Huawei OptiX OSN 9800 and Boards Datasheet

CONTENT

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Overview

Intended for 100G and beyond 100G optical networks, the Huawei OSN 9800 U64/U32/U16 subrack is a next-generation large-capacity OTN product that integrates ASON, OTN, and packet functions. It is applicable to various networks, including super-backbone, backbone, and metro networks.

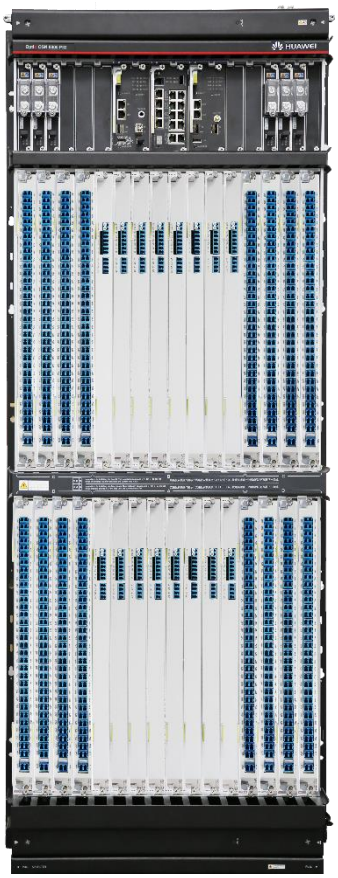
OSN 9800 M24 is a next-generation ultra-large capacity, high integration, and optoelectronic OTN/WDM product developed based on new software and hardware platforms. It is applicable to backbone and metro networks.

OSN 9800 universal platform subrack mainly works with the OSN 9800 U64/U32/U16/M24, which is applied at the electrical layer in WDM and OTN system. Empowered with these features, OSN 9800 universal platform subrack enables end-to-end OTN/WDM backbone transport solutions and implements multi-service, large-capacity, and fully transport transmission.

The OSN 9800 P32 subrack is an ultra-large capacity all-optical cross-connect product. It is mainly used at the backbone core layer and metro aggregation layer. It works with the OSN 9800/1800 to build a complete E2E WDM/OTN backbone transmission solution, achieving transparent and ultra-large capacity transmission.

OptiX OSN 9800 UPS

OptiX OSN 9800 M24



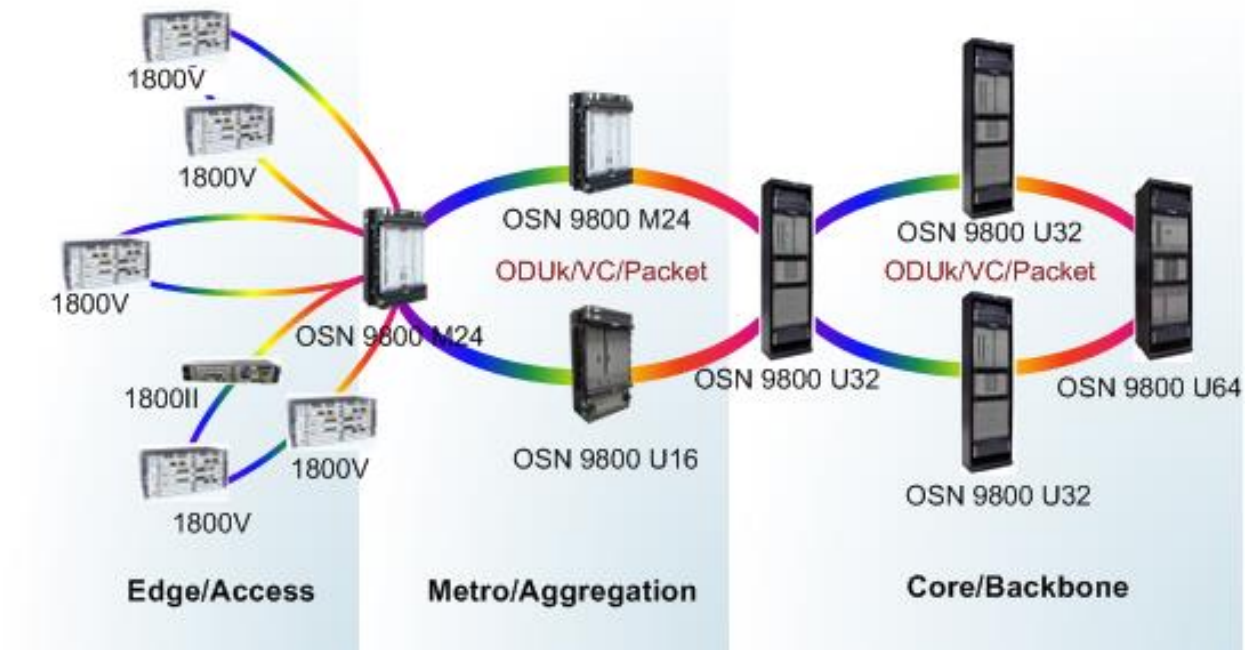
OptiX OSN 9800 P32

OptiX OSN 9800 U16

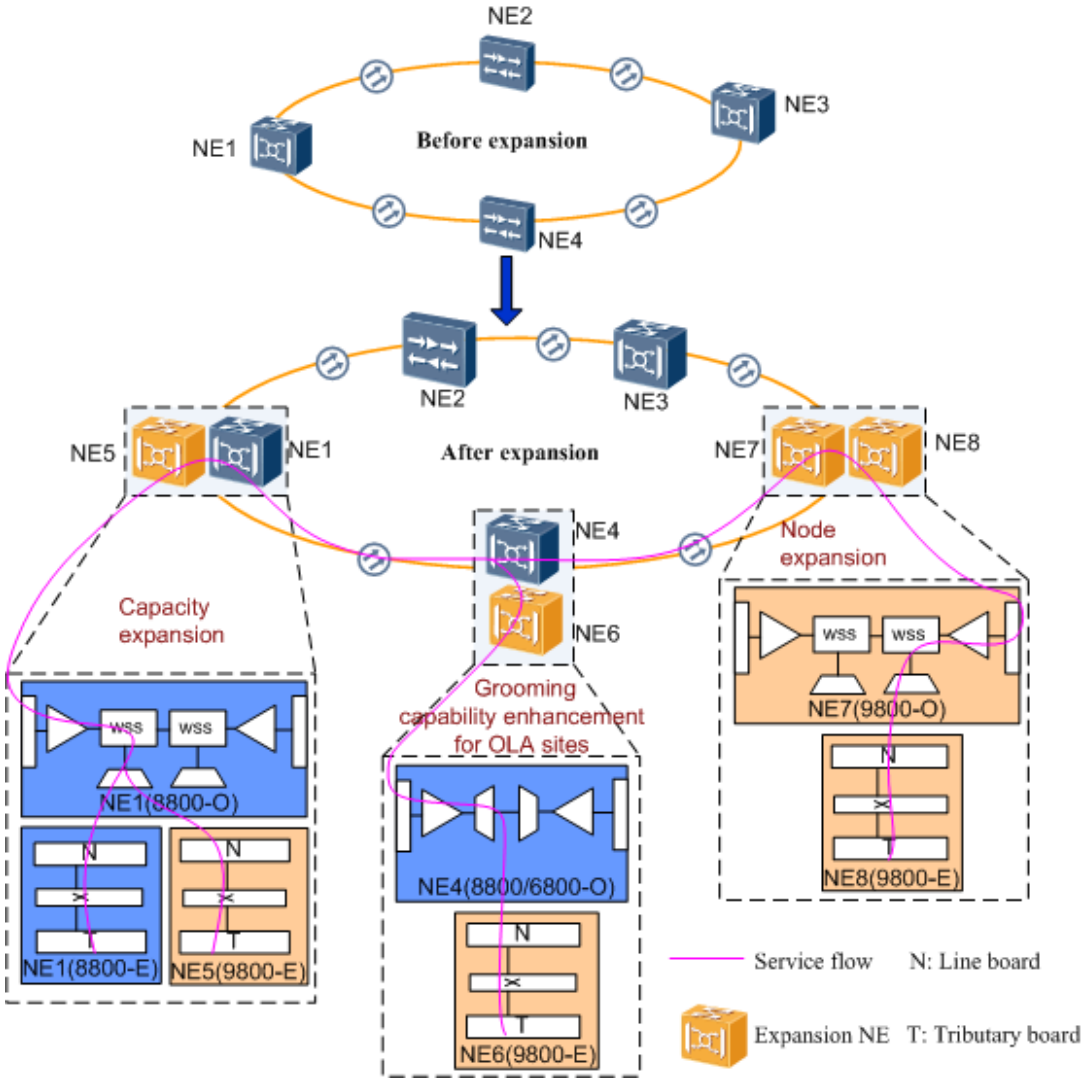
OptiX OSN 9800 U32

OptiX OSN 9800 U64

Role of the OptiX OSN 9800 in a network-wide solution



Hybrid networking with OptiX OSN 9800 and OptiX OSN 8800/6800



Specification

Table 1. Specification of OSN 9800 U64/U32/U16

Specifications	OSN 9800 U64 Standard	OSN 9800 U32 Standard	OSN 9800 U16	OSN 9800 U64 Enhanced	OSN 9800 U32 Enhanced
Subrack dimensions (mm)	2200 (H) x 600 (W) x 600 (D) (the subrack is	1900 (H) x 498 (W) x 295 (D)	847 mm (H) x 442 mm (W) x 295 mm (D)	2200 (H) x 600 (W) x 600 (D) (the subrack is	1900 (H) x 498 (W) x 295 (D)

		integrated into a cabinet)	(without cabinet)	(without cabinet)	integrated into a cabinet)	(without cabinet)
Suitable cabineta		The subrack is integrated into a cabinet, and no additional cabinet needs to be configured.	ETSI 300/600 cabinets, such as N63B and N66B	ETSI 300/600 cabinets, such as N63B and N66B 19-inch cabinet	The subrack is integrated into a cabinet, and no additional cabinet needs to be configured.	ETSI 300/600 cabinets, such as A63B
Number of slots for service boards		64	32	14	64	32
Switching capability	**Optical**	N/A				
	Electrical	25.6 Tbit/s ODUk (k = 0, 1, 2, 2e, 3, 4, flex) 12.8 Tbit/s packet services 10.24 Tbit/s VC-4 160 Gbit/s VC-3/VC-12	12.8 Tbit/s ODUk (k = 0, 1, 2, 2e, 3, 4, flex) 6.4 Tbit/s packet services 5.12 Tbit/s VC-4 160 Gbit/s VC-3/VC-12	5.6 Tbit/s ODUk (k = 0, 1, 2, 2e, 3, 4, flex) 2.8 Tbit/s packet services 1.12 Tbit/s VC-4 80 Gbit/s VC-3/VC-12	64 Tbit/s ODUk (k = 0, 1, 2, 2e, 3, 4, flex) 12.8 Tbit/s packet services 10.24 Tbit/s VC-4 160 Gbit/s VC-3/VC-12	32 Tbit/s ODUk (k = 0, 1, 2, 2e, 3, 4, flex) 6.4 Tbit/s packet services 5.12 Tbit/s VC-4 160 Gbit/s VC-3/VC-12
Max. number of wavelengths		Fixed grid: 96 wavelengths @50 GHz grid Flexible grid: The maximum number of wavelengths is related to the width of the flex channel.				

Center wavelength range		DWDM system: 1529.16 nm to 1567.13 nm (extend C-band, ITU-T G.694.1)	
Max. rate per channel		400 Gbit/s (OTUC4)	
Service type		Synchronous digital hierarchy (SDH)/synchronous optical network (SONET), Ethernet, storage area network (SAN), optical transport network (OTN), and video	
Packet service capacity		Support E-Line/E-LAN (MEF) and VPWS/VPLS (IETF) Support MPLS-TP Number of MPLS tunnel: 64x1024 Number of PW: 64x1024 Number of E-Line: 32x1024 Number of E-LAN: 8x1024	
Line rate		10 Gbit/s, 40 Gbit/s, 100 Gbit/s, 200 Gbit/s and 400 Gbit/s	10 Gbit/s, 100 Gbit/s, 200 Gbit/s and 400 Gbit/s
Supported pluggable optical modules		eSFP, SFP+, XFP, CFP, CXP, CFP2, QSFP28	eSFP, SFP+, CFP, CFP2, QSFP28
Topology		Point-to-point, chain, star, ring, ring-with-chain, tangent ring, intersecting ring, and mesh	
Redundancy and protection	**Equipment level protection**	Power redundancy, fan redundancy, cross-connect board redundancy, communication control and clock processing unit redundancy	
	Network level protection (OTN)	Client 1+1 protection, ODUk SNCP, tributary SNCP, intra-board 1+1 protection, LPT, Port-level M:N protection	Client 1+1 protection, ODUk SNCP, tributary SNCP, intra-board 1+1 protection, LPT

	Network level protection (Packet)	ERPS, LAG, MC-LAG, LMSP, MC-LMSP, MRPS, PW APS, MC-PW APS, Tunnel APS, LPT	LAG, PW APS, Tunnel APS
	Network level protection (OCS)	LMSP, SNCP, Ring MSP	
Optical power management		ALS, IPA, IPA of Raman System	
Synchronization		Synchronous Ethernet clock IEEE 1588v2 ITU-T G.8275.1	
ASON		Electrical-Layer ASON	
TSDN		Online Service Provisioning Survivability Analysis BOD IP and Optical Collaboration	
Submarine features		Supports application of extended C band in submarine scenarios.	
Nominal working voltage		Nominal working voltage: -48V DC/-60V DC Working voltage range: -48 V DC: -40 V to -57.6 V -60 V DC: -48 V to -72 V	

Operation environment	Subrack temperature: Long-term operation: 5°C (41 °F) to 40°C (104 °F) Short-term operationb: -5°C (23 °F) to 45°C (113 °F) Relative humidity: Long-term operation: 5% to 85% Short-term operationb: 5% to 90%	Subrack temperature: Long-term operation: 5°C (41 °F) to 40°C (104 °F) Short-term operationb: -5°C (23 °F) to 50°C (122 °F) Relative humidity: Long-term operation: 5% to 85% Short-term operationb: 5% to 90%	Subrack temperature: Long-term operation: 5°C (41 °F) to 40°C (104 °F) Short-term operationb: -5°C (23 °F) to 45°C (113 °F) Relative humidity: Long-term operation: 5% to 85% Short-term operationb: 5% to 90%
Mean Time To Repair (MTTR)	4 hours		
Mean Time Between Failure (MTBF)	66.83 years		

a: The ETSI/19-inch standard defines only part of the cabinet dimensions. Therefore, the distance between the cabinet column and door plate varies depending on cabinet manufacturers. For details about the dimensions of different subracks, see the detailed description of each subrack.

b: Short-term operation means that the continuous operating time does not exceed 96 hours and the accumulated time per year does not exceed 15 days.

Table 2. Specification of OSN 9800 M24

Specifications		**OSN 9800 M24**
Subrack dimensions (mm)		747.2 mm (H) x 442 mm (W) x 295 mm (D)
Suitable cabineta		ETSI 300/600 cabinets, such as A63B 19-inch cabinet
Number of slots for service boards		1:1 cross-connect mode: 12 large slots or 24 small slots 1:3 cross-connect mode: 10 large slots or 20 small slots NOTE: The M24 subrack supports slot splitting. One 11 U slot of the M24 subrack can be split into two 5.5 U slots.
Switching capability	**Electrical**	1:1 cross-connect mode: 4.8 Tbit/s ODUk 2.4 Tbit/s packet services 1.92 Tbit/s VC-4 80 Gbit/s VC-3/VC-12 1:3 cross-connect mode: 10 Tbit/s ODUk 2 Tbit/s packet services 1.6 Tbit/s VC-4 80 Gbit/s VC-3/VC-12
Max. number of wavelengths		Fixed grid: 96 wavelengths @50 GHz grid

		Flex grid: The maximum number of wavelengths is related to the width of the flex channel.
Wavelength range		1529.16 nm-1567.13 nm (extended C-band, ITU-T G.694.1)
Max. rate per channel		400G bit/s (OTUC4)
Service type		Synchronous digital hierarchy (SDH)/synchronous optical network (SONET), Ethernet, SAN, OTN, video
Packet service capacity		Support E-Line/E-LAN (MEF) and VPWS/VPLS (IETF) Support MPLS-TP Number of MPLS tunnel: 64x1024 Number of PW: 64x1024 Number of E-Line: 32x1024 Number of E-LAN: 8x1024
Line rate		10Gbit/s, 100 Gbit/s, 200G bit/s, 400G bit/s
Supported pluggable optical modules		eSFP, SFP+, TSFP+, CFP, CFP2, QSFP28
Topology		Point-to-point, chain, star, ring, ring-with-chain, tangent ring, intersecting ring, and mesh
Redundancy and protection	**Network level protection (OTN)**	Client 1+1 protection, ODUk SNCP, tributary SNCP, intra-board 1+1 protection, LPT
	Network level protection (Packet)	LAG, PW APS, Tunnel APS
	Network Level Protection (OCS)	LMSP, SNCP, Ring MSP

	Equipment level protection	Power redundancy, fan redundancy, cross-connect board redundancy, communication control and clock processing unit redundancy
Synchronization		Synchronous Ethernet, IEEE 1588v2, ITU-T G.8275.1/G.8273.2
ASON		Electrical-Layer ASON
TSDN		Online Service Provisioning Survivability Analysis BOD IP and Optical Collaboration
Power Supply		Nominal working voltage: -48V DC/-60V DC Working voltage range: -48 V DC: -40 V to -57.6 V -60 V DC: -48 V to -72 V
Operation environment		Subrack temperature: Long-term operation: 0°C to 45°C; Short-term operationb: -5°C to 50°C Relative humidity: Long-term operation: 5% to 85% Short-term operationb: 5% to 90%
Mean Time To Repair (MTTR)		4 hours
Mean Time Between Failure (MTBF)		66.89 years

a: The ETSI/19-inch standard defines only part of the cabinet dimensions. Therefore, the distance between the cabinet column and door plate varies depending on cabinet manufacturers. For details about the dimensions of different subracks, see the detailed description of each subrack.

b: Short-term operation means that the continuous operating time does not exceed 96 hours and the accumulated time per year does not exceed 15 days.

Table 3. Specification of OSN 9800 UPS

Specifications		**OSN 9800 Universal Platform Subrack**
Subrack dimensions (mm)		397 mm (H) x 442 mm (W) x 295 mm (D) (without cabinet)
Suitable cabineta		ETSI 300/600 cabinets, such as N63B and N66B 19-inch cabinet
Number of slots for service boards		DC power supply: 16 AC power supply: 15
Switching capability	**Optical**	1 to 20-degree reconfigurable optical add/drop multiplexer (ROADM)
	Electrical	N/A
Max. number of wavelengths		Fixed grid: 96 wavelengths @50 GHz grid Flex grid: The maximum number of wavelengths is related to the width of the flex channel.
Center wavelength range		DWDM system: 1529.16 nm to 1567.13 nm (extend C-band, ITU-T G.694.1)
Max. rate per channel		400 Gbit/s (OTUC4)
Service type		Synchronous digital hierarchy (SDH)/ synchronous optical network (SONET), Ethernet, storage area network (SAN), optical transport network (OTN), and video

Packet service capacity		N/A
Line rate		2.5 Gbit/s, 10 Gbit/s, 40 Gbit/s, 100 Gbit/s, 200 Gbit/s, 400 Gbit/s
Supported pluggable optical modules		eSFP, SFP+, XFP, CFP, CFP2, QSFP28, QSFP+
Topology		Point-to-point, chain, star, ring, ring-with-chain, tangent ring, intersecting ring, and mesh
Redundancy and protection	**Equipment level protection**	Power redundancy, fan redundancy, system control and communication board redundancy
	Network level protection (OTN)	Optical line protection, client 1+1 protection, SW SNCP, intra-board 1+1 protection, LPT
	Network Level Protection (Packet)	N/A
	Network Level Protection (OCS)	N/A
Optical power management		ALS, AGC, ALC, APE, IPA, IPA of Raman System
Easy O&M		Optical Doctor System(OD), Fiber Doctor System
Synchronization		Synchronous Ethernet clock IEEE 1588v2 ITU-T G.8275.1
ASON		Optical-Layer ASON
TSDN		N/A
Submarine Features		Supports application of extended C band in submarine scenarios.
Power Supply		DC Power Supply:

	Nominal working voltage: -48V DC/-60V DC Working voltage range: -48V DC: -40V to -57.6V -60V DC: -48V to -72V AC Power Supply: Nominal working voltage: 110V AC/220V AC Working voltage range: 90 V to 290 V
Operation Environment	Subrack temperature: Long-term operation: 5°C (41 °F) to 45°C (113 °F) Short-term operationa: -5°C (23 °F) to 55°C (131 °F) Relative humidity: Long-term operation: 5% to 85% Short-term operationa: 5% to 95%
Mean Time To Repair (MTTR)	4 hours
Mean Time Between Failure (MTBF)	50 years

a: The ETSI/19-inch standard defines only part of the cabinet dimensions. Therefore, the distance between the cabinet column and door plate varies depending on cabinet manufacturers. For details about the dimensions of different subracks, see the detailed description of each subrack.

b: Short-term operation means that the continuous operating time does not exceed 96 hours and the accumulated time per year does not exceed 15 days.

Table 4. Specification of OSN 9800 P32

Specifications		**OSN 9800 P32**
Subrack dimensions (mm)		1390 (H) x 496 (W) x 315 (D) (without cabinet)
Suitable cabinet		ETSI 300 cabinets, such as A63B
Number of slots for service boards		32
Switching capability	**Optical**	1 to 32-degree reconfigurable optical add/drop multiplexer (ROADM)
	Electrical	N/A
Max. number of wavelengths		Fixed grid: 96 wavelengths @50 GHz grid Flex grid: The maximum number of wavelengths is related to the width of the flex channel.
Channel spacing		Fixed grid: 50 GHz grid/100 GHz grid Flex grid: Supports channel spacing designs, and the minimum can be set to 6.25 GHz.
Center wavelength range		DWDM system: 1529.16 nm to 1567.13 nm (extend C-band, ITU-T G.694.1)
Topology		Point-to-point, chain, star, ring, ring-with-chain, tangent ring, intersecting ring, and mesh
Redundancy and protection	**Network level protection**	Optical line protection
	Equipment level protection	Power redundancy, fan redundancy, communication control and clock processing unit redundancy
Optical power management		IPA

Easy O&M	Optical Doctor System (OD), Fiber Doctor System (FD)
Synchronization	Synchronous Ethernet clock IEEE 1588v2 ITU-T G.8275.1
Power Supply	Nominal working voltage: -48V DC/-60V DC Working voltage range: -48 V DC: -40 V to -57.6 V -60 V DC: -48 V to -72 V
Operation environment	Subrack temperature: Long-term operation: 5°C (41°F) to 40°C (104°F) Short-term operationba: -5°C (23°F) to 45°C (113°F) Relative humidity: Long-term operation: 5% to 85% Short-term operationa: 5% to 90%
Mean Time To Repair (MTTR)	4 hours
Mean Time Between Failure (MTBF)	64.37 years
a: Short-term operation means that the continuous operating time does not exceed 96 hours and the accumulated time per year does not exceed 15 days.	

Table 5. Service types, service rates, and corresponding service boards supported by the OptiX OSN 9800 U64/U32/U16 Subrack.

Service Category	Service Type	Service Rate	Board	Standard Compliance
SDH	STM-1	155.52 Mbit/s	T130, T210, T220, T230, EC116, S216	ITU-T G.707 ITU-T G.691 ITU-T G.957 ITU-T G.693 ITU-T G.783 ITU-T G.825
	STM-4	622.08 Mbit/s	T130, T210, T220, T230, EC404, S216	
	STM-16	2.5 Gbit/s	T130, T210, T220, T230, S216	
	STM-64	9.95 Gbit/s	T216, T210, T220, T230, G210, G220, S208, S216	
	STM-256	39.81 Gbit/s	T302	
SONET	OC-3	155.52 Mbit/s	T130, T210, T220, T230	GR-253-CORE GR-1377-CORE ANSI T1.105
	OC-12	622.08 Mbit/s	T130, T210, T220, T230	
	OC-48	2.5 Gbit/s	T130, T210, T220, T230	
	OC-192	9.95 Gbit/s	T216, T210, T220, T230, G210, G220	
	OC-768	39.81 Gbit/s	T302	
Ethernet service	FE (optical signal)	Interface rate: 125 Mbit/s Service rate: 100 Mbit/s	T130, T210, T220, T230, T220E, E124, E224	IEEE 802.3u
	FE (electrical signal)	Interface rate: 125 Mbit/s	E124	

		Service rate: 100 Mbit/s		
	GE (optical signal)	Interface rate: 1.25 Gbit/s Service rate: 1 Gbit/s	T130, T210, T220, T230, T220E, E124, E224	IEEE 802.3z
	GE (electrical signal)	Interface rate: 1.25 Gbit/s Service rate: 1 Gbit/s	T130, T210, T220, T230, T220E, E124, E224	
	10GE WAN	9.95 Gbit/s	T216, T210, T220, T230, G210, G220	IEEE 802.3ae
	10GE LAN	10.31 Gbit/s	T216, T210, T220, T230, T220E, E208, E212, G210, G220, E224	
	40GE	41.25 Gbit/s	T302, E302, TNV5T401, TNV5T402, TNV5T404	IEEE 802.3ba
	100GE	103.125 Gbit/s	T401, T402, T404, E401, G402, G404, E402	
	400GE	425 Gbit/s	T601	
SAN service	FDDI	125 Mbit/s	T130, T210, T220, T230	ISO 9314
	ESCON	200 Mbit/s	T130, T210, T220, T230	ANSI X3.296 ANSI X3.230 ANSI X3.303
	FICON	1.06 Gbit/s	T130, T210, T220, T230	
	FICON Express	2.12 Gbit/s	T130, T210, T220, T230	
	FC100	1.06 Gbit/s	T130, T210, T220, T230	

	FC200	2.12 Gbit/s	T130, T210, T220, T230	
	FC400	4.25 Gbit/s	T130, T210, T220, T230	
	FC800	8.5 Gbit/s	T210, T216, T220, T230, G210, G220	
	FC1200	10.51 Gbit/s	T210, T216, T220, T230, G210, G220	
	FC1600	14.025 Gbit/s	T210, T220, T230	
	FICON4G	4.25 Gbit/s	T130, T210, T220, T230	
	FICON8G	8.5 Gbit/s	T210, T216, T220, T230, G210, G220	
OTN service	OTU1	2.67 Gbit/s	T130, T210, T220, T230	ITU-T G.709 ITU-T G.959.1 GR-2918-CORE
	OTU2	10.71 Gbit/s	T216, T210, T220, T230, G210, G220	
	OTU2e	11.10 Gbit/s	T216, T210, T220, T230, G210, G220	
	OTU3	43.02 Gbit/s	T302	
	OTU4	111.81 Gbit/s	T401, T402, T404, G402, G404	
Video service	DVB-ASI	270 Mbit/s	T130, T210, T220, T230	EN 50083-9
	SDI	270 Mbit/s	T130, T210, T220, T230	SMPTE 259M
	HD-SDI	1.49 Gbit/s	T130, T210, T220, T230	SMPTE 292M
	HD-SDIRBR	1.49/1.001 Gbit/s	T130, T210, T220, T230	
	3G-SDI	2.97 Gbit/s	T130, T210, T220, T230	SMPTE 424M
	3G-SDIRBR	2.97/1.001 Gbit/s	T130, T210, T220, T230	

Table 6. Service types, service rates, and corresponding service boards supported by the OptiX OSN 9800 M24 Subrack

Service Category	Service Type	Service Rate	Board	Standards Compliance
SDH	STM-1	155.52 Mbit/s	T212, A212, T206, T210, T220, T230, S216	ITU-T G.707 ITU-T G.691 ITU-T G.957 ITU-T G.693 ITU-T G.783 ITU-T G.825
	STM-4	622.08 Mbit/s		
	STM-16	2.5 Gbit/s		
	STM-64	9.95 Gbit/s		
SONET	OC-3	155.52 Mbit/s	T212, A212, T206 , T210, T220, T230	GR-253-CORE GR-1377-CORE ANSI T1.105
	OC-12	622.08 Mbit/s		
	OC-48	2.5 Gbit/s		
	OC-192	9.95 Gbit/s		
Ethernet service	FE (optical signal)	Interface rate: 125 Mbit/s Service rate: 100 Mbit/s	T212, A212, T206, T210, T220, T230, E224	IEEE 802.3u
	GE (optical signal)	Interface rate: 1.25 Gbit/s Service rate: 1 Gbit/s	T212, A212, T206, T210, T220, T230, E224	IEEE 802.3z

	GE (electrical signal)	Interface rate: 1.25 Gbit/s Service rate: 1 Gbit/s	T212, A212, T206, T210, T220, T230, E224	
	10GE WAN	9.95 Gbit/s	T212, A212, T206, T210, T220, T230	IEEE 802.3ae
	10GE LAN	10.31 Gbit/s	T212, A212, T206, T210, T220, T230, E224	
	40GE	41.25 Gbit/s	TNV5T401, TNV5T402, TNV5T404	IEEE 802.3ba
	100GE	103.125 Gbit/s	G402, G404, M402, TNG1T401 , TNV3T401, TNV3T402 , TNV3T404, TNV5T401, TNV5T402, TNV5T404, E402	
	400GE	425 Gbit/s	T601	
SAN service	FDDI	125 Mbit/s	T212, A212, T206, T210, T220, T230	ANSI X3.296 ANSI X3.230 ANSI X3.303
	ESCON	200 Mbit/s		
	FC100/FICON	1.06 Gbit/s		
	FC200/FICON Express	2.12 Gbit/s		
	FC400/FICON4G	4.25 Gbit/s		
	FC800/FICON8G	8.5 Gbit/s		
	FC1200/FICON 10G	10.51Gbit/s		
	FC1600	14.025Gbit/s		

OTN service	OTU1	2.67 Gbit/s	T212, A212, T206, T210, T220, T230	ITU-T G.709 ITU-T G.959.1 GR-2918-CORE
	OTU2	10.71 Gbit/s		
	OTU2e	11.10 Gbit/s		
	OTU4	111.81Gbit/s	G402, G404, M402, TNG1T401, TNV3T401, TNV3T402, TNV3T404, TNV5T401, TNV5T402, TNV5T404	
Video service	DVB-ASI	270 Mbit/s	T212, A212, T206, T210, T220, T230	EN 50083-9
	SD-SDI	270 Mbit/s		SMPTE 259M
	HD-SDIa	1.49 Gbit/s		SMPTE 292M
	HD-SDIRBR	1.49/1.001 Gbit/s		
	3G-SDIa	2.97 Gbit/s		SMPTE 424M
	3G-SDIRBR	2.97/1.001 Gbit/s		

GE: Gigabit Ethernet

ESCON: enterprise system connection

FICON: Fibre Connect

FC: fiber channel

DVB-ASI: digital video broadcast-asynchronous serial interface

SD-SDI: standard definition-serial digital interface signal. For SMPTE-259M specifically, SD-SDI is also called SDI.

a: According to SMPTE 292M standards, both HD-SDI and 3G-SDI have two rates. The rates of HD-SDI are 1.485 Gbit/s and 1.485/1.001 Gbit/s, and those of 3G-SDI are 2.97 Gbit/s and 2.97/1.001 Gbit/s. The 1/1.001 factor is the parameter that complies with National Transportation Safety Committee (NTSC) standards. NTSC is the analog television system that is widely used in the North America, some Latin America regions, South Korea, Japan, and some Pacific island nations and territories.

Table 7. Service types, service rates, and corresponding service boards supported by the OptiX OSN 9800 universal platform subrack.

Service Category	Service Type	Service Rate	Board	Standard Compliance
SDH	STM-1	155.52 Mbit/s	LOA, TOM, LQM, LWXS	ITU-T G.707 ITU-T G.691 ITU-T G.957 ITU-T G.693 ITU-T G.783 ITU-T G.825
	STM-4	622.08 Mbit/s	LOA, TOM, LQM, LWXS	
	STM-16	2.5 Gbit/s	LOA, TOM, LQM, LWXS, TMX	
	STM-64	9.95 Gbit/s	LDX, LSX, LTX	
	STM-256	39.81 Gbit/s	LSQ, LSXL	
SONET	OC-3	155.52 Mbit/s	LOA, TOM, LQM, LWXS	GR-253-CORE GR-1377-CORE ANSI T1.105
	OC-12	622.08 Mbit/s	LOA, TOM, LQM, LWXS	
	OC-48	2.5 Gbit/s	LOA, TOM, LQM, LWXS, TMX	
	OC-192	9.95 Gbit/s	LDX, LSX, LTX	
	OC-768	39.81 Gbit/s	LSQ, LSXL	
Ethernet service	FE (optical signal)	Interface rate: 125 Mbit/s Service rate: 100 Mbit/s	LOA, TOM, LQM, LWXS	IEEE 802.3u
	GE (optical signal)	Interface rate: 1.25 Gbit/s Service rate: 1 Gbit/s	LOA, LOM, TOM, LQM, LWXS, LOG	IEEE 802.3z

	GE (electrical signal)	Interface rate: 1.25 Gbit/s Service rate: 1 Gbit/s	LOA, LOM, TOM, LQM, LWXS, LOG	
	10GE WAN	9.95 Gbit/s	LDX, LSX, LTX	IEEE 802.3ae
	10GE LAN	10.31 Gbit/s	LDX, LOA, LSX, LTX, LQCP	
	40GE	41.25 Gbit/s	LQCP	IEEE 802.3ba
	100GE	103.125 Gbit/s	LSC, LSCM, LDC, LQCP	
SAN service	ETR	16 Mbit/s	LWXS	IBM GDPS (Geographically Dispersed Parallel Sysplex) Protocol
	CLO	16 Mbit/s		
	FDDI	125 Mbit/s	LOA, TOM, LQM, LWXS	ISO 9314
	ESCON	200 Mbit/s	LOA, TOM, LQM, LWXS	ANSI X3.296 ANSI X3.230 ANSI X3.303
	FICON	1.06 Gbit/s	LOA, LOM, TOM, LQM, LWXS	
	FICON Express	2.12 Gbit/s	LOA, LOM, TOM, LQM, LWXS	
	FC100	1.06 Gbit/s	LOA, LOM, TOM, LQM, LWXS	
	FC200	2.12 Gbit/s	LOA, LOM, TOM, LQM, LWXS	
	FC400	4.25 Gbit/s	LOA, LOM	
	FC800	8.5 Gbit/s	LOA, LTX	
	FC1200	10.51 Gbit/s	LOA, LSX, LTX	

	FC1600	14.025 Gbit/s	LDC	
	FC3200	28.05 Gbit/s	LDC	
	FICON4G	4.25 Gbit/s	LOA, LOM	
	FICON8G	8.5 Gbit/s	LOA	
	FICON10G	10.51 Gbit/s	LOA	
	InfiniBand 2.5G	2.5 Gbit/s	LOAa	InfiniBand TM Architecture Release 1.2.1
	InfiniBand 5G	5 Gbit/s	LOAa, LTX	
	ISC 1G	1.06 Gbit/s	LOM	IBM GDPS (Geographically Dispersed Parallel Sysplex) Protocol
	ISC 2G	2.12 Gbit/s	LOM	
OTN service	OTU1	2.67 Gbit/s	LOA, TOM, TMX	ITU-T G.709 ITU-T G.959.1 GR-2918-CORE
	OTU2	10.71 Gbit/s	LDX, LSX, LTX	
	OTU2e	11.10 Gbit/s	LDX, LSX, LTX	
	OTU3	43.02 Gbit/s	LSQ, LSXL	
	OTU4	111.81 Gbit/s	LSC, LSCM, LDC, LQCP	
Video service	DVB-ASI	270 Mbit/s	LOA, TOM, LQM, LWXS	EN 50083-9
	SDI	270 Mbit/s	LOA, TOM	SMPTE 259M
	HD-SDI	1.49 Gbit/s	LOA, TOM	SMPTE 292M
	HD-SDIRBR	1.49/1.001 Gbit/s	LOA	

	3G-SDI	2.97 Gbit/s	LOA	SMPTE 424M
	3G-SDIRBR	2.97/1.001 Gbit/s	LOA	
a: When InfiniBand 5G and InfiniBand 2.5G services are received on the client side of an LOA02 board, the WDM-side optical signals can be transmitted at a maximum distance of 100 km. When receiving InfiniBand 5G and InfiniBand 2.5G services on the client side, an LOA02 board can only work with TN12OLP and TN13OLP boards to support the bidirectional switching of optical line protection.				

Table 8. Service capabilities supported by the OSN 9800 U64/U32/U16 Subrack.

Service Category	**Service Type**	**Max. Number of Service Inputs Supported by the 9800 U64 Standard Subracka**	**Max. Number of Service Inputs Supported by the 9800 U64 EnhancedSubracka**	**Max. Number of Service Inputs Supported by the 9800 U32 Standard Subracka**	**Max. Number of Service Inputs Supported by the 9800 U32 Enhanced Subracka**	**Max. Number of Service Inputs Supported by the 9800 U 16 Subracka**
SDH	STM-1	1920	1920	960	960	420
	STM-4	1920	1920	960	960	420
	STM-16	1920	1920	960	960	420
	STM-64	1920	1920	960	960	420
	STM-256	128	N/A	64	N/A	28
SONET	OC-3	1920	1920	960	960	420

	OC-12	1920	1920	960	960	420
	OC-48	1920	1920	960	960	420
	OC-192	1920	1920	960	960	420
	OC-768	64	N/A	32	N/A	14
Ethernet service	FE (optical signal)	1920	1920	960	960	420
	GE (optical signal)	1920	1920	960	960	420
	GE (electrical signal)	1920	1920	960	960	420
	10GE WAN	1920	1920	960	960	420
	10GE LAN	1920	1920	960	960	420
	40GE	256	256	128	128	56
	100GE	256	256	128	128	56
	400GE	64	64	32	32	N/A
SAN service	FDDI	1920	1920	960	960	420
	ESCON	1920	1920	960	960	420

	FICON	1920	1920	960	960	420
	FICON Express	1920	1920	960	960	420
	FC100	1920	1920	960	960	420
	FC200	1920	1920	960	960	420
	FC400	1920	1920	960	960	420
	FC800	1920	1920	960	960	420
	FC1200	1920	1920	960	960	420
	FC1600	512	512	256	256	112
	FICON4G	1920	1920	960	960	420
	FICON8G	1920	1920	960	960	420
OTN service	OTU1	1920	1920	960	960	420
	OTU2	1920	1920	960	960	420
	OTU2e	1920	1920	960	960	420
	OTU3	128	N/A	64	N/A	28
	OTU4	256	256	128	128	56
Video service	DVB-ASI	1920	1920	960	960	420
	SDI	1920	1920	960	960	420

	HD-SDI	1920	1920	960	960	420
	HD-SDIRBR	1920	1920	960	960	420
	3G-SDI	1920	1920	960	960	420
	3G-SDIRBR	1920	1920	960	960	420
a: This value only refers to the maximum tributary service capacity when the subrack is fully configured with tributary boards but with no line boards.						

Table 9. Service capabilities supported by the OSN 9800 M24 Subrack

Service Category	**Service Type**	**Max. Number of Service Inputs Supported by the 9800 M24 Subrack**
SDH	STM-1	288
	STM-4	288
	STM-16	288
	STM-64	240
SONET	OC-3	288
	OC-12	288
	OC-48	288
	OC-192	240
Ethernet service	FE (optical signal)	288
	GE (optical signal)	288

	GE (electrical signal)	288
	10GE WAN	240
	10GE LAN	240
	40GE	48
	100GE	48
	400GE	10
SAN service	FDDI	288
	ESCON	288
	FC100/FICON	288
	FC200/FICON Express	288
	FC400/FICON4G	288
	FC800/FICON8G	240
	FC1200/FICON 10G	240
	FC1600	96
OTN service	OTU1	288
	OTU2	240
	OTU2e	240
	OTU4	48
Video service	DVB-ASI	288

	SD-SDI	288
	HD-SDIa	288
	HD-SDIRBR	288
	3G-SDIa	288
	3G-SDIRBR	288
a: This value only refers to the maximum tributary service capacity when the subrack is fully configured with tributary boards but with no line boards.		

Table 10. Service capabilities supported by the OSN 9800 Universal Platform Subrack

Service Category	**Service Type**	**Max. Number of Service Inputs Supported by the 9800 Universal Platform Subrack**
SDH	STM-1	128
	STM-4	128
	STM-16	64
	STM-64	80
	STM-256	8
SONET	OC-3	128
	OC-12	128
	OC-48	64
	OC-192	80
	OC-768	8

Ethernet service	FE (optical signal)	128
	GE (optical signal)	128
	GE (electrical signal)	128
	10GE WAN	80
	10GE LAN	96
	40GE	32
	100GE	32
SAN service	ETR	32
	CLO	32
	FDDI	128
	ESCON	128
	FICON	128
	FICON Express	64
	FC100	128
	FC200	64
	FC400	32
	FC800	80
	FC1200	80
	FC1600	32

	FC3200	32
	FICON4G	32
	FICON8G	16
	FICON10G	16
	InfiniBand 2.5G	32
	InfiniBand 5G	80
	ISC 1G	128
	ISC 2G	64
OTN service	OTU1	64
	OTU2	80
	OTU2e	80
	OTU3	8
	OTU4	32
Video service	DVB-ASI	128
	SDI	128
	HD-SDI	64
	HD-SDIRBR	64
	3G-SDI	32
	3G-SDIRBR	32

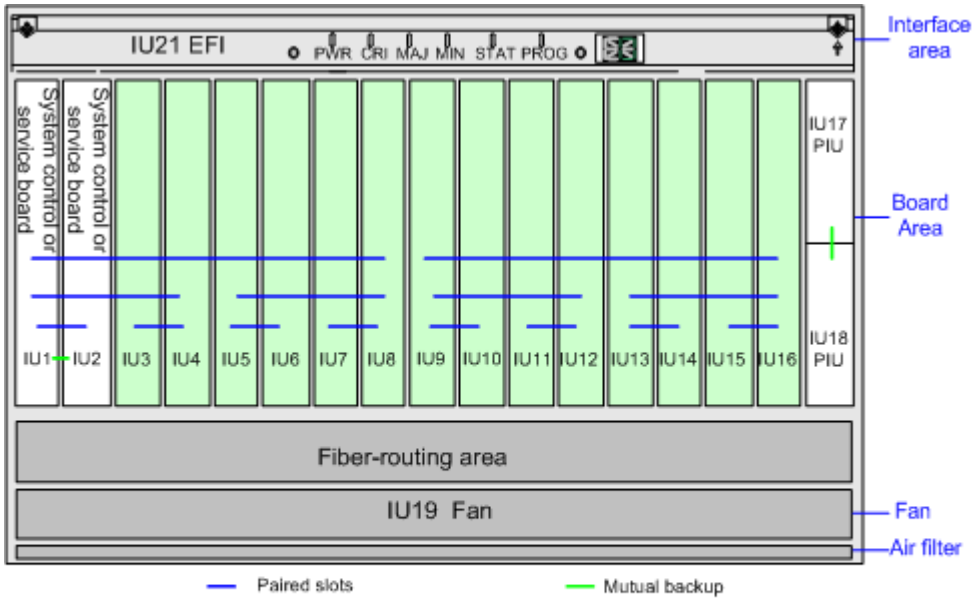
a: This value only refers to the maximum tributary service capacity when the subrack is fully configured with tributary boards but with no line boards.

OptiX OSN 9800 UPS Chassis

Subrack Areas and Slots

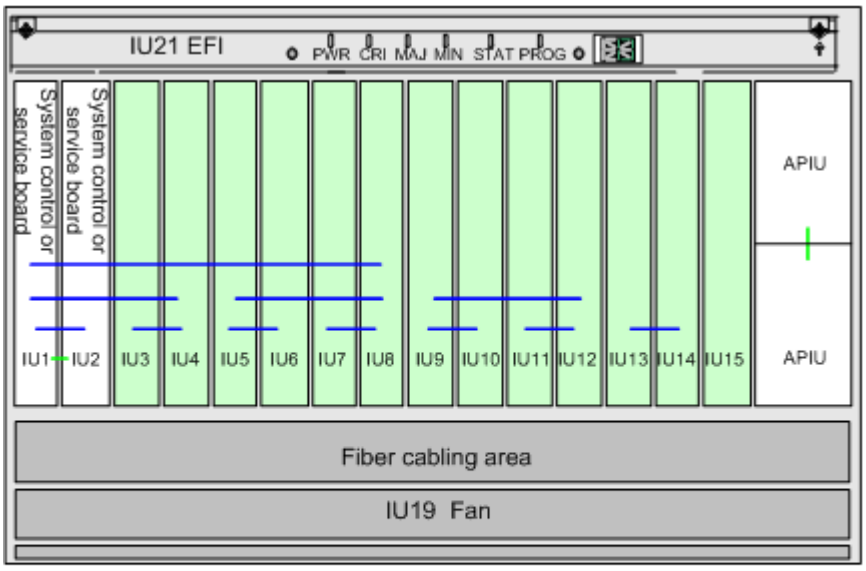
Boards need to be installed in the designated slots in the subrack. The subrack includes the following areas: interface area, board area, fiber-routing area, and fan area.

Slots of the subrack (DC power supply)



For one-slot boards, the paired slots must be configured as follows: slots IU1 and IU2, slots IU3 and IU4, and so on.
For two-slot boards, the paired slots must be configured as follows: slots IU1 to IU2 and slots IU3 to IU4, slots IU5 to IU6 and slots IU7 to IU8, and so on.
For four-slot boards, the paired slots must be configured as follows: slots IU1 to IU4 and slots IU5 to IU8, slots IU9 to IU12 and slots IU13 to IU16.

Slots of the subrack (AC power supply)



For one-slot boards, the paired slots must be configured as follows: slots IU1 and IU2, slots IU3 and IU4, ---, slots IU13 and IU14.
For two-slot boards, the paired slots must be configured as follows: slots IU1 to IU2 and slots IU3 to IU4, slots IU5 to IU6 and slots IU7 to IU8, slots IU9 to IU10 and slots IU11 to IU12.
For four-slot boards, the paired slots must be configured as follows: slots IU1 to IU4 and slots IU5 to IU8.

Pair slots refer to a pair of slots whose resident boards' overhead can be processed by the buses on the backplanes.
Interface area: The EFI board provides maintenance and management interfaces.

Board area: IU1 to IU16 (DC power supply) or IU1 to IU15 (AC power supply) are reserved for the service boards.

- When a universal platform subrack serves as a master subrack, the subrack can be provisioned with two SCC boards.
  - When two SCC boards are provisioned, they are in mutual backup and are inserted in slots IU1 and IU2.
- When the universal platform subrack serves as a slave subrack, the SCC board is not required. In this case, slots IU1 and IU2 are used to hold service boards.
- When the universal platform subrack needs to use the IEEE 1588v2 or physical clock synchronization function, STG board must be configured. Two STG boards need to be configured. The two STG boards work in active/standby mode and are inserted in slots IU3 and IU4.

Fiber-routing area: Fiber jumpers from the ports on the front panel of each board are routed to the fiber cabling area before being routed on a side of the cabinet.

NOTE:

The IEEE 1588v2 or physical clock synchronization function is not supported by all services boards or ST2 boards in slots 3 and 4 in an OSN 9800 universal platform subrack.

Mechanical Specifications

Table 11. The mechanical specifications of the OptiX OSN 9800 universal platform subrack.

Parameter	Specifications
Dimensions (W x D x H)	442 mm×295mm×397mm
Weighta	8 kg
a: The weight is measured when the subrack has no boards or fan tray assemblies installed.	

OptiX OSN 9800 M24 Chassis

Subrack Areas and Slots

When the M24 subrack works in 1:1 or 1:3 cross-connect mode, boards need to be installed in the designated slots in the subrack.

Schematic diagram of the areas and slots in the OptiX OSN 9800 M24 subrack(1:1 cross-connect mode)

The subrack includes the following areas: power and interface area, fan area, fiber-routing area, service board area, and system control and cross-connect board area.

Schematic diagram of the areas and slots in the OptiX OSN 9800 M24 subrack(1:1 cross-connect mode)

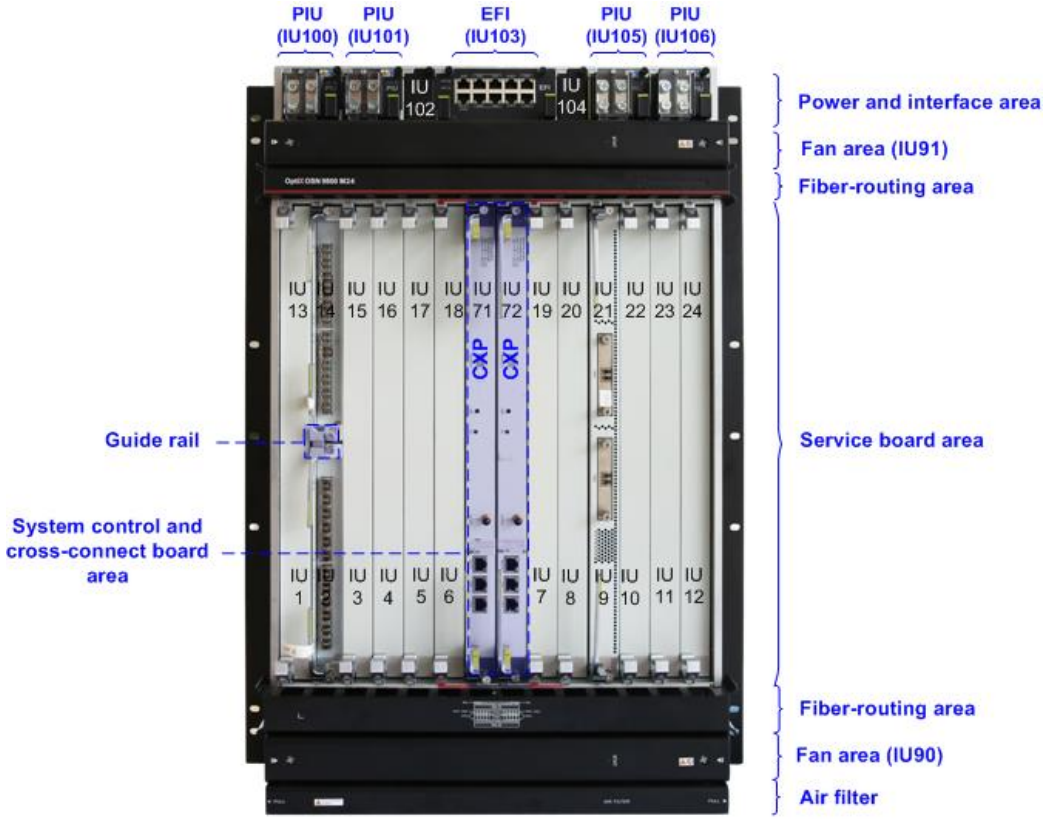


Table 12. Descriptions of the areas and slots in the OptiX OSN 9800 M24 subrack(1:1 cross-connect mode)

Area	Composition	Slot	Function
Power and interface area	4 PIU boards 1 EFI board	PIU: IU100-IU101, IU105-IU106 EFI: IU103 IU102/IU104: reserved	The PIU boards are in mutual backup. Therefore, the failure of any power input to the equipment does not affect the normal operation of the equipment. NOTE: The PIU boards on the left and right sides are in mutual backup, for example, the PIU boards in slots IU100 and IU105, the PIU boards in slots IU101 and IU106, and so on.

			The EFI board provides maintenance and management interfaces. The EFI board is powered by the CXP board.
Fan areas	2 fan tray assemblies	Lower portion: IU90 Upper portion: IU91	The fan tray assemblies are used to ventilate the equipment.
Fiber-routing areas	2 fiber troughs	N/A	Fiber patch cords connecting to boards are routed to the left or right side of the equipment through the upper- and lower-side fiber troughs.
Service board areas	24 x 5.5 U service boards 12 x 11 U service boards	Lower portion: IU1-IU6, IU7-IU12 Upper portion: IU13-IU18, IU19-IU24	Service boards need to be configured based on the service plan and all of them are installed in the two service board areas. A slot splitter is used to split one 11 U slot into two 5.5 U slots. Guide rails describes the guide rails. NOTE: Service boards installed in slots have their ejector levers on the left sides of the board front panels. You are advised to install service boards in the outer slots first. In this manner, if the cross-connect mode needs to be upgraded to 1:3, the CXCS boards can be installed in slot IU6/IU7/IU18/IU19.
System control and cross-connect board area	Two CXP boards	IU71-IU72	Function: They manage and provide clock signals for all other boards in the subrack, implement inter-NE communication, and provide cross-connections and service grooming between service boards. Protection:

			Two CXP boards work in 1+1 backup mode to provide system control and communication functions. The cross-connect units support load sharing.

Schematic diagram of the areas and slots in the OptiX OSN 9800 M24 subrack(1:3 cross-connect mode)

The subrack includes the following areas: power and interface area, fan area, fiber-routing area, service board area, and system control and cross-connect board area.

Schematic diagram of the areas and slots in the OptiX OSN 9800 M24 subrack(1:3 cross-connect mode)

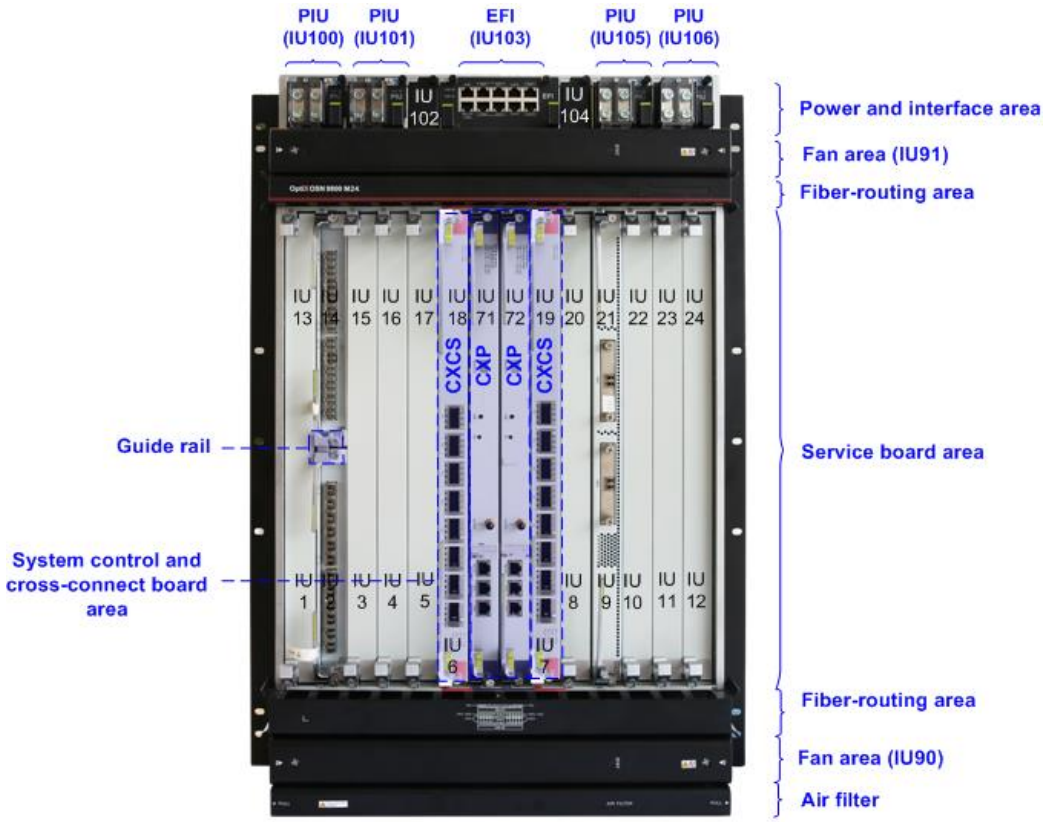


Table 13. Descriptions of the areas and slots in the OptiX OSN 9800 M24 subrack(1:3 cross-connect mode)

Area	Composition	Slot	Function
Power and interface area	4 PIU boards 1 EFI board	PIU: IU100-IU101, IU105-IU106 EFI: IU103 IU102/IU104: reserved	The PIU boards are in mutual backup. Therefore, the failure of any power input to the equipment does not affect the normal operation of the equipment. NOTE: The PIU boards on the left and right sides are in mutual backup, for example, the PIU boards in slots IU100 and IU105, the PIU boards in slots IU101 and IU106, and so on. The EFI board provides maintenance and management interfaces. The EFI board is powered by the CXP board.
Fan areas	2 fan tray assemblies	Lower portion: IU90 Upper portion: IU91	The fan tray assemblies are used to ventilate the equipment.
Fiber-routing areas	2 fiber troughs	N/A	Fiber patch cords connecting to boards are routed to the left or right side of the equipment through the upper- and lower-side fiber troughs.
Service board areas	20 x 5.5 U service boards 10 x 11 U service boards	Lower portion: IU1-IU5, IU8-IU12 Upper portion: IU13-IU17, IU20-IU24	Service boards need to be configured based on the service plan and all of them are installed in the two service board areas. A slot splitter is used to split one 11 U slot into two 5.5 U slots. NOTE: Service boards installed in slots have their ejector levers on the left sides of the board front panels.

System control and cross-connect board area	Two CXP boards Two CXCS boards	CXP: IU71-IU72 CXCS: (IU6, IU18), (IU7, IU19)	Function: Two CXP boards manage and provide clock signals for all other boards in the subrack, implement inter-NE communication. Two CXP boards and two CXCS boards provide cross-connections and service grooming between service boards. Protection: Two CXP boards work in 1+1 backup mode to provide system control and communication functions. The cross-connect units support load sharing.

Cross-Connect Capacities

This topic describes the cross-connect capacity of a service slot and the subrack.

An OptiX OSN 9800 M24 subrack supports grooming of ODUk (k = 0, 1, 2, 2e, 3, 4, flex) services, VC-3/VC-4/VC-12 services, and packet services. The cross-connect capacity of the Slots IU1-IU6, IU7-IU18, IU19-IU24 is as follows.

Table 14. Configuration and cross-connect capacity

Subrack Type	Work Mode	Maximum Cross-Connect Capacity of Each Large Slot				Maximum Cross-Connect Capacity of Subrack			
		ODUk	VC-4	VC-3/VC-12a	Packet	ODUk	VC-4	VC-3/VC-12	Packet
9800 M24	In the 1:1 mode	400 Gbit/s	160 Gbit/s	80 Gbit/s	200 Gbit/s	4.8 Tbit/s	1.92 Tbit/s	80 Gbit/s	2.4 Tbit/s

	In the 1:3 mode	1 Tbit/s	160 Gbit/s	80 Gbit/s	200 Gbit/s	10 Tbit/s	1.6 Tbit/s	80 Gbit/s	2 Tbit/s
a: All service slots share VC-3/VC-12 cross-connections. The maximum cross-connect capacity of a single slot or the entire subrack is 80 Gbit/s.									

Mechanical Specifications

Table 15. The mechanical specifications of the OptiX OSN 9800 M24 subrack.

Parameter	**9800 M24 Specifications**
Dimensions (H x W x D)	747.2 mm x 442 mm x 295 mm
Weighta	26.49 kg
Standard working voltage	–48 V or –60 V DC power input
Operation Environment	Long-term running operation temperature: 0°C to +45°C Short-term running operation temperatureb: -5°C to +50°C
Mounting option	Mounted in a 19-inch or 21-inch cabinet
a: There are no boards in the board area, and no PIU or EFI boards in the power supply and interface area. In addition, there are no fan tray assemblies in each subrack. b: A short term refers to a maximum of 96 consecutive operating hours and the total time of short-term operating in a year cannot exceed 15 days.	

OptiX OSN 9800 P32 Chassis

Subrack Areas and Slots

Boards need to be installed in the designated slots in a subrack. The subrack runs on -48 V DC or -60 V DC.

The equipment includes the following areas: the power supply, system control, optical supervisory, and interface area, fan area, fiber routing area, and service board area. PIU boards are located in the power supply, system control, optical supervisory, and interface area. If an area has the same background color as a PIU board, the PIU board powers the boards located in this area.

Schematic diagram of the areas and slots in the OptiX OSN 9800 P32 subrack

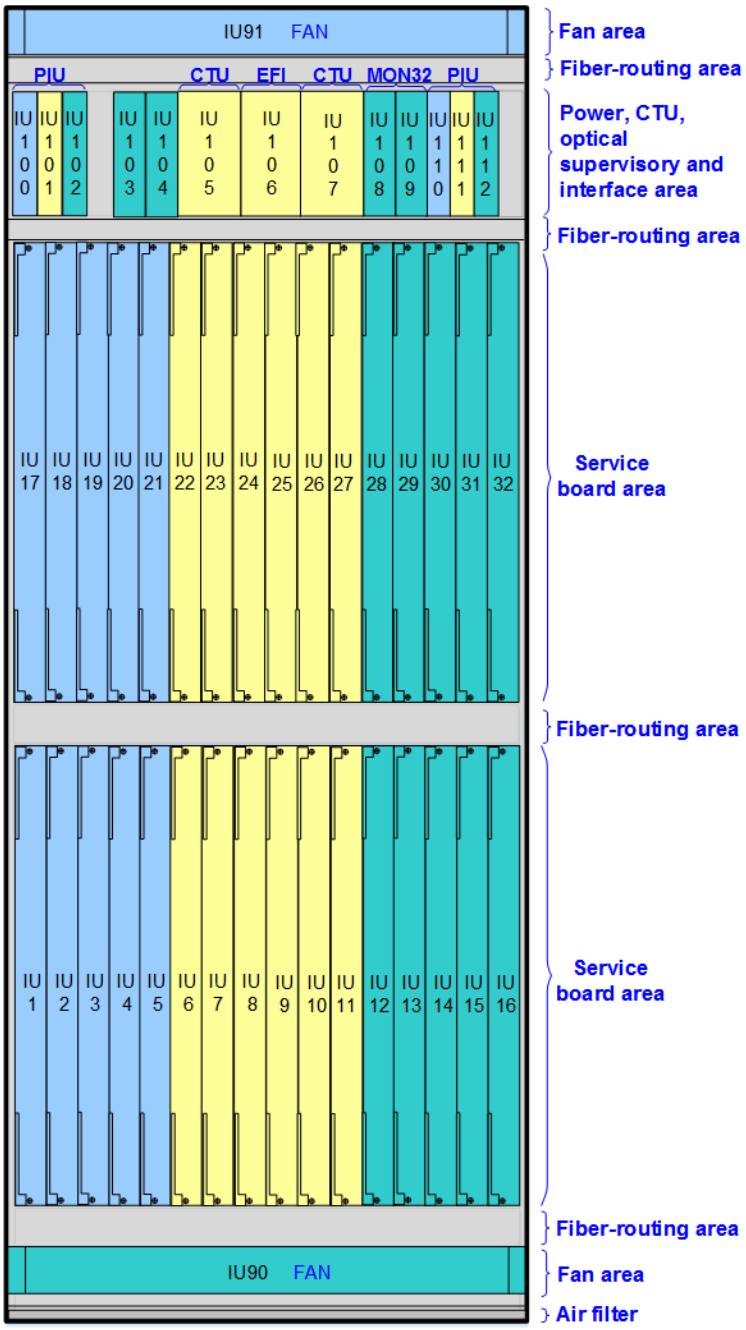


Table 16. Descriptions of the areas and slots in the OptiX OSN 9800 P32 subrack

Area	Composition	Slot	Function
Power supply, system control, optical supervisory, and interface area	6 PIU boards (PIU) 2 CTU system control boards (TMP1CTU) 1 EFI board (TMP1EFI) 1 spectrum analyzer boards (TMP1MON32)	PIU: IU100-IU102, IU110-IU112 CTU: IU105, IU107 EFI: IU106 MON32: IU108-IU109 Reserved slots: IU103-IU104	The PIU boards are in mutual backup. Therefore, the failure of any power input to the equipment does not affect the normal operation of the equipment. NOTE: The PIU boards on the left and right sides of the EFI board are in mutual backup, for example, the PIU boards in slots IU100 and IU110, the PIU boards in slots IU101 and IU111, and the PIU boards in slots IU102 and IU112. The system control boards are configured in 1+1 backup mode. The system control board manages and provides a clock to all other boards in the equipment. It also provides for inter-NE communication. The EFI board provides maintenance and management interfaces.

			The MON32 board detects the insertion loss between the board and the backplane and detects the single-wavelength optical power of optical signals in line directions.
Fan areas	2 fan tray assemblies (TMP1FAN)	Lower portion: IU90 Upper portion: IU91	The fan tray assemblies are used to ventilate the equipment.
Fiber-routing areas	4 fiber troughs	N/A	Fiber patch cords connecting to boards are routed to the left or right side of the equipment through the upper- and lower-side fiber troughs.

Service board areas	32 service boards	Lower portion: IU1–IU16 Upper portion: IU17–IU32	Service boards need to be configured based on the service plan and all of them are installed in the two service board areas. NOTE: To insert service boards into a P32 subrack, certain requirements must be met, see Requirements for Inserting Service Boards in a Subrack.

Requirements for Inserting Service Boards in a Subrack

To ensure that service grooming is normal and fiber routing is convenient, service boards must be inserted into the subrack in accordance with certain requirements.

To insert service boards into the 9800 P32 subrack, the following requirements must be met:

- The sequence of installing optical tributary boards is D->C->B->A. That is, you can insert boards in the next area only after all slots of area D are fully inserted with boards.
- The sequence of installing optical line boards is A->B->C->D. That is, you can insert boards in the next area only after all slots of area A are fully inserted with boards.

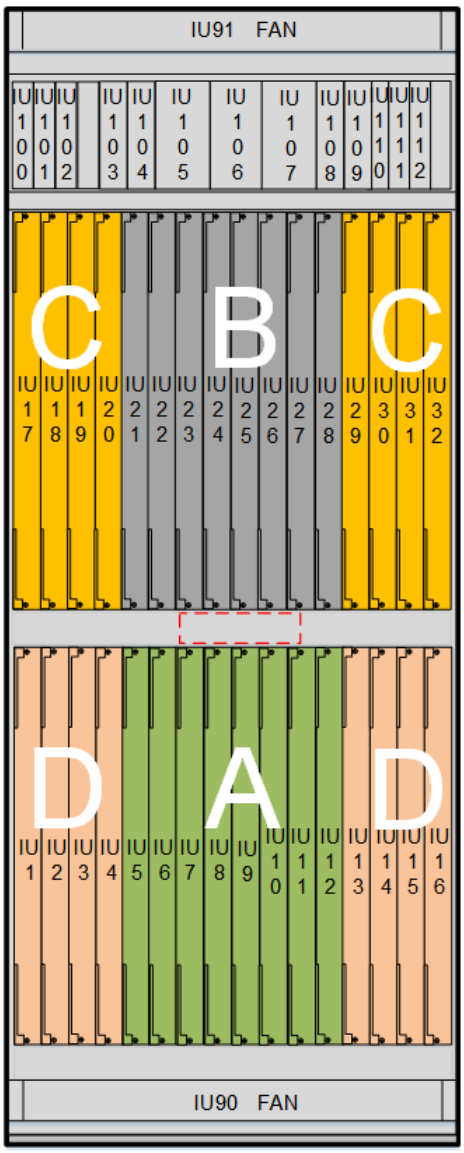
When the preceding board installation sequence is met:

- Because there are a large number of optical fibers on the front panels of optical tributary boards, to facilitate future expansion using optical fibers, install the optical tributary boards from edge side to the middle in sequence. Example: During the installation in area D, if there are two OT3232 optical tributary boards, you need to select the area with the most convenient fiber routing according to the actual environment. Assume that the left-side area D is selected. Preferentially use slots IU1 and IU2, and then use slots IU3 and IU4 in sequence. Assume that the right-side area D is selected. Preferentially use slots IU16 and IU15. Other areas comply with the same rules.
- Because there are a few optical fibers on the front panels of optical line boards, install the optical line boards in each area from left to right. Example: If there are three optical line boards, preferentially install the three optical line boards in slots IU5-IU7 of area A from left to right in sequence. If new optical line boards need to be installed, install them from left to right in sequence until area A is full. Other areas comply with the same rules.

NOTE:

Slots D and C on the left and right sides are the same. There is no requirement on the sequence of installing boards in the two slots.

Slots for installing service boards in the OptiX OSN 9800 P32 subrack



NOTE:

The cable trough in the middle of the subrack is printed with the requirements for inserting service boards.

Mechanical Specifications

Table 17. The mechanical specifications of the OptiX OSN 9800 P32 subrack.

Item	**OptiX OSN 9800 P32 subrack**
Dimensions (H x W x D)	1390 mm x 496 mm x 315 mm
Weighta	82 kg
Standard working voltage	–48 V or –60 V DC power input
Operation Environment	Long-term running operation temperature: 5°C to +40°C Short-term running operation temperatureb: -5°C to +45°C
Mounting option	Mounted in an ETSI 300 A63B cabinet
a: The weight is measured when the equipment has no boards or fan tray assemblies installed. b: A short term refers to a maximum of 96 consecutive operating hours and the total time of short-term operating in a year cannot exceed 15 days.	

OptiX OSN 9800 U16 Chassis

Subrack Areas and Slots

Boards need to be installed in the designated slots in a subrack. The subrack runs on -48 V DC or -60 V DC and is divided into multiple areas in which boards are powered by designated PIU boards in different slots. The subrack can be installed in an ETSI cabinet or a 19-inch cabinet.

If an area has the same background color as a PIU board, then the PIU board powers the boards located in this area.

Schematic diagram of the areas and slots in the OptiX OSN 9800 U16 subrack

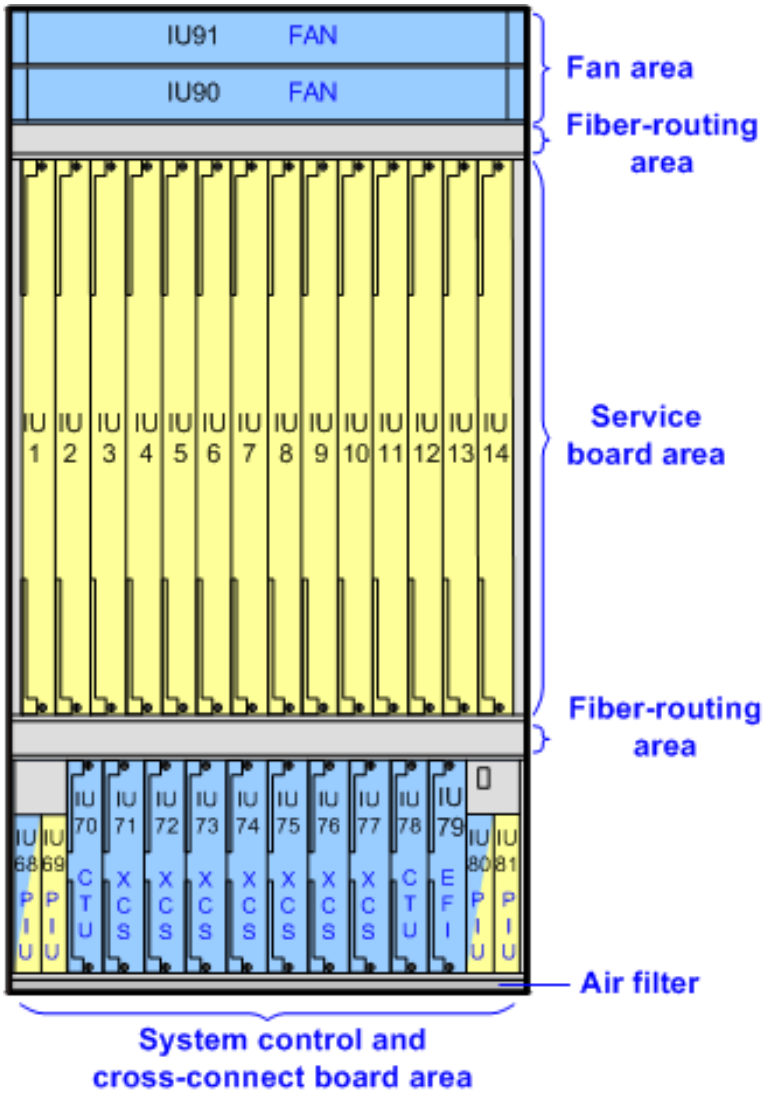


Table 18. Descriptions of the areas and slots in the OptiX OSN 9800 U16 subrack

Area	Composition	Slot	Function
System control and cross-connect	4 PIU boards	IU68, IU69, IU80, IU81	They supply power to the subrack. The PIU boards in slots IU68 and IU80, and the PIU boards in slots IU69 and IU81 are in mutual backup. Therefore, the failure of any power input to the subrack does not affect the normal operation of the subrack.

board area	1 EFI board	IU79	The EFI board provides maintenance and management interfaces.
	2 CTU boards	IU70, IU78	The CTU boards manage the subrack, provide clock for service boards, and implement inter-NE communication. Two CTU boards are configured for mutual backup.
	7 cross-connect boards (TNS1XCS/TNS1UXCS/TNV1SXCL)	IU71-IU77	The cross-connect boards groom services between service boards. Cross-connect boards are configured in M:N backup mode. When a U16 subrack is used as a pure regeneration subrack, no cross-connect board is required.
Fan area	2 fan tray assemblies	IU90, IU91	Fan tray assemblies are used to ventilate the equipment.
Fiber-routing areas	2 fiber troughs	N/A	Fiber patch cords connecting to boards are routed to the left or right side of the equipment through the upper- and lower-side fiber troughs.
Service board area	14 service boards	IU1-IU14	Service boards need to be configured based on the service plan and all of them are installed in the service board area.

Cross-Connect Capacities

This topic describes the maximum cross-connect capacity of a service slot and an OptiX OSN 9800 U16 subrack.

An OptiX OSN 9800 U16 subrack supports grooming of ODUk (k = 0, 1, 2, 2e, 3, 4, flex) services, packet services and VC-3/VC-4/VC-12 services. Slots IU1-IU14 provide the same cross-connect capacity.

- For ODUk services, each service slot supports a maximum cross-connect capacity of 400 Gbit/s, and the subrack provides a maximum cross-connect capacity of 5.6 Tbit/s.
- For packet services, each service slot supports a maximum cross-connect capacity of 200 Gbit/s and the subrack provides a maximum cross-connect capacity of 2.8 Tbit/s.

- For VC-4 services, each service slot supports a maximum cross-connect capacity of 80 Gbit/s and the subrack provides a maximum cross-connect capacity of 1.12 Tbit/s.
- For VC-3/VC-12 services, the subrack supports a maximum cross-connect capacity of 80 Gbit/s.

Mechanical Specifications

Table 19. The mechanical specifications of the OptiX OSN 9800 U16 subrack.

Item	Mechanical Specifications
Dimensions (H x W x D)	847 mm (33.3 in.) x 442 mm (17.4 in.) x 295 mm (11.6 in.)
Weight a	40 kg (88.2 lb)
a: indicates the weight of an empty subrack. An empty subrack is equipped with no boards, fan tray assembly, or air filter.	

OptiX OSN 9800 U32 Chassis

Subrack Areas and Slots

Boards need to be installed in the designated slots in the subrack. The subrack runs on -48 V DC or -60 V DC and is divided into different areas in which boards are powered by designated PIU boards in different slots.

The subrack includes the following areas: indicator area, power and interface area, fan area, fiber-routing area, service board area, and system control and cross-connect board area. PIU boards are located in the power and interface area. If an area has the same background color as a PIU board, then the PIU board powers the boards located in this area.

Schematic diagram of the areas and slots in the 9800 U32 subrack

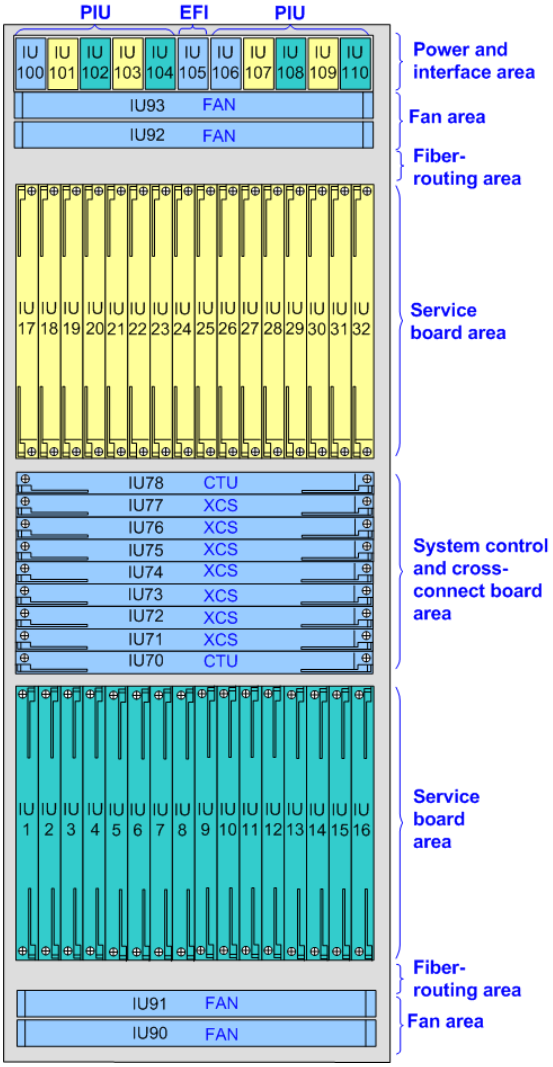


Table 20. Descriptions of the areas and slots in the OptiX OSN 9800 U32 subrack

Area	Composition	Slot	Function
Power and interface area	1 EFI board and 10 PIU boards	PIU: IU100-IU104, IU106-IU110 EFI: IU105	The PIU boards are in mutual backup. Therefore, the failure of any power input to the equipment does not affect the normal operation of the equipment. NOTE: The PIU boards on the left and right sides of the EFI board are in mutual backup, for example, the PIU

			boards in slots IU100 and IU106, the PIU boards in slots IU101 and IU107, and so on. The EFI board provides maintenance and management interfaces.
Fan areas	4 fan tray assemblies	Lower portion: IU90, IU91 Upper portion: IU92, IU93	The fan tray assemblies are used to ventilate the equipment.
Fiber-routing areas	2 fiber troughs	N/A	Fiber patch cords connecting to boards are routed to the left or right side of the subrack through the upper- and lower-side fiber troughs.
Service board areas	32 service boards	Lower portion: IU1-IU16 Upper portion: IU17-IU32	Service boards need to be configured based on the service plan and all of them are installed in the two service board areas. NOTE: Service boards installed in slots IU1-IU16 have their ejector levers on the right sides of the board front panels. Service boards installed in remaining slots in the two areas have their ejector levers on the left sides of the board front panels.
System control and cross-connect board area	2 CTU system control boards and 7 XCS cross-connect boards	XCS: IU71-IU77 CTU: IU70, IU78	Cross-connect boards are configured in M:N backup mode. The cross-connect boards provide cross-connections for service boards. The system control boards are configured in 1+1 backup mode. The active system control board manages and provides a clock to all other boards in the equipment. It also provides for inter-NE communication.

			When a U32 subrack is used as a pure regeneration subrack, no cross-connect board is required.

Cross-Connect Capacities

This topic describes the cross-connect capacity of a service slot and an OptiX OSN 9800 U32 subrack.

An OptiX OSN 9800 U32 subrack supports grooming of ODUk (k = 0, 1, 2, 2e, 3, 4, flex) services, packet services and VC-3/VC-4/VC-12 services. Slots IU1-IU32 provide the same cross-connect capacity.

- For ODUk services, each service slot supports a maximum cross-connect capacity of 400 Gbit/s, and the subrack provides a maximum cross-connect capacity of 12.8 Tbit/s.
- For packet services, each service slot supports a maximum cross-connect capacity of 200 Gbit/s and the subrack provides a maximum cross-connect capacity of 6.4 Tbit/s.
- For VC-4 services, each service slot supports a maximum cross-connect capacity of 80 Gbit/s and the subrack provides a maximum cross-connect capacity of 2.56 Tbit/s.
- For VC-3/VC-12 services, the subrack supports a maximum cross-connect capacity of 80 Gbit/s.

Mechanical Specifications

Table 21. The mechanical specifications of the OptiX OSN 9800 U32 subrack

Item	Specification
Dimensions (H x W x D)	1900 mm x 498 mm x 295 mm
Weighta	68 kg
a: The weight is measured when the subrack has no boards or fan tray assemblies installed.	

OptiX OSN 9800 U64 Chassis

Subrack Areas and Slots

The OptiX OSN 9800 U64 equipment has integrated the OptiX OSN 9800 U64 subrack in a cabinet and provides board slots on both the front and rear sides. Boards need to be installed in the designated slots. The equipment runs on -48 V DC or -60 V DC and is divided into different areas in which boards are powered by designated PIU boards in different slots.

The equipment includes the following areas: indicator area, power and interface area, fan area, fiber-routing area, service board area, and system control and cross-connect board area. PIU boards are located in the power and

interface area. If an area has the same background color as a PIU board, then the PIU board powers the boards located in this area.

Schematic diagram of the areas and slots in the OptiX OSN 9800 U64 subrack

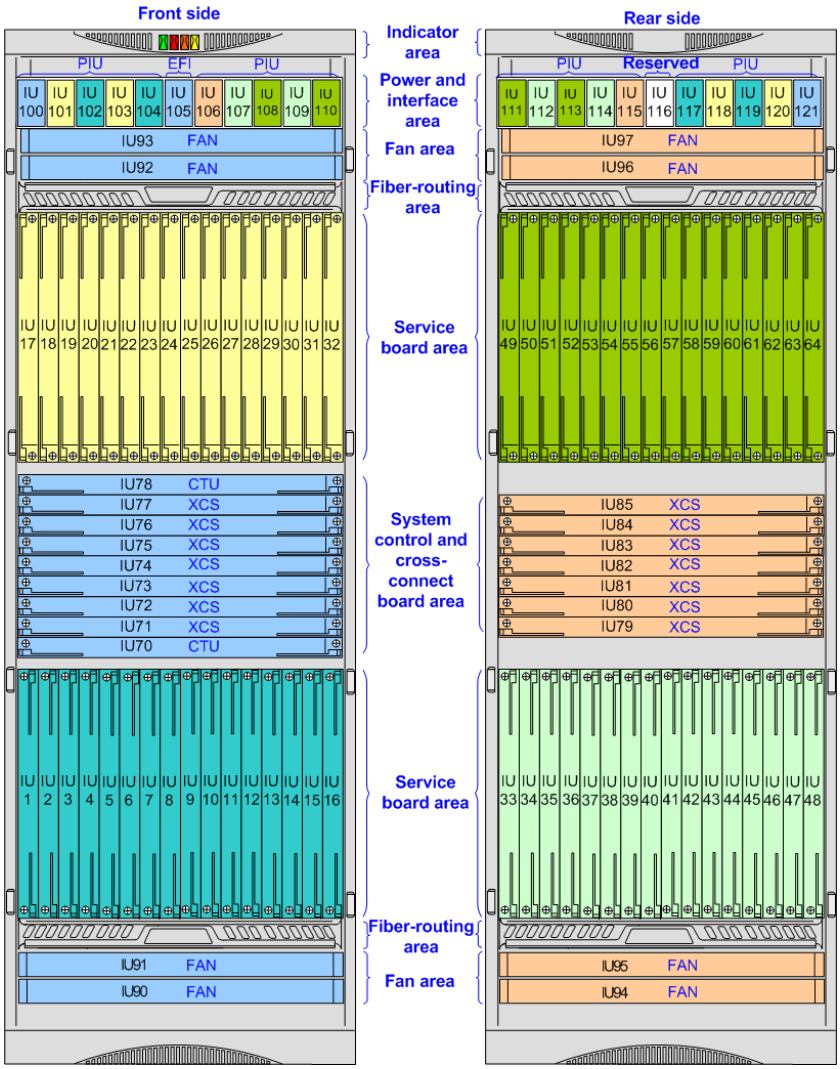


Table 22. Descriptions of the areas and slots in the OptiX OSN 9800 U64 subrack

Area		Composition	Slot	Function
Power and	Front	1 EFI board and 10 PIU boards	PIU: IU100-IU104, IU106-IU110 EFI: IU105	The PIU boards on the front and rear sides are in mutual backup. Therefore, the failure of any power input to the equipment does not

interface area	Rear	10 PIU boards	PIU: IU111-IU115, IU117-IU121 IU116: reserved	affect the normal operation of the equipment. NOTE: The PIU boards installed back-to-back are in mutual backup, for example, the PIU boards in slots IU100 and IU121, the PIU boards in slots IU101 and IU120, and so on. The EFI board provides maintenance and management interfaces.
Fan areas	Front	4 fan tray assemblies	Lower portion: IU90, IU91 Upper portion: IU92, IU93	The fan tray assemblies are used to ventilate the equipment.
	Rear	4 fan tray assemblies	Lower portion: IU94, IU95 Upper portion: IU96, IU97	
Fiber-routing areas	Front	2 fiber troughs	N/A	Fiber patch cords connecting to boards are routed to the left or right side of the equipment through the upper- and lower-side fiber troughs.
	Rear	2 fiber troughs		
Service board areas	Front	32 service boards	Lower portion: IU1-IU16 Upper portion: IU17-IU32	Service boards need to be configured based on the service plan and all of them are installed in the two service board areas. NOTE: Service boards installed in slots IU1-IU16 and IU33-IU48 have their ejector levers on the right sides of the board front panels. Service boards installed in remaining slots in
	Rear	32 service boards	Lower portion: IU33-IU48 Upper portion: IU49-IU64	

				the two areas have their ejector levers on the left sides of the board front panels.
System control and cross-connect board area	Front	2 CTU system control boards and 7 XCS cross-connect boards	XCS: IU71-IU77 CTU: IU70, IU78	Cross-connect boards are configured in M:N backup mode to implement cross-connections for services boards on the front and rear sides. The system control boards are configured in 1+1 backup mode. The active system control board manages and provides a clock to all other boards in the equipment. It also provides for inter-NE communication. When a U64 subrack is used as a pure regeneration subrack, no cross-connect board is required.
	Rear	7 XCS cross-connect boards	XCS: IU79-IU85	

Cross-Connect Capacities

This topic describes the cross-connect capacity of a service slot and an OptiX OSN 9800 U64 subrack.

An OptiX OSN 9800 U64 subrack supports grooming of ODUk (k = 0, 1, 2, 2e, 3, 4, flex) services, packet services and VC-3/VC-4/VC-12 services. Slots IU1-IU64 provide the same cross-connect capacity.

- For ODUk services, each service slot supports a maximum cross-connect capacity of 400 Gbit/s, and the subrack provides a maximum cross-connect capacity of 25.6 Tbit/s.
- For packet services, each service slot supports a maximum cross-connect capacity of 200 Gbit/s and the subrack provides a maximum cross-connect capacity of 12.8 Tbit/s.
- For VC-4 services, each service slot supports a maximum cross-connect capacity of 80 Gbit/s, and the subrack provides a maximum cross-connect capacity of 5.12 Tbit/s.
- For VC-3/VC-12 services, the subrack supports a maximum cross-connect capacity of 80 Gbit/s.

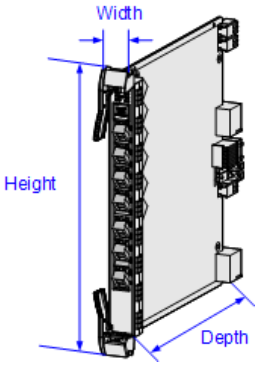
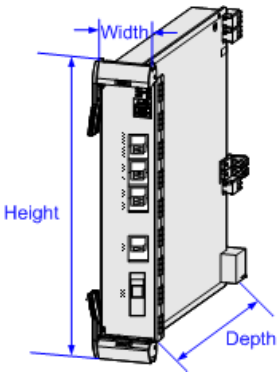
Mechanical Specifications

Table 23. The specifications of the OptiX OSN 9800 U64 equipment

Item	Specification
Dimensions (H x W x D)	2200 mm x 600 mm x 600 mm
Weighta	180 kg
a: The weight is measured when the equipment has no boards or fan tray assemblies installed.	

Board Description

Table 24. Appearance and Dimensions of Universal Platform Subrack Boards

Board Appearance	Board Name	Number of Slots Required by the Board	Height (mm)	Width (mm)	Depth (mm)
	TN52ND2	1	264.6	25.4	220.0
	TN11RAU1	2	264.6	50.8	220.0

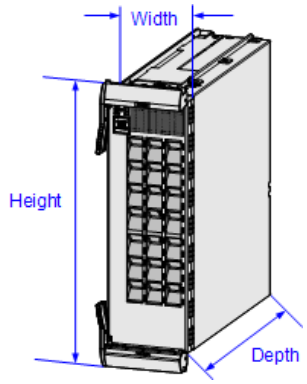
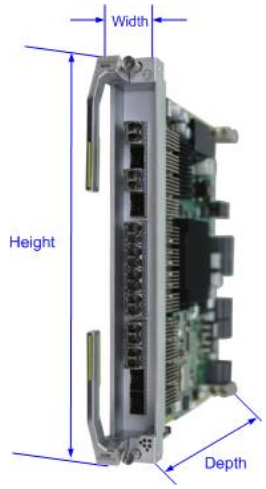
	TN11M40	3	264.6	76.2	220.0

Table 25. Appearance and Dimensions of M24 Boards

Board Appearance	Board Name	Number of Slots Required by the Board	Height (mm)	Width (mm)	Depth (mm)
	TNG1A212	1	237.1	30.5	220.0

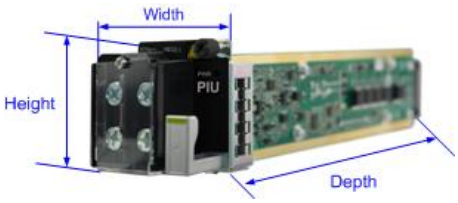
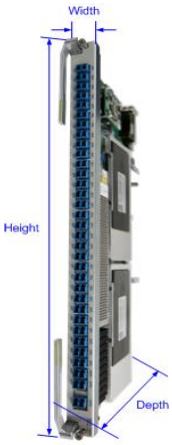
	TNG1CXP	1	489.5	30.5	220.0
	TNG1EFI	1	57.1	121.9	247.5
	TNG2PIU	1	57.1	61.0	241.2

Table 26. Appearance and Dimensions of P32 Boards

Board Appearance	Board Name	Number of Slots Required by the Board	Height (mm)	Width (mm)	Depth (mm)
	TMP1OT3232	1	477.25	29.98	276.5
	TMP1ON32	1	477.25	29.98	276.5

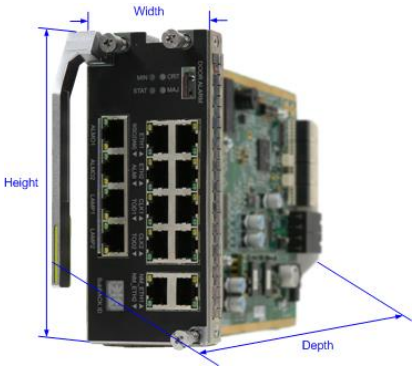
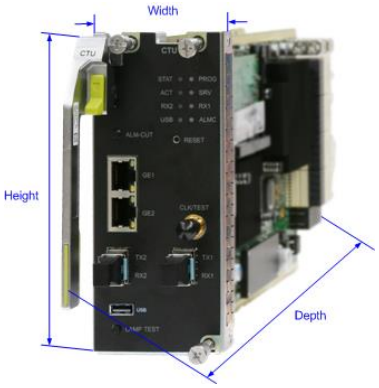
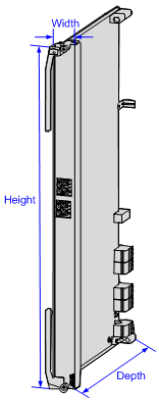
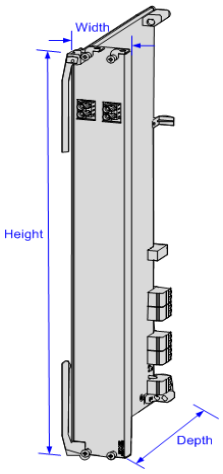
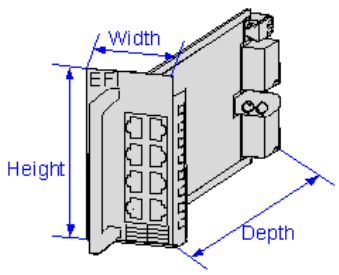
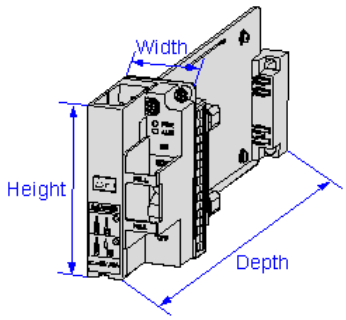
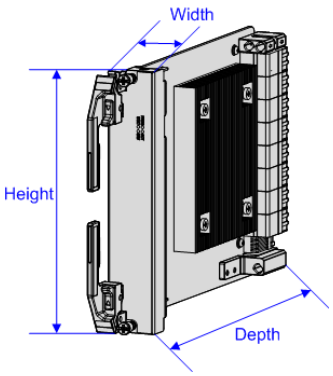
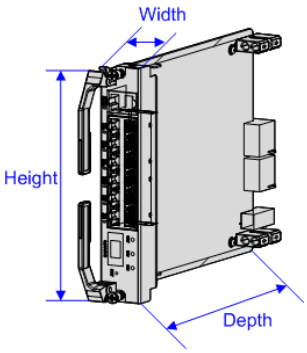
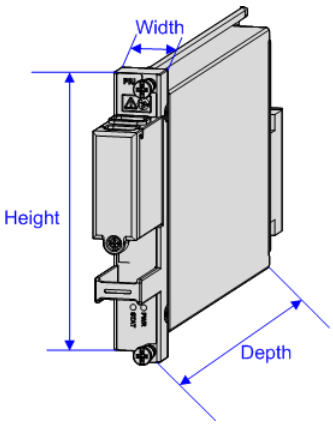
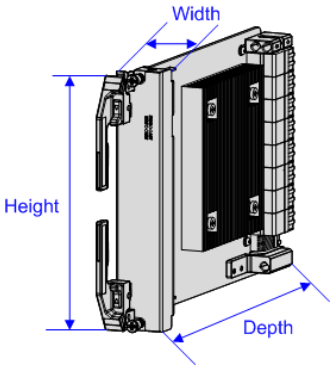
	TMP1MON32	2	136.5	60.46	276.5
	TMP1EFI	1	136.5	60.46	267.86
	TMP1CTU	1	136.5	60.46	267.86

Table 27. Appearance and Dimensions of U64/U32/U16 Boards

Board Appearance	Board Name	Number of Slots Required by the Board	Height (mm/in.)	Width (mm/in.)	Depth (mm/in.)
	TNV1N302	1	477.3	30.5	220.0
	TNU1N601	2	477.3	61.0	220.0
	TNV1EFI	1	102.8	56.9	220.0

	TNV1PIU	1	102.8	44.4	220.0
	TNS1CTU	1	182.9	29.98	267.75
	TNS1EFI	1	182.9	35	267.75
	TNS1PIU	1	136.5	22.36	279.7

	TNS1XCS	1	182.9	35	265.9

Basic Ordering Information

Table 28. Ordering information of Huawei OptiX OSN 9800.

Model	Description
Huawei Optix OSN 9800 U16	Huawei OSN 9800 U16 subrack, a next-generation large-capacity OTN product that integrates ASON, OTN, and packet functions for 100G optical networks, applicable to various networks, including super-backbone, backbone, and metro networks
Huawei Optix OSN 9800 U32	Huawei OSN 9800 U32 subrack, a next-generation large-capacity OTN product that integrates ASON, OTN, and packet functions for 100G optical networks, applicable to various networks, including super-backbone, backbone, and metro networks
Huawei Optix OSN 9800 U64	Huawei OSN 9800 U64 subrack, a next-generation large-capacity OTN product that integrates ASON, OTN, and packet functions for 100G optical networks, applicable to various networks, including super-backbone, backbone, and metro networks
Huawei Optix OSN 9800 Ups	Huawei OSN 9800 universal platform subrack mainly works with the OSN 9800 U64/U32/U16/M24, which is applied at the electrical layer in WDM and OTN system, enables end-to-end OTN/WDM backbone transport solutions and implements multi-service, large-capacity, and fully transport transmission

Huawei Optix OSN 9800 M24	Huawei OSN 9800 M24, a next-generation ultra-large capacity, high integration, and optoelectronic OTN/WDM product developed based on new software and hardware platforms, applicable to backbone and metro networks.
Huawei Optix OSN 9800 P32	Huawei OSN 9800 P32 subrack is an ultra-large capacity all-optical cross-connect product, used at the backbone core layer and metro aggregation layer and works with the OSN 9800/1800 to build a complete E2E WDM/OTN backbone transmission solution, achieving transparent and ultra-large capacity transmission

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Sources

https://support.huawei.com/enterprise/en/transmission-network/optix-osn-9800-u16-pid-21110042