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:
<table>
<thead>
<tr>
<th>Data Mapping</th>
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<th>Encapsulation and Framing Protocols</th>
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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/](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*

- **Telecordia Publications**
  
  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**
  
  Fujitsu FLM Series SONET Phase II Interface Disclosure
  *Technical Information Bulletin G-0264 applicable to FLASHWAVE 4500*

- **Nortel Documents**
  
  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**
  *Cisco ONS 15454 TL1 Command Guide*

- **Fujitsu Documents**
  *FNC-660-0021-274 FLASHWAVE 4500 – TL1 Commands*

- **Telcordia Publications**
  *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.

- **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**

  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/](http://www.itu.int/home/)

  Q.811
  *Lower Layer protocol profiles for the Q3 and X interfaces*

• **SIF/NSIF Documents**

  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](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)**

  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:

Jeff Falk
Engineer – SONET, DWDM & Ethernet Services
Phone: (320)-255-8338