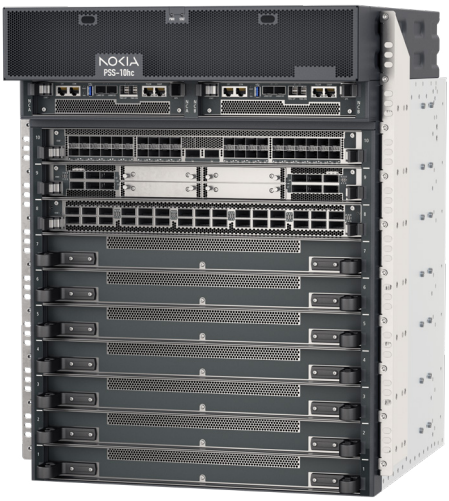
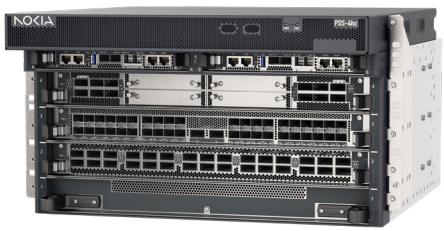
Nokia 1830 Photonic Service Switch – High Capacity (PSS-HC)

The carrier-grade Nokia 1830 PSS-HC provides a next generation addition to the 1830 PSS family that is designed to support both current and future coherent generations, pluggable and high-performance, with transponder/ muxponder, distributed OTN switching, and ultra-high capacity centralized OTN switching options.

The 1830 PSS-HC provides a future-proof solution for high density, power-efficient coherent transport in metro, long-haul and DCI applications. The PSS-4hc provides a 6RU shelf that supports four high-capacity service slots, while the PSS-10hc is a 15RU shelf with ten high-capacity service slots. The PSS-HC supports high-performance coherent traffic cards leveraging both 1.2 Tb/s PSE-6s and ICE-X 800ZR/ZR+ pluggables. With front-to-back airflow and >1RU slots it has also been architected to support future coherent generations beyond today's state-of-the-art PSE-6s and ICE-X 800ZR/ZR+ pluggables. The 1830 PSS-HC is both carrier-grade, with redundant hardware and support for optical protection and GMPLS restoration, and multi-service with support for a wide range of Ethernet, OTN and fiber channel client types.



1830 PSS-10hc



1830 PSS-4hc

Features

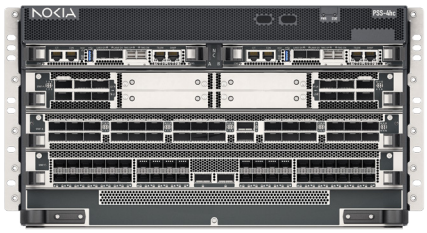
- 1.2 Tb/s per wavelength 140 Gbaud high performance coherent leveraging PSE-6s, up to 4x1.2 Tb/s pluggable interfaces (4.8 Tb/s) per single slot card
- 800G per wavelength with 130+ Gbaud ICE-X 800ZR/ZR+ coherent pluggables, up to 16x 800ZR/ZR+ (12.8 Tb/s) per single slot card
- Ready for future coherent generations beyond today's state-of-the-art PSE-6s and ICE-X 800ZR/ZR+
- Multi-service with support for clients including 800GbE, 400GbE, OTUC4 (400G OTN interface), 100GbE, OTU4, 25GbE, 10GbE, OTU2/2e, 16G and above Fiber Channel
- Redundant hardware including controllers, fans and AC/DC power
- Front-to-back airflow and support in 600 mm deep racks (ETSI, 19", 21", 23")
- Feature-rich, multi-layer GMPLS control plane with fast restoration, and network protection options including O-SNCP and OCH-P

Benefits

- Scale coherent capacity with up to 51.2 Tb/s per 6RU PSS-4hc, up to 128 Tb/s per 15RU PSS-10hc
- Future-proof your network with a carrier-grade platform ready for future coherent generations, and distributed or centralized OTN switching
- Minimize network downtime with fully redundant hardware, optical protection and GMPLS restoration
- Reduce operational costs with minimized footprint (8.533 Tb/s per RU) and power consumption (<0.1W/G), and with operation features including streaming telemetry and multi-shelf management
- Pay as you grow with a fully pluggable solution including PSE-6s 1.2T, 800ZR/ZR+ and 400ZR/ZR+ line interfaces; AC/DC PSUs are also PAYG
- Extend the life of your 1830 PSS network with a next generation platform that leverages the same software and release cycle, supports cluster integration, and and will support multiple PSS-HC/ PSS/PSI-L shelves managed as single NE (future)

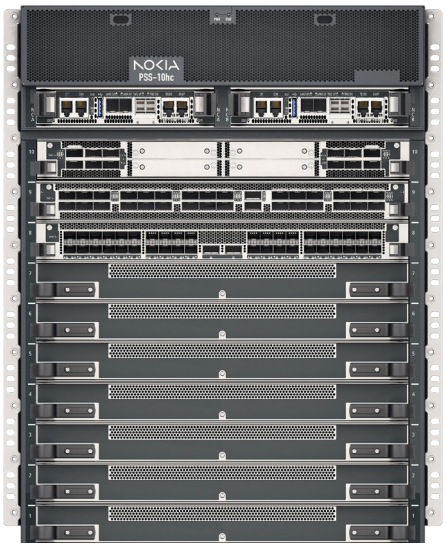
Product descriptions

1830 PSS-4hc shelf



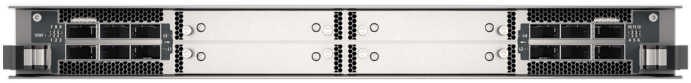
The 6RU 1830 PSS-4hc supports front-to-back airflow and is supported in 600 mm deep ETSI, 19", 21" and 23" racks. It supports both AC and DC power options. Hardware redundancy includes the controllers, fans, and power. It provides four service slots and can deliver up to 19.2 Tb/s of line capacity with 4x1.2T 4CP4T8 cards or up to 51.2 Tb/s of line capacity with the 16x800ZR+ 16CP12T8 cards.

1830 PSS-10hc shelf



The 15RU 1830 PSS-10hc supports front-to-back airflow and is supported in 600 mm deep ETSI, 19", 21" and 23" racks. It supports both AC and DC power options. Hardware redundancy includes the controllers, fans and power. It provides ten service slots and can deliver up to 48 Tb/s of line capacity with the 4x1.2T 4CP4T8 card or up to 128 Tb/s of line capacity with the 16x800ZR+ 16CP12T8.

4x1.2T transponder/muxponder



The single slot 4CP4T8 leverages high performance Nokia PSE-6s coherent optical engines coherent optical engines to provide up to 4.8 Tb/s coherent line capacity. The PSE-6s supports up to 140 Gbaud and 1.2 Tb/s per wavelength and leverages a comprehensive coherent toolkit 3rd-generation probabilistic constellation shaping (PCS-64QAM and PCS-16QAM), QPSK modulation, a continuously tuneable baud rate, C-band and L-band support, an overhead efficient Ethernet framing mode, high chromatic dispersion tolerance, and encryption. Each 4CP4T8 supports up to four PSE-6s pluggables (BMDCO12) enabling pay-as-you-grow scaling and the ability to mix C-band and L-band pluggables in the same card. The 4CP4T8 supports eight QSFP56-DD clients (400GbE/OTUC4, 4x100GbE/OTU4) and four QSFP56-DD/QSFP800 clients (800GbE, 400GbE/OTUC4, 4x100GbE/OTU4). Leveraging 2x100G LR4 QSFP-DDs, the 4CP4T8 can support a configuration with 2x1.2 Tb/s coherent interfaces and the full 24x100G LR4 clients. The 4CP4T8 also support client bandwidth sharing (e.g. 5x400GbE over 2x1 Tb/s).

800ZR+ transponder/muxponder

The single slot 16CP12T8 provides a thin transponder layer solution for 800G coherent pluggables, with aggregate coherent line capacity of up to 12.8 Tb/s. The 16CP12T8 has 32 QSFP-DD/QSFP-DD800 ports divided into five groups of five groups of six ports, plus two additional ports. Each group of six ports can be configured with two 800ZR/ZR+WDM line interfaces and four client ports (800GbE, 400GbE, OTUC4, 4x100GbE/OTU4) or alternatively with three 800ZR/ZR+WDM line interfaces and three 800GbE clients. The two additional ports can be used for one additional 400G or 800G transponder. The 16CP12T8 also supports client bandwidth sharing (e.g, 800GbE over 2x400G, 3x400GbE over 2x600G). The 800ZR/ZR+ DWDM ports leverage industry-leading Nokia ICE-X 800ZR/ZR ICE-X 800ZR/ZR+ QSFP-DD800 pluggables. With a 3 nm CMOS DSP, ICE-X 800ZR/ZR+ pluggables deliver high performance in a low-power, pluggable form factor. They support 200 Gb/s, 400 Gb/s, 600 Gb/s and 800 Gb/s line rates with baud rates of 130+ Gbaud. They deliver multi-vendor interoperability, including open probabilistic constellation shaping (PCS), and a high-performance PCS mode that supports 800 Gb/s to 1,700+ km.

Sub-100G aggregation card

The single slot 42P800 provides aggregation for up to forty SFP+/SFP28 clients onto two 400G QSFP-DD line interfaces. Supported clients include 10GbE (max 40), 25GbE (max 32), OTU2/2e (max 40), 16G fiber channel (max 40) and 32G fiber channel (max 24). Half the client ports (i.e., 20x10GbE) map to each 400G line port. The primary application for the 42P800 is to aggregate sub-100G clients onto a 4CP4T8 or a 16CP12T8, leveraging 400G QSFP-DD-based DAC (direct attach copper), AEC (active electrical cable) or AOC (active optical cable) cables to connect the 42P800 to the 4CP4T8 or 16CP12T8. In addition, the 42P800's 400G line ports can support coherent 400ZR/ZR+ pluggables for transponder/muxponder and add/drop multiplexer (ADM) applications.

Technical specifications

Shelves	1830 PSS-4hc	1830 PSS-10hc
Traffic card slots	• 4	• 10
Dimensions	• Height 264.7 mm (6RU) • Width: 482 mm (494mm with dust cover) • Depth: 568 mm (598 mm with dust cover)	• Height: 664.7 mm (15RU) • Width: 482 mm (494mm with dust cover) • Depth: 568 mm (598mm with dust cover)
Controller cards	• 1+1 redundant	• 1+1 redundant
Fans	• 8 fans in 4 fan modules, rear • 6+2 redundancy (i.e.. if any 2 fans fail)	• 12 fans in 3 fan modules, rear • 10+2 redundancy (i.e. if any 2 fans fail)
Power supplies	• A/C or D/C • 4 PSU, rear • 1+1 redundancy	• A/C or D/C • 12 PSU, rear • 1+1 (N working, N backup) or N+1 redundancy (N working, 1 backup)
Weight	• 20 kg	• 38 kg
Typical power	• 228 W	• 273 W
Operating temperature	• Normal: 5° C to +40° C (41° F to 104° F) • Short-term: -5° C to +45° C (23° F to +113° F)	
Network resiliency	• Feature-rich, multi-layer Nokia GMPLS control plane with fast restoration • 1+1 client protection (O-SNCP, also Y-cable with 42P800) • 1+1 line interface protection (OCH-P) • 1+1 OMS and OTS with 1830 PSS/PSI-L optical line systems	
Management	• WaveSuite, SNMP, WebUI, CLI, NETCONF, gRPC streaming telemetry • Up to 24 1830 PSS-HC shelves can be managed as a single NE • Multiple 1830 PSS-HC/PSS/PSI-L shelves managed as a single NE (Future)	
Security	• L1 encryption on 4CP4T8 PSE-6s-based transponder/muxponder • Part of Nokia quantum-safe networking (QSN) solution • Radius, TACACS+, SSH, SFTP, TLS	
Applications	• High density 1.2T transponder/muxponder (4CP4T8) • High density 800ZR/ZR+ transponder/muxponder (16CP12T8) • Optional low speed aggregation (42P800) • 2x400ZR/ZR+ low speed transponder/muxponder (42P800) • 2x400ZR/ZR+ add/drop multiplexer (42P800) • Coherent transport over 1830 PSS/PSI-L optical line system (OLS) • Coherent transport over other Nokia OLS (1830 GX, 1830 FlexILS, 1830 XTM, 7300) • Coherent transport over third-party optical line system • Distributed, card-based OTN switching (future) • Centralized, fabric-based OTN switching, 100+Tb/s (future)	
Standards	• UL/CSA 60950-1 • GR-3160 • IEC/EN 60950-1 • IEC/EN 60825-1, 60825-2 • AS/NZS 60950.1 • ROHS6 • CE Mark	

Traffic cards	4CP4T8	16CP12T8	42P800
Slots required per card	• 1	• 1	• 1
Line interfaces	• Up to 4 per card • PSE-6s 1.2T/140Gbaud • Pluggable form factor • Total capacity: 4.8 Tb/s	• Up to 16 per card • ICE-X 800ZR/ZR+ • QSFP-DD800 • Total capacity: 12.8 Tb/s	• 2x 400G QSFP-DD • Gray (DAC, AEC, AOC) • 400ZR/ZR+ • Total capacity: 800 Gb/s
DWDM bands	• C-band • L-band	• C-band • L-band	• C-band
Client interfaces	• 8xQSFP-DD • 4XQSFP-DD/DD800	• Up to 16 QSFP-DD800 • Up to 21 QSFP-DD	• 40xSFP+/SFP28
Client types	• 800GbE (max 4) • 400GbE (max 12) • OTUC4 (max 12) • 100GbE (max 36) • OTU4 (max 36)	• 800GbE (max 16) • 400GbE (max 21) • OTUC4 (max 21) • 100GbE (max 80) • OTU4 (max 80)	• 10GbE (max 40) • OTU2/2e (max 40) • 25GbE (max 32) • 16G FC (max 40) • 32G FC (max 24)
Client bandwidth sharing	• Yes	• Yes	• No
Network resiliency	• GMPLS • O-SNCP • OCH-P • OMS/OTS with OLS	• GMPLS • O-SNCP • OCH-P • OMS/OTS with OLS	• GMPLS control plane • O-SNCP • ODUk-SNCP • Y-Cable • OCH-P • OLP/OMSP
Typical power	• 465 W	• 625 W	• 160 W
Applications	• Transponder/muxponder	• Transponder/muxponder	• Sub-100G aggregation onto 4CP4T8/16CP12T8 • 2x400ZR+ muxponder • 2x400ZR+ ADM

About Nokia

Nokia is a global leader in connectivity for the AI era. With expertise across fixed, mobile, and transport networks, powered by the innovation of Nokia Bell Labs, we're advancing connectivity to secure a brighter world.

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