
Shelf Assembly	SA-HD, SA-ANSI	SA-ETSI
Timing, Communications, and Control Card	TCC2 or TCC2P	TCC2 or TCC2P
Cross-Connect Card	XC-VXC-10G	XC-VXC-10G
Cisco ONS 15454 System Software	Release 6.0 or later	Release 6.0 or later
Slot Compatibility	8 and 10	8 and 10

Ordering Information

To place an order, visit the [Cisco Ordering Home Page](#). Table 5 outlines the orderable part numbers for the XC-VXC card.

Table 5.   Ordering Information

Product Description	Part Number
60G/5G high-order/low-order cross-connect card, XC-VXC-series, I-Temp, SONET system	15454-XC-VXC-10G
60G/5G high-order/low-order cross-connect card, XC-VXC-series, I-Temp, SDH system	15454E-XC-VXC-10G

Service and Support

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For More Information

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

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