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Nokia 7750 Service Router and Nokia 7450 Ethernet Service Switch

Media Dependent Adapters

The Nokia 7750 Service Router (SR) and Nokia 7450 Ethernet Service Switch (ESS) Media Dependent Adapter-XP (MDA-e-XP) and MDA-e deliver high-density Ethernet interfaces for highly scalable IP routing functions and services.

With support for Gigabit Ethernet (GE), 10GE, 25GE, 100GE and 400GE interfaces, the Nokia MDA-e-XP and MDA-e provide modular interface flexibility with a variety of variants, connector types, optical breakouts and density configurations to maximize system configuration versatility and investment protection. They house the forwarding plane, perform all MAC-layer and physical-layer functions and provide faceplate connectors for optical modules and cables.

The Nokia MDA-e-XP is based on the Nokia FP4 network processing silicon and delivers up to 750 Gb/s full duplex (FD) performance. The half-slot adapter supports 400G QSFP double density (QSFP-DD), 100G QSFP28, 25G SFP28, 40G QSFP+ 10G SFP+ and CFP2-Digital Coherent Optical (DCO) optics along with flexible 10GE and 100GE breakout options. Optics support for QSFP-DD connectors includes 400G ZR and 400G ZR+ pluggable transceivers. Connectors on variants supporting QSFP-DD and QSFP28 optics are universal, supporting any speed in any connector.

The Nokia MDA-e is based on the Nokia FP3 network processing silicon and delivers up to 100 Gb/s FD performance. The half-slot adapter supports 100G QSFP28, 40G QSFP+, 25G SFP28, 10G SFP+ optics along with 10GE and 25GE breakout options. Connectors on variants supporting QSFP28 are universal, supporting any speed in any connector.



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Up to two MDA-e-XPs are supported by the Nokia FP4-based Input/Output Module 5-e (IOM5-e) in the 7750 SR-7, SR-12 and the SR-12e. The 7750 SR-1 system has an integrated IOM5-e based on the Nokia FP4 silicon and supports up to two MDA-e-XPs.

Up to two MDA-e adapters are supported in the IOM4-e and IOM4-e-B in 7750 SR-7, 7750 SR-12 and 7750 SR-12e systems.

Up to four MDA-e adapters are supported by the IOM-e in 7750 SR-e systems. For 7450 ESS systems, up to two MDA-e adapters are supported using the 7750 SR IOM4-e.

Enabled by Nokia FP technology, the combination of the 7750 SR IOM with the MDA-e-XP and MDA-e delivers deterministic forwarding performance at scale, ensuring that even at full capacity when complex processing-intensive operations are required, performance does not degrade.

This combination also enables exceptional system versatility, allowing operators to mix and match IOMs with MDA-e-XP and MDA-e types to meet a wide range of networking requirements in a single system while supporting the full array of IP networking functions and services and protecting hardware investments over time.

Features and benefits

- The 750 Gb/s FD 6-connector and 3-connector QSFP-DD MDA-e-XP has universal faceplate connects and supports 10GE, 40GE, 100GE and 400GE on any connector with flexible optical breakout options, including 10 x 10GE (QSFP28) 2 x 100GE (QSFP-DD) and 4 x 100GE (on the 6-connector QSFP-DD MDA-e-XP). Optics support for the 6-connector and 3-connector QSFP-DD MDA-e-XP includes 400G ZR and 400G ZR+ QSFP56-DD pluggable transceivers.
- The 750 Gb/s FD 12-connector and 6-connector QSFP28/QSFP+ MDA-e-XP has universal faceplate connectors and supports 10GE, 40GE and 100GE on any connector with flexible optical breakout options, including 4 x 10GE (QSFP+), 10 x 10GE (QSFP28) and 1 x 100GE (QSFP28).

- The 16-connector SFP28/SFP+ and 2-connector QSFP28/QSFP+ MDA-e-XP supports dual rate 10/25GE natively and MACsec on any of the 16 SFP28 connectors along with 4 x 10GE (QSFP+), 10 x 10GE (QSFP28) and 1 x 100GE (QSFP28) breakouts on each of the QSFP28 connectors.
- The 3-connector CFP2-DCO MDA-e-XP supports 100 Gb/s using QPSK modulation and 2 x 100 Gb/s using either 8QAM or 16QAM for enhanced flexibility in a pluggable coherent solution.
- With the IOM5-e and MDA-e-XP, a flexible pay-asyou-grow licensing model provides a choice of entry points for immediate requirements and the ability to scale in-place for evolving needs with software-only upgrades. Capacity licenses provide bandwidth, connector and intelligent aggregation mode options. Functional licenses scale services through control options on egress hardware queues and egress policers.
- The 100 Gb/s FD MDA-e provides GE, 10GE, 25GE, 40GE and 100GE interfaces with support for CSFP, SFP, SFP+, SFP28, CFP2, CFP4, QSFP+ and QSFP28 optics.
- The 2-connector QSFP28/QSFP+ MDA-e is available in a variant that supports MACsec on all connectors, RS-FEC (Clause 91 FEC) and flexible optical breakout options, including 4 x 10GE (QSFP+), 4 x 25GE (QSFP28) and 1 x 100GE (QSFP28). The eight-port SFP28/SFP+ MDA-e supports dual rate 10/25GE natively and MACsec on all ports.
- Modular, compact MDA-e-XP and MDA-e adapters and IOMs provide a flexible, mix-and-match approach to system configuration, for reduced TCO and investment protection.
- Select MDA-e variants support OTU1e, OTU2, OTU2e and OTU4 line rates and a wide range of OTN environments and automatically increase the payload rate from the standard 10.709 Gb/s (OTU2) to either 11.0491 Gb/s (OTU1e) or 11.0957 Gb/s (OTU2e).
- Select MDA-e variants support ITU-T G.709 FEC and generic FEC (GFEC) algorithms and extend optical reach for longhaul applications.

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- ITU-T Synchronous Ethernet (SyncE) and IEEE 1588v2 distribute precision network timing and synchronization over Ethernet.
- Variants with MACsec support IEEE 802.1AE MACsec to provide secure connectivity for all traffic on Ethernet links between nodes and support VLAN tags in clear (WAN) mode or encrypted.

Technical specifications

Table 1. Nokia 7750 SR and 7450 ESS MDA-e-XP and MDA-e summary

MDA type	Connector/ port	Connector/ port type	Maximum density						
			7750 SR/7450 ESS	7450 ESS			7750 SR-e		
			SR-12e	SR-12/ESS-12	SR-7/ESS-7	SR-1	SR-3e	SR-2e	SR-1e
MDA-e-XP									
400GBASE/100GBASE /10GBASE*	6	QSFP-DD	72/360/1,080	_	_	8/40/120	_	_	_
400GBASE/100GBASE /10GBASE*	3	QSFP-DD	36/180/540	10/100/600	5/50/300	4/20/60	_	_	—
100GBASE/10GBASE*	12	QSFP28/ QSFP+	216/2,160	_	_	24/240	_	_	_
100GBASE/10GBASE	6	QSFP28/ QSFP+	108/1,080	120/1,200	60/600	12/120	_	_	_
10G/25GBASE (MACsec) + 100G/10GBASE	16 + 2	SFP28/SFP+ + QSFP28/ QSFP+	288 + 36/360	320 + 40/400	160 + 20/200	32 + 4/40	_	_	_
100GBASE	3	CFP2-DCO/ CFP2	108	60	30	12	_	_	_
MDA-e									
100GBASE/25GBASE/ 10GBASE (MACsec)	2	QSFP28/ QSFP+	36/144/144	40/160/160	20/80/80	_	24/96/96	16/64/64	8/32/32
100GBASE	2	QSFP28/ QSFP+	36	40	20	_	24	16	8
10GBASE/25GBASE (MACsec)	8	SFP28/SFP+	144	160	80	_	96	64	32
100GBASE	1	CFP2	18	20	10	_	12	8	4
10GBASE	10, 6	SFP+	180, 108	200, 120	100, 60	_	120, 72	80, 48	40, 24
10GBASE/1000BASE (MACsec)	12	SFP+/SFP	216	240	120	_	144	96	48
1000BASE	40	CSFP/SFP	720	800	400	_	480	320	160

* With intelligent aggregation

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Table 2. MDA-e-XP and MDA-e weights and dimensions

MDA-e-XP type and MDA-e type	Weight	Dimensions		
		Height	Width	Depth
6-connector QSFP-DD MDA-e-XP	1.2 kg (2.7 lb)	3.6 cm (1.4 in)	19.3 cm (7.6 in)	19.3 cm (7.6 in)
12-connector QSFP28 MDA-e-XP	1.13 kg (2.5 lb)	3.6 cm (1.4 in)	19.3 cm (7.6 in)	19.3 cm (7.6 in)
6-connector QSFP28 MDA-e-XP	0.95 kg (2.1 lb)	3.6 cm (1.4 in)	19.3 cm (7.6 in)	19.3 cm (7.6 in)
16-connector SFP28 + 2-connector QSFP28 MDA-e-XP	1.2 kg (2.6 lb)	3.6 cm (1.4 in)	19.3 cm (7.6 in)	19.3 cm (7.6 in)
3-connector CFP2-DCO MDA-e-XP	1.13 kg (2.5 lb)	3.6 cm (1.4 in)	19.3 cm (7.6 in)	19.3 cm (7.6 in)
2-connector QSFP28 (MACsec) MDA-e	1.3 kg (2.8 lb)	3.6 cm (1.4 in)	19.3 cm (7.6 in)	19.6 cm (7.7 in)
2-port 100GE QSFP28 MDA-e	1 kg (2.2 lb)	3.6 cm (1.4 in)	19.3 cm (7.6 in)	19.6 cm (7.7 in)
8-connector SFP28 MDA-e	1.8 kg (3.9 lb)	3.6 cm (1.4 in)	19.3 cm (7.6 in)	19.3 cm (7.6 in)
1-port 100GE CFP2 MDA-e	0.91 kg (2.01 lb)	3.6 cm (1.4 in)	19.3 cm (7.6 in)	19.6 cm (7.7 in)
12-port 10/1GE SFP+ (MACsec) MDA-e	1.06 kg (2.33 lb)	3.6 cm (1.4 in)	19.3 cm (7.6 in)	19.6 cm (7.7 in)
10-port 10GE SFP+ MDA-e	0.90 kg (1.98 lb)	3.6 cm (1.4 in)	19.3 cm (7.6 in)	19.6 cm (7.7 in)
6-port 10GE SFP+ MDA-e	0.88 kg (1.94 lb)	3.6 cm (1.4 in)	19.3 cm (7.6 in)	19.6 cm (7.7 in)
40-port GE CSFP/SFP MDA-e	0.95 kg (2.1 lb)	3.6 cm (1.4 in)	19.3 cm (7.6 in)	19.6 cm (7.7 in)

Note: Refer to the 7750 SR and 7450 ESS product and release documentation for system details on dimensions, weights, hardware, safety standards, compliance agency certifications and protocol support.

About Nokia

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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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