

Nokia 1830 PSS-8x, PSS-12x and PSS-24x OTN switching and transport platforms

The Nokia 1830 Photonic Service Switch (PSS) portfolio consists of platforms optimized for varying optical network deployment environments ranging from data center interconnect (DCI) to efficiently scaling large metro, regional and long-haul multi-layer, multiservice optical networks. Each platform leverages common software, hardware, management and control to offer seamless operations across the portfolio.

Overview

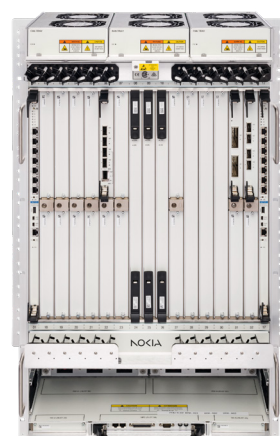
The 1830 PSS-x family consists of platforms optimized for optical transport network (OTN) switching applications. It includes the 1830 PSS-8x, PSS-12x and PSS-24x multiservice platforms designed for versatility and scalability, with guaranteed performance and efficient operation.

The 1830 PSS-x platforms deliver multi-terabit switching scale along with integrated high-capacity wavelength division multiplexing (WDM) transport optics, and expanded range of service options using high-density, multi-rate client interfaces. The 1830 PSS-8x and 1830 PSS-12x are optimized for both metro aggregation and metro core applications. The 1830 PSS-24x offers even more capacity for core and large metro applications.

The platforms are enabled by centralized switching fabrics that scale from 1.6 Tb/s to 48 Tb/s non-blocking OTN switching capacity. The multiservice platforms support Layer 1 and Layer 2 services using client interface types from sub-10G to 400G. On the line side they support up to 1 Tb/s coherent uplinks powered by the Nokia Photonic Service Engine (PSE). The platforms facilitate a smooth transition from legacy networks to a modern service delivery platform, including capability to deliver beyond 100G (B100G) services.



Nokia 1830 PSS-8x



Nokia 1830 PSS-12x



Nokia 1830 PSS-24x

The Nokia 1830 PSS-x platforms offer industry-leading switching scale, port densities, and wavelength distances, while also reducing power consumption per bit. From metro aggregation to metro core to large metro core and backbone networks, these high-performance platforms provide the flexibility, scalability and efficiency operators need to deliver today's optimized, high-capacity services.

Benefits

- Significantly and simultaneously scales network capacity, distance and density, making feasible the mass delivery of sub-10G, 10G, 100G and 400G services
- Isolates line cards from client cards for investment and operational decoupling
- Better fiber utilization through optimized WDM capacity-reach performance
- Offers improved service separation, network efficiency and utilization, including transport network slicing using hard and soft isolation
- Delivers guaranteed service level performance for speed, latency, availability, and security to ensure the ability to meet strict SLAs demanded by end users
- Provides a smooth evolutionary path for the Nokia 1830 PSS product portfolio, allowing network operators to leverage their existing investment and migrate to higher service rates

Features and technologies

Nokia PSE coherent DSP and optics

- Latest generation of Nokia Photonic Service Engine (PSE) coherent digital signal processing (DSP) and optics
- Integrated dense wavelength division multiplexing (DWDM) coherent line interfaces enabling direct connection to WDM line systems
- Flexible, rate-adaptive up to 1 Tb/s coherent DWDM line interfaces

- Support for client services from sub-10G to 400G
- Single or multi carrier operation
- Integrated Probabilistic Constellation Shaping (PCS) ensures optimized capacity at reach for any optical path
- Next-generation soft decision forward error correction (SD-FEC)
- Pay-as-you-grow DWDM pluggable line options

OTN switching and scalability

- Efficient, reliable, high-density OTN switching and transport applications
- Scalable centralized OTN fabric from 1.6 Tb to 48 Tb switching capacity
- ODUk switching and protection from ODU0 to ODU4, including ODUFlex
- The ability to scale to 4 Tb per shelf and 16 Tb per rack for 1830 PSS-8x
- The ability to scale to 12 Tb per shelf and 24 Tb per rack for 1830 PSS-12x
- The ability to scale to 24 Tb per single shelf, 48 Tb per dual-shelf, and 48 Tb per rack for 1830 PSS-24x

Next-generation OTN

- Beyond 100G (B100G) applications with N x OTU4 and OTUCn line structure
- High-speed, programmable cards for high-capacity applications
- WDM uplinks based on Nokia's latest fifth- and sixth-generation Photonic Service Engines (PSE-V and PSE-6), including 1 Tb/s per wavelength super coherent optics (PSE-6s) and 400G pluggable digital coherent optics (PSE-Vc)
- Client interfaces supporting 400GE services
- 1 Tb/s transmission capacity per slot uplink and client cards for 1830 PSS-24x
- 500 Gb/s transmission capacity per slot uplink and client cards for 1830 PSS-8x/12x

Reliability and efficiency

- Redundant control, power and timing to support high-availability network
- Efficient 2+1 electrical fabric protection reducing start-up costs and power
- Ultra-fast wavelength multi-layer protection and restoration
- Power consumption of less than 0.4 W/Gb (including optics)
- Large-scale transport of sub-10G to 400G services with traffic segregation, bandwidth, loss, latency, and availability guarantees
- Direct multiplexing of low-speed clients to coherent line interfaces
- Simplified protection and spares inventory
- Trail (DMt) and Path (DMp) latency measurements

Integrated packet transport (IPT)

- MEF-certified Carrier Ethernet switch cards for 1830 PSS-24x
- State-of-the-art carrier-grade Layer 2 switches
- Nokia Service Router – Operating System (SR OS)
- Enables a fully managed, end-to-end packet solution with a common service, operations and management model across the optical and Ethernet/IP/MPLS portfolios
- Carrier Ethernet and Multiprotocol Label Switching – Transport Profile (MPLS-TP) services and networking

Network slicing and hard/soft isolation

- Network slicing to assure multiple SLAs across clouds, data centers and network segments
- Hard and soft isolation to maximize bandwidth efficiency while providing deterministic QoS
- Scalable packet OTN (P-OTN) multiservice transport

Multi-layer control plane capabilities

- Multi-layer, multi-region networking support, including coordinated multi-layer protection and restoration
- IP/optical integration via Generalized Multiprotocol Label Switching (GMPLS) user-network interface (UNI)

Management and software

- WaveSuite Network Operations Center (formerly Network Functions Manager for Transport - NFM-T)
- WaveSuite Resource Controller
- WaveSuite Service Enablement
- WaveSuite Health and Analytics
- WaveSuite Planner
- 1830 Engineering and Planning Tool (EPT)
- Nokia Network Services Platform (NSP)
- Open model-driven API

Software-defined networking (SDN)

- Centralized, multi-layer control via Nokia NSP

Network design and planning

- Integrated network planning tools for optimized multi-layer network planning/ deployment

Network applications

- Large-scale grooming of sub-10G, 10G, 100G and 400G client services on to efficient DWDM transport:
 - Business services
 - Wholesale services
 - Multiservice transport
 - Data center interconnect (DCI)
- Metro aggregation, core and regional packet/OTN switching

Product descriptions

1830 PSS-8x and PSS-12x

The 1830 PSS-8x and 1830 PSS-12x are optimized for both metro aggregation and metro core switching applications in optical transport networks (OTNs). The platforms are designed to address multi-layer, multiservice optical network scale and efficiency by delivering an industry-leading level of switching in a compact footprint. By leveraging class-leading, in-house-designed silicon for both electrical switching and DWDM interface port density and capacity, the two platforms offer a network evolution path that enables operators to keep up with bandwidth demands while minimizing space and power requirements.

With 4.0 Tb/s of non-blocking switching capacity in a single 10RU shelf, 16 Tb/s per 300 mm rack, the 1830 PSS-8x provides a small form factor high-capacity metro aggregation point. With 12 Tb/s of non-blocking switching capacity in a 21RU shelf, 24 Tb/s per 300 mm rack, the 1830 PSS-12x offers efficient, high-capacity, any-rate switching scale in the metro core, while also using less power per bit.

The platforms share common cards and are designed to support a wide range of client interface types from 100 Mb/s to 400GE, coherent programmable uplinks, and 500G-capable card slots. The 1830 PSS-8x and 1830 PSS-12x thus enable a smooth transition from legacy networks to a modern services delivery platform, including seamless scaling toward B100G services.

1830 PSS-24x

The 1830 PSS-24x platform is optimized for core and large metro packet/optical transport network (OTN) switching applications, placing industry-leading electrical switching scale at international/national, regional and metro core network locations. It provides the scale and efficiency required to support an evolution to 100G/400G services, enabling continued revenue streams as customers demand more bandwidth and enterprises move toward higher capacity connectivity between their routers and data centers.

With support for 24 Tb/s of non-blocking switching capacity in a single shelf, and upgradability to 48Tb/s capacity through interconnection of shelf pairs, the Nokia 1830 PSS-24x offers industry-leading OTN and packet switch scale, port densities, and wavelength distances, while also using less power per bit. This new level of switching scale is enabled by intelligent electrical fabric design coupled with terabit-capable card slots for transport wavelength cards powered by the Photonic Service Engine (PSE), and services cards with high client port density.

Related Nokia Products

- 1830 Photonic Service Switch (PSS)-4, PSS-8, PSS-16, PSS-32
- 1830 Optical Network Extender (ONE)
- 1830 Photonic Service Demarcation (PSD)

Technical specifications

Specifications	1830 PSS-8x	1830 PSS-12x	1830 PSS-24x
Capacity and performance	1.6 Tb per shelf, scalable to 4 Tb per shelf, 16 Tb per rack	4.8 Tb per shelf, scalable to 12 Tb per shelf, 24 Tb per rack	9.6 per shelf, scalable to 24 Tb per shelf, 48 Tb per dual shelf, 48 Tb per rack
Interface card slots	8	24	24 (single shelf) 48 (dual shelf)
Slot capacity	500 Gb	500 Gb	1 Tb
Dimensions (height/width/depth)	500 mm (19.68 in) 450 mm (17.714 in) 300 mm (11.8 in)	950 mm (37.40 in) 500mm (19.68 in) 300 mm (11.8 in)	950 mm (37.4 in) 500 mm (19.7 in) 600 mm (23.6 in)
Weight	9.2 kg (20.3 lb)	22.3 kg (49.2 lb)	33 kg (73 lb)
OTN/packet fabric options	2+1 protected, centralized fabric	2+1 protected, centralized fabric	2+1 protected, centralized OTN fabric, and/or card-based packet fabric
Controller card slots	2 protected	2 protected	2 protected
Power modules	Redundant power, modular, scalable power architecture	Redundant power, modular, scalable power architecture	Redundant power, modular, scalable power architecture
Power options	-48 V DC/-60 V DC	-48 V DC/-60 V DC	-48 V DC/-60 V DC
Typical power requirements	0.9 W/Gb (1.6 Tb shelf), 0.4 W/Gb (4 Tb shelf)	0.9 W/Gb (4.8 Tb shelf), 0.4 W/Gb (12 Tb shelf)	0.8 W/Gb (9.6 Tb shelf), 0.4 W/Gb (24 Tb shelf)
Operating temperature	Normal: 5 °C to +40 °C (41 °F to 104 °F) Short-term: -5 °C to +50 °C (23 °F to +122 °F)	Normal: 5 °C to +40 °C (41 °F to 104 °F) Short-term: -5 °C to +50 °C (23 °F to +122 °F)	Normal: 5 °C to +40 °C (41 °F to 104 °F) Short-term: -5 °C to +50 °C (23 °F to +122 °F)
Humidity	5% to 85% non-condensing	5% to 85% non-condensing	5% to 85% non-condensing
Multi-shelf management	Up to 8 1830 PSS-8x/12x/24x shelves per NE	Up to 8 1830 PSS-8x/12x/24x shelves per NE	Up to 8 1830 PSS-8x/12x/24x shelves per NE

1830 PSS-8x/12x interface cards*

Card ID	Card description	Notes
1UX500	200G-500G regional/LH transport uplink card	500G programmable high-speed card based on PSE-Vs coherent DSP, maximum optical reach / capacity
2UX500	100G-400G metro/regional/LH transport 2-port uplink card	500G programmable high-speed card based on PSE-Vc coherent DSP with pay-as-you-grow CFP2-DCO pluggables
2UX200	100G/200G 2-port uplink card	Metro aggregation/core uplink card, CFP4-ACO pluggables
1UX100	100G uplink card	Metro aggregation/core uplink card, CFP2-ACO pluggable
5MX500	100G/400G programmable multiservice, 5-port client card	500G high-density, multi-rate client card, QSFP28/QSFP56DD pluggables
4MX200	100G /40G any rate client card	100G /40G flexible multi-rate interface configuration, QSFP28/QSFP+ pluggables
20AX200	20 x 10G any rate client card	10G high-density, flexible interface configuration, SFP+ pluggables
20MX80	20 x sub-10G/10G multi-rate client card	Sub10G/10G flexible, multi-rate interface configuration, SFP/SFP+ pluggables



1830 PSS-24x interface cards*

Card ID	Card description	Notes
2UC1TH	300G-1T regional/LH/ULH transport 2-port uplink card	High-performance, programmable card based on PSE-6s coherent DSP with up to 1 Tb/s coherent WDM line
2UC1T	100G-500G regional/LH/ULH transport 2-port uplink card	1 Terabit programmable high-speed card based on PSE-Vs coherent DSP, maximum optical reach / capacity
4UC1T	100G-400G metro/regional/LH transport 4-port uplink card	1 Terabit programmable high-speed card based on PSE-Vc coherent DSP with pay-as-you-grow CFP2-DCO pluggables
8UC1T	100G/200G metro/regional/LH transport 8-port uplink card	1 Terabit programmable with pay-as-you-grow CFP4-ACO pluggables for high-density 100G/200G applications
2UC400	100G/200G long-haul/ultra-long-haul transport 2-port uplink card	Super coherent line ports, optimized for highest spectral efficiency, includes option for subsea applications
2UC400E	100G/200G 2-port uplink card with line encryption	Protocol agnostic encryption with minimum latency
4UC400	4 x 100G regional/long-haul transport uplink card	Supports pay-as-you-grow CFP2-ACO pluggables for high-density 100G applications
20UC200	20 x 10G any uplink card	Programmable, high-density, multiservice 10G , SFP+ uplink/client pluggables
10AN1T	100G/400G programmable multiservice 10-port client card	1 Terabit high-density, multi-rate client card QSFP28/QSFP56DD pluggables
4AN400	4 x 100G multiservice client card	High-density multiservice 100G, CFP4 pluggables
10AN400	10G/40G/100G client card	High-density, multi-rate any port unit, QSFP28/QSFP+ pluggables
30AN300	30 x 10G multiservice client card	High-density multiservice 10G SFP+ pluggables
20AN80	20 x Sub-10G/10G client card	Sub-10G and 10G flexible, multi-rate interfaces, SFP/SFP+ pluggables
6SE300	100GE optimized Carrier Ethernet switch card	High-capacity Carrier Ethernet services over packet OTN, based on Nokia SR OS, SFP/SFP+ pluggables
30SE300	10GE optimized Carrier Ethernet switch card	High-capacity Carrier Ethernet services over packet OTN, based on Nokia SR OS, QSFP28/QSFP+ pluggables

* Note: Support for interface cards and related features depends on the software release. Please refer to release notes and user documentation for additional details.

About Nokia

At Nokia, we create technology that helps the world act together.

As a B2B technology innovation leader, we are pioneering networks that sense, think and act by leveraging our work across mobile, fixed and cloud networks. In addition, we create value with intellectual property and long-term research, led by the award-winning Nokia Bell Labs.

Service providers, enterprises and partners worldwide trust Nokia to deliver secure, reliable and sustainable networks today – and work with us to create the digital services and applications of the future.

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