

Network Disclosure Announcement No. 478

Public Notice of Network Change(s), Pursuant to CFR 47, subsections 51.325 - 51.335.
Qwest's Internet address: <http://www.qwest.com/disclosures>.

Synchronous Optical Network (SONET) Interfaces: STS-1, OC-3, OC-12, OC-48 and OC-192

- And -

Ethernet over SONET (EoS) Interfaces: 10Base-T, 100Base-TX/LX10/FX, 1000Base-LX/SX/ZX*; *Updated 9-11-09*

Original Disclosure Date: November 30, 2001

Summary:

*Qwest announces the availability **October 24th, 2009** of 100Base-LX10/FX and 1000Base-ZX, where available as well as Gigabit Ethernet over STS-3c-2v and STS-3c-3v along with other VCAT Group mapping enhancements and support for the Tellabs 7100 OTS.

Qwest currently offers STS-1 electrical as well as OC-3, OC-12, OC-48 and OC-192 1+1 & 0X1 Linear interfaces delivered from Fujitsu and Nortel standard OC-3, OC-12, OC-48 and OC-192 SONET Add-Drop Multiplexers (ADMs) as well as Fujitsu and Cisco Next Generation SONET Hybrid (ADM/DCS) equipment. Tellabs STS-1 electrical interface provided via the Titan 5500 Wideband Digital Cross-connect System (DCS) along with standard DS1 and DS3 interfaces including VT Transmux – DS3 and STS-1 are also supported.

Additionally available are:

- TL1 over 1) 3-layer X.25 (DTE or DCE mode) at 9.6 Kbps (or greater) and 2) TCP/IP 10/100Base-T Ethernet serial interfaces. These OS management interfaces are limited to SHNS ACCU-Ring and Software Reconfiguration Capability (SRC) applications only.
- Point-to-point, bidirectional Data Communications Channel (DCC) tunnels on standard SONET Optical Carrier (OC-3/12/48/192) Network Interfaces delivered from Cisco Next Generation SONET ADMs.
- Point-to-point, bidirectional, full duplex 10Base-T, 100Base-TX, 1000Base-LX (Single-Mode Fiber only) and 1000Base-SX Ethernet over SONET Network Interfaces on SST and SHNS.
- SONET Network Interfaces with the following embedded Ethernet payloads:

Data Mapping	SPE or VCAT Group	Encapsulation and Framing Protocols		Next Generation SONET ADM/DCS
10Base-T	STS-1-1v	GFP-F per ITU-T G.7041/Y.1303		Cisco ONS 15454; Fujitsu FLASHWAVE 4020, 4100, 4500
	STS-1	PPP/BCP per IETF RFC 1661, 2615 and RFC 3518	HDLC per IETF RFC 1662	Fujitsu FLASHWAVE 4500
		LEX per IETF RFC 1841 or Cisco HDLC or PPP/BCP per RFC 1661, 2615 and RFC 3518	HDLC per IETF RFC 1662	Cisco ONS 15454
100Base-TX; 100Base-LX10/FX	STS-1-1v	GFP-F per ITU-T G.7041/Y.1303		Cisco ONS 15454; Fujitsu FLASHWAVE 4020, 4100, 4500
	STS-1	PPP/BCP per IETF RFC 1661, 2615 and RFC 3518	HDLC per IETF RFC 1662	Fujitsu FLASHWAVE 4500
		LEX per IETF RFC 1841 or Cisco HDLC or PPP/BCP per RFC 1661, 2615 and RFC 3518	HDLC per IETF RFC 1662	Cisco ONS 15454
	STS-1-2v	GFP-F per ITU-T G.7041/Y.1303		Cisco ONS 15454; Fujitsu FLASHWAVE 4020, 4100, 4500
		PPP/BCP per IETF RFC 1661, 2615 and RFC 3518	HDLC per IETF RFC 1662	Fujitsu FLASHWAVE 4500
	STS-3c-1v or STS-1-3v	GFP-F per ITU-T G.7041/Y.1303		Cisco ONS 15454; Fujitsu FLASHWAVE 4020, 4100, 4500; Tellabs 7100 OTS (STS-1-3v only)
	STS-3c	PPP/BCP per IETF RFC 1661, 2615 and RFC 3518	HDLC per IETF RFC 1662	Fujitsu FLASHWAVE 4500
		LEX per IETF RFC 1841 or Cisco HDLC or PPP/BCP per RFC 1661, 2615 and RFC 3518	HDLC per IETF RFC 1662	Cisco ONS 15454

Data Mapping	SPE or VCAT Group	Encapsulation and Framing Protocols		Next Generation SONET ADM/DCS
1000Base-LX; 1000Base-SX; 1000Base-ZX	STS-1-1v	GFP-F per ITU-T G.7041/Y.1303		Alcatel-Lucent LambdaUnite MSS; Cisco ONS 15454; Fujitsu FLASHWAVE 4100, 4500; Tellabs 7100 OTS
	STS-1	PPP/BCP per IETF RFC 1661, 2615 and RFC 3518	HDLC per IETF RFC 1662	Fujitsu FLASHWAVE 4500
		LEX per IETF RFC 1841 or Cisco HDLC or PPP/BCP per RFC 1661, 2615 and RFC 3518	HDLC per IETF RFC 1662	Cisco ONS 15454
	STS-1-2v	GFP-F per ITU-T G.7041/Y.1303		Alcatel-Lucent LambdaUnite MSS; Cisco ONS 15454; Fujitsu FLASHWAVE 4100, 4500; Tellabs 7100 OTS
	STS-3c-1v or STS-1-3v	GFP-F per ITU-T G.7041/Y.1303		Alcatel-Lucent LambdaUnite MSS; Cisco ONS 15454; Fujitsu FLASHWAVE 4100, 4500; Tellabs 7100 OTS
	STS-3c	PPP/BCP per IETF RFC 1661, 2615 and RFC 3518	HDLC per IETF RFC 1662	Fujitsu FLASHWAVE 4500
		LEX per IETF RFC 1841 or Cisco HDLC or PPP/BCP per RFC 1661, 2615 and RFC 3518	HDLC per IETF RFC 1662	Cisco ONS 15454
	STS-3c-2v or STS-1-6v	GFP-F per ITU-T G.7041/Y.1303		Alcatel-Lucent LambdaUnite MSS; Cisco ONS 15454; Fujitsu FLASHWAVE 4100, 4500; Tellabs 7100 OTS

Data Mapping	SPE or VCAT Group	Encapsulation and Framing Protocols		Next Generation SONET ADM/DCS
1000Base-LX; 1000Base-SX; 1000Base-ZX (Continued)	STS-3c-3v or STS-1-9v	GFP-F per ITU-T G.7041/Y.1303		Alcatel-Lucent LambdaUnite MSS; Cisco ONS 15454; Fujitsu FLASHWAVE 4100, 4500; Tellabs 7100 OTS
	STS-3c-4v or STS-1-12v	GFP-F per ITU-T G.7041/Y.1303		Alcatel-Lucent LambdaUnite MSS; Cisco ONS 15454; Fujitsu FLASHWAVE 4100, 4500; Tellabs 7100 OTS
	STS-12c	GFP-F per ITU-T G.7041/Y.1303		Fujitsu FLASHWAVE 4100, 4500
		PPP/BCP per IETF RFC 1661, 2615 and RFC 3518	HDLC per IETF RFC 1662	Fujitsu FLASHWAVE 4500
		LEX per IETF RFC 1841 or Cisco HDLC or PPP/BCP per RFC 1661, 2615 and RFC 3518	HDLC per IETF RFC 1662	Cisco ONS 15454
	STS-3c-7v or STS-1-21v	GFP-F per ITU-T G.7041/Y.1303		Alcatel-Lucent LambdaUnite MSS; Cisco ONS 15454; Fujitsu FLASHWAVE 4100, 4500; Tellabs 7100 OTS
	'STS-24c'	LEX per IETF RFC 1841 or Cisco HDLC or PPP/BCP per RFC 1661, 2615 and RFC 3518	HDLC per IETF RFC 1662	Cisco ONS 15454
	STS-3c-8v	GFP-F per ITU-T G.7041/Y.1303		Fujitsu FLASHWAVE 4100, 4500
PPP/BCP per IETF RFC 1661, 2615 and RFC 3518		HDLC per IETF RFC 1662	Fujitsu FLASHWAVE 4500	

Locations and

Timing of Deployment:

These SONET, corresponding OS management, DCC tunnels and Ethernet over SONET interfaces are/will be available in Arizona, Colorado, Idaho, Iowa, Minnesota, Montana, Nebraska, New Mexico, North Dakota, Oregon, South Dakota, Utah, Washington and Wyoming. Determination is on an Individual Case Basis (ICB) for each customer request, dependent upon where equipment and facilities are available.

Pricing:

Qwest's SONET-based services are offered under interstate and intrastate Tariffs or Rates and Services Schedule (RSS) No. 1.

Interface Requirements:

1) The SONET standards designate some bits and bytes in the overhead as undefined or unused. Any interfaces offered as a part of Qwest's SONET-based services employing nonstandard usage of these bits and bytes must be disclosed. Vendor specific variations from the ANSI and Telcordia Technologies standards, if any for STS-1 electrical and SONET Optical Carrier Linear interfaces are as indicated below for Alcatel-Lucent, Cisco, Fujitsu, Nortel and Tellabs NEs.

- American National Standards Institute Documents

Available from ANSI at: <http://www.ansi.org/>

ANSI T1.105

Synchronous Optical Network (SONET) – Basic Description including Multiplex Structure, Rates, and Formats

ANSI T1.105.02

Synchronous Optical Network (SONET) – Payload Mappings

- Telcordia Publications

Available from Telcordia at: <http://www.telcordia.com/>

GR-253-CORE

Synchronous Optical Network (SONET) Transport Systems: Common Generic Criteria

GR-1377-CORE

SONET OC-192 Transport System Generic Criteria

The Alcatel-Lucent LambdaUnite MSS, Cisco ONS 15454, Fujitsu FLASH-192, FLASHWAVE 4100, FLASHWAVE 4500 and Tellabs Titan 5500 STS-1 electrical as well as **7100 OTS** SONET OC-N Linear (Line Terminating Equipment) interfaces comply with the above technical specifications. With the DCC tunneling application, the customer's Section DCC messages will be transparent to and not interpreted by the Qwest ONS 15454 network.

- Fujitsu Documents

Available from Fujitsu at: <http://www.fujitsu.com/>

Fujitsu FLM Series SONET Phase II Interface Disclosure

Technical Information Bulletin G-0264 applicable to FLASHWAVE 4500

- Nortel Documents

Available from Nortel at: <http://www.nortelnetworks.com/>

S/DMS Transport Node OC-3 and OC-12 Network Elements Interface Disclosure

S/DMS Transport Node OC-48 Network Elements Interface Disclosure

2) TL1 over 3-layer X.25 (DTE or DCE mode) at 9.6 Kbps (or greater) and TCP/IP 10/100Base-T Ethernet serial interfaces for SHNS ACCU-Ring and Software Reconfiguration Capability applications will comply with the following:

- Cisco Documents

Available from Cisco at: <http://www.cisco.com/>

Cisco ONS 15454 TL1 Command Guide

- Fujitsu Documents

Available from Fujitsu at: <http://www.fujitsu.com/>

FNC-660-0021-274

FLASHWAVE 4500 – TL1 Commands

- Telcordia Publications

Available from Telcordia at: <http://www.telcordia.com/>

GR-253-CORE

Synchronous Optical Network (SONET) Transport Systems: Common Generic Criteria

Note: GR-253-CORE requirements for TL1 over X.25 and TCP/IP supersede all other standards documents listed below.

GR-199-CORE

Operations Application Messages – Memory Administration Messages

GR-828-CORE

Generic Operations Interface – OSI Communications Architecture

GR-833-CORE

Network Maintenance: Network Element and Transport Surveillance Messages

GR-834-CORE

Network Maintenance: Access and Testing Messages

SR-NWT-002723

Applicable TL1 Messages for SONET Network Elements

TR-TSY-000827

Generic Operations Interfaces: Non-OSI Communications Architecture

- Institute of Electrical and Electronics Engineers Documents

Available from IEEE at: <http://www.ieee.org/portal/site>

IEEE 802.3-2005

Information technology – Telecommunications and information exchange between systems – Local and metropolitan area networks – Specific requirements – Part 3: Carrier sense multiple access with collision detection (CSMA/CD) access method and physical layer specifications

- International Organization for Standardization/International Electrotechnical Commission (ISO/IEC) Documents
Available from American National Standards Institute at: <http://www.ansi.org/>

ISO/IEC 8208

Information technology – Data communications – X.25 Packet Layer Protocol for Data Terminal Equipment

- ITU-T Recommendations
Available from the International Telecommunication Union at: <http://www.itu.int/home/>

Q.811

Lower Layer protocol profiles for the Q3 and X interfaces

- SIF/NSIF Documents
Available from the Alliance for Telecommunications Industry Solutions at:
<http://www.atis.org/>

NSIF-033

Requirements for the TCP/IP Protocol Suite on the SONET Access DCN

3) 10Base-T, 100Base-TX/LX10/FX and 1000Base-LX/SX/ZX Ethernet interfaces on SST and SHNS will conform to these physical layer specifications.

- Institute of Electrical and Electronics Engineers Documents
Available from IEEE at: <http://www.ieee.org/portal/site>

IEEE 802.3-2005

Information technology – Telecommunications and information exchange between systems – Local and metropolitan area networks – Specific requirements – Part 3: Carrier sense multiple access with collision detection (CSMA/CD) access method and physical layer specifications

4) SONET STS-1, OC-3, OC-12, OC-48 and OC-192 interfaces with embedded 10Base-T, 100Base-TX/LX10/FX and 1000Base-LX/SX/ZX Ethernet payloads will additionally comply with these documents.

- Internet Engineering Task Force Request For Comments (RFC)
Available from IETF at: <http://www.ietf.org/>

RFC 1661

The Point-to-Point Protocol (PPP)

RFC 1662

PPP in HDLC-like Framing

RFC 1841

PPP Network Control Protocol for LAN Extension

RFC 2615

PPP over SONET/SDH

RFC 3518

Point-to-Point Protocol (PPP) Bridging Control Protocol (BCP)

- ITU-T Recommendations
Available from the International Telecommunication Union at: <http://www.itu.int/home/>

G.7041/Y.1303
Generic Framing Procedure (GFP)
- Alcatel-Lucent Documents
Available from Alcatel-Lucent at: <http://www.alcatel-lucent.com>

365-374-177R8.0.2
LambdaUnite MultiService Switch (MSS) Release 8.0.2 User Operations Guide
- Cisco Documents
Available from Cisco at: <http://www.cisco.com/>

DOC-7815242
Cisco ONS 15454 Reference Manual
- Fujitsu Documents
Available from Fujitsu at: <http://www.fujitsu.com/>

FNC-4020-0012-120
FLASHWAVE 4020 SYSTEM DESCRIPTION AND ENGINEERING

FNC-4100-0053-120A
FLASHWAVE 4100 SYSTEM DESCRIPTION AND ENGINEERING LARGE AND SMALL SHELF

FNC-4100-0053-120B
FLASHWAVE 4100 SYSTEM DESCRIPTION AND ENGINEERING EXTENSION SHELF

FNC-660-0081-120
FLASHWAVE 4500 SYSTEM DESCRIPTION AND ENGINEERING
- Tellabs Documents
Available from Tellabs at: <http://www.tellabs.com/>

76.8271328x
Subrate Multiplexer Transponder Module (SMTM) Technical Manual

76.7144FP43/30
TL1 Command Reference Manual

Specifically, those sections related to deploying and provisioning the SMTM-U integrated SONET Add/Drop Multiplexer and Multi-Service Provisioning Platform “on a blade” features

Additional Information:

Any Customer Premises Equipment vendor/manufacturer or Enhanced Services Provider wanting to offer products or services in conjunction with these SONET and corresponding OS management interfaces offered by Qwest may request additional information by contacting:

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