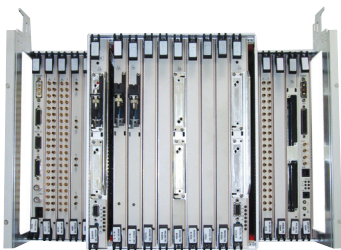


Alcatel-Lucent 1662 Synchronous Multiplexer Compact

RELEASE 2.7

The Alcatel-Lucent 1662 Synchronous Multiplexer Compact (SMC) is a compact, Synchronous Transport Mode 16 (STM-16) multiservice provisioning platform (MSPP). It serves as a building block for metropolitan networks, providing unmatched performance for its size and service-mix capabilities. Addressing metro-edge and metro-access applications, the Alcatel-Lucent 1662 SMC offers a transport platform with integrated packet functions, supporting revenues from multiple broadband services such as private-line and Ethernet business services, triple play and mobile aggregation.



The Alcatel-Lucent 1662 SMC is a metro-edge component of the Alcatel-Lucent Optical Multi-Service Node (OMSN) product family, a family that also includes the Alcatel-Lucent 1660 SM, an STM-64 MSPP, and the Alcatel-Lucent 1650 SMC, an STM-4 MSPP. For offering capital and operational efficiencies, the Alcatel-Lucent OMSN products share many common features and modules.

Features

- Fully non-blocking redundant Synchronous Digital Hierarchy (SDH) matrix with 96 x 96 or 64 x 64 high-order/low-order (HO/LO) STM-1 equivalent switching
- Up to six STM-16 interfaces for double 2.5 Gb/s ring interconnection
- Richly featured 10/100 Ethernet and Gigabit Ethernet (GE)
- E1, E3/DS3
- Multi-Protocol Label Switching (MPLS)-enabled Ethernet, packet ring and ATM switching
- Digital video switching
- Transport for IBM® Enterprise Systems Connection (ESCON®), IBM Fibre Connection (FICON®), fiber distributed data interface (FDDI) and Fibre Channel (FC)
- CWDM multiplexer/demultiplexer (MUX/DEMUX)
- Colored STM-16 for direct interworking with Dense WDM (DWDM) systems
- Service extension over symmetric high-speed DSL (SHDSL) for E1 and 10/100 Ethernet
- ITU-T G.8032 v2 Ethernet Ring Protection (ERP)
- Synchronous Ethernet (SyncE) for Alcatel-Lucent Integrated Service Adapter Ethernet Switch (ISA-ES) blades linked to SDH Synchronization Status Message (SSM)

Benefits

- Supports high-capacity Plesiochronous Digital Hierarchy (PDH)/SDH metro-edge service support
- Aggregates broadband services:
 - Triple play
 - Business Ethernet: MEF (former Metro Ethernet Forum)-compliant virtual LAN (VLAN) and Virtual Private LAN Service (VPLS)
 - Extending service reach over copper loops
- Provides Third Generation (3G) mobile backhaul
- Functions as a terminal multiplexer, add-drop multiplexer (ADM) or mini cross-connect in spur, multiple-ring or mesh topologies
- Offers highly reliable and manageable TDM and data services
- Delivers feature transparency and operational savings with Alcatel-Lucent OMSN common components
- Supports ITU-T G.8032 v2 ERP for 100 percent increase in Ethernet over SDH (EoS) bandwidth for protected services
- Supports SyncE derived from SDH synchronization supply unit (SSU) quality

Technical specifications

Interfaces

- Network interfaces, compact ADM function with one of:
 - 2 x STM-1
 - 2 x STM-4
 - 1 x STM-16Each supports EPS 1+1
- Customer interfaces: up to eight slots available
 - 63 x 2 Mb/s: ISDN-PRA and retiming function
 - 3 x 34/45 Mb/s switchable
 - 4 x 140 Mb/s/STM-1 switchable
 - 4 x STM-1: electrical, S-1.1, L-1.1, L-1.2
 - 8 x STM-1 optical SFP: S-1.1, L-1.1, L-1.2, CWDM
 - 4 x OC-3 with administrative unit (AU) 3/tributary unit (TU) 3 conversion
 - 1 x STM-4: S-4.1, L-4.1, L-4.2
 - 2 x STM-4 optical SFP: S-4.1, L-4.1, L-4.2, CWDM
 - 1 x STM-16: L-16.1, S-16.1, L-16.1, L-16.2
 - 1 x STM-16 optical SFP: L-16.1, S-16.1, L-16.1, L-16.2, CWDM, DWDM
 - Integrated booster +10 dB/+15 dB/+17 dB
 - 4 x any sub-lambda multiplexing function: four channels in 2.5G lambda: transparent Ethernet/FE, GE, STM-4, FC, ESCON, FICON, FDDI, digital video
 - Digital Video Broadcasting (DVB) ASI blade

- Maximum 14 x Ethernet 10/100Base-T per ISA blade
- Maximum 8 x Ethernet 100Base-FX per ISA blade
- Maximum 4 x GE Base-SX/LX/ZX per ISA blade

Connectivity

- 32 x 32 (HO/LO) or 96 x 96 (HO)/64 x 64 (LO) STM-1 equivalent full non-blocking SDH fabric in all configurations
- Unidirectional, bidirectional, drop-and-continue multicast, broadcast SDH connections
- Line and virtual container (VC) loopbacks
- Virtual concatenation (VCAT) and contiguous concatenation
- 1- or 2-channel CWDM optical add-drop multiplexer (OADM) function
- 8-channel CWDM MUX/DEMUX function
- Embedded ATM star, ring and mesh topologies
- Embedded Ethernet/MPLS star, ring and mesh topologies
- Embedded Ethernet multiple-ring topologies

Equipment protection

- Matrix, control and synchronization EPS 1+1
- ISA-ATM switch EPS 1+1
- ISA-ES16 EPS 1+1
- 63 x 2 Mb/s EPS $n+1$, 2 x maximum $n = 3$
- 3 x 34/45 Mb/s EPS $n+1$, maximum $n = 7$
- 4 x STM-1e EPS $n+1$, maximum $n = 7$

Network protection

Transport

- Linear single-/dual-ended 1+1 APS at STM-1/4/16
- Linear dual-ended $n+1$ APS at STM-1
- SNCP/I, SNCP/N
- SNCP drop-and-continue
- 2 x 2 fiber Multiplex Section – Shared Protection Ring (MS-SPRING) at STM-16
- Collapsed single-node ring interconnection
- Collapsed dual-node ring interconnection

Packet

- Dual attach: packet-ring interconnection
- ITU-T G.8032 v2 ERP

Monitoring

- Performance monitoring according to ITU-T G.784, G.826, G.821
- Path overhead monitoring (POM) on all VCs
- Supervisory unequipped trail (SUT)
- Tandem connection monitoring (TCM)
- Ethernet performance monitoring counters
 - Port/aggregate/flow
 - Incoming/outgoing

Synchronization

- Internal oscillator ± 4.6 ppm
- Holdover drift ± 0.37 ppm per day
- External sources: STM- $n/2$ Mb/s ports, one external 2 MHz/2 Mb/s output
- Priority and quality SSM synchronization algorithms

- SyncE for Alcatel-Lucent ISA-ES blades linked to SDH SSM

Data blades: ISA

ISA-ATM

- 600 Mb/s and 1.2 Gb/s cell switch with optional STM-1 access on board
- Equipment protection 1+1
- VPC/VCC switch/cross-connect
- Hard/soft PVC connections for PNNI
- Point-to-point/multipoint from E1 up to VC4-4c payloads
- Up to 252 ATM logical ports
- IMA support: maximum 126 groups/32 links
- Policing, shaping and congestion management
- CBR, UBR, UBR+, rt-VBR/nrt-VBR, GFR ATM traffic contracts
- ATM operations, administration, and maintenance (OA&M)

ISA-ES1

- 1 Gb/s throughput
- 155 Mb/s back-panel capacity
- 8 x Ethernet 10/100Base-T
- 8 x Ethernet 100Base-FX
- GFP-F/LAPS, VCAT, LCAS
- LACP
- VC-12/VC-3/VC-4 terminations
- VC groups: maximum 8 at 50/2/1
- Classification/forwarding
 - Per port
 - MAC DA IEEE 802.3
 - C-VLAN/S-VLAN
 - IEEE 802.1p
 - DSCP/ToS
 - Ethertype

- Ethernet multicast: IGMP
- Ethernet OA&M CFM
- Q-in-Q: IEEE 802.1Q/ad
- QoS: IEEE 802.1p
- CoS
 - Guaranteed
 - Regulated
 - Best effort
- Congestion avoidance
- STP/RSTP/MSTP/PVSTP: IEEE 802.1d/w/s
- ERP standard G.8032 v2
- Ethernet performance counters
 - Per port/aggregate/flow
 - Incoming/outgoing
 - Unicast
 - Multicast
 - Broadcast
- E-Line, E-LAN, Ethernet aggregation services in accordance with MEF

ISA-ES4

- 2.5 Gb/s throughput
- 622 Mb/s back-panel capacity
- 1 x GE SFPs, 8 x Ethernet 10/100Base-T
- GFP-F/LAPS, VCAT, LCAS
- LACP
- VC-12/VC-3/VC-4 terminations
- VC groups: maximum 16 at 63/12/4
- Classification/forwarding
 - Per port
 - MAC DA: IEEE 802.3
 - C-VLAN/S-VLAN
 - IEEE 802.1p
 - DSCP/ToS
 - Ethertype
- Ethernet multicast: IGMP
- Ethernet OA&M CFM
- Q-in-Q: IEEE 802.1Q/ad
- QoS: IEEE 802.1p
- CoS
 - Guaranteed
 - Regulated
 - Best-effort
- STP/RSTP/MSTP/PVSTP: IEEE 802.1d/w/s

- Congestion avoidance
- ITU-T G.8032 v2
- Ethernet performance counters
 - Per port/aggregate/flow
 - Incoming/outgoing
 - Unicast
 - Multicast
 - Broadcast
- E-Line, E-LAN, Ethernet aggregation services in accordance with MEF

ISA-ES16

- 4.5 Gb/s throughput
- 2.5 Gb/s back-panel capacity
- 4 x GE SFPs, 14 x Ethernet 10/100Base-T, 7 x 100Base-FX
- GFP-F/LAPS, VCAT, LCAS
- LACP
- VC-12/VC-3/VC-4 terminations
- VC groups: maximum 64 at 63/12/16
- Classification/forwarding
 - Per port
 - MAC DA: IEEE 802.3
 - C-VLAN/S-VLAN
 - IEEE 802.1p
 - DSCP/ToS
 - Ethertype
 - MPLS label switching (pseudowire/tunnel)
 - MPLS EXP bits
- Ethernet and MPLS multicast, IGMP
- Martini encapsulation
- Q-in-Q: IEEE 802.1Q/ad
- QoS: IEEE 802.1p, MPLS
- CoS
 - Guaranteed
 - Regulated
 - Best-effort up to eight CoS
- Policing dual-rate token bucket, metering, marking, CIR/CBS, EIR/EBS, dropping (OOP)
- Scheduling HOL, weighted-deficit round robin
- Congestion-avoidance WRED per queue
- STP/RSTP/MSTP/PVSTP: IEEE 802.1d/w/s

- ITU-T G.8032 v2
- Ethernet and MPLS performance counters
 - Per port/aggregate/flow
 - Incoming/outgoing
 - Unicast
 - Multicast
 - Broadcast
- Ethernet OA&M CFM
- E-Line/VLL, E-LAN/VPLS, Ethernet aggregation services in accordance with MEF

DVB-ASI

Unidirectional transparent transport

- CBR MPEG-*n* transport stream (TS)
 - Single program TS (SPTS)
 - Multiple program TS (MPTS)
- TS rate: 1.5 Mb/s to maximum 100 Mb/s: with C-12 or C-3 granularity

ISA Broadband Copper Extender (BCE)-E1/ISA BCE-Ethernet

- Eight interfaces: up to eight remote NT devices can be connected
- Full NT management
- PM on VC-12 and SHDSL line
- Maintenance operation on NT: loopback and restart

Physical specifications

Power

- Station battery: -48-V DC to -60-V DC
- Power consumption: 200 W, typical

Dimensions

Subrack

- Height: 390 mm (15.4 in.)
- Width: 470 mm (18.5 in.)
- Depth: 250 mm (9.8 in.)

Rack

- Height: 2.2 m (7.22 ft)
- Width: 600 mm (23.6 in.)
- Depth: 300 mm (11.8 in.)

Regulatory compliance

Environmental

- Operating conditions: ETS 300 019, Class 3.2
- Storage conditions: ETS 300 019, Class 1.2
- Transportation conditions: ETS 300 019, Class 2.2
- ESD/EMC: ETS 300 386 "Telecommunications Center"

Operational

- Alcatel-Lucent 1350 Optical Management System (OMS)
- CMISE craft terminal through TIA/EIA-232 at 38.4 kb/s
- Network management access through QB3 interface or Qecc G.784
- Local and remote software download
- Remote inventory
- Housekeeping: 12 inputs plus 2 outputs
- Auxiliary channels
 - EOW
 - 2 x 64 kb/s G.703
 - 2 x TIA/EIA-232
 - 2 x V.11
 - 1 x 2 Mb/s G.703

Standards

- In compliance with all the latest relevant ITU-T standards
 - ITU G.7041
 - ITU G.7042
 - ITU G.707
 - ITU-T G.8032 v2
- ATM Forum
- IETF
- IEEE
- MEF 9, MEF 14, MEF 21 certified for Ethernet application

