Nokia 1830 Optical Network Extender - Hub

Release 25.6

The Nokia 1830 Optical Network Extender – Hub (1830 ONE-h) is a compact OTN switch/muxponder/transponder designed for access and metro networks. Its flexible architecture supports OTN and packet aggregation and transport as well as TDM renewal.

As part of the Nokia 1830 ONE portfolio of OTN/WDM metro access products, the Nokia 1830 ONE-h equips your 5G-era network with more capacity through support for more connections and capabilities. It also complements the Nokia 1830 Photonic Service Switch (1830 PSS) portfolio in an open, seamlessly managed edge-to-core architecture.

Features

- Modular architecture for independent technology life-cycle evolution
- Maximum I/O flexibility with configurable ports
- Stackable, 1RU platform supports simplified, multi-shelf, single network element management
- Compact platform with small footprint and low power consumption
- Fully redundant, protected architecture

Benefits

- Reduces OPEX through flexible, compact design
- Optimizes CAPEX by supporting pay-as-you-grow strategy through modular design
- Simplifies operations with single network element management

Product description

OTN and packet aggregation and transport

The 1830 ONE-h is a new generation of optical micro nodes. In a very compact form factor, they perform OTN switching and cross-connect with integrated optical pluggable modules, offering line interfaces up to 200 Gb/s. SDN native by design, the ONE-h allows abstraction to the optical domain SDN controller, multi-domain/multi-layer controller or service orchestrator, liaising over open APIs (YANG models with the RESTCONF protocol).

The 1830 ONE-h offers multiservice (e.g. packet, OTN) client ports and multiple OTN line ports. To improve the flexibility of equipment connectivity, the ports support Flex I/O and can be custom-configured by software to operate as either client or line interfaces to meet site-specific traffic needs. The port bit rate is also software configurable.

The OTN B&W or CWDM/DWDM line interfaces can directly connect to any new or existing WDM infrastructure, maximizing the transport network utilization, or can be stacked over an 1830 ONE WDM functional block, creating a single network element that includes the optical line system.

100G/200G Transponder/Muxponder Card

The 1830 ONE-h 200G operates as a 200G muxponder or 100G transponder for either 100GE or OTU4 clients, in any mix. It hosts up to two I/O cards, for a total capacity of 400 Gb/s in a 1 RU chassis. The ONE-h 200G also provides redundant power filters for increased system availability.

100G OTN Switching Card

The 1830 ONE-h 100G is designed to close multiple metro access OTU2 (10 Gb/s) rings that, together with local traffic, are aggregated and transported over OTU4 (100 Gb/s) metro core rings. Two versions of the cards are available, one having B&W QSFP28-based 100G/OTU4 line and another having a DWDM Coherent CFP2-DCO-based 100G/OTU4 line.

10G OTN and Packet Switching Card

The 1830 ONE-h OTN 10G collects local metro access traffic from SDH, Ethernet, SAN, OTN services and aggregates them over multiple OTU2 (10 Gb/s) metro rings. Two SW load options are available, one more focused to CBR services and the other on L2 (packet) services.

100G Packet Switching and Card

The 1830 ONE-h 100G Packet card collects and processes metro L2 services from multiple 10G and 100G UNI ports, for aggregation and transmission via Nx10G(OTU2) lines. It can also act as a pure L2 switch for switching and aggregation of 10GE/100GE UNI traffic into a 100GE NNI.

TDM renewal

The 1830 ONE-h can transport Ethernet and any TDM traffic (including low-speed PDH) directly over OTN. SDN native by design, it allows abstraction of the legacy traffic to the optical domain SDN controller, SD-WAN controller or service orchestrator, operating over open APIs (YANG models with RESTCONF protocol).

The innovative mapping capability of the 1830 ONE-h extends the use of OTN containers to encapsulate PDH/VCx/FE traffic with 100 percent efficiency (using ODUk containers as defined in ITU G. Sup. 70). This allows operators to eventually decommission any PDH/SDH equipment from their transport network, maintaining the existing services and client user interfaces while boosting capacity up to four times in existing access networks. Transporting all services over OTN enables operation over existing WDM networks, resulting in the de-layering of the transport infrastructures.

The result is a converged optical network that spans from core to access, over a common OTN over WDM infrastructure. This architecture maximizes the capacity transported per fiber and offers the lowest latency and optimal cost per bit.

The 1830 ONE-h is designed to close both legacy SDH and new OTU2 OTN rings that, together with local traffic, are groomed and transported over OTU2 (10 Gb/s) metro rings.

The TDM renewal application is enabled by the 10G OTN/SDH Switching Card with up to 2 cards per 1830 ONE-h chassis.

10G OTN/SDH Switching Card

Technical specifications

Parameter	10G OTN/SDH Switching Card	10G OTN and Packet Switching Card	100G OTN Switching Card[1]	100G PKT/OTN Switching Card	100G/200G Transponder/Muxponder
Switch fabric	60 Gb/s at LO; 100 Gb/s at HO	280 Gb/s at ODU0 92 Gb/s (packet)	400 Gb/s at ODU0	240 Gb/s at ODU0 520 Gb/s (packet)	N/A
Number of blades per shelf	2	2	2	2	2
Client interfaces (per blade)	10 x STM-1/4/16 or FE/GE; 2 x STM-1/4/16/64[2] (SFP/SFP+ ports), OTU1, E3/T3	Up to 10 clients (SFP/SFP+ ports): STM-1/4/16/64, 1GE/10GE, OTU1[1]/OTU2, FC400/FC800		4 x 10GE 1 x 100GE	Up to 2 clients (QSFP28 port): 100GE, OTU4
Line interfaces (per blade)	2 x OTU2	Up to 4 x OTU2	1 x OTU4[4]	6 x OTU2	1 x 200G/100G[3]
Redundancy (1+1)	Power, control, fabric	Power, control, fabric	Power, control, fabric	Power, control, fabric	Power, control
OTN containers for clients	ODU0/1/2 and ODUε	ODU0/1/2 and ODUFlex	ODU0/1/2 and ODUFlex	ODUFlex	ODU4
Transmission	ODU0/1/2 and ODUε	ODU0/1/2 and ODUFlex unidirectional/bidirectional		ODUFlex/unidirectional/ bidirectional	2 x ODU4
Services	Transparent P2P	EPL, EVPL, E-Tree, E-LAN	Transparent P2P	L2 P2P EPL, EVPL	Transparent P2P
Protection	VC4 SNCP, VC12 SNCP, ODUε SNC and ODU0/1 SNC	ODU0/1/2 and ODUFlex SNC	ODU0/1/2 and ODUFlex SNC	ODUFlex SNC	O-SNCP
Client protection	MSP 1+1	Y-cable, Single and Multi-card LAG	Y-cable	LAG Single Card	Y-cable
Packet features	N/A	VLAN management, QoS handling, OAM, performance monitoring	N/A	VLAN management, QoS handling, OAM, performance monitoring	N/A
Synchronization	Transparent mode (default mode); locked mode (synchronous configuration); SDH Sync; synchronization over OTN	SyncE, synchronization over OTN, 1588v2 (PTPoOTN)[5]	SynchE, PTP/1588v2[5]	Synchronization over OTN	N/A
Synchronization physical interface	2 MHz, 2 Mb/s	2 MHz, 2 Mb/s,1PPS/TOD	2 MHz, 2 Mb/s,1PPS/TOD	2 MHz, 2 Mb/s,1PPS/TOD	N/A
Management	Stackable; managed as one network element with RESTCONF protocol and YANG model				
Dimensions (height x weight x depth)	44.2 x 482.6 x 282.0 mm (1.74 x 19.00 x 11.10 in)				
Weight	1.12 kg (2.47 lb)	1.12 kg (2.47 lb)	1.12 kg (2.47 lb)	1.12 kg (2.47 lb)	1.12 kg (2.47 lb)
Power supply	-48 V DC (-40.5 to -57 V DC)	-48 V DC (-40.5 to -57 V DC)	-48 V DC (-40.5 to -57 V DC)	-48 V DC (-40.5 to -57 V DC)	-48 V DC (-40.5 to -57 V DC)
Power consumption with chassis full commons and two traffic cards	400 W max	400 W max	500 W max	500 W max	200 W max
Operating temperature	-5°C to +45°C (23°F to 113°F)	-5°C to +45°C (23°F to 113°F)	-5°C to +45°C (23°F to 113°F)	-5°C to +45°C (23°F to 113°F)	-5°C to +45°C (23°F to 113°F)
Relative humidity	5% to 95%	5% to 95%	5% to 95%	5% to 95%	5% to 95%

1 Two flavors of the cards are available, one having B/W QSFP28 based 100G line and another having a DWDM Coherent CFP2-DCO based 100G line.
2 SDH structured client
3 CFP2 DCO optical module supporting QPSK (at 100G), 16QAM (at 200G) modulations.
4 Either QSFP28 or CFP2-DCO card versions are available
5 Synch-E and 1588v2 are made available on dedicated GE ports of 10G OTN and 100G OTN with 100G CFP2 based line cards

Regulations and standards

- Operating conditions: ETSI EN 300 019-1-3, Class 3.2 / GR 63 CORE (clause 4.1.2 to 4.1.8) / BS EN 50125-3, Class T1 in Shelter (TC) “Outside the track”
- Storage conditions: ETSI EN 300 019-1-1, Class 1.2/GR 63 CORE (clause 4.4)
- Transportation conditions: ETSI EN 300 019-1-2, Class 2.2 / GR 63 CORE (clauses 4.1.1, 4.3.1 to 4.3.2)
- EMI / EMC: EN 300386, EN 55032, ES 20146,8 CISPR 32, GR 1089 CORE (clause 2, 3) and FCC part 15
- EMC immunity: Power Station and Substation Environments IEC 61000-6-5 and Railway Applications IEC 62236-4/EN 50121-4
- Power Supply Interface: EN 300132-2/GR 1089 CORE (clause 10)
- Acoustic: EN 30075 /GR 63 CORE (clauses 4.6)
- Safety: EN 60825-1/2/Safety: EN 60950-1/ GR 63 CORE (clauses 7 and 9)

About Nokia

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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.

Nokia OYJ
Karakaari 7
02610 Espoo
Finland
Tel. +358 (0) 10 44 88 000

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