2. FEATURES

Current Features

2.1 The main features for the 1603 SM product are listed in this section. To determine which features are new for R09.00, refer to section 3, Product Releases.

General

- SONET-compliant
- Comprehensive system hardware protection:
    - 1+1 protection for high speed interfaces, drop group mux units, and drop group interfaces (other than DS1 and Ethernet interfaces)
    - 1-for-7 protection for DS1 low speed interfaces
- In-shelf, in-service upgrade capability provides routing of ATM VP cells in addition to existing functionality (e.g., VT1.5, DS3, DS1)
- The push button automatic turn-up feature provides an easy way to perform the initial provisioning of a NE.
- The facility automatic turn-up feature provides a mechanism to automatically change the state of a facility from Memory Adminstration (MA) to In-Service (IS) after initial facility testing is complete.

Networking Options

- Asychronous Transfer Mode (ATM) linear and VP path switched ring configurations
- ATM routing function provides routing of 512 VPs
- STS3c, STS1, and DS3 ATM formatted add/drop interfaces. The ATM payload may be contained in a concatenated STS3c, STS1, or DS3 signal
- OC3, OC12, and OC48 high speed interfaces support carrying and routing ATM-based payloads STS1 or STS3c for OC12/OC48; STS1 only for OC3 high speed-interfaces, except for HIFB0x and HIFC0x, which support STS3c payloads
- STM-1 payload (cross-connected as STS3c) transported on the high speed side when using the HIF603/604/605, HIF704, HIF903/904/907, HIFA03/A04/A08, HIFB01/B02/B03, HIFC01/C02/C03, HIFG0x
- Single DS3 ATM drop interface that operates as a User-Network Interface or Network-Network Interface and accepts ATM cells from the external DS3 interface
- Ethernet to ATM cell translation
- Single common platform and a flexible architecture designed to support a variety of hardware and software options that provide extensive flexibility in network configurations, such as:
    - OC3 or OC12 terminal multiplexer
    - OC3 or OC12 add/drop multiplexer

    - OC3 or OC12 through-connection repeater function
    - Unidirectional Path Switched Ring (UPSR) software (VT/STS path switched capability with drop and continue; and VP ATM path switched capability)
- 1310-nm Very Long Reach (VLR), Long Reach (LR), and Intermediate Reach (IR) fiber-optic interfaces, as well as OC12 short reach multimode fiber-optic interfaces; OC12 1550-nm interfaces also available for LR and VLR optics
- Four types of cross-connects:
    - Fixed-path Synchronous Transmission Signal level 1 (STS1) cross-connect capability (OC3 high speed interfaces only)
    - Variable (software-provisionable) Virtual Tributary (VT1.5) and STS1 cross-connect capability (OC3 only)
    - Variable VT1.5, STS1, and STS3c cross-connect capability (OC12)
    - Variable VT1.5, STS1, STS3c, and ATM cross-connect capability
- ATM function associated with high speed interfaces is software provisionable to support 1 x STS3c or 1 x STS1 rate for high speed interfaces (STS1 only with HIF10x/HIF50x OC3 interfaces)
- ATM routing function associated with low speed interfaces is software provisionable to support 1 x STS3c (OC3 drop or Ethernet LAN) or 3 x STS1 (combination of OC3 drop, EC1, ATM mapped DS3, or Ethernet LAN) rate for all drop groups combined
- Asynchronous (floating) mappings of DS1 into VT1.5
- Up to 84 low speed asynchronous Digital Signal level 1 (DS1) interfaces (up to 28 per drop group)
- Choice of either sequential or VT1.5 grouped numbering schemes for DS1 and VT1.5 signals
- Up to 12 EC1 (STS1) low speed interfaces
- Up to 12 DS3 low speed interfaces
- Up to three DS3 Transmultiplexer low speed interfaces supporting DS3-to-VT mapping
- Up to three ATM mapped DS3 low speed interfaces
- Up to 12 10BaseT Ethernet LAN interfaces or up to three 100BaseT Ethernet LAN interfaces
- Nested switching of LDRs
- Provisioning of specific LIF and LDR units as either DS3 or EC1 facility
- Both optical and electrical line and drop interfaces support Loss-of-Frame (LOF) integration timer (as described in Telcordia's GR-253)
- Enhanced DS1 Path performance monitoring (requires the DMI301 and the VTG301 plug-in units). This adds Extended Superframe (ESF) and Superframe (SF) modes of operation
- VTG102 and VTG301 provide a Protection Switch Activated (PSA) visual indicator (active when traffic is switched to protection unit)
- Up to three drop groups equipped with OC3 low speed interfaces

NOTE: *The SP101 shelf can support a maximum of four OC3 interfaces: three OC3 low speed interfaces (one per drop group) plus a fourth OC3 interface (one line group). This is a terminal application configuration that uses all of the OC12 bandwidth.*

Software

- The FTP download feature provides a mechanism to transfer system software from a remote file server to the program backup in a NE, using the standard FTP application.

- System software download capability through local Personal Computer (PC) link
- Software-controlled operation with user-programmed system provisioning
- Remote NE-to-NE download of system software
- Automatic software loading from like unit (HIF, DMI, LIF and VSCC programmable units)
- Optional automatic software loading to any supported card type in the shelf
- Software distribution on CD-ROM, as well as diskettes

Communications

- 1301 NMX *Windows* ® based, PC-resident user system interface support
- Direct X.25 Operations System (OS) gateway interface with concentration capabilities using Permanent Virtual Circuit (PVC) or Switched Virtual Circuit (SVC)
- TCP/IP to DCC gateway interface with concentration capabilities using Permanent Virtual Circuit (PVC) or Switched Virtual Circuit (SVC)
- Supported by Telcordia Operations Systems: OPS/INE 1.9, 2.0, 2.2, and 2.4 and NMA 4.2, 5.0, 5.1, 6.0, and 6.1
- TL1, seven-layer Open Systems Interconnection (OSI) interface (i.e., communication and control by way of SONET Data Communications Channel) and Local Area Network
- ES-IS/IS-IS Protocol
- TID Address Resolution Protocol (TARP)
- IEEE 802.3 10BaseT and 10Base2 OSI Local Area Network (LAN) Interface options
- Edge Management Gateway
- DS1-based Synchronous Maintenance Link (SML) Local Communication Network (LCN) for intraoffice connectivity of two 1603 SM systems or DCC backhaul interoffice
- Local or remote ASCII terminal user system interfaces
- Local and express orderwire (requires external orderwire panel)

Synchronization

- Versatile system synchronization capabilities using a variety of external sources, as well as an internal Stratum 3 clock
- Two DS1 outputs (primary and secondary) to BITS derived from line rate
- Two composite clock outputs (primary and secondary)

Alarms and Controls

- TBOS (Serial E2A) alarms and controls
- Parallel (E2A) office alarms
- Power source failure alarms: A-side and B-side feeds
- Far-end alarm reporting
- Customer-Defined Alarms and Controls (CDAC)
- Synchronization messages on SONET S1 byte and ESF BITS interfaces
- Autonomous reporting of database changes

Diagnostics

- PC Domain function support through 1301 NM
- SONET section tracer read/write capability; unique ID in each STS path tracer; each STS

path tracer is individually traceable
- Test access functions for DS1 testing
- Ring switching at VT level for SFBER, DGBER unequipped, Signal Mismatch
- EC1 Line FEBE Performance Monitoring
- DS3 path Performance Monitoring of P-bits and CP-bits
- DS3 AIS and out-of-frame detection
- DS1 loopback codes and test capabilities
- DS1 path monitoring of Performance Report Messages (PRM) on Extended SuperFrame (ESF) datalink in both transmit and receive signals (requires DMI301 and VTG301 combination)
- DS1 path monitoring for SuperFrame (SF) and ESF framing, path yellow, and ESF Cyclic Redundancy Check errors in both transmit and receive signals
- Detection and generation of Idle mode and Quasi Random Signal Source (QRSS) data patterns on DS1 facility
- ESF datalink line loopback request support
- Test access functionally expanded to include (CONN-TACC-T1) for VT1.5 within a selected VT-mapped STS1 low speed I/O port, in addition to existing DS1s
- Path Defect Indicator (PDI) when using the VSCC501 with HIF603/604/605, HIF903/904/907, HIFA03/A04/A08, HIFB0x, HIFC0x, HIFG0x, and LIF30x/40x/50x/70x units
- Three-bit RDI supported on HIF603/604/605, HIF903/904/907, HIFA03/A04/A08, HIFB0x, HIFC0x, and HIFG0x interfaces for STS1 and STS3c paths

Mechanical

- Extended temperature operation
- Front fiber optic cable access (fiber access from the rear of the frame is possible if the BFL301 heat baffle is used)
- U.L. Approved/Listed
- FCC/EMI compliant