

Cisco ASR 900 Series Aggregation Services Router Interface Modules

Cisco® ASR 900 Series Aggregation Services Router interface modules (Figure 1) are designed to support a wide range of services, speeds, temperature ranges, and rich capabilities. They provide cost-effective delivery of converged mobile and business Ethernet services.

Figure 1. Selection of Cisco ASR 900 Series ASR Interface Modules



Ethernet Interface Modules

Cisco ASR 900 Series Ethernet interface modules are designed to give customers a high degree of flexibility and value. All Ethernet interface modules share a common core that supports time stamping on the module for Y.1731 operations, administration, and maintenance (OAM) delay measurement functions to achieve precise results for one-way and two-way delay measurement. The modules also provide time-stamping functions for the IEEE 1588-2008 protocol. These time stamps help ensure that ASR 900 Series routers achieve outstanding results when deploying IEEE 1588-2008 protocols for frequency and phase synchronization. Not all customers will deploy IEEE 1588-2008 for synchronization. Therefore, the Ethernet interface modules also support input and output frequency synchronization using synchronous Ethernet (SyncE).

All ASR 900 Series Ethernet interface modules support online insertion and removal (OIR), which contributes to a higher uptime for ASR 900 Series routers.

Cisco ASR 900 Series 1-Port 100GE CPAK Module

This 1-port 100 Gigabit Ethernet Cisco CPAK™ module delivers the highest performance per slot on Cisco ASR 900 Series routers and provides physical connectivity using a single pluggable 100 Gigabit Ethernet CPAK optic. (See Table 1.)

Table 1. 100 Gigabit Ethernet Optics Supported in 1-Port 100GE CPAK Module

Optic Product Number	Supported as of Cisco IOS XE Software Release	Description
CPAK-100G-LR4	3.16.1S	Cisco CPAK transceiver module for 100-Gbps optical links, single-mode fiber (SMF, G.652), SC connectors, low power (5.5W), up to 10km
CPAK-100G-SR10	3.16.1S	Cisco CPAK transceiver module for 100 Gigabit Ethernet optical links over 24-fiber ribbon cables terminated with MPO/MTP connectors, up to 100m and 150m on OM3 and OM4 multifiber cables respectively.

Cisco ASR 900 Series 2-Port 40GE QSFP Module

This 2-port 40 Gigabit Ethernet QSFP module provides physical connectivity using two pluggable 40 Gigabit Ethernet optics. (See Table 2.)

Table 2. 40 Gigabit Ethernet Optics Supported in 2-Port 40GE QSFP Module

Optic Product Number	Supported as of Cisco IOS XE Software Release	Description
QSFP-40G-LR4	3.16.1S	Cisco QSFP transceiver module for 40-Gbps optical links, single-mode fiber (SMF, G.652), SC connectors, up to 10km
QSFP-40G-SR4	3.16.1S	Cisco QSFP transceiver module for 40-Gigabit Ethernet optical links over laser-optimized OM3 and OM4 multimode fibers (up to 100m and 150m, respectively). It primarily enables high-bandwidth 40G optical links over 12-fiber parallel fiber terminated with MPO/MTP multifiber connectors. It can also be used in a 4x10G mode for interoperability with 10GBASE-SR interfaces up to 100 and 150 meters on OM3 and OM4 fibers, respectively.

Cisco ASR 900 Series 8-Port 10GE SFP+ Module

This interface module provides eight 10 Gigabit Ethernet ports with physical connectivity, using pluggable 10 Gigabit Ethernet Enhanced Small Form-Factor Pluggable (SFP+) on each port. The module is hardware ready to support 1 Gigabit Ethernet mode per group of four interfaces, and this capability will be provided in future software releases. The interface module supports both the LAN and WAN physical layer (PHY), which allows flexible and versatile deployment models.

Table 3 lists the pluggable optics that are supported in the Cisco ASR 900 Series 8-Port 10GE SFP+ Module, on the Cisco IOS[®] XE Software releases for the ASR 900 Series router.

Table 3. 10 Gigabit Ethernet Optics Supported in 8-Port 10GE SFP+ Module

Optic Product Number	Supported as of Cisco IOS XE Software Release	Description
SFP-10G-SR-S	3.17.0S	Cisco 10GBASE-SR Ethernet SFP+ transceiver module for MMF, 850 nm, S-class
SFP-10G-LR-S	3.17.0S	Cisco 10GBASE-LR Ethernet SFP+ transceiver module for SMF, 1310 nm, S-class
SFP-10G-ER-S	3.17.0S	Cisco 10GBASE-ER Ethernet SFP+ transceiver module for SMF, 1550 nm, S-class
SFP-10G-ZR-S	3.17.0S	Cisco 10GBASE-ZR Ethernet SFP+ transceiver module for SMF, 1550 nm, S-class
SFP-10G-SR	3.16.1S	Cisco 10GBASE-SR Ethernet SFP+ transceiver module for MMF, 850 nm
SFP-10G-LR	3.16.1S	Cisco 10GBASE-LR Ethernet SFP+ transceiver module for SMF, 1310 nm
SFP-10G-SR-X	3.16.1S	Cisco 10GBASE-SR Ethernet SFP+ transceiver module for MMF, 850 nm, extended temperature range
SFP-10G-LR-X	3.16.1S	Cisco 10GBASE-LR Ethernet SFP+ transceiver module for SMF, 1310 nm, extended temperature range
SFP-10G-ER	3.16.1S	Cisco 10GBASE-ER Ethernet SFP+ transceiver module for SMF, 1550 nm
SFP-10G-ZR	3.16.1S	Cisco multirate 10GBASE-ZR, 10GBASE-ZW and OTU2/OTU2e SFP+ transceiver module for SMF, 1550 nm
DWDM-SFP10G-xx.xx	3.16.1S	Cisco multirate (LAN/WAN/OTU2/OTU2E) 10GBASE-DWDM single wavelength SFP+ module (100-GHz ITU grid) – 40 individual wavelength pluggable modules
CWDM-SFP10G-xxxx	3.14.1S	Cisco multirate 10G BASE CWDM SFP+ over single mode fiber (SMF), with eight different wavelengths ranging from 1470-nm to 1610-nm
SFP-10G-BXD-I	3.16.1S	10GBASE-BX single-strand SMF bidirectional SFP+ module, 1320-nm to 1340-nm TX/1260-nm to 1280-nm RX wavelength, single LC/PC connector, 10 km reach
SFP-10G-BXU-I	3.16.1S	10GBASE-BX single-strand SMF bidirectional SFP+ module, 1260-nm to 1280-nm TX/1320-nm to 1340-nm RX wavelength, single LC/PC connector, 10 km reach

Optic Product Number	Supported as of Cisco IOS XE Software Release	Description
SFP-10G-BX40D-I	3.16.1S	10GBASE-BX single-strand SMF bidirectional SFP+ module, 1320-nm to 1340-nm TX/1260-nm to 1280-nm RX wavelength, single LC/PC connector, 40 km reach
SFP-10G-BX40U-I	3.16.1S	10GBASE-BX single-strand SMF bidirectional SFP+ module, 1260-nm to 1280-nm TX/1320-nm to 1340-nm RX wavelength, single LC/PC connector, 40 km reach

Cisco ASR 900 Series 1-Port 10GE XFP Module

This interface module provides physical connectivity using a single pluggable 10 Gigabit Ethernet XFP optic. It supports both the LAN and WAN PHY, which allows flexible and versatile deployment models.

Table 4 lists the pluggable optics that are supported in the ASR 900 Series 1-Port 10GE XFP Module, on the Cisco IOS XE Software releases for the ASR 900 Series router.

Table 4. 10 Gigabit Ethernet Optics Supported in 1-Port 10GE XFP Module

Optic Product Number	Supported as of Cisco IOS XE Software Release	Description
XFP10GER-192IR-L	3.8.0S	Cisco multirate XFP transceiver module for 10GBASE-ER/-EW Ethernet and OC-192/STM-64 intermediate-reach (IR-2), single-mode fiber (SMF), dual LC connector, low power (2.5W)
XFP10GLR-192SR-L	3.8.0S	Cisco multirate XFP transceiver module for 10GBASE-LR/-LW Ethernet and OC-192/STM-64 short-reach (SR-1), SMF, dual LC connector, low power (1.5W)
XFP-10GZR-OC192LR	3.8.0S	Cisco multirate XFP transceiver module for 10GBASE-ZR/-ZW Ethernet and OC-192/STM-64 long-reach, SMF, dual LC connector
XFP10GLR192SR-RGD	3.5.0S	Cisco multirate XFP transceiver module for 10GBASE-LR/-LW Ethernet and OC-192/STM-64 short-reach (SR-1), SMF, dual LC connector, industrial temperature range
XFP10GER192IR-RGD	3.5.0S	Cisco multirate XFP transceiver module for 10GBASE-ER/-EW Ethernet and OC-192/STM-64 intermediate-reach (IR-2), SMF, dual LC connector, industrial temperature range
XFP10GZR192LR-RGD	3.5.0S	Cisco multirate XFP transceiver module for 10GBASE-ZR/-ZW Ethernet and OC-192/STM-64 long-reach, SMF, dual LC connector, industrial temperature range
DWDM-XFP-C	3.5.0S	10GBASE-DWDM Tunable XFP (50-GHz ITU grid), dual LC connector
DWDM-XFP-xx.yy	3.8.0S	10GBASE-DWDM single wavelength XFP (100-GHz ITU grid), dual LC connector – 32 individual wavelength pluggable modules
ONS-XC-10G-EPxx.y=	3.8.0S	10GBASE-DWDM single wavelength Edge Performance XFP (100-GHz ITU grid), dual LC connector, 50-km reach – 40 individual wavelength pluggable modules
ONS-XC-10G-xxxx=	3.10.0S	10GBASE-CWDM single wavelength XFP (ITU G694.2), dual LC connector, 40-km reach – 8 individual wavelength pluggable modules
XFP-10G-MM-SR	3.5.0S	Cisco 10GBASE-SR Ethernet XFP transceiver module for multimode fiber (MMF), dual LC connector
XFP-10GLR-OC192SR	3.5.0S	Cisco multirate XFP transceiver module for 10GBASE-LR Ethernet and OC-192/STM-64 short-reach (SR-1) PoS applications, SMF, dual LC connector
XFP-10GZR-OC192LR	3.5.0S	Cisco multirate XFP transceiver module for 10GBASE-ZR Ethernet and OC-192/STM-64 long-reach PoS applications, SMF, dual LC connector

Cisco ASR 900 Series 2-Port 10GE XFP/SFP+ Module

This interface module provides two 10 Gigabit Ethernet ports with physical connectivity, using either a pluggable 10 Gigabit Ethernet SFP+ optic or a pluggable 10 Gigabit Ethernet XFP optic per port. The interface module supports both LAN and WAN PHY, which allows flexible and versatile deployment models.

Table 5 lists the pluggable optics that are supported in the Cisco ASR 900 Series 2-Port 10GE XFP/SFP+ Module, on the Cisco IOS XE Software releases for the ASR 900 Series router.

Table 5. 10 Gigabit Ethernet Optics Supported in 2-Port 10GE XFP/SFP+ Module

Optic Product Number	Supported as of Cisco IOS XE Software Release	Description
SFP-10G-SR-S	3.17.0S	Cisco 10GBASE-SR Ethernet SFP+ transceiver module for MMF, 850 nm, S-class
SFP-10G-LR-S	3.17.0S	Cisco 10GBASE-LR Ethernet SFP+ transceiver module for SMF, 1310 nm, S-class
SFP-10G-ER-S	3.17.0S	Cisco 10GBASE-ER Ethernet SFP+ transceiver module for SMF, 1550 nm, S-class
SFP-10G-ZR-S	3.17.0S	Cisco 10GBASE-ZR Ethernet SFP+ transceiver module for SMF, 1550 nm, S-class
XFP10GER-192IR-L	3.13.0S	Cisco multirate XFP transceiver module for 10GBASE-ER/-EW Ethernet and OC-192/STM-64 intermediate-reach (IR-2), single-mode fiber (SMF), dual LC connector, low power (2.5W)
XFP10GLR-192SR-L	3.13.0S	Cisco multirate XFP transceiver module for 10GBASE-LR/-LW Ethernet and OC-192/STM-64 short-reach (SR-1), SMF, dual LC connector, low power (1.5W)
XFP-10GZR-OC192LR	3.13.0S	Cisco multirate XFP transceiver module for 10GBASE-ZR/-ZW Ethernet and OC-192/STM-64 long-reach, SMF, dual LC connector
XFP10GLR192SR-RGD	3.13.0S	Cisco multirate XFP transceiver module for 10GBASE-LR/-LW Ethernet and OC-192/STM-64 short-reach (SR-1), SMF, dual LC connector, industrial temperature range
XFP10GER192IR-RGD	3.13.0S	Cisco multirate XFP transceiver module for 10GBASE-ER/-EW Ethernet and OC-192/STM-64 intermediate-reach (IR-2), SMF, dual LC connector, industrial temperature range
XFP10GZR192LR-RGD	3.13.0S	Cisco multirate XFP transceiver module for 10GBASE-ZR/-ZW Ethernet and OC-192/STM-64 long-reach, SMF, dual LC connector, industrial temperature range
DWDM-XFP-C	3.13.0S	10GBASE-DWDM tunable XFP (50-GHz ITU grid), dual LC connector
DWDM-XFP-xx.yy	3.13.0S	10GBASE-DWDM single wavelength XFP (100-GHz ITU grid), dual LC connector – 32 individual wavelength pluggable modules
ONS-XC-10G-EPxx.y=	3.13.0S	10GBASE-DWDM single wavelength Edge Performance XFP (100-GHz ITU grid), dual LC connector, 50-km reach – 40 individual wavelength pluggable modules
ONS-XC-10G-xxxx=	3.13.0S	10GBASE-CWDM single wavelength XFP (ITU G694.2), dual LC connector, 40-km reach – eight individual wavelength pluggable modules
XFP-10G-MM-SR	3.13.0S	Cisco 10GBASE-SR Ethernet XFP transceiver module for multimode fiber (MMF), dual LC connector
XFP-10GLR-OC192SR	3.13.0S	Cisco multirate XFP transceiver module for 10GBASE-LR Ethernet and OC-192/STM-64 short-reach (SR-1) PoS applications, SMF, dual LC connector
XFP-10GZR-OC192LR	3.13.0S	Cisco multirate XFP transceiver module for 10GBASE-ZR Ethernet and OC-192/STM-64 long-reach PoS applications, SMF, dual LC connector
SFP-10G-SR	3.13.0S	Cisco 10GBASE-SR Ethernet SFP+ transceiver module for MMF, 850 nm
SFP-10G-LR	3.13.0S	Cisco 10GBASE-LR Ethernet SFP+ transceiver module for SMF, 1310 nm
SFP-10G-SR-X	3.13.0S	Cisco 10GBASE-SR Ethernet SFP+ transceiver module for MMF, 850 nm, extended temperature range
SFP-10G-LR-X	3.13.0S	Cisco 10GBASE-LR Ethernet SFP+ transceiver module for SMF, 1310 nm, extended temperature range
SFP-10G-ER	3.13.0S	Cisco 10GBASE-ER Ethernet SFP+ transceiver module for SMF 1550 nm
SFP-10G-ZR	3.13.0S	Cisco multirate 10GBASE-ZR, 10GBASE-ZW and OTU2/OTU2e SFP+ transceiver module for SMF 1550 nm
DWDM-SFP10G-xx.xx=	3.13.0S	Cisco multirate (LAN/WAN/OTU2/OTU2E) 10GBASE-DWDM single wavelength SFP+ module (100-GHz ITU grid) – 40 individual wavelength pluggable modules
CWDM-SFP10G-xxxx	3.14.0S	Cisco multirate 10GBASE CWDM SFP+ over single mode fiber (SMF), with eight different wavelengths ranging from 1470-nm to 1610-nm
SFP-10G-BXD-I	3.14.0S	10GBASE-BX single-strand SMF bidirectional SFP+ module, 1320-nm to 1340-nm TX/1260-nm to 1280-nm RX wavelength, single LC/PC connector, 10 km reach

Optic Product Number	Supported as of Cisco IOS XE Software Release	Description
SFP-10G-BXU-I	3.14.0S	10GBASE-BX single-strand SMF bidirectional SFP+ module, 1260-nm to 1280-nm TX/1320-nm to 1340-nm RX wavelength, single LC/PC connector, 10 km reach
SFP-10G-BX40D-I	3.14.0S	10GBASE-BX single-strand SMF bidirectional SFP+ module, 1320-nm to 1340-nm TX/1260-nm to 1280-nm RX wavelength, single LC/PC connector, 40 km reach
SFP-10G-BX40U-I	3.14.0S	10GBASE-BX single-strand SMF bidirectional SFP+ module, 1260-nm to 1280-nm TX/1320-nm to 1340-nm RX wavelength, single LC/PC connector, 40 km reach

Cisco ASR 900 Series 8-Port 1GE SFP Module

This interface module delivers eight ports of Gigabit Ethernet and Fast Ethernet connectivity on Cisco ASR 900 Series routers. The interface speed can be selected per interface, depending on the optic used. The module provides physical connectivity using eight SFP optics.

Table 6 lists the pluggable optics that are supported in the ASR 900 Series 8-Port 1GE SFP Module, on the Cisco IOS XE Software releases for the ASR 900 Series router.

Table 6. Ethernet Optics Supported in 8-Port 1GE SFP Module

Optic Product Number	Supported as of Cisco IOS XE Software Release	Description
GLC-FE-100FX-RGD	3.5.0S	100BASE-FX SFP module for Industrial Ethernet 100-MB ports, 1310 nm wavelength, 2 km over MMF
GLC-FE-100LX-RGD	3.5.0S	100BASE-LX SFP module for Industrial Ethernet 100-MB ports, 1310 nm wavelength, 10 km over SMF
GLC-FE-100LX	3.8.0S	100BASE-LX SFP for Fast Ethernet SFP ports, 1310 nm wavelength, 10 km over SMF
GLC-FE-100FX	3.8.0S	100BASE-FX SFP for Fast Ethernet SFP ports, 1310 nm wavelength, 2 km over MMF
GLC-FE-100ZX	3.10.0S	100BASE-ZX SFP for Fast Ethernet SFP ports, 1550 nm wavelength, 80 km over SMF
GLC-FE-100EX	3.10.0S	100BASE-EX SFP for Fast Ethernet SFP ports, 1310 nm wavelength, 40 km over SMF
GLC-FE-100BX-U	3.8.0S	100BASE-BX10-U SFP for Fast Ethernet SFP ports. Single-strand SMF up to 10 km, transmits on a 1310-nm channel and receives on a 1550-nm signal
GLC-FE-100BX-D	3.8.0S	100BASE-BX10-D SFP for Fast Ethernet SFP ports. Single-strand SMF up to 10 km, transmits on a 1550-nm channel and receives on a 1310-nm signal
GLC-EX-SMD	3.5.0S	100BASE-EX SFP transceiver module for SMF, 1310-nm wavelength, extended operating temperature range and Digital Optical Monitoring (DOM) support, dual LC/PC connector
GLC-BX-D	3.5.0S	100BASE-BX10 SFP module for single-strand SMF, 1490-nm TX/1310-nm RX wavelength, single LC/PC connector
GLC-BX-U	3.5.0S	100BASE-BX10 SFP module for single-strand SMF, 1310-nm TX/1490-nm RX wavelength, single LC/PC connector
GLC-ZX-SM-RGD	3.5.0S	100BASE-ZX SFP transceiver module for SMF, 1550-nm wavelength, industrial Ethernet, dual LC/PC connector
GLC-SX-MM-RGD	3.5.0S	100BASE-SX SFP transceiver module for MMF, 850-nm wavelength, industrial Ethernet, dual LC/PC connector
GLC-LX-SM-RGD	3.5.0S	100BASE-LX/LH SFP transceiver module for MMF and SMF, 1300-nm wavelength, industrial Ethernet, dual LC/PC connector
SFP-GE-T	3.5.0S	100BASE-T SFP transceiver module for Category 5 copper wire, extended operating temperature range, RJ-45 connector
SFP-GE-L	3.10.0S	100BASE-LX/LH SFP transceiver module for MMF and SMF, 1310-nm wavelength
SFP-GE-S	3.10.0S	100BASE-SX SFP transceiver module for MMF, 850-nm wavelength
SFP-GE-Z	3.10.0S	100BASE-ZX SFP transceiver module for SMF, 1550-nm wavelength
DWDM-SFP-xxxx (36 wavelengths)	3.6.0S	Cisco 100BASE-DWDM Gigabit Ethernet SFP, with 36 different wavelengths ranging from 1561.42 nm to 1530.33 nm or ITU channel 20 to 59
CWDM-SFP-xxxx (8 wavelengths)	3.6.0S	Cisco CWDM Gigabit Ethernet SFP, with eight different wavelengths ranging from 1470 nm to 1610 nm

Optic Product Number	Supported as of Cisco IOS XE Software Release	Description
GLC-ZX-SMD	3.6.0S	1000BASE-ZX SFP transceiver module for SMF, 1550-nm wavelength, dual LC/PC connector
GLC-SX-MMD	3.6.0S	1000BASE-SX SFP transceiver module for MMF, 850-nm wavelength, extended operating temperature range and DOM support, dual LC/PC connector
GLC-LH-SMD	3.6.0S	1000BASE-LX/LH SFP transceiver module for MMF and SMF, 1300-nm wavelength, extended operating temperature range and DOM support, dual LC/PC connector
ONS-SI-GE-LX	3.17.0S	1000BASE-LX Gigabit Ethernet transceiver module for SMF, 1310 nm wavelength, extended operating temperature range and DOM support, dual LC/PC connector
ONS-SE-ZE-EL	3.17.0S	10/100/1000BASE-T SFP transceiver module for Category 5 copper wire, extended operating temperature range, RJ-45 connector
ONS-SC-155-TSOP	3.17.0S	SFP transceiver module for STM1/OC3 clear channel transport over GE

Cisco ASR 900 Series 8-Port 1GE SFP and 1-Port 10GE SFP+ Module

This interface module delivers eight ports of Gigabit Ethernet and Fast Ethernet and one port of 10 Gigabit Ethernet connectivity on Cisco ASR 900 Series routers. The interface speed of the SFP interfaces can be selected per interface, depending on the optic used. For the 10 Gigabit Ethernet SFP+ port, the speed is not configurable. This module provides physical connectivity using eight SFP transceivers and one SFP+ transceiver.

Table 7 lists the pluggable optics that are supported in the Cisco 900 Series 8-Port 1GE SFP and 1-Port 10GE SFP+ Module, on the Cisco IOS XE Software releases for the ASR 900 Series router.

Table 7. Ethernet Optics Supported in 8-Port 1GE SFP and 1-Port 10GE SFP+ Module

Optic Product Number	Supported as of Cisco IOS XE Software Release	Description
GLC-FE-100FX-RGD	3.13.0S	100BASE-FX SFP module for Industrial Ethernet 100-MB ports, 1310 nm wavelength, 2 km over MMF
GLC-FE-100LX-RGD	3.13.0S	100BASE-LX SFP module for Industrial Ethernet 100-MB ports, 1310 nm wavelength, 10 km over SMF
GLC-FE-100LX	3.13.0S	100BASE-LX SFP for Fast Ethernet SFP Ports, 1310 nm wavelength, 10 km over SMF
GLC-FE-100FX	3.13.0S	100BASE-FX SFP for Fast Ethernet SFP Ports, 1310 nm wavelength, 2 km over MMF
GLC-FE-100ZX	3.13.0S	100BASE-ZX SFP for Fast Ethernet SFP Ports, 1550 nm wavelength, 80 km over SMF
GLC-FE-100EX	3.13.0S	100BASE-EX SFP for Fast Ethernet SFP Ports, 1310 nm wavelength, 40 km over SMF
GLC-FE-100BX-U	3.13.0S	100BASE-BX10-U SFP for Fast Ethernet SFP Ports. Single-strand SMF up to 10 km, transmits on a 1310-nm channel and receives on a 1550-nm signal
GLC-FE-100BX-D	3.13.0S	100BASE-BX10-D SFP for Fast Ethernet SFP Ports. Single-strand SMF up to 10 km, transmits on a 1550-nm channel and receives on a 1310-nm signal
GLC-EX-SMD	3.13.0S	1000BASE-EX SFP transceiver module for SMF, 1310-nm wavelength, extended operating temperature range and Digital Optical Monitoring (DOM) support, dual LC/PC connector
GLC-BX-D	3.13.0S	1000BASE-BX10 SFP module for single-strand SMF, 1490-nm TX/1310-nm RX wavelength, single LC/PC connector
GLC-BX-U	3.13.0S	1000BASE-BX10 SFP module for single-strand SMF, 1310-nm TX/1490-nm RX wavelength, single LC/PC connector
GLC-ZX-SM-RGD	3.13.0S	1000BASE-ZX SFP transceiver module for SMF, 1550-nm wavelength, industrial Ethernet, dual LC/PC connector
GLC-SX-MM-RGD	3.13.0S	1000BASE-SX SFP transceiver module for MMF, 850-nm wavelength, industrial Ethernet, dual LC/PC connector
GLC-LX-SM-RGD	3.13.0S	1000BASE-LX/LH SFP transceiver module for MMF and SMF, 1300-nm wavelength, industrial Ethernet, dual LC/PC connector
SFP-GE-T	3.13.0S	1000BASE-T SFP transceiver module for Category 5 copper wire, extended operating temperature range, RJ-45 connector
SFP-GE-L	3.13.0S	1000BASE-LX/LH SFP transceiver module for MMF and SMF, 1310-nm wavelength

Optic Product Number	Supported as of Cisco IOS XE Software Release	Description
SFP-GE-S	3.13.0S	1000BASE-SX SFP transceiver module for MMF, 850-nm wavelength
SFP-GE-Z	3.13.0S	1000BASE-ZX SFP transceiver module for SMF, 1550-nm wavelength
DWDM-SFP-xxxx (36 wavelengths)	3.13.0S	Cisco 1000BASE-DWDM Gigabit Ethernet SFP, with 36 different wavelengths ranging from 1561.42 nm to 1530.33nm or ITU channel 20 to 59
CWDM-SFP-xxxx (8 wavelengths)	3.13.0S	Cisco CWDM Gigabit Ethernet SFP, with eight different wavelengths ranging from 1470 nm to 1610 nm
GLC-ZX-SMD	3.13.0S	1000BASE-ZX SFP transceiver module for SMF, 1550-nm wavelength, dual LC/PC connector
GLC-SX-MMD	3.13.0S	1000BASE-SX SFP transceiver module for MMF, 850-nm wavelength, extended operating temperature range and DOM support, dual LC/PC connector
GLC-LH-SMD	3.13.0S	1000BASE-LX/LH SFP transceiver module for MMF and SMF, 1300-nm wavelength, extended operating temperature range and DOM support, dual LC/PC connector
GLC-BX40-U-I	3.14.0S	1000BASE-BX10 SFP module for single-strand SMF, 1310-nm TX/1490-nm RX wavelength, 40 km reach, single LC/PC connector
GLC-BX40-D-I	3.14.0S	1000BASE-BX10 SFP module for single-strand SMF, 1550-nm TX/1310-nm RX wavelength, 40 km reach, single LC/PC connector
GLC-BX40-DA-I	3.14.0S	1000BASE-BX10 SFP module for single-strand SMF, 1490-nm TX/1310-nm RX wavelength, 40 km reach, single LC/PC connector
GLC-BX80-U-I	3.14.0S	1000BASE-BX10 SFP module for single-strand SMF, 1490-nm TX/1490-nm RX wavelength, 80 km reach, single LC/PC connector
GLC-BX80-D-I	3.14.0S	1000BASE-BX10 SFP module for single-strand SMF, 1570-nm TX/1310-nm RX wavelength, 80 km reach, single LC/PC connector
ONS-SI-GE-LX	3.17.0S	1000BASE-LX Gigabit Ethernet transceiver module for SMF, 1310 nm wavelength, extended operating temperature range and DOM support, dual LC/PC connector
ONS-SE-ZE-EL	3.17.0S	10/100/1000BASE-T SFP transceiver module for Category 5 copper wire, extended operating temperature range, RJ-45 connector
SFP-10G-SR-S	3.17.0S	Cisco 10GBASE-SR Ethernet SFP+ transceiver module for MMF, 850 nm, S-class
SFP-10G-LR-S	3.17.0S	Cisco 10GBASE-LR Ethernet SFP+ transceiver module for SMF, 1310 nm, S-class
SFP-10G-ER-S	3.17.0S	Cisco 10GBASE-ER Ethernet SFP+ transceiver module for SMF, 1550 nm, S-class
SFP-10G-ZR-S	3.17.0S	Cisco 10GBASE-ZR Ethernet SFP+ transceiver module for SMF, 1550 nm, S-class
ONS-SC-155-TSOP	3.17.0S	SFP transceiver module for STM1/OC3 clear channel transport over GE
SFP-10G-SR	3.13.0S	Cisco 10GBASE-SR Ethernet SFP+ transceiver module for MMF, 850 nm
SFP-10G-LR	3.13.0S	Cisco 10GBASE-LR Ethernet SFP+ transceiver module for SMF, 1310 nm
SFP-10G-SR-X	3.13.0S	Cisco 10GBASE-SR Ethernet SFP+ transceiver module for MMF, 850 nm, extended temperature range
SFP-10G-LR-X	3.13.0S	Cisco 10GBASE-LR Ethernet SFP+ transceiver module for SMF, 1310 nm, extended temperature range
SFP-10G-ER	3.13.0S	Cisco 10GBASE-ER Ethernet SFP+ transceiver module for SMF and MMF, 1550 nm
SFP-10G-ZR	3.13.0S	Cisco multirate 10GBASE-ZR, 10GBASE-ZW and OTU2/OTU2e SFP+ transceiver module for SMF and MMF, 1550 nm
DWDM-SFP10G-xx.xx=	3.13.0S	Cisco multirate (LAN/WAN/OTU2/OTU2E) 10GBASE-DWDM single wavelength SFP+ module (100-GHz ITU grid) – 40 individual wavelength pluggable modules
CWDM-SFP10G-xxxx	3.14.0S	Cisco multirate 10G BASE CWDM SFP+ over single mode fiber(SMF), with eight different wavelengths ranging from 1470-nm to 1610-nm
SFP-10G-BXD-I	3.14.0S	10GBASE-BX single-strand SMF bidirectional SFP+ module, 1320-nm to 1340-nm TX/1260-nm to 1280-nm RX wavelength, single LC/PC connector, 10 km reach
SFP-10G-BXU-I	3.14.0S	10GBASE-BX single-strand SMF bidirectional SFP+ module, 1260-nm to 1280-nm TX/1320-nm to 1340-nm RX wavelength, single LC/PC connector, 10 km reach
SFP-10G-BX40D-I	3.14.0S	10GBASE-BX single-strand SMF bidirectional SFP+ module, 1320-nm to 1340-nm TX/1260-nm to 1280-nm RX wavelength, single LC/PC connector, 40 km reach
SFP-10G-BX40U-I	3.14.0S	10GBASE-BX single-strand SMF bidirectional SFP+ module, 1260-nm to 1280-nm TX/1320-nm to 1340-nm RX wavelength, single LC/PC connector, 40 km reach

Cisco ASR 900 Series 8-Port 1GE RJ45 Module

This interface module delivers eight ports of Gigabit Ethernet, Fast Ethernet, and Ethernet connectivity on Cisco ASR 900 Series routers. The interface speed can be software selected per interface. This interface module provides physical connectivity using eight RJ-45 connectors.

Cisco ASR 900 Series 8-Port 1GE RJ45 and 1-Port 10GE SFP+ Module

This interface module delivers eight ports of Gigabit and Fast Ethernet and one port of 10 Gigabit Ethernet connectivity on Cisco ASR 900 Series routers. The interface speed of the copper interfaces can be software selected per interface. The module provides physical connectivity using eight RJ-45 connectors and one SFP+ transceiver slot.

Table 8 lists the pluggable optics that are supported in the Cisco ASR 900 Series 8-Port 1GE RJ45 and 1-Port 10GE SFP+ Module, on Cisco IOS XE Software releases for ASR 900 Series routers.

Table 8. Ethernet Optics Supported in 8-Port 1GE RJ45 and 1-Port 10GE SFP+ Module

Optic Product Number	Supported as of Cisco IOS XE Software Release	Description
SFP-10G-SR-S	3.17.0S	Cisco 10GBASE-SR Ethernet SFP+ transceiver module for MMF, 850 nm, S-class
SFP-10G-LR-S	3.17.0S	Cisco 10GBASE-LR Ethernet SFP+ transceiver module for SMF, 1310 nm, S-class
SFP-10G-ER-S	3.17.0S	Cisco 10GBASE-ER Ethernet SFP+ transceiver module for SMF, 1550 nm, S-class
SFP-10G-ZR-S	3.17.0S	Cisco 10GBASE-ZR Ethernet SFP+ transceiver module for SMF, 1550 nm, S-class
SFP-10G-SR	3.13.0S	Cisco 10GBASE-SR Ethernet SFP+ transceiver module for multimode fiber (MMF), 850 nm
SFP-10G-LR	3.13.0S	Cisco 10GBASE-LR Ethernet SFP+ transceiver module for single-mode fiber (SMF), 1310 nm
SFP-10G-SR-X	3.13.0S	Cisco 10GBASE-SR Ethernet SFP+ transceiver module for MMF, 850 nm, extended temperature range
SFP-10G-LR-X	3.13.0S	Cisco 10GBASE-LR Ethernet SFP+ transceiver module for SMF, 1310 nm, extended temperature range
SFP-10G-ER	3.13.0S	Cisco 10GBASE-ER Ethernet SFP+ transceiver module for SMF and MMF, 1550 nm
SFP-10G-ZR	3.13.0S	Cisco multirate 10GBASE-ZR, 10GBASE-ZW and OTU2/OTU2e SFP+ transceiver module for SMF and MMF, 1550 nm
DWDM-SFP10G-xx.xx=	3.13.0S	Cisco multirate (LAN/WAN/OTU2/OTU2E) 10GBASE-DWDM single wavelength SFP+ module (100-GHz ITU grid) – 40 individual wavelength pluggable modules
CWDM-SFP10G-xxxx	3.14.0S	Cisco multirate 10G BASE CWDM SFP+ over single mode fiber(SMF), with eight different wavelengths ranging from 1470-nm to 1610-nm
SFP-10G-BXD-I	3.14.0S	10GBASE-BX single-strand SMF bidirectional SFP+ module, 1320-nm to 1340-nm TX/1260-nm to 1280-nm RX wavelength, single LC/PC connector, 10 km reach
SFP-10G-BXU-I	3.14.0S	10GBASE-BX single-strand SMF bidirectional SFP+ module, 1260-nm to 1280-nm TX/1320-nm to 1340-nm RX wavelength, single LC/PC connector, 10 km reach
SFP-10G-BX40D-I	3.14.0S	10GBASE-BX single-strand SMF bidirectional SFP+ module, 1320-nm to 1340-nm TX/1260-nm to 1280-nm RX wavelength, single LC/PC connector, 40 km reach
SFP-10G-BX40U-I	3.14.0S	10GBASE-BX single-strand SMF bidirectional SFP+ module, 1260-nm to 1280-nm TX/1320-nm to 1340-nm RX wavelength, single LC/PC connector, 40 km reach

Multiservice Interface Modules

Cisco ASR 900 Series Router multiservice interface modules are designed to help customers connect to legacy networks and transition to packet networks. The modules support connections to Point-to-Point Protocol (PPP), Multilink PPP, ATM, Inverse Multiplexing over ATM (IMA), and High-Level Data Link Control (HDLC) links. In addition, the interface modules can be used to transport time-division multiplexing (TDM) and ATM interfaces over an IP/Multiprotocol Label Switching (MPLS) packet network using Pseudowire Emulation (PWE) services, such as Circuit Emulation Services over Packet Switched Network (CESoPSN) and Structure-Agnostic Transport over Packet (SAToP) transport. Software support for the interface module hardware capabilities will be delivered over time in the several Cisco IOS XE Software releases scheduled for the Cisco ASR 900 Series routers. Software support is described in the Cisco IOS XE Software for Cisco ASR 900 Series Aggregation Services Routers data sheet, which will contain updates for new capabilities when they are supported.

All ASR 900 Series multiservice interface modules support OIR, which contributes to a higher uptime for ASR 900 Series routers.

Cisco ASR 900 Series 6-Port E&M Module

This interface module delivers six ports of ear and mouth (E&M) interfaces. The design emphasizes smart-grid and low-latency applications environments. Typical use cases for this module are teleprotection and land mobile radio applications. The module supports E&M types I, II, III, and V on 2- or 4-wire modes with selectable 600- or 900-ohm impedances. The physical connectivity on the interface module uses standards-based RJ-45 connectors. The E&M signals and voice data can be transported using CESoPSN with and without channel-attached signaling (CAS) over MPLS.

Cisco ASR 900 Series 14-Port Serial Module

This interface module delivers 14 ports of asynchronous RS-232 to facilitate connectivity to devices that require RS-232 connectivity. Coupled with the Raw Socket feature and functionality, this interface module is a key enabler to provide transport of traditional async serial-based protocols, such as supervisory control and data acquisition (SCADA), across IP/MPLS networks. These scenarios help ease migration from traditional serial-based devices to next-generation IP-enabled devices by adding to the flexible set of connectivity options on the Cisco ASR 903 Router.

The interface module uses six standard Cisco 12-in-1 connectors, along with two high-density 68-pin connectors, to provide the 14 ports of asynchronous RS-232. Supported cables for both the 12-in-1 connectors and the 68-pin connectors are listed in Table 9.

Table 9. Asynchronous RS-232 Cables Supported in 14-Port Serial Interface Module

Cable Product ID	Supported as of Cisco IOS XE Software Release	Description
CAB-HD4-232MT	3.10.0S	4-port EIA-232 DTE cable, 68-pin port, 10 ft. length, male DB-25 connector
CAB-HD4-232FC	3.10.0S	4-port EIA-232 DCE cable, 68-pin port, 10 ft. length, female DB-25 connector
CAB-QUAD-ASYNC-F	3.10.0S	4-port EIA-232 DTE cable, 68-pin port, 10 ft. length, female RJ-45 connector
CAB-QUAD-ASYNC-M	3.10.0S	4-port EIA-232 DTE cable, 68-pin port, 10 ft. length, male RJ-45 connector
CAB-9AS-M	3.10.0S	4-port EIA-232 DTE cable, 68-pin port, 10 ft. length, male DB-9 connector
CAB-SS-232MT	3.10.0S	4-port EIA-232 DTE cable, 12-in-1 port, 10 ft. length, male DB-25 connector
CAB-SS-232FC	3.10.0S	4-port EIA-232 DCE cable, 12-in-1 port, 10 ft. length, female DB-25 connector

Cisco ASR 900 Series 8-Port T1/E1 Module

This interface module delivers 8 ports of T1 or E1 connectivity on ASR 900 Series routers. The module can be software configured as either T1 mode or E1 mode per interface module in an ASR 900 Series platform. This interface module provides physical connectivity using eight individual on-board physical RJ-48C port connectors.

Cisco ASR 900 Series 16-Port T1/E1 Module

This interface module delivers 16 ports of T1 or E1 connectivity on ASR 900 Series routers. The module can be software configured as either T1 mode or E1 mode per interface module in an ASR 900 Series platform. This interface module provides physical connectivity using a single high-density connector and requires a breakout cable and patch panel for individual port connections.

The module is software configurable for 16 T1 or 16 E1 ports. Mixing T1 and E1 ports on the same interface module is not supported. The module can be clocked from a line or from an internal clock source. The protocols supported on the module are software configurable per interface, which allows for flexible deployment and efficient use of the hardware.

The module requires an external patch panel and a breakout cable to deliver a BNC or RJ48C port for the user application.

Table 10 lists the cables and patch panels that are required with the Cisco ASR 900 Series 16-Port T1/E1 Module on the Cisco IOS XE Software releases for ASR 900 Series routers.

Table 10. Accessories Required with ASR 900 Series 16-Port E1/T1 Module

Optic Product ID	Supported as of Cisco IOS XE Software Release	Description
CABLE-16T1E1	3.6.0S	Cable for 16-Port T1/E1 Interface Module, 12 feet
PANEL-16-BNC	3.6.0S	Breakout panel with 16 T1/E1 75-ohm BNC ports
PANEL-32-RJ48	3.6.0S	Breakout panel with 32 T1/E1 100/120-ohm RJ48 ports

Cisco ASR 900 Series 32-Port T1/E1 Module

This interface module delivers 32 ports of T1 or E1 connectivity on ASR 900 Series routers. The module can be software configured as either T1 mode or E1 mode per interface module in an ASR 900 Series platform. This interface module provides physical connectivity using a single high-density connector and requires a breakout cable and patch panel for individual port connections.

The module is software configurable for 32 T1 or 32 E1 ports. Mixing T1 and E1 ports on the same interface module is not supported. The interfaces can be clocked from a line or from an internal clock source. The protocols supported on the module are software configurable per interface, which allows for flexible deployment and efficient use of the hardware.

The module requires an external patch panel and a breakout cable to deliver a BNC or RJ48C port for the user application.

Table 11 lists the cables and patch panels that are required with the Cisco ASR 900 Series 32-Port T1/E1 Module on the Cisco IOS XE Software releases for ASR 900 Series routers.

Table 11. Accessories Required with 32-Port E1/T1

Optic Product ID	Supported as of Cisco IOS XE Software Release	Description
CABLE-32T1E1	3.14.0S	Cable for 32 Port T1/E1 Interface Module
PANEL-16-BNC	3.14.0S	Breakout panel with 16 T1/E1 75-ohm BNC ports
PANEL-32-RJ48	3.14.0S	Breakout panel with 32 T1/E1 100/120- ohm RJ48 ports

Cisco ASR 900 Series 4-Port OC3/STM1 or 1-Port OC12/STM4 Module

This interface module delivers four active ports of OC-3 or Synchronous Transport Module level 1 (STM-1) connectivity or one active port of OC-12 or STM-4 connectivity on ASR 900 Series routers. The interface module supports:

- Channelized OC-3 to clear channel T1, clear channel DS3 and channelized T1/E1
- Channelized OC-12 to clear channel T1/E1
- Clear channel OC-3
- Channelized STM-1 to clear channel T1/E1 and channelized T1/E1
- Channelized STM-4 to clear channel T1/E1

The module is supported in all interface module slots on ASR 900 Series routers and can be clocked from a line or from an internal clock source.

By using per-port software licenses, this module delivers a true multiservice and multirate capability in a small form factor in combination with an incremental pricing model. The interface module can be software configured as either Synchronous Optical Networking (SONET) mode or Synchronous Digital Hierarchy (SDH) mode per module in the ASR 900 Series configuration.

The interface module hardware has been designed for high availability, including Access Circuit Redundancy (ACR), 1+1 Automatic Protection Switching (APS) across two modules, and SDH Linear Multiplexer Section Protection (MSP) protocols. Support of these capabilities is software dependent and described in the Cisco IOS XE Software for Cisco ASR 900 Series Routers data sheet.

This interface module provides physical connectivity using pluggable SFP optics. Table 12 lists the pluggable optics that are supported in the Cisco ASR 900 Series 4-Port OC-3/STM-1 or 1-Port OC-12/STM-4 Module on the Cisco IOS XE Software releases for ASR 900 Series routers.

Table 12. Optics Supported in 4-Port OC3/STM1 or 1-Port OC12/STM4 Module

Optic Product ID	Supported as of Cisco IOS XE Software Release	Description
ONS-SI-155-SR-MM	3.6.0S	OC-3/STM-1, short reach (SR), 1310 nm, multimode (MM), SFP, industrial temperature range
ONS-SI-155-I1	3.6.0S	OC-3/STM-1 intermediate reach (IR), 1310 nm, SFP, industrial temperature range
ONS-SI-155-L1	3.6.0S	OC-3/STM-1 long reach (LR), 1310 nm, SFP, industrial temperature range
ONS-SI-155-L2	3.6.0S	OC-3/STM-1 LR, 1550 nm, SFP, industrial temperature range
ONS-SC-155-EL	3.10.2S	STM-1 Electrical SFP, Commercial temperature range

Optic Product ID	Supported as of Cisco IOS XE Software Release	Description
ONS-SI-622-SR-MM	3.9.0S	OC-12/STM-4, SR, 1310 nm, MM, SFP, industrial temperature range
ONS-SI-622-I1	3.9.0S	OC-12/STM-4 IR, 1310 nm, SFP, industrial temperature range
ONS-SI-622-L1	3.9.0S	OC-12/STM-4 LR, 1310 nm, SFP, industrial temperature range
ONS-SI-622-L2	3.9.0S	OC-12/STM-4 LR, 1550 nm, SFP, industrial temperature range

Ordering Information

Table 13 lists part numbers for Cisco ASR 900 Series interface modules.

Table 13. Cisco ASR 900 Series Interface Modules

Part Number	Description
A900-IMA8T	ASR 900 8-Port 10/100/1000 Ethernet Interface Module
A900-IMA8T=	ASR 900 8-Port 10/100/1000 Ethernet Interface Module, Spare
A900-IMA8T1Z	ASR 900 Combo 8 port 10/100/1000 and 1 port 10GE Interface Module
A900-IMA8T1Z=	ASR 900 Combo 8 port 10/100/1000 and 1 port 10GE Interface Module, Spare
A900-IMA8S	ASR 900 8-Port SFP Gigabit Ethernet Interface Module
A900-IMA8S=	ASR 900 8-Port SFP Gigabit Ethernet Interface Module, Spare
A900-IMA8S1Z	ASR 900 Combo 8 port SFP GE and 1 port 10GE IM
A900-IMA8S1Z=	ASR 900 Combo 8 port SFP GE and 1 port 10GE IM, spare
A900-IMA1X	ASR 900 1-port 10GE XFP Interface Module
A900-IMA1X=	ASR 900 1-port 10GE XFP Interface Module, spare
A900-IMA2Z	ASR 900 2 port 10GE SFP+/XFP Interface Module
A900-IMA2Z=	ASR 900 2 port 10GE SFP+/XFP Interface Module, spare
A900-IMA8Z	ASR 900 8-Port 10GE SFP+ Interface Module
A900-IMA8Z=	ASR 900 8-Port 10GE SFP+ Interface Module, spare
A900-IMA2F	ASR 900 2-Port 40GE QSFP Interface Module
A900-IMA2F=	ASR 900 2-Port 40GE QSFP Interface Module, spare
A900-IMA1C	ASR 900 1-Port 100GE CPAK Interface Module
A900-IMA1C=	ASR 900 1-Port 100GE CPAK Interface Module, spare
A900-IMA6EM	ASR 900 6-port E&M Interface Module
A900-IMA6EM=	ASR 900 6-port E&M Interface Module, Spare
A900-IMASER14A/S	ASR 900 14-port Serial Interface Module (Sync/Async)
A900-IMASER14A/S=	ASR 900 14-port Serial Interface Module (Sync/Async), Spare
A900-IMA8D	ASR 900 8-Port T1/E1 Interface Module
A900-IMA8D=	ASR 900 8-Port T1/E1 Interface Module, Spare
A900-IMA16D	ASR 900 16-Port T1/E1 Interface Module
A900-IMA16D=	ASR 900 16-Port T1/E1 Interface Module, Spare
A900-IMA32D	ASR 900 32-Port T1/E1 Interface Module
A900-IMA32D=	ASR 900 32-Port T1/E1 Interface Module, Spare
A900-IMA4OS	ASR 900 4-Port OC-3/STM1 or 1-Port OC-12/STM4 Interface Module
A900-IMA4OS=	ASR 900 4-Port OC-3/STM1 or 1-Port OC-12/STM4 Interface Module, Spare

Software and Licensing

Cisco IOS Software Licenses

Cisco ASR 900 Series routers are supported in Cisco IOS XE Software, which is designed to provide modular packaging, feature velocity, and powerful resiliency.

With the Cisco ASR 903 Router supported as of Cisco IOS XE Software Release 3.5.0S, and the Cisco ASR 902 Router supported as of Cisco IOS XE Software Release 3.12.0S, the concept of Cisco software activation is also introduced to ASR 900 Series routers. Feature and software licenses details are provided in the Cisco IOS XE Software for Cisco ASR 900 Series Routers data sheet.

Feature Licenses

In addition to Cisco IOS Software license, licenses are used for specific ATM and TDM services and OC-3 and STM-1 ports. These additional feature licenses for ASR 900 Series router are:

- **ATM license:** Allows service providers to activate ATM functionality on TDM interfaces when required. One license is required for each ASR 900 Series router that needs ATM functionality. This includes support for ATM pseudowires over MPLS (ATMoMPLS), ATM local switching, ATM interworking, and local ATM termination. This license requires the system to have at least one T1/E1, OC-3/STM-1, or OC-12/STM-4 card installed.
- **OC-3 port license:** Allows service providers to activate one OC-3/STM-1 port, supporting a pay-as-you-grow strategy and simplified spare parts management. One license is required for each OC-3/STM-1 port that needs to be activated on the ASR 900 Series router (requires the purchase of a combined OC-3, STM-1, OC-12, and STM-4 combination interface module).
- **OC-12 port license:** Allows service providers to activate one OC-12/STM-4 port, supporting a pay-as-you-grow strategy and simplified spare part management. One license is required for each OC-12/STM-4 port that needs to be activated on the ASR 900 Series router (requires the purchase of a combined OC-3, STM-1, OC-12, and STM-4 combination interface module).

Table 14 lists the Cisco ASR 900 Series router feature licenses and product activation keys (PAKs).

Table 14. Cisco ASR 900 Series Router Feature Licenses

Part Number	Supported as of Cisco IOS XE Software Release	Description
Port and Feature Licenses		
FLSASR902-ATM	3.12.0S	ASR 902 ATM License
FLSASR903-ATM	3.5.0S	ASR 903 ATM License
FLSASR900-1OC3	3.6.0S	ASR 900 1 Port OC-3/STM-1 License
FLSASR900-1OC12	3.9.0S	ASR 900 1 Port OC-12/STM-4 License
Port and Feature Licenses Product Activation Keys		
FLSASR902-ATM=	3.12.0S	ASR 902 ATM License Paper PAK
L-FLSASR902-ATM=	3.12.0S	ASR 902 ATM License E-Delivery PAK
FLSASR903-ATM=	3.5.0S	ASR 903 ATM License Paper PAK
L-FLSASR903-ATM=	3.5.0S	ASR 903 ATM License E-Delivery PAK
FLSASR900-1OC3=	3.6.0S	ASR 900 1 Port OC-3/STM-1 License Paper PAK

Part Number	Supported as of Cisco IOS XE Software Release	Description
L-FLSASR900-1OC3=	3.6.0S	ASR 900 1 Port OC-3/STM-1 License E-Delivery PAK
FLSASR900-1OC12=	3.9.0S	ASR 900 1 Port OC-12/STM-4 License Paper PAK
L-FLSASR900-1OC12=	3.9.0S	ASR 900 1 Port OC-12/STM-4 License E-Delivery PAK

Product Specifications

Table 15 shows the Cisco ASR 900 Series platform and interface module compatibility matrix. Table 16 shows the Cisco ASR 907 Series Interface Module Compatibility Matrix. Table 17 provides Cisco ASR 900 Series interface module specifications, and Table 18 lists the safety and compliance specifications.

Table 15. Cisco ASR 900 Series Interface Module Compatibility Matrix

Platform		Slot 0	Slot 1	Slot 2	Slot 3	Slot 4	Slot 5
Cisco ASR 902 Router with A903-RSP1A-55 or A903-RSP1B-55	A900-IMA8T	3.12.0S	3.12.0S	3.12.0S ¹	3.12.0S	–	–
	A900-IMA8T1Z	–	–	–	–	–	–
	A900-IMA8S	3.12.0S	3.12.0S	3.12.0S ¹	3.12.0S	–	–
	A900-IMA8S1Z	–	–	–	–	–	–
	A900-IMA1X	3.12.0S	3.12.0S	3.12.0S	3.12.0S	–	–
	A900-IMA2Z	–	–	–	–	–	–
	A900-IMA8Z	–	–	–	–	–	–
	A900-IMA2F	–	–	–	–	–	–
	A900-IMA1C	–	–	–	–	–	–
	A900-IMA6EM	–	–	–	–	–	–
	A900-IMASER14A/S	–	–	–	–	–	–
	A900-IMA8D	–	–	–	–	–	–
	A900-IMA16D	3.12.0S	3.12.0S	3.12.0S	3.12.0S	–	–
	A900-IMA32D	–	–	–	–	–	–
A900-IMA4OS	3.12.0S	3.12.0S	3.12.0S	3.12.0S	–	–	
Cisco ASR 903 Router with A903-RSP1A-55 or A903-RSP1B-55	A900-IMA8T	3.5.0S	3.5.0S	3.5.0S	3.5.0S	3.5.0S	3.5.0S ¹
	A900-IMA8T1Z	–	–	–	–	–	–
	A900-IMA8S	3.5.0S	3.5.0S	3.5.0S	3.5.0S	3.5.0S	3.5.0S ¹
	A900-IMA8S1Z	–	–	–	–	–	–
	A900-IMA1X	3.5.0S	3.5.0S	3.5.0S	3.5.0S	–	–
	A900-IMA2Z	–	–	–	–	–	–
	A900-IMA8Z	–	–	–	–	–	–
	A900-IMA2F	–	–	–	–	–	–
	A900-IMA1C	–	–	–	–	–	–
	A900-IMA6EM	–	–	–	–	–	–
	A900-IMASER14A/S	3.10.0S ²	3.10.0S ²	3.10.0S ²	3.10.0S ²	3.10.0S ²	3.10.0S ²
	A900-IMA8D	–	–	–	–	–	–
	A900-IMA16D	3.5.0S	3.5.0S	3.5.0S	3.5.0S	3.5.0S	3.5.0S
	A900-IMA32D	–	–	–	–	–	–
A900-IMA4OS	3.6.0S	3.6.0S	3.6.0S	3.6.0S	3.6.0S	3.6.0S	

Platform		Slot 0	Slot 1	Slot 2	Slot 3	Slot 4	Slot 5
Cisco ASR 902 Router with A900-RSP2A-64	A900-IMA8T	3.13.0S	–	3.13.0S	3.13.0S	–	–
	A900-IMA8T1Z	3.13.0S	–	3.13.0S	–	–	–
	A900-IMA8S	3.13.0S	–	3.13.0S	3.13.0S	–	–
	A900-IMA8S1Z	3.13.0S	–	3.13.0S	–	–	–
	A900-IMA1X	3.13.0S	3.13.0S	3.13.0S	–	–	–
	A900-IMA2Z	3.13.0S	3.13.0S	3.13.0S	–	–	–
	A900-IMA8Z	–	–	–	–	–	–
	A900-IMA2F	–	–	–	–	–	–
	A900-IMA1C	–	–	–	–	–	–
	A900-IMA6EM	–	–	–	–	–	–
	A900-IMASER14A/S	3.14.0S ²	–	3.14.0S ²	3.14.0S ²	–	–
	A900-IMA8D	3.14.0S	–	3.15.0S	3.15.0S	–	–
	A900-IMA16D	3.13.0S	–	3.13.0S	3.13.0S	–	–
	A900-IMA32D	3.14.0S	–	3.14.0S	3.14.0S	–	–
	A900-IMA4OS	3.13.0S	3.13.0S	3.13.0S	–	–	–
Cisco ASR 903 Router with A900-RSP2A-64	A900-IMA8T	–	–	–	3.13.0S	3.13.0S	3.13.0S
	A900-IMA8T1Z	–	–	–	–	–	–
	A900-IMA8S	–	–	–	3.13.0S	3.13.0S	3.13.0S
	A900-IMA8S1Z	–	–	–	–	–	–
	A900-IMA1X	3.13.0S	3.13.0S	3.13.0S	–	–	–
	A900-IMA2Z	3.13.0S	3.13.0S	3.13.0S	–	–	–
	A900-IMA8Z	–	–	–	–	–	–
	A900-IMA2F	–	–	–	–	–	–
	A900-IMA1C	–	–	–	–	–	–
	A900-IMA6EM	–	–	–	3.17.0S	3.17.0S	3.17.0S
	A900-IMASER14A/S	–	–	–	3.14.0S ²	3.14.0S ²	3.14.0S ²
	A900-IMA8D	–	–	–	3.15.0S	3.15.0S	3.15.0S
	A900-IMA16D	–	–	–	3.13.0S	3.13.0S	3.13.0S
	A900-IMA32D	–	–	–	3.14.0S	3.14.0S	3.14.0S
	A900-IMA4OS	3.13.0S	3.13.0S	3.13.0S	–	–	–
Cisco ASR 902 Router with A900-RSP2A-128	A900-IMA8T	3.13.0S	3.13.0S	3.13.0S	3.13.0S	–	–
	A900-IMA8T1Z	3.13.0S	3.13.0S	3.13.0S	3.13.0S	–	–
	A900-IMA8S	3.13.0S	3.13.0S	3.13.0S	3.13.0S	–	–
	A900-IMA8S1Z	3.13.0S	3.13.0S	3.13.0S	3.13.0S	–	–
	A900-IMA1X	3.13.0S	3.13.0S	3.13.0S	3.13.0S	–	–
	A900-IMA2Z	3.13.0S	3.13.0S	3.13.0S	3.13.0S	–	–
	A900-IMA8Z	–	–	–	–	–	–
	A900-IMA2F	–	–	–	–	–	–
	A900-IMA1C	–	–	–	–	–	–
	A900-IMA6EM	–	–	–	–	–	–
	A900-IMASER14A/S	3.14.0S ²	3.14.0S ²	3.14.0S ²	3.14.0S ²	–	–
	A900-IMA8D	3.15.0S	3.15.0S	3.15.0S	3.15.0S	–	–

Platform		Slot 0	Slot 1	Slot 2	Slot 3	Slot 4	Slot 5
Cisco ASR 903 Router with A900-RSP2A-128	A900-IMA16D	3.13.0S	3.13.0S	3.13.0S	3.13.0S	–	–
	A900-IMA32D	3.14.0S	3.14.0S	3.14.0S	3.14.0S	–	–
	A900-IMA4OS	3.13.0S	3.13.0S	3.13.0S	3.13.0S	–	–
	A900-IMA8T	3.13.0S	3.13.0S	3.13.0S	3.13.0S	3.13.0S	3.13.0S
	A900-IMA8T1Z	3.13.0S	3.13.0S	3.13.0S	3.13.0S	3.13.0S	3.13.0S
	A900-IMA8S	3.13.0S	3.13.0S	3.13.0S	3.13.0S	3.13.0S	3.13.0S
	A900-IMA8S1Z	3.13.0S	3.13.0S	3.13.0S	3.13.0S	3.13.0S	3.13.0S
	A900-IMA1X	3.13.0S	3.13.0S	3.13.0S	3.13.0S	3.13.0S	3.13.0S
	A900-IMA2Z	3.13.0S	3.13.0S	3.13.0S	3.13.0S	3.13.0S	3.13.0S
	A900-IMA8Z	–	–	–	–	–	–
	A900-IMA2F	–	–	–	–	–	–
	A900-IMA1C	–	–	–	–	–	–
	A900-IMA6EM	3.17.0S	3.17.0S	3.17.0S	3.17.0S	3.17.0S	3.17.0S
	A900-IMASER14A/S	3.14.0S ²	3.14.0S ²	3.14.0S ²	3.14.0S ²	3.14.0S ²	3.14.0S ²
	A900-IMA8D	3.15.0S	3.15.0S	3.15.0S	3.15.0S	3.15.0S	3.15.0S
Cisco ASR 902 Router with A900-RSP3C-200-S	A900-IMA16D	3.13.0S	3.13.0S	3.13.0S	3.13.0S	3.13.0S	3.13.0S
	A900-IMA32D	3.14.0S	3.14.0S	3.14.0S	3.14.0S	3.14.0S	3.14.0S
	A900-IMA4OS	3.13.0S	3.13.0S	3.13.0S	3.13.0S	3.13.0S	3.13.0S
	A900-IMA8T	3.18.0S	3.18.0S	3.18.0S	3.18.0S	–	–
	A900-IMA8T1Z	3.18.0S	3.18.0S	3.18.0S	3.18.0S	–	–
	A900-IMA8S	3.18.0S	3.18.0S	3.18.0S	3.18.0S	–	–
	A900-IMA8S1Z	3.18.0S	3.18.0S	3.18.0S	3.18.0S	–	–
	A900-IMA1X	3.18.0S	3.18.0S	–	–	–	–
	A900-IMA2Z	3.18.0S	3.18.0S	3.18.0S	3.18.0S	–	–
	A900-IMA8Z	3.18.0S	–	–	–	–	–
	A900-IMA2F	3.18.0S	–	–	–	–	–
	A900-IMA1C	–	–	–	–	–	–
	A900-IMA6EM	–	–	–	–	–	–
	A900-IMASER14A/S	–	–	–	–	–	–
	A900-IMA8D	–	–	–	–	–	–
Cisco ASR 903 Router with A900-RSP3C-200-S	A900-IMA16D	–	–	–	–	–	–
	A900-IMA32D	–	–	–	–	–	–
	A900-IMA4OS	3.18.0S	3.18.0S	–	–	–	–
	A900-IMA8T	3.18.0S	3.18.0S	3.18.0S	3.18.0S	3.18.0S	3.18.0S
	A900-IMA8T1Z	3.18.0S	3.18.0S	3.18.0S	3.18.0S	3.18.0S	3.18.0S
	A900-IMA8S	3.18.0S	3.18.0S	3.18.0S	3.18.0S	3.18.0S	3.18.0S
	A900-IMA8S1Z	3.18.0S	3.18.0S	3.18.0S	3.18.0S	3.18.0S	3.18.0S
	A900-IMA1X	3.18.0S	–	3.18.0S	–	3.18.0S	–
	A900-IMA2Z	3.18.0S	3.18.0S	3.18.0S	3.18.0S	3.18.0S	3.18.0S
	A900-IMA8Z	3.19.0S ⁶	–	–	–	3.18.0S	–
A900-IMA2F	–	–	–	–	3.18.0S	–	
A900-IMA1C	–	–	–	–	3.19.0S	–	

Platform		Slot 0	Slot 1	Slot 2	Slot 3	Slot 4	Slot 5	
Cisco ASR 903 Router with A900-RSP3C-400-S	A900-IMA6EM	-	-	-	-	-	-	
	A900-IMASER14A/S	-	-	-	-	-	-	
	A900-IMA8D	-	-	-	-	-	-	
	A900-IMA16D	-	-	-	-	-	-	
	A900-IMA32D	-	-	-	-	-	-	
	A900-IMA4OS	3.18.0S	-	3.18.0S	-	3.18.0S	-	
	A900-IMA8T	3.16.1S ⁵	3.16.1S ⁵	3.16.1S ⁵	3.16.1S ⁵	3.16.1S ⁵	3.16.1S ⁵	
	A900-IMA8T1Z	3.16.1S ⁵	3.16.1S ⁵	3.16.1S ⁵	3.16.1S ⁵	3.16.1S ⁵	3.16.1S ⁵	
	A900-IMA8S	3.16.1S ⁵	3.16.1S ⁵	3.16.1S ⁵	3.16.1S ⁵	3.16.1S ⁵	3.16.1S ⁵	
	A900-IMA8S1Z	3.16.1S ⁵	3.16.1S ⁵	3.16.1S ⁵	3.16.1S ⁵	3.16.1S ⁵	3.16.1S ⁵	
	A900-IMA1X	3.16.1S ³	3.16.1S ⁴	3.16.1S ⁵	3.16.1S	3.16.1S	3.16.1S	
	A900-IMA2Z	3.16.1S	3.16.1S	3.16.1S	3.16.1S	3.16.1S	3.16.1S	
	A900-IMA8Z	3.16.1S ³	3.16.1S ⁴	3.16.1S ⁵	3.16.1S	3.16.1S	3.16.1S	
	A900-IMA2F	-	-	-	-	3.16.1S	3.16.1S	
	A900-IMA1C	-	-	-	-	3.16.1S	3.16.1S	
	A900-IMA6EM	-	-	-	-	-	-	
	A900-IMASER14A/S	-	-	-	-	-	-	
A900-IMA8D	-	-	-	-	-	-		
A900-IMA16D	-	-	-	-	-	-		
A900-IMA32D	-	-	-	-	-	-		
A900-IMA4OS	3.16.1S ³	3.16.1S ⁴	3.16.1S ⁵	3.16.1S	3.16.1S	3.16.1S		
Cisco ASR 920 Router, ASR-920-24SZ-IM	A900-IMA8T	3.14.0S	-	-	-	-	-	
	A900-IMA8T1Z	3.15.0S	-	-	-	-	-	
	A900-IMA8S	-	-	-	-	-	-	
	A900-IMA8S1Z	-	-	-	-	-	-	
	A900-IMA1X	3.14.0S	-	-	-	-	-	
	A900-IMA2Z	3.14.0S	-	-	-	-	-	
	A900-IMA8Z	-	-	-	-	-	-	
	A900-IMA2F	-	-	-	-	-	-	
	A900-IMA1C	-	-	-	-	-	-	
	A900-IMA6EM	-	-	-	-	-	-	
	A900-IMASER14A/S	-	-	-	-	-	-	
	A900-IMA8D	3.14.0S	-	-	-	-	-	
	A900-IMA16D	3.14.0S	-	-	-	-	-	
	A900-IMA32D	-	-	-	-	-	-	
	A900-IMA4OS	-	-	-	-	-	-	
	Cisco ASR 920 Router, ASR-920-12SZ-IM	A900-IMA8T	3.16.0S	-	-	-	-	-
		A900-IMA8T1Z	3.16.0S	-	-	-	-	-
A900-IMA8S		3.16.0S	-	-	-	-	-	
A900-IMA8S1Z		3.16.0S	-	-	-	-	-	
A900-IMA1X		3.16.0S	-	-	-	-	-	
A900-IMA2Z		3.16.0S	-	-	-	-	-	

Platform		Slot 0	Slot 1	Slot 2	Slot 3	Slot 4	Slot 5
	A900-IMA8Z	–	–	–	–	–	–
	A900-IMA2F	–	–	–	–	–	–
	A900-IMA1C	–	–	–	–	–	–
	A900-IMA6EM	–	–	–	–	–	–
	A900-IMASER14A/S	–	–	–	–	–	–
	A900-IMA8D	3.16.0S	–	–	–	–	–
	A900-IMA16D	3.16.0S	–	–	–	–	–
	A900-IMA32D	3.16.0S	–	–	–	–	–
	A900-IMA4OS	3.18.0S	–	–	–	–	–

¹ Maximum 7 ports available in this slot, interface module, and Route Switch Processor combination.

² Maximum 2 of the 14-port serial interface modules concurrently per chassis. Actual protocols and interface types supported may differ per RSP version.

³ A900-IMA1X, A900-IMA4OS, or A900-IMA8Z could not be in slot 0 when A900-IMA1C is present in slot 4.

⁴ A900-IMA1X, A900-IMA4OS, or A900-IMA8Z could not be in slot 1 when A900-IMA1C is present in slot 5.

⁵ A900-IMA1X, A900-IMA4OS, or A900-IMA8Z in slot 2 is incompatible with the support for A900-IMA8S, A900-IMA8T, A900-IMA8S1Z, and A900-IMA8T1Z for the chassis, as well as incompatible with the IPsec feature support.

⁶ A900-IMA8Z in slot 0 with A900-RSP3C-200-S supports maximum 6 ports at 10GE speed and needs explicit enablement using a CLI command.

Table 16. Cisco ASR 907 Series Interface Module Compatibility Matrix

	A900-IMA4OS	A900-IMA8T A900-IMA8S	A900-IMA8T1Z A900-IMA8S1Z	A900-IMA2Z	A900-IMA8Z	A900-IMA2F	A900-IMA1C
Slot 0	–	3.16.1S ⁶	–	–	–	–	–
Slot 1	–	3.17.0S ⁵	–	–	–	–	–
Slot 2	–	3.16.1S ⁶	3.16.1S ⁴	–	–	–	–
Slot 3	3.16.1S ³	–	–	3.16.1S	3.16.1S ³	3.16.1S ³	–
Slot 4	3.16.1S ⁴	–	–	3.16.1S	3.16.1S ⁴	3.16.1S ⁴	–
Slot 5	–	3.16.1S ⁵	3.16.1S ³	–	–	–	–
Slot 6	–	3.16.1S ⁶	3.16.1S ⁴	–	–	–	–
Slot 7	3.16.1S	–	–	3.16.1S	3.16.1S	3.16.1S	3.16.1S ¹
Slot 8	3.16.1S	–	–	3.16.1S	3.16.1S	3.16.1S	3.16.1S ²
Slot 9	–	3.16.1S ⁵	3.16.1S ³	–	–	–	–
Slot 10	–	3.16.1S ⁶	3.16.1S ⁴	–	–	–	–
Slot 11	3.16.1S ¹	–	–	3.16.1S ⁵	3.16.1S ^{1,5}	3.16.1S ^{1,5}	–
Slot 12	3.16.1S ¹	–	–	3.16.1S ⁶	3.16.1S ^{2,6}	3.16.1S ^{2,6}	–
Slot 13	–	3.16.1S ⁵	3.16.1S ³	–	–	–	–
Slot 14	–	3.16.1S ⁶	3.16.1S ⁴	–	–	–	–
Slot 15	–	3.16.1S ⁵	3.16.1S ³	–	–	–	–

¹ Neither A900-IMA4OS, A900-IMA2F, nor A900-IMA8Z can be in slot 11 when A900-IMA1C is present in slot 7.

² Neither A900-IMA4OS, A900-IMA2F, nor A900-IMA8Z can be in slot 12 when A900-IMA1C is present in slot 8.

³ Neither A900-IMA8T1Z nor A900-IMA8S1Z can be in slot 5, 9, 13, or 15 when A900-IMA4OS, A900-IMA8Z, or A900-IMA2F is present in slot 3.

⁴ Neither A900-IMA8T1Z nor A900-IMA8S1Z can be in slot 2, 6, 10, or 14 when A900-IMA4OS, A900-IMA8Z, or A900-IMA2F is present in slot 4.

⁵ No IM could be used in slot 1, 5, 9, 13, or 15 when A900-IMA2Z, A900-IMA2F, or A900-IMA8Z is present in slot 11.

⁶ No IM could be used in slot 0, 2, 6, 10, or 14 when A900-IMA2Z, A900-IMA2F, or A900-IMA8Z is present in slot 12.

Table 17. Cisco ASR 900 Series Interface Module Specifications

Features	Description
Port density	<ul style="list-style-type: none"> • 8-port Gigabit Ethernet, SFP, and RJ-45 version • 8-port Gigabit Ethernet and 1-port 10 Gigabit Ethernet SFP+, in a Gigabit Ethernet SFP and RJ-45 version 1-port 10 Gigabit Ethernet, XFP • 1-port 10 Gigabit Ethernet, XFP • 2-port 10 Gigabit Ethernet, SFP+/XFP • 8-port 10 Gigabit Ethernet, SFP/SFP+ • 2-port 40 Gigabit Ethernet, QSFP • 1-port 100 Gigabit Ethernet, CPAK • 6-port 2-wire/4-wire E&M • 14-port Asynchronous Serial RS-232/X.21 • 8-port, 16-port and 32-port T1/E1 TDM versions • 4-port OC-3/STM-1 TDM or 1-Port OC-12/STM-4
Power draw	<ul style="list-style-type: none"> • 8-port Gigabit Ethernet SFP: 17W maximum • 8-port Gigabit Ethernet SFP and 1-port 10 Gigabit Ethernet SFP+: 25W maximum • 8-port Gigabit Ethernet RJ-45: 17W maximum • 8-port Gigabit Ethernet RJ-45 and 1-port 10 Gigabit Ethernet SFP+: 25W maximum • 1-port 10 Gigabit Ethernet XFP: 13W maximum • 2-port 10 Gigabit Ethernet SFP+/XFP: 25W maximum • 8-port 10 Gigabit Ethernet SFP/SFP+: 48W maximum • 2-port 40 Gigabit Ethernet QSFP: 53W maximum • 1-port 100 Gigabit Ethernet CPAK: 62W maximum • 6-port 2-wire/4-wire E&M: 33W maximum • 14-port Asynchronous Serial RS-232: 31W maximum • 8-port T1/E1 TDM: 14W maximum • 16-port T1/E1 TDM: 14W maximum • 32-port T1/E1 TDM: 18W maximum • 4-port OC-3/STM-1 TDM: 30W maximum
Module shipment weight	<ul style="list-style-type: none"> • 8-port Gigabit Ethernet SFP: 2.1 lbs • 8-port Gigabit Ethernet SFP and 1-port 10 Gigabit Ethernet SFP+: 3.4 lbs • 8-port Gigabit Ethernet RJ-45: 2.1 lbs • 8-port Gigabit Ethernet RJ-45 and 1-port 10 Gigabit Ethernet SFP+: 2.9 lbs • 1-port 10 Gigabit Ethernet XFP: 2 lbs • 2-port 10 Gigabit Ethernet SFP+/XFP: 1.8 lbs • 8-port 1/10 Gigabit Ethernet SFP/SFP+: 3.8 lbs • 2-port 40 Gigabit Ethernet QSFP: 2.55 lbs • 1-port 100 Gigabit Ethernet CPAK: 2.23 lbs • 6-port 2-wire/4-wire E&M: 2.1 lbs • 14-port Asynchronous Serial RS-232: 2.1 lbs • 8-port T1/E1 TDM: 2.1 lbs • 16-port T1/E1 TDM: 2.1 lbs • 32-port T1/E1 TDM: 1.92 lbs • 4-port OC-3/STM-1 TDM: 2.1 lbs
Module shipment package size (LxWxH)	15.44 x 9.44 x 4.31 inches
Environmental specifications¹	–40 to 65°C (–40 to 149°F) operating temperature (using Industrial temperature XFP, SFP, and SFP+ optics) 0 to 40°C (32 to 104°F) operating temperature (CPAK and QSFP optics)
Relative humidity	5 to 95%, noncondensing
Storage environment	Temperature: –40 to 70°C (–40 to 158°F) altitude: 4570 m (15,000 ft)
MTBF at 40°C (104°F) operating temperature	700,000 hours

Features	Description
Reliability and availability	<p>OIR field-replaceable SFP optics modules</p> <p>Support for both 1+1 SONET Automatic Protection Switching (APS) and SDH Linear Multiplexer Section Protection (MSP) protocols</p> <p>Single interface module software reset</p> <p>Rolling software upgrade, interface module by interface module</p>
SONET/SDH multiplexing granularity	<p>Up to 336 T1 or 252 E1 per OC-12/STM-4 interface module</p> <p>Up to 84 T1 or 63 E1 ports per OC-3/STM-1 port and up to 336 T1 or 252 E1 per OC-3/STM-1 interface module</p> <p>Up to 1024 nxDS-0 channels (where n is 1 to 31) per STM-1 interface module</p> <p>Channelized OC-3 to T1</p> <p>Channelized STM-1 to E1, full-rate T1, channelized T1/E1 and fractional T1/E1 for Circuit Emulation Pseudo Wires</p> <ul style="list-style-type: none"> • Support for SONET Virtual Tributary 1.5 (VT1.5) mapping: OC-3 <-> STS-3 <-> STS-1 <-> VTG <-> VT1.5 <-> T1 • Support for ITU-T G.707 (SDH CEPT/ETSI) Virtual Container 12 (VC-12) mapping: STM-1 <-> AUG <-> AU-4 <-> VC-4 <-> TUG-3 <-> TUG-2 <-> TU-12 <-> VC-12 <-> E1 • Support for ITU-T G.707 (SDH-ANSI) Virtual Container 11 (VC-11) mapping: STM-1 <-> AUG <-> AU-3 <-> VC-3 <-> TUG-2 <-> TU-11 <-> VC-11 <-> T1

¹ Optics, power supplies, fan tray, and chassis type used may limit the temperature range.

Table 18. Safety and Compliance

Type	Standards
Safety	<ul style="list-style-type: none"> • UL 60950-1, 2nd edition • CAN/CSA C22.2 No. 60950-1-07 2nd edition • IEC 60950-1, 2nd edition • EN 60950-1, 2nd edition • AS/NZS 60950.1:2003
Electromagnetic Emissions compliance	<ul style="list-style-type: none"> • FCC CFR47 Part 15, Class A • EN55022, class A • CISPR22, class A • ICES-003, class A • EN 300 386, class A • VCCI, class A • KN22, class A • EN61000-3-2 to EN61000-3-3
Immunity compliance	<ul style="list-style-type: none"> • EN 300 386 • EN 61000-6-1 • EN 50082-1 • CISPR24 • EN 55024 • KN 24 • EN 50121-4 • EN/KN 61000-4-2 to EN/KN 61000-4-6 • EN/KN 61000-4-8 • EN/KN 61000-4-11
Network Equipment-Building Systems (NEBS)¹	<ul style="list-style-type: none"> • GR-63-CORE Issue 3 • GR-1089-CORE Issue 5 • SR-3580 NEBS Level 3
Power substation system standards	<ul style="list-style-type: none"> • IEC 61850-3 (2002) • IEEE 1613 (2009)
ETSI	<ul style="list-style-type: none"> • ETS/EN 300 119 Part 4 • ETS/EN 300 019 - Storage: Class 1.2, Transportation: Class 2.3, In-Use/Operational: Class 3.2 • ETS/EN 300 753

Type	Standards
Telecom	<p>T1:</p> <ul style="list-style-type: none"> • ITU-T G.703 • ITU-T G.824 • TIA-968-B • IC CS-03 • HKTA 2028 • ID0002 • DSPR Technical Conditions • ANSI T1.403 <p>E1:</p> <ul style="list-style-type: none"> • ITU-T G.703/G.704 • ITU-T G.823 • AS/ACIF S016 • ETSI TBR12/13 • RRA 2009-38 (RRL 2005-96) • IDA TS DLCN <p>SONET/SDH subrate:</p> <ul style="list-style-type: none"> • GR-253-CORE • ANSI T1.105 • ITU G.957 • ITU G.783 • ITU G.707 <p>Ethernet:</p> <ul style="list-style-type: none"> • DSPR Technical Conditions • RRA 2009-38 (RRL 2005-96) • IEEE 802.3-2005 • IEEE 802.3z • IEEE 802.3ab • IEEE 802.3ae
Network synchronization	<ul style="list-style-type: none"> • GR-1244-CORE • GR-253-CORE • ANSI T1.101 • ITU-T G.813 • ITU-T G.703 clause 5 • ITU-T G.703 clause 9 • ITU-T G.823 • ITU-T G.824 • ITU-T G.8261/Y.1361 • ITU-T G.781 • ITU-T G.8262 • ITU-T G.8264 • IEEE1588-2008

¹ Notable exceptions: All cabling is provided through the front panel.

Warranty Information

Find warranty information on Cisco.com at the [Product Warranties](#) page.

Service and Support

Cisco offers a wide range of services programs to help accelerate customer success. These innovative services programs are delivered through a unique combination of people, processes, tools, and partners, promoting high levels of customer satisfaction. Cisco Services help you protect your network investment, optimize network operations, and prepare your network for new applications to extend network intelligence and the power of your business. For more information about Cisco Services, refer to Cisco Technical Support Services or Cisco Advanced Services.

Cisco is committed to reducing your total cost of ownership. Cisco offers a portfolio of technical support services to help ensure that Cisco products operate efficiently, remain highly available, and benefit from the most up-to-date system software. The services and support programs described in Table 19 are available as part of the Cisco Carrier Ethernet Switching Service and Support solution and are available directly from Cisco and through resellers.

Table 19. Service and Support

Advanced Services	Features	Benefits
<p>Cisco Total Implementation Solutions (TIS), available directly from Cisco</p> <p>Cisco Packaged TIS, available through resellers</p>	<ul style="list-style-type: none"> • Project management • Site survey, configuration, and deployment • Installation, test, and cutover • Training • Major moves, adds, and changes • Design review and product staging 	<ul style="list-style-type: none"> • Supplement existing staff • Help ensure functions meet needs • Mitigate risk
<p>Cisco SP Base Support and Service Provider-Based Onsite Support, available directly from Cisco</p> <p>Cisco Packaged Service Provider-Based Support, available through resellers</p>	<ul style="list-style-type: none"> • 24-hour access to software updates • Web access to technical repositories • Telephone support through the Cisco Technical Assistance Center (TAC) • Advance replacement of hardware parts 	<ul style="list-style-type: none"> • Facilitate proactive or expedited problem resolution • Lower total cost of ownership by taking advantage of Cisco expertise and knowledge • Reduce network downtime

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