Nokia 7750 Service Router

Media Dependent Adapters

The Nokia 7750 Service Router (SR) Media Dependent Adapter-XP (MDA-e-XP) and MDA-e deliver high-density 10 Gigabit Ethernet (GE), 25GE, 40GE, 100GE and 400GE interfaces, enabling quantum-safe IP network cryptography and advanced packet processing to support demanding IP applications.

Powered by the Nokia FP4 routing silicon, the Nokia MDA-e-XP supports up to 750 Gb/s full duplex (FD) in capacity, which scales to 2 Tb/s with intelligent aggregation (IA). The half-slot adapter supports 400G QSFP-DD, 100G QSFP28, 25G SFP28, 40G QSFP+, 10G SFP+ and 100G CFP2-Digital Coherent Optical (DCO) optics along with 100G and 400G breakout options. Connectors on variants supporting QSFP-DD and QSFP28 optics are universal, supporting any speed in any connector and a variety of compatible optics.

The innovative Nokia MDA-e-XP design and packet processing intelligence enables quantum-safe MACsec line-rate network cryptography, precise IP payload filters to mitigate DDoS attacks, superior Quality of Service (QoS) performance, robust control plane protection and intelligent aggregation.

The Nokia MDA-e is based on Nokia FP3 routing silicon and supports up to 100 Gb/s FD capacity. The half-slot adapter supports 100G QSFP28, 40G QSFP+, 10/25G SFP28, 10G SFP+ and 100G CFP2 along with 4 x10G and 4 x 25G breakout options.

The Nokia MDA-e-XP and MDA-e offer modular interface flexibility and support for a wide range of optical modules, maximizing 7750 SR system configuration versatility and optimizing network designs.

Up to two Nokia MDA-e-XP and MDA-e variants are inserted into a Nokia 7750 SR Input/Output Module (IOM). Up to four Nokia MDA-e variants are supported by a Nokia 7750 SR-e IOM. Enabled by Nokia's FP technology, this combination is always deterministic, for predictable performance under all operating conditions.
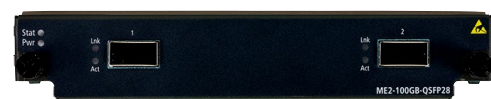

6-connector 400G QSFP-DD MDA-e-XP

12-connector 100G QSFP28 MDA-e-XP

3-connector CFP2-DCO MDA-e-XP

2-connector 100G QSFP28 MDA-e

8-port 25G SFP28/SFP+ MDA-e

Features and benefits

- Modular, compact Nokia MDA-e-XP and MDA-e variants provide exceptional versatility, offering a mix-and-match approach to system configuration and connector expansion to meet diverse networking requirements, while reducing TCO and ensuring investment protection.

- Nokia MDA-e-XP and MDA-e variants house the forwarding plane and associated memory, perform all MAC-layer and physical-layer functions, and provide faceplate connectors for pluggable optical transceivers and cables.

- Together, the performance of the Nokia 7750 SR IOM and/or MDA-e-XP and MDA-e is always deterministic. Even at full scale and with demanding processing-intensive applications, performance remains certain and throughput does not degrade, with no compromises.

- Advanced DDoS mitigation capabilities enabled by the Nokia MDA-e-XP uses signature-based ACLs to provide first-level payload inspection at line rate to filter out DDoS traffic, without compromising performance.

- Quantum-safe 802.1AE MACsec line-rate network cryptography for Ethernet networks is enabled by the Nokia MDA-e-XP.

- Ensuring superior QoS performance on the Nokia 7750 SR, the Nokia MDA-e-XP delivers full packet pre-classification and pre-buffering with priority tagging, to guarantee priority traffic for all critical flows regardless of network congestion.

- Resilient control plane protection and availability are enabled by configurable hardware-based ACL filters, which, combined with pre-classification and rate-limiting functions enable the Nokia MDA-e-XP to discard unwanted traffic before it reaches the control processor.

- Intelligent aggregation allows the Nokia MDA-e-XP to aggregate port capacity beyond its forwarding capacity in a deterministic way with full respect for QoS and packet priority, enabling the elimination of pre-aggregation layers, driving CAPEX and OPEX savings.

- Flexible licensing offered by the Nokia MDA-e-XP and IOM5-e provides bandwidth options along with the scaling of egress hardware queues and policers for core, edge, and high-scale edge functionality.

- The Nokia MDA-e-XP and MDA-e support ITU-T Synchronous Ethernet (SyncE) and IEEE 1588v2 distribute precision network timing and synchronization over Ethernet.

- Field upgrades are simplified because hot-swappable Nokia MDA-e-XP and MDA-e variants can be exchanged in-service to change media type and physical interfaces as required.

Technical specifications

Table 1. Nokia 7750 SR MDA-e-XP overview

MDA-e-XP variants	Speed options	Optical transceiver support	Breakout options	Capacity: Line rate/IA (FD)	IOM support
6-connector 400G QSFP-DD MDA-e-XP	400G, 100G, 40G, 10G	QSFP56-DD (Includes 400G ZR/ZR+), QSFP28-DD, QSFP28, QSFP+	4 x 100G, 2 x 100G, 10 x 10G, 8 x 10G, 4 x 10G	750G / 2.0T	IOM5-e with two MDA-e-XP's 7750 SR-1 with two MDA-e-XP's
3-connector 400G QSFP-DD MDA-e-XP	400G, 100G, 40G, 10G	QSFP56-DD (Includes 400G ZR/ZR+), QSFP28-DD, QSFP28, QSFP+	4 x 100G, 2 x 100G, 10 x 10G, 8 x 10G, 4 x 10G	750G / 1.0T	IOM5-e with two MDA-e-XP's 7750 SR-1 with two MDA-e-XP's
12-connector 100G QSFP28 MDA-e-XP	100G, 10G	QSFP28, QSFP+	10 x 10G, 4 x 10G	750G / 2.0T	IOM5-e with two MDA-e-XP's 7750 SR-1 with two MDA-e-XP's
6-connector 100G QSFP28 MDA-e-XP	100G, 40G, 10G	QSFP28, QSFP+	10 x 10G, 4 x 10G	750G / 1.0T	IOM5-e with two MDA-e-XP's 7750 SR-1 with two MDA-e-XP's
16-connector 10/25G SFP28 (MACsec) + 2-connector 100G QSFP28 MDA-e-XP	100G, 25G, 10G	QSFP28, QSFP+, SFP28, SFP+	10 x 10G, 4 x 10G	750G / 2.0T	IOM5-e with two MDA-e-XP's 7750 SR-1 with two MDA-e-XP's
3-connector 400G CFP2-DCO MDA-e-XP	100G	CFP, CFP2-DCO	-	750G /1.0T	IOM5-e with two MDA-e-XP's 7750 SR-1 with two MDA-e-XP's

Note: For 7450 ESS-7 and ESS-12 systems, up to two MDA-e-XP adapters are supported using the 7750 SR IOM5-e

Table 2. Nokia 7750 SR MDA-e-XP maximum density*

MDA-e-XP variants	Speed options	7750 SR-1	7750 SR-7**	7750 SR-12**	7750 SR-12e
6-connector 400G QSFP-DD MDA-e-XP	400G./100G/10G	8/40/120	-	-	72/360/1,080
3-connector 400G QSFP-DD MDA-e-XP	400G./100G/10G	4/20/60	5/50/300	10/100/600	36/180/540
12-connector 100G QSFP28 MDA-e-XP	100G/10G	24/240	-	-	216/2,160
6-connector 100G QSFP28 MDA-e-XP	100G/10G	12/120	60/600	120/1,200	108/1,080
16-connector 10/25T SFP28 (MACsec) + 2-connector 100G QSFP28 MDA-e-XP	10/25G +100G/10G	32 + 4/40	160 + 20/200	320 + 40/400	288 + 36/360
3-connector 400G CFP2-DCO MDA-e-XP	100G	12	30	60	108

*   With intelligent aggregation (IA)   **   The new ess-system-type BOF option allows a 7750 SR-7-B or SR-12-B chassis to operate as a 7450 ESS-7 or ESS-12 chassis

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Table 3. Nokia 7750 SR MDA-e overview

MDA-e variants	Speed options	Optical transceivers	Capacity: Line rate (FD)	IOM support
2-connector 100G QSFP28 MDA-e (MACsec, 4x10G and 4x25G breakouts)	100G, 25G, 40G, 10G	QSFP28, QSFP+	100G	7750 SR: IOM4-e with up to two MDA-e's
				7750 SR-e: IOM-e with up to four MDA-e's
8-port 10/25G SFP28 MDA-e (MACsec)	25G, 10G	SFP28, SFP+	100G	7750 SR: IOM4-e with up to two MDA-e's
				7750 SR-e: IOM-e with up to four MDA-e's
1-port 100G CFP2 MDA-e	100G	CFP2	100G	7750 SR: IOM4-e with up to two MDA-e's
				7750 SR-e: IOM-e with up to four MDA-e's
12-port 10/1G SFP+ MDA-e (MACsec)	10G, 1G	SFP+, SFP	100G	7750 SR: IOM4-e with up to two MDA-e's
				7750 SR-e: IOM-e with up to four MDA-e's
10-port 10G SFP+ MDA-e	10G	SFP+	100G	7750 SR: IOM4-e with up to two MDA-e's
				7750 SR-e: IOM-e with up to four MDA-e's
6-port 10G SFP+ MDA-e	10G, 1G	SFP+, SFP	100G	7750 SR: IOM4-e with up to two MDA-e's
				7750 SR-e: IOM-e with up to four MDA-e's
40-port 1G CSFP/SFP MDA-e	1G	CSFP, SFP	100G	7750 SR: IOM4-e with up to two MDA-e's
				7750 SR-e: IOM-e with up to four MDA-e's

Note: For 7450 ESS-6 and ESS-12 systems, up to two MDA-e adapters are supported using the 7750 SR IOM4-e.

Table 4. Nokia 7750 SR and 7750 SR-e MDA-e maximum density

MDA-e variants	Speed options	7750 SR				7750 SR-e		
		SR-1	SR-7	SR-12	SR-12e	SR-1e	SR-2e	SR-3e
2-connector 100G QSFP28 MDA-e (MACsec, 4x10G and 4x25G breakouts)	100G/25G/10G	-	20/80/80	40/160/160	36/144/144	8/32/32	16/64/64	24/96/96
8-port 10/25G SFP28 MDA-e (MACsec)	10G/25G	-	80	160	144	32	64	96
1-port 100G CFP2 MDA-e	100G	-	10	20	18	4	8	12
12-port 10/1G SFP+ MDA-e (MACsec)	10G/1G	-	120	240	216	48	96	144
10-port 10G SFP+ MDA-e	10G	-	100	200	180	40	80	120
6-port 10G SFP+ MDA-e	10G	-	60	120	108	24	48	72
40-port 1G CSFP/SFP MDA-e	1G	-	400	800	720	160	320	480

Table 5. Nokia 7750 SR MDA-e-XP and MDA-e weights and dimensions

MDA-e-XP and MDA-e variants	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)
8-port 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 MDA-e-XP and MDA-e product and release documentation for system details on dimensions, weights, hardware, safety standards, compliance agency certifications and protocol support.

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, which is celebrating 100 years of innovation.

With truly open architectures that seamlessly integrate into any ecosystem, our high-performance networks create new opportunities for monetization and scale. 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.