Alcatel-Lucent 1830 PSS-8 and PSS-16
Photonic Service Switch
Release 8

The Alcatel-Lucent 1830 Photonic Service Switch (PSS-8 and PSS-16) provides a high-capacity aggregation and transport solution for optical transport, packet and photonic networks. This solution delivers a versatile, scalable, metro-optimized form factor with distributed switching. The packet-optical transport (P-OT) platforms offer metro networks the scalability, agility and efficiency to maximize revenue generation and ROI by accelerating services availability and improving network operational efficiency.

Features
- Scalable architecture supports up to 1.6 Tb of capacity per shelf to aggregate and transport sub-10G, 10G, 40G and 100G-plus services
- Agile and intelligent no-compromise distributed switching to dynamically reconfigure network resources and deploy services
- Efficient metro-optimized design featuring a flexible backplane, high 10G port density and low power consumption in a compact footprint
- Integrated IP and optical technologies across the data, management and control planes to maximize the design and efficiency of multilayer IP and optical networks

Benefits
- Maximize revenue generation and ROI by accelerating services availability
- Improve network efficiency with increased performance and reduced space and power
- Minimize initial first cost with pay-as-you-grow scaling
- Enable rapid instantiation of on-demand, application-driven network services

Overview
The 1830 PSS-8 and 1830 PSS-16 enhance the widely deployed 1830 PSS portfolio by adding advanced metro-specific features and capabilities. The multifunction platforms are optimized for multiservice metro transport network applications by leveraging Alcatel-Lucent Photonic Service Engine (PSE)-based 100G technology, scalable distributed switching, and a highly-integrated, efficient architecture.

The platforms provide the scalability to support a variety of sub-10G, 10G, 40G or 100G services over 10G/100/200G xWDM channels; the switching agility and intelligence to dynamically reconfigure network resources and deploy services on demand; and a compact and low-power architecture for maximum network operational efficiency.

Like all products in the 1830 PSS portfolio, the PSS-8 and PSS-16 transform a traditional wavelength division multiplexing (WDM) solution into a platform that offers a versatile transport layer with managed agile photonics, multi-layer switched services and network intelligence.

The PSS-8 and PSS-16 extend an already comprehensive range of applications and services supported by the 1830 PSS portfolio, including:
- Business services
- Mobile and broadband backhaul
- Multicast video
- Data Center Interconnect (DCI)
- Cloud services
With 1830 PSS platforms ranging from access through converged Optical Transport Network/wavelength division multiplexing (OTN/WDM) core to long-haul transport, network operators can seamlessly grow and optimize multiservice networks to meet unpredictable traffic demands in the cloud services era.

The Alcatel-Lucent 5620 Service Aware Manager (SAM) provides management for the 1830 PSS portfolio.

Detailed features

**Scalability**
The PSS-8 and PSS-16 aggregate and transport sub-10G, 10G, 40G and 100G services within and beyond the metro with multidimensional packet, OTN and photonic scalability in a single, compact platform.

- Platform scalability
  - PSS-8 aggregation shelf up to 800-Gb capacity in 3RU
  - PSS-16 small CO shelf up to 1.6-Tb capacity in 8RU
  - High-capacity, slot-to-slot interconnectivity
  - Multi-shelf node scaling
  - 100G-and-beyond support
  - In-house PSE innovation
  - Rate-adaptive 100G/200G module
- Integrated OTN/Packet Transport
  - Sub-10G and 10G switching/grooming onto 100G/200G wavelengths
  - High-density n x 10G transport
  - Family of scalable MEF CE 2.0, SR OS-based modules and network interface devices
  - Carrier grade packet transport solution with SROS-based services model, Ethernet OAM, ERP, LAG, MPLS-TP and PTP
  - Integrated Wavelength Tracker™ (WT) encoding

**Agility**
Graceful, pay-as-you-grow, scaling with no-compromise distributed switching enables cost-effective and rapid instantiation of high-performance, on-demand, application-driven network services.

- Multiservice transport
  - 10G/100G/200G xWDM lines
  - xWDM lines
  - Client-line connectivity
  - Photonic, packet and OTN switching
  - High-capacity 100G coherent muxponder
- Dynamic photonic layer: Integrated flexible photonic switching with integrated ROADM
- Flexible, open architecture: Four-slot-group interconnectivity for high-capacity, versatile configurations
- On-demand features
  - Rate adaptive 100G/200G
  - Configurable FEC, modulation, power, SE, latency measurement
  - SDN-WAN controller/APIs

**Efficiency**
The PSS-8 and PSS-16 deliver high performance in a compact, modular and low-power architecture for maximum network operational efficiency.

- Converge multiple metro networks
- Class-leading switching density and power consumption
- SDN toolset to more efficiently visualize and manage network resources
- Metro-optimized architecture
  - Open, flexible backplane
  - High-density, low-power, small-footprint platform
  - Common modules and software stream
  - Backwards compatibility
  - Integrated ROADM
- Optimized 10G transport: High port density and WT encoding
- Network intelligence
  - Distributed control plane/Multiregion Networking (MRN)
  - Common management and operations across the portfolio
  - Network Planning Tool (NPT) for optimized multilayer network planning/deployment
  - SDN-WAN Controller
  - Integrated Wavelength Tracker 2.0

**Integrated IP and optical technologies**
The PSS-8 and PSS-16 integrate class-leading IP and optical technologies to maximize the design and efficiency of multilayer IP and optical networks.

- Data plane: The Alcatel-Lucent Integrated Packet Transport family of SR OS-based Carrier Ethernet modules enables a fully managed, end-to-end packet solution with a common service, operations and management model across the optical and Ethernet/IP/MPLS portfolio.
- Management plane: The 5620 SAM provides cross-layer visibility and common management tools to simplify operations of a converged IP and optical network.
- Control plane: SDN-enabled control interfaces, multi-layer topology, resource management and path compute capabilities provide optimal IP and optical convergence.

**Technical specifications**

**Applications**

- Scalable photonic applications for metro aggregation and core networks
  - ROADM/FOADM with optical transponders
  - ROADM/FOADM with ODUk/packet switching cards
- Metro aggregation nodes offer:
  - Small footprint/power
  - ROADM and ODUk/packet switching capability
  - Pay-as-you-grow expansion
- Backwards compatible with existing products, enabling smooth introduction of new configurations in a variety of deployed networks
- High-capacity multiservice packet/OTN aggregation of sub-10G and 10G services onto a 100G+ carrier
- Data Center Interconnection
- Footprint-optimized Optical Extension Shelf (OES) configuration for high degree nodes
- Small-footprint, start-up ROADM (up to 4D ROADM) or OES configurations
- Extended temperature range (hardened) support for 10G applications

**Interfaces**

- SDH: STM-1/-4/-16/-64
- SONET: OC-3/-12/-48/-192
- OTN: OTU1/2/2e/4
- Ethernet
  - Fast Ethernet
  - Gigabit Ethernet (GE)
  - 10 GE LAN and WAN
  - 40 GE
  - 100 GE
- Video: SD-SDI/HD-SDI/3D-SDI
- SAN
  - FC-100 (1G FC)
  - FC-200 (2G FC)
  - FC-400 (4G FC)
  - FICON
  - FICON Express
  - ISC-3
  - FC-800 (8G FC)
  - FC-1200 (10G FC)
  - FC-1600 (16G FC)
  - IB SDR (2.5G)
  - IB DDR (5G)
• Pluggable interfaces
  - SFP
  - XFP
  - SFP+
  - QSFP+
  - CFP
  - CFP2

Capacity and performance
• PSS-8: 800G capacity
• PSS-16: 1.6T capacity
• High-capacity slot-to-slot interconnectivity

System configuration
• PSS-8 and PSS-16 support redundant control, power and timing
• Multi-shelf support with redundant control chain
• Extension to existing 1830 PSS platform with full service card compatibility
• Integration with 1830 Versatile WDM Module (VWM) and Alcatel-Lucent 44-channel Mux/Demux SFD44 for more flexibility and scalability

1UD200
Full-slot uplink card with one line port
• Configurable line rate
  - 100G mode: PDM-16QAM modulation; SD-FEC or HD-FEC supported
  - 200G mode: PDM-QPSK modulation
• Provides an uplink card to 2OP200 or 12P120 through backplane data plane bus

2OP200
Full-slot client card with 20x10G client ports
• Client port: SFP+ pluggable modules (B&W, CWDM, DWDM)
  - 10 SFP+ enables integrated WTE support
  - Remote node interconnect using GCC0/1/2
• Client types: 10GE, OTU2/2e, OC-192/STM64
• Application
  - High-capacity 200G Muxponder: 1UD200+2OP200
  - ODUk switched Add/Drop Multiplexer (10G/sub-10G to 100G/200G lines): 1UD200+2OP200
  - 40x10G ODUk switched card pair (utilizing mate interconnection)
  - ODU2/1/0/flex grooming and switching

12P120
Full-slot 6x10G transponder or 12x10G as client ports
• Pluggable interfaces
  - 6x SFP+ at client side
  - 6x XFP at line side or client side
  - 6x VOA (optionally for Wavelength Tracker or power management)
• Wave key encoding by Wavelength Tracker Encoder (WTE)-XFPs or VOA
• Client types
  - 10G, OC-192/STM64 or OTU2/2e on SFP+ ports
  - OTU2/2e on XFP ports
• LO-ODUk grooming and switching
• Remote node interconnect using GCC0/1/2
• Service protection
  - ODUk SNCP
  - Y-cable

IROADM
Single-slot, full-height module supporting 1D to 4D ROADM configurations
• In-service ROADM degree growth
• Card type
  - Short-span (up to 50 km) IROADMF
  - Long-span (up to 100 km) IROADMV
• Support for 10G, 100G and 200G transport
• Integrates:
  - Ingress/egress amplifiers
  - Wavelength Selective Switching (WSS)
  - Optical Supervisory Channel (OSC)
  - Wavelength Tracker channel monitoring
• Compatible with existing ROADM architecture

Physical dimensions (PSS-8)
• Height: 133 mm (5.2 in.)
• Width: 438.9 mm (17.2 in.)
• Depth: 325 mm (12.7 in.)

Physical dimensions (PSS-16)
• Height: 354.8 mm (13.9 in.)
• Width: 440 mm (17.3 in.)
• Depth: 325 mm (12.7 in.)

Power
• PSS-8
  - Max. 1200 W (up to 240 W/slot)
  - Typical: 520 W
• PSS-16
  - Max. 2400 W (up to 240 W/slot)
  - Typical: 1350 W
• Power supply
  - 48 V DC or 110 /220 V AC
  - External AC converter (110/220V->48V)

Operating temperature
• PSS-8
  - -5°C to +55°C (23°F to 131°F)
  - -40°C to +65°C (-40°F to +149°F) for Outside Plant (OSP) deployments
• PSS-16
  - -5°C to +55°C (23°F to 131°F)

Humidity
• 5% to 95% non-condensing

Regulatory and standards compliance
• PSS-8
  - EMC level: Class A
• PSS-16
  - EMC Level: Class A
• Details in following table
Table 1. Regulatory and standards compliance

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<td>• EN 300 386 v1.6.1 (2012-4) (CE)</td>
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<tr>
<td>• Telcordia Special Report SR 3880, Issue 3, January 2007</td>
<td>• CISPR 24 – First edition (1997-09) and Amendment 1 (2001-07) and Amendment 2 (2002-10)</td>
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<td>• IEC 60950-1:2005 (2nd Edition); Am 1:2009</td>
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<td>• Telcordia GR-63-CORE (NEBS Requirements: Physical Protection)</td>
<td>• EN 60825-1, Edition 2.0, 2007-03</td>
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<td>• Telcordia GR-63-CORE (78dB at 27C ambient temperature)</td>
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