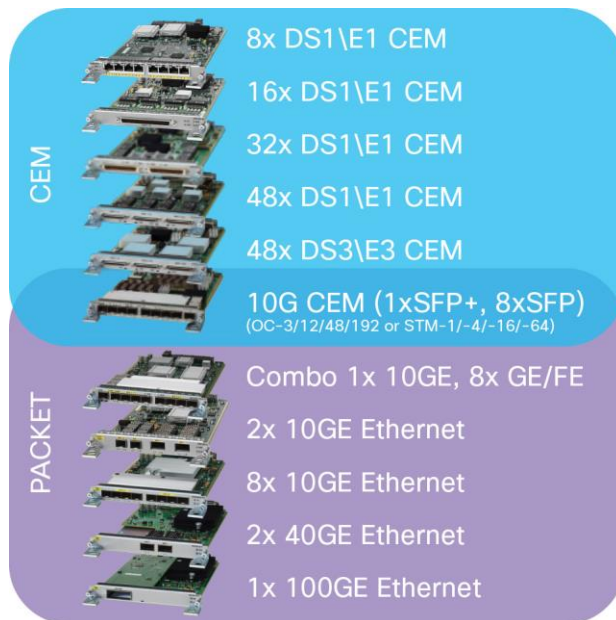# Cisco ASR 900 Series Interface Modules

Cisco® ASR 900 Series interface modules are designed to support a wide range of services, speeds, temperature ranges, and capabilities. They provide cost-effective delivery of converged circuit emulation, optical transport network and business Ethernet services.

Product overview

Overcome the limitations of legacy network technologies in your access network (PDH, SONET, SDH) and evolve beyond a circuit-switched transport networks to a future-proof packet-based network with the Cisco ASR 900 Series. The ASR 900 Series addresses legacy network inefficiencies by delivering a cost-effective, modular solution based on a protocol-independent fabric architecture. The ASR 900 Series, delivers unbounded scale with Circuit Emulation (CEM) and Optical Transport Network (OTN) capabilities, in addition to supporting Carrier Ethernet business services, over a redundant and protected packet-based network (Multiprotocol Label Switching [MPLS]/FlexLSP).

Figure 1.   Cisco ASR 900 series interface modules

Features and benefits

Feature	Benefit
Support for TDM and SONET/SDH Migration to Modernized Packet-Based Optical Metro Network	Provides cost-effective delivery of Circuit Emulation (CEM) and Carrier Ethernet (CE) capabilities over a redundant and protected packet-based network (MPLS/FlexLSP).
Metro Carrier Ethernet Aggregation	Enables the service flexibility and delivery of Layer 2, Layer 3, IP, and MPLS transport for advanced L2VPN, L3VPN, and Multicast services.
Industry leading, carrier-class circuit emulation (CEM) technology	Delivers any-to-any connectivity via a packet-based network (MPLS/Flex LSP) using TDM, PDH, SONET/SDH, and Carrier Ethernet (FE, GE, and 10GE) interfaces.
Next generation access network with fully distributed and unique packet capabilities	Supports state-of-the-art Pseudowire Emulation Edge-to-Edge (PWE3), Hierarchical Quality of Service (H-QoS), and next generation IP/MPLS.
	Cisco's MPLS FlexLSP guarantees resiliency (sub 50 ms switchover time), fault propagation, connectivity verification, statistical multiplexing and scalability, with RSVP-TE extensions as the control plane for bi-directional tunnel (LSP) setup and programmability for SDN functionality support.
Operation Efficiency with End-to-End Network Management	Supported by the Evolved Programmable Network Manager (EPN-M), which enables business agility and operational efficiencies through automated device operations, fast provisioning and proactive assurance.
Comprehensive variety of interfaces and protocols	Ethernet interfaces are available in copper and fiber, with speeds ranging from 10 Mbps to 100 Gbps.
	Legacy interfaces are available in speeds ranging from nxDS0 to OC-192/STM-64 for Plesiochronous Digital Hierarchy (PDH), Synchronous Digital Hierarchy (SDH), and Synchronous Optical Network (SONET).
	Optical Transport Network (OTN) wrapping functionalities are also supported.

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 systems 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 systems.

Cisco ASR 900 series 1-Port 100GE CPAK module (A900-IMA1C)

This 1-port 100 Gigabit Ethernet Cisco CPAK™ module delivers the highest performance per slot on Cisco ASR 900 Series systems and provides physical connectivity using a single pluggable 100GE CPAK optic. Table 1 lists the CPAK optics that are supported in the Cisco ASR 900 Series 1-Port 100GE CPAK Module, with the Cisco IOS® Software releases for the ASR 900 Series router.

Table 1.   100 Gigabit Ethernet Optics supported in 1-Port 100GE CPAK module

Optic Product Number	Supported as of Cisco IOS Software Release	Description
CPAK-100G-LR4	3.16.1S	Cisco CPAK transceiver module for 100 Gigabit Ethernet 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 multi-fiber cables respectively.
CPAK-100G-ER4L	16.6.1	Cisco CPAK transceiver module for 100 Gigabit Ethernet optical links, single-mode fiber (SMF, G.652), SC connectors, up to 25km.
CPAK-100G-SR4	16.6.2	Cisco CPAK transceiver module for 100 Gigabit Ethernet optical links over 12-fiber ribbon cables terminated with MPO/MTP connectors, up to 70m and 100m on OM3 and OM4 multi-mode cables respectively.

Cisco ASR 900 Series 2-Port 40GE QSFP module (A900-IMA2F)

This 2-port 40 Gigabit Ethernet QSFP module provides physical connectivity using two pluggable 40 Gigabit Ethernet optics. Table 2 lists the QSFP optics that are supported in the Cisco ASR 900 Series 2-Port 40GE QSFP Module, with the Cisco IOS® Software releases for the ASR 900 Series router.

Table 2.   40 Gigabit Ethernet Optics supported in 2-Port 40GE QSFP module

Optic Product Number	Supported as of Cisco IOS Software Release	Description
QSFP-40G-LR4	3.16.1S	Cisco QSFP transceiver module for 40-Gbps optical links, single-mode fiber (SMF, G.652), LC 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 multi-fiber connectors.
QSFP-40G-ER4	3.18S	Cisco QSFP transceiver module for 40-Gigabit Ethernet optical links, Single-Mode Fiber (SMF, G.652), LC connectors, up to 40km.

Cisco ASR 900 Series 8-Port 10GE SFP+ module (A900-IMA8Z)

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 allow 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, with the Cisco IOS® 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 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-ER	3.16.1S	Cisco 10GBASE-ER Ethernet SFP+ transceiver module for SMF, 1550 nm
SFP-10G-ZR	3.16.1S	Cisco multi-rate 10GBASE-ZR, 10GBASE-ZW and OTU2e SFP+ transceiver module for SMF, 1550 nm

Optic Product Number	Supported as of Cisco IOS Software Release	Description
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
ONS-SC+-10G-SR	16.5.1	Cisco 10GBASE-SR Ethernet SFP+ transceiver module for MMF, 850 nm, commercial temperature range
ONS-SC+-10G-LR	3.18.0SP	Cisco 10GBASE-LR Ethernet SFP+ transceiver module for SMF, 1310 nm, commercial temperature range
ONS-SC+-10G-ER	3.18.0SP	Cisco 10GBASE-ER Ethernet SFP+ transceiver module for SMF, 1550 nm, commercial temperature range
ONS-SC+-10G-ZR	16.5.1	Cisco 10GBASE-ZR Ethernet SFP+ transceiver module for SMF, 1550 nm, commercial temperature range
DWDM-SFP10G-xx.xx	3.16.1S	Cisco multi-rate (LAN/WAN/OTU2E) 10GBASE-DWDM single wavelength SFP+ module (100-GHz ITU grid) – 40 individual wavelength pluggable modules
DWDM-SFP10G-C	3.18.0S	Cisco 10G BASE-DWDM tunable SFP+ with 96 DWDM ITU-50GHz channels to which the device can be tuned, ranging from 1528-nm to 1566-nm
ONS-SC+-10G-C=	16.6.1	Cisco 10G BASE-DWDM full C-band tunable SFP+, ITU-50Ghz
ONS-SC+-10G-xx.x	3.18.0SP	Cisco multi-rate 10G BASE DWDM SFP+ with different wavelengths ranging from 1530-nm to 1561-nm, 100 GHz, LC
ONS-SC+-10GEPxx.x	3.18.0SP	Cisco multi-rate 10G BASE DWDM Edge Performance SFP+ with different wavelengths ranging from 1530-nm to 1561-nm, 100 GHz, LC
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
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 1-port 10 Gigabit Ethernet (SFP+) / 1-port Gigabit Ethernet (SFP) / 2-port Gigabit Ethernet (CSFP) + 16-port Gigabit Ethernet (CSFP) / 8-port Gigabit Ethernet (SFP) Module (A900-IMA8CS1Z-M

This interface module can operate in a number of different modes, using specific Bandwidth subscription or oversubscription configuration, dependent on Interface module slot and optics use. The default mode is delivering one port of 10 Gigabit Ethernet and eight ports of Gigabit Ethernet using regular SFP+ and SFP interfaces respectively on Cisco ASR 900 Series systems. Optional mode two is delivering one port of 10 Gigabit Ethernet and sixteen ports of Gigabit Ethernet using one regular SFP+ and eight bi-directional Compact SFP interfaces respectively on Cisco ASR 900 Series systems. Optional mode three is delivering eighteen ports of 1 Gigabit Ethernet using nine bi-directional Compact SFP interfaces on Cisco ASR 900 Series systems. The Interface Module mode selection is available through a Command Line Interface command. Interface Module Slot compatibility and subscription modes can be found in tables 16-19. This module is capable to support MACsec in a future release.

Table 4.   Ethernet Optics Supported in 1-port 10 Gigabit Ethernet SFP+/SFP/CSFP and 8-Port 1 Gigabit Ethernet SFP/CSFP module

Optic Product Number	Supported as of Cisco IOS Software Release	Description
GLC-FE-100FX	16.7.1	100BASE-FX SFP for Fast Ethernet SFP Ports, 1310 nm wavelength, 2 km over MMF
GLC-FE-100LX	16.7.1	100BASE-LX SFP for Fast Ethernet SFP Ports, 1310 nm wavelength, 10 km over SMF
GLC-FE-100EX	16.7.1	100BASE-EX SFP for Fast Ethernet SFP Ports, 1310 nm wavelength, 40 km over SMF
GLC-FE-100ZX	16.7.1	100BASE-ZX SFP for Fast Ethernet SFP Ports, 1550 nm wavelength, 80 km over SMF
GLC-FE-100BX-U	16.7.1	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	16.7.1	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-BX-D	16.7.1	1000BASE-BX10 SFP module for single-strand SMF, 1490-nm TX/1310-nm RX wavelength, single LC/PC connector
GLC-BX-U	16.7.1	1000BASE-BX10 SFP module for single-strand SMF, 1310-nm TX/1490-nm RX wavelength, single LC/PC connector
GLC-BX40-U-I	16.7.1	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	16.7.1	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	16.7.1	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	16.7.1	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	16.7.1	1000BASE-BX10 SFP module for single-strand SMF, 1570-nm TX/1310-nm RX wavelength, 80 km reach, single LC/PC connector
GLC-TE	16.7.1	1000BASE-T SFP transceiver module for Category 5 copper wire, RJ-45 connector
SFP-GE-T	16.7.1	1000BASE-T SFP transceiver module for Category 5 copper wire, extended operating temperature range, RJ-45 connector
SFP-GE-S	16.7.1	1000BASE-SX SFP transceiver module for MMF, 850-nm wavelength
SFP-GE-L	16.7.1	1000BASE-LX/LH SFP transceiver module for MMF and SMF, 1310-nm wavelength
SFP-GE-Z	16.7.1	1000BASE-ZX SFP transceiver module for SMF, 1550-nm wavelength
GLC-SX-MMD	16.7.1	1000BASE-SX SFP transceiver module for MMF, 850-nm wavelength, extended operating temperature range and DOM support, dual LC/PC connector
GLC-LH-SMD	16.7.1	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-EX-SMD	16.7.1	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-ZX-SMD	16.7.1	1000BASE-ZX SFP transceiver module for SMF, 1550-nm wavelength, extended operating temperature range and Digital Optical Monitoring (DOM) support, dual LC/PC connector
ONS-SC-2GE-BX-D	16.7.1	1000BASE-BX10 2 Channel Gigabit Ethernet transceiver module for SMF, 1490 nm wavelength, dual LC/PC connector
SFP-10G-SR	16.7.1	Cisco 10GBASE-SR Ethernet SFP+ transceiver module for MMF, 850 nm
SFP-10G-LR	16.7.1	Cisco 10GBASE-LR Ethernet SFP+ transceiver module for SMF, 1310 nm
SFP-10G-ER	16.7.1	Cisco 10GBASE-ER Ethernet SFP+ transceiver module for SMF and MMF, 1550 nm
SFP-10G-ZR	16.7.1	Cisco multi-rate 10GBASE-ZR, 10GBASE-ZW and OTU2e SFP+ transceiver module for SMF and MMF, 1550 nm
SFP-10G-SR-X	16.7.1	Cisco 10GBASE-SR Ethernet SFP+ transceiver module for MMF, 850 nm, extended temperature range
SFP-10G-LR-X	16.7.1	Cisco 10GBASE-LR Ethernet SFP+ transceiver module for SMF, 1310 nm, extended temperature range

Optic Product Number	Supported as of Cisco IOS Software Release	Description
SFP-10G-BXD-I	16.7.1	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	16.7.1	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	16.7.1	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	16.7.1	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 and 1-Port 10GE SFP+ module (A900-IMA8S1Z)

This interface module delivers eight ports of Gigabit Ethernet and Fast Ethernet and one port of 10 Gigabit Ethernet interface on Cisco ASR 900 Series systems. 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 SPF+ transceiver.

Table 5 lists the pluggable optics supported in the Cisco ASR 900 Series 8-Port 1GE SFP and 1-Port 10GE SFP+ Module, with the Cisco IOS Software releases for the ASR 900 Series system.

Table 5.   Ethernet Optics Supported in 8-Port 1GE SFP and 1-Port 10GE SFP+ module

Optic Product Number	Supported as of Cisco IOS Software Release	Description
GLC-FE-100FX	3.13.0S	100BASE-FX SFP for Fast Ethernet SFP Ports, 1310 nm wavelength, 2 km over MMF
GLC-FE-100LX	3.13.0S	100BASE-LX SFP for Fast Ethernet SFP Ports, 1310 nm wavelength, 10 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-100ZX	3.13.0S	100BASE-ZX SFP for Fast Ethernet SFP Ports, 1550 nm wavelength, 80 km over SMF
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-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-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-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-ZX-SMD	3.18.0SP	1000BASE-ZX SFP transceiver module for SMF, 1550-nm wavelength, extended operating temperature range and Digital Optical Monitoring (DOM) support, 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
GLC-ZX-SM-RGD	3.13.0S	1000BASE-ZX SFP transceiver module for SMF, 1550-nm wavelength, industrial Ethernet, dual LC/PC connector
GLC-TE	3.18.0SP1	1000BASE-T SFP transceiver module for Category 5 copper wire, RJ-45 connector
SFP-GE-T	3.13.0S	1000BASE-T SFP transceiver module for Category 5 copper wire, extended operating temperature range, RJ-45 connector

Optic Product Number	Supported as of Cisco IOS Software Release	Description
SFP-GE-S	3.13.0S	1000BASE-SX SFP transceiver module for MMF, 850-nm wavelength
SFP-GE-L	3.13.0S	1000BASE-LX/LH SFP transceiver module for MMF and SMF, 1310-nm wavelength
SFP-GE-Z	3.13.0S	1000BASE-ZX SFP transceiver module for SMF, 1550-nm wavelength
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-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
GLC-GE-DR-LX	3.17.0S	Dual Rate 100BASE-LX / 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-SC-GE-LX	3.18.0S	1000BASE-LX Gigabit Ethernet transceiver module for SMF, 1310 nm wavelength, commercial operating temperature range and DOM support, dual LC/PC connector
ONS-SC-GE-BXD	3.18.0S	1000BASE-BX10 SFP module for single-strand SMF, 1490-nm TX/1310-nm RX wavelength, single LC/PC connector
ONS-SC-GE-BXU	3.18.0S	1000BASE-BX10 SFP module for single-strand SMF, 1310-nm TX/1490-nm RX wavelength, single 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-SE-Z1	3.18.0SP	1000BASE-LX Gigabit Ethernet / OC-48/STM-16 IR / OC-12/-2 / STM-1/-4 SR transceiver module, 1310 nm, SFP, extended temperature range
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-SI-GE-ZX	16.5.1	1000BASE-ZX Gigabit Ethernet transceiver module, SMF, 1550 nm, SFP, industrial temperature range
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
ONS-SC-155-TSOP	3.17.0S	OC3/STM-1 Clear channel over Gigabit Ethernet SFP
ONS-SC-622-TSOP	3.18.0S	OC12/STM-4 Clear channel over Gigabit Ethernet SFP
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 MMF, 850 nm
SFP-10G-LR	3.13.0S	Cisco 10GBASE-LR Ethernet SFP+ transceiver module for SMF, 1310 nm
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 multi-rate 10GBASE-ZR, 10GBASE-ZW and OTU2e SFP+ transceiver module for SMF and MMF, 1550 nm
SFP-10G-SR-X	3.13.0S	Cisco 10GBASE-SR Ethernet SFP+ transceiver module for MMF, 850 nm, extended temperature range

Optic Product Number	Supported as of Cisco IOS Software Release	Description
SFP-10G-LR-X	3.13.0S	Cisco 10GBASE-LR Ethernet SFP+ transceiver module for SMF, 1310 nm, extended temperature range
ONS-SC+-10G-SR	16.5.1	Cisco 10GBASE-SR Ethernet SFP+ transceiver module for MMF, 850 nm, commercial temperature range
ONS-SC+-10G-LR	3.18.0SP	Cisco 10GBASE-LR Ethernet SFP+ transceiver module for SMF, 1310 nm, commercial temperature range
ONS-SC+-10G-ER	3.18.0SP	Cisco 10GBASE-ER Ethernet SFP+ transceiver module for SMF, 1550 nm, commercial temperature range
ONS-SC+-10G-ZR	16.5.1	Cisco 10GBASE-ZR Ethernet SFP+ transceiver module for SMF, 1550 nm, commercial temperature range
DWDM-SFP10G-C	3.18.0S	Cisco 10G BASE-DWDM tunable SFP+ with 96 DWDM ITU-50GHz channels to which the device can be tuned, ranging from 1528-nm to 1566-nm
DWDM-SFP10G-xx.xx	3.16.0S	Cisco multi-rate (LAN/WAN/OTU2E) 10GBASE-DWDM single wavelength SFP+ module (100-GHz ITU grid) – 40 individual wavelength pluggable modules
ONS-SC+-10G-xx.x	3.18.0S	Cisco multi-rate 10G BASE DWDM SFP+ with different wavelengths ranging from 1530-nm to 1561-nm, 100 GHz, LC
ONS-SC+-10GEPxx.x	3.18.0SP	Cisco multi-rate 10G BASE DWDM Edge Performance SFP+ with different wavelengths ranging from 1530-nm to 1561-nm, 100 GHz, LC
ONS-SC+-10G-C=	16.6.1	Cisco 10G BASE-DWDM full C-band tunable SFP+, ITU-50Ghz
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 and 1-Port 10GE SFP+ module (A900-IMA8T1Z)

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

Table 6.   Ethernet Optics Supported in 8-Port 1GE RJ45 and 1-Port 10GE SFP+ module

Optic Product Number	Supported as of Cisco IOS XE 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

Optic Product Number	Supported as of Cisco IOS XE Release	Description
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 multi-rate 10GBASE-ZR, 10GBASE-ZW and OTU2e SFP+ transceiver module for SMF and MMF, 1550 nm
ONS-SC+-10G-SR	16.5.1	Cisco 10GBASE-SR Ethernet SFP+ transceiver module for MMF, 850 nm, commercial temperature range
ONS-SC+-10G-LR	3.18.0SP	Cisco 10GBASE-LR Ethernet SFP+ transceiver module for SMF, 1310 nm, commercial temperature range
ONS-SC+-10G-ER	3.18.0SP	Cisco 10GBASE-ER Ethernet SFP+ transceiver module for SMF, 1550 nm, commercial temperature range
ONS-SC+-10G-ZR	16.5.1	Cisco 10GBASE-ZR Ethernet SFP+ transceiver module for SMF, 1550 nm, commercial temperature range
DWDM-SFP10G-xx.xx=	3.13.0S	Cisco multi-rate (LAN/WAN/OTU2/OTU2E) 10GBASE-DWDM single wavelength SFP+ module (100-GHz ITU grid) – 40 individual wavelength pluggable modules
DWDM-SFP10G-C	3.18.0S	Cisco 10G BASE-DWDM tunable SFP+ with 96 DWDM ITU-50GHz channels to which the device can be tuned, ranging from 1528-nm to 1566-nm
CWDM-SFP10G-xxxx	3.14.0S	Cisco multi-rate 10G BASE CWDM SFP+ over Single Mode Fiber(SMF), with eight different wavelengths ranging from 1470-nm to 1610-nm
ONS-SC+-10G-C=	16.6.1	Cisco 10G BASE-DWDM full C-band tunable SFP+, ITU-50Ghz
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 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 7 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 7. Ethernet Optics Supported in 1-Port 10GE XFP module

Optic Product Number	Supported as of Cisco IOS XE Release	Description
XFP10GER-192IR-L	3.8.0S	Cisco multi-rate 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)[1]
XFP10GLR-192SR-L	3.8.0S	Cisco multi-rate 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)[1]
XFP-10GZR-OC192LR	3.8.0S	Cisco multi-rate XFP transceiver module for 10GBASE-ZR/-ZW Ethernet and OC-192/STM-64 long-reach, SMF, dual LC connector[1]
XFP10GLR192SR-RGD	3.5.0S	Cisco multi-rate XFP transceiver module for 10GBASE-LR/-LW Ethernet and OC-192/STM-64 short-reach (SR-1), SMF, dual LC connector, industrial temperature range[1]
XFP10GER192IR-RGD	3.5.0S	Cisco multi-rate XFP transceiver module for 10GBASE-ER/-EW Ethernet and OC-192/STM-64 intermediate-reach (IR-2), SMF, dual LC connector, industrial temperature range[1]
XFP10GZR192LR-RGD	3.5.0S	Cisco multi-rate XFP transceiver module for 10GBASE-ZR/-ZW Ethernet and OC-192/STM-64 long-reach, SMF, dual LC connector, industrial temperature range[1]
DWDM-XFP-C	3.5.0S	10GBASE-DWDM Tunable XFP (50-GHz ITU grid), dual LC connector

Optic Product Number	Supported as of Cisco IOS XE Release	Description
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 multi-rate XFP transceiver module for 10GBASE-LR Ethernet and OC-192/STM-64 short-reach (SR-1) PoS applications, SMF, dual LC connector[1]
XFP-10GZR-OC192LR	3.5.0S	Cisco multi-rate XFP transceiver module for 10GBASE-ZR Ethernet and OC-192/STM-64 long-reach PoS applications, SMF, dual LC connector[1]

[1] OC192/STM-64 PoS not supported.

Cisco ASR 900 series 2-Port 10GE XFP/SFP+ module (A900-IMA2Z)

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

Table 8. Ethernet Optics Supported in 2-Port 10GE XFP module

Optic Product Number	Supported as of Cisco IOS XE 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 multi-rate 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)[1]
XFP10GLR-192SR-L	3.13.0S	Cisco multi-rate 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)[1]
XFP-10GZR-OC192LR	3.13.0S	Cisco multi-rate XFP transceiver module for 10GBASE-ZR/-ZW Ethernet and OC-192/STM-64 long-reach, SMF, dual LC connector[1]
XFP10GLR192SR-RGD	3.13.0S	Cisco multi-rate XFP transceiver module for 10GBASE-LR/-LW Ethernet and OC-192/STM-64 short-reach (SR-1), SMF, dual LC connector, industrial temperature range[1]
XFP10GER192IR-RGD	3.13.0S	Cisco multi-rate XFP transceiver module for 10GBASE-ER/-EW Ethernet and OC-192/STM-64 intermediate-reach (IR-2), SMF, dual LC connector, industrial temperature range[1]
XFP10GZR192LR-RGD	3.13.0S	Cisco multi-rate XFP transceiver module for 10GBASE-ZR/-ZW Ethernet and OC-192/STM-64 long-reach, SMF, dual LC connector, industrial temperature range[1]
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

Optic Product Number	Supported as of Cisco IOS XE Release	Description
XFP-10GLR-OC192SR	3.13.0S	Cisco multi-rate XFP transceiver module for 10GBASE-LR Ethernet and OC-192/STM-64 short-reach (SR-1) PoS applications, SMF, dual LC connector[1]
XFP-10GZR-OC192LR	3.13.0S	Cisco multi-rate XFP transceiver module for 10GBASE-ZR Ethernet and OC-192/STM-64 long-reach PoS applications, SMF, dual LC connector[1]
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 multi-rate 10GBASE-ZR, 10GBASE-ZW and OTU2e SFP+ transceiver module for SMF 1550 nm
ONS-SC+-10G-SR	16.5.1	Cisco 10GBASE-SR Ethernet SFP+ transceiver module for MMF, 850 nm, commercial temperature range
ONS-SC+-10G-LR	3.18.0SP	Cisco 10GBASE-LR Ethernet SFP+ transceiver module for SMF, 1310 nm, commercial temperature range
ONS-SC+-10G-ER	3.18.0SP	Cisco 10GBASE-ER Ethernet SFP+ transceiver module for SMF, 1550 nm, commercial temperature range
ONS-SC+-10G-ZR	16.5.1	Cisco 10GBASE-ZR Ethernet SFP+ transceiver module for SMF, 1550 nm, commercial temperature range
DWDM-SFP10G-xx.xx=	3.13.0S	Cisco multi-rate (LAN/WAN/OTU2E) 10GBASE-DWDM single wavelength SFP+ module (100-GHz ITU grid) – 40 individual wavelength pluggable modules
DWDM-SFP10G-C	3.18.0S	Cisco 10G BASE-DWDM tunable SFP+ with 96 DWDM ITU-50GHz channels to which the device can be tuned, ranging from 1528-nm to 1566-nm
ONS-SC+-10G-C=	16.6.1	Cisco 10G BASE-DWDM full C-band tunable SFP+, ITU-50Ghz
CWDM-SFP10G-xxxx	3.14.0S	Cisco multi-rate 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
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

[1] OC192/STM-64 PoS not supported

Cisco ASR 900 series 8-Port 1GE SFP module (A900-IMA8S)

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

Table 9.   Ethernet Optics Supported in the 8-Port 1GE SFP module

Optic Product Number	Supported As of Cisco IOS XE 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

Optic Product Number	Supported As of Cisco IOS XE Release	Description
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	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	3.5.0S	1000BASE-BX10 SFP module for single-strand SMF, 1490-nm TX/1310-nm RX wavelength, single LC/PC connector
GLC-BX-U	3.5.0S	1000BASE-BX10 SFP module for single-strand SMF, 1310-nm TX/1490-nm RX wavelength, single LC/PC connector
GLC-ZX-SM-RGD	3.5.0S	1000BASE-ZX SFP transceiver module for SMF, 1550-nm wavelength, industrial Ethernet, dual LC/PC connector
GLC-SX-MM-RGD	3.5.0S	1000BASE-SX SFP transceiver module for MMF, 850-nm wavelength, industrial Ethernet, dual LC/PC connector
GLC-LX-SM-RGD	3.5.0S	1000BASE-LX/LH SFP transceiver module for MMF and SMF, 1300-nm wavelength, industrial Ethernet, dual LC/PC connector
GLC-TE	3.18.0SP1	1000BASE-T SFP transceiver module for Category 5 copper wire, RJ-45 connector
SFP-GE-T	3.5.0S	1000BASE-T SFP transceiver module for Category 5 copper wire, extended operating temperature range, RJ-45 connector
SFP-GE-L	3.10.0S	1000BASE-LX/LH SFP transceiver module for MMF and SMF, 1310-nm wavelength
SFP-GE-S	3.10.0S	1000BASE-SX SFP transceiver module for MMF, 850-nm wavelength
SFP-GE-Z	3.10.0S	1000BASE-ZX SFP transceiver module for SMF, 1550-nm wavelength
GLC-GE-DR-LX	3.18.0S	Dual Rate 100BASE-LX / 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-SC-GE-LX	3.18.0SP	1000BASE-LX Gigabit Ethernet transceiver module for SMF, 1310 nm wavelength, commercial operating temperature range and DOM support, dual LC/PC connector
ONS-SC-GE-BXD	3.18.0S	1000BASE-BX10 SFP module for single-strand SMF, 1490-nm TX/1310-nm RX wavelength, single LC/PC connector
ONS-SC-GE-BXU	3.18.0S	1000BASE-BX10 SFP module for single-strand SMF, 1310-nm TX/1490-nm RX wavelength, single 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-SE-Z1	3.18.0SP	1000BASE-LX Gigabit Ethernet / OC-48/STM-16 IR / OC-12/-2 / STM-1/-4 SR transceiver module, 1310 nm, SFP, extended temperature range
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-SI-GE-ZX	16.5.1	1000BASE-ZX Gigabit Ethernet transceiver module, SMF, 1550 nm, SFP, industrial temperature range
DWDM-SFP-xxxx (36 wavelengths)	3.6.0S	Cisco 1000BASE-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
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

Optic Product Number	Supported As of Cisco IOS XE Release	Description
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 RJ45 module (A900-IMA8T)

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.
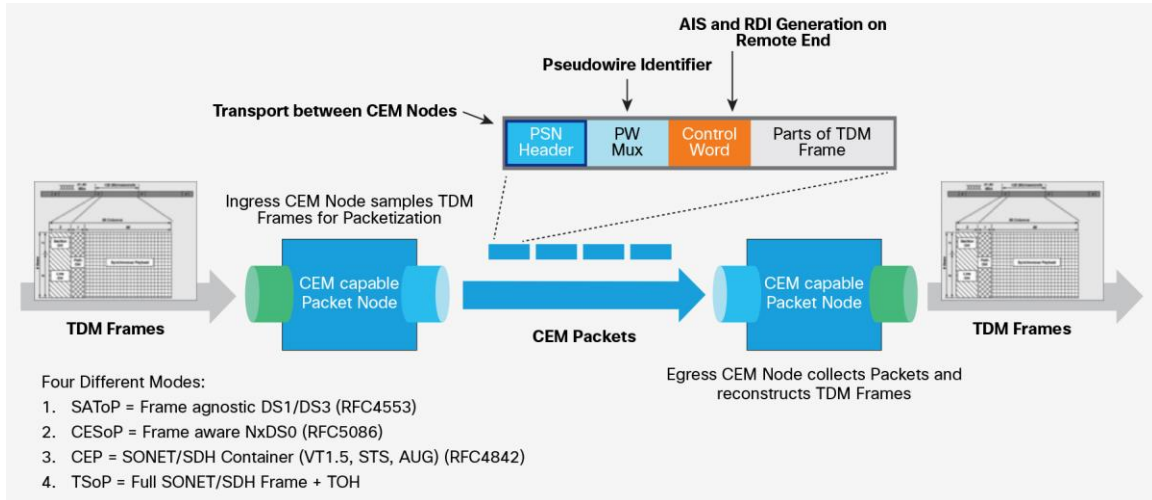
TDM/PDH/SONET/SDH interface modules

Migrating circuit-switched TDM, PDH and SONET/SDH networks to Ethernet/IP/MPLS capable switches and routers can be challenging, particularly when service providers need to replicate the functionalities and provisioning capabilities of the legacy infrastructure. Although the legacy TDM infrastructure is aging, expensive to operate, and an inefficient platform for data transport, service providers and carriers are still required to maintain their TDM connectivity. End customers are sometimes reluctant to move to native Ethernet/IP/MPLS handoffs and might switch to a different service provider if forced to transition early.

The ASR 900 Series products provide a purpose-built solution that enables service providers to meet their legacy TDM requirements. With high-density TDM, SONET/SDH, OTN and Carrier Ethernet (FE, GE, 10GE, 40GE and 100GE) interfaces, the ASR 900 series delivers any-to-any connectivity via a packet-based network (MPLS/Flex LSP), more efficiently than any other packet transport mechanism and is not bounded by TDM transport inefficiencies. The ASR 900 series features include:

- Cisco's high-density Circuit Emulation technology which provides boundless scale with High density TDM circuit emulation over a protected Flex LSP core
- A complete central office modernization option for legacy TDM DCS migration and SONET/SDH ADM ring overlay/migration, as well as facilitating the transition to packet-based networks over time
- A carrier class design that requires a much smaller central office footprint (some configurations provide more than 2 times the capacity of multiple DCS/ADM equipment) with significant power and cooling savings compared to legacy products

**Figure 2.**   Circuit Emulation (CEM) standards

All ASR 900 Series TDM/PDH/SONET/SDH interface modules support Online Insertion and Removal (OIR), which contributes to a higher uptime for ASR 900 Series systems.

Cisco ASR 900 series 8-Port T1/E1 module (A900-IMA8D)

This interface module delivers 8 ports of T1 or E1 connectivity on ASR 900 Series systems with RSP2. This 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.

Figure 3.   Supported CEM Types for T1/E1
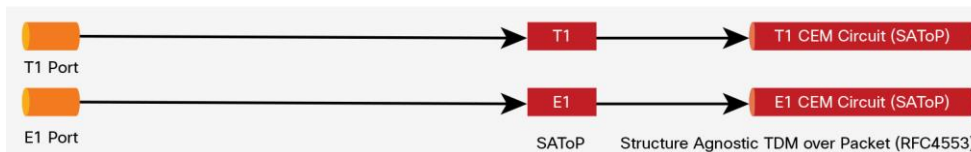
Cisco ASR 900 series 16-Port T1/E1 module (A900-IMA16D)

Similar to the 8-port T1/E1 interface module, this interface module delivers 16 ports of T1 or E1 connectivity on ASR 900 Series routers with RSP1 or RSP2. 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 with the Cisco IOS XE Software releases for ASR 900 Series routers.

Table 10.　Accessories required with the ASR 900 series 16-Port E1/T1 module

Optic Product ID	Supported As of Cisco IOS XE Release	Description
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
CABLE-16T1E1	3.6.0S	Cable for 16-Port T1/E1 Interface Module, 12 feet

Cisco ASR 900 series 32-Port T1/E1 module (A900-IMA32D)

Similar to the 16-port T1/E1 interface module, this interface module delivers 32 ports of T1 or E1 connectivity on ASR 900 Series routers with RSP2. 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 the 32-Port E1/T1

Optic Product ID	Supported As of Cisco IOS XE Release	Description
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
CABLE-32T1E1	3.14.0S	Cable for 32 Port T1/E1 Interface Module

Cisco ASR 900 series 48-Port T1/E1 module (A900-IMA48D-C)

This interface module delivers 48 ports of T1 or E1 connectivity on ASR 900 Series systems with RSP3. 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 48 T1 or 48 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.

Figure 4. Supported CEM types for T1/E1
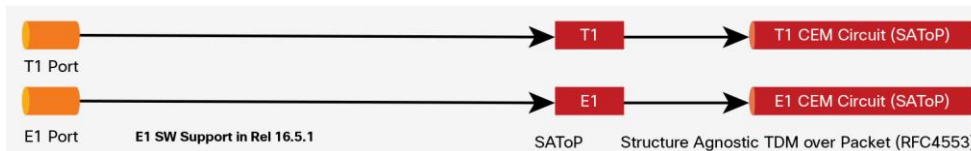
The module requires an external patch panel and a breakout cable to deliver a DIN, RJ48 or AMP64 port for the user application.

Table 12 lists the cables and patch panels that are required with the Cisco ASR 900 Series 48-Port T1/E1 Module on the Cisco IOS Software releases for ASR 900 Series systems.

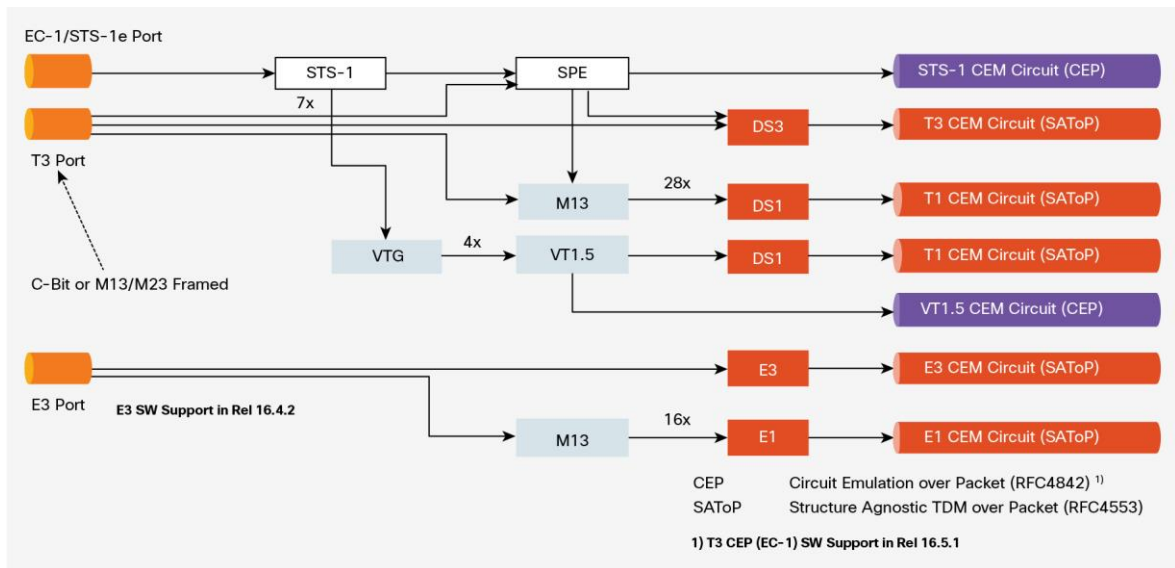**Table 12.** Accessories required with ASR 900 series 48-Port E1/T1 module

Product ID	Supported as of Cisco IOS Software Release	Description
PANEL-48-1-DIN	3.18.1SP	48 x 75 ohm E1/DS1 termination, thru DIN 1.0/2.3 connectors
PANEL-48-1-RJ48	3.18.1SP	48 x 120 ohm E1/110 ohm DS1 termination, thru RJ 48C connectors
PANEL-48-1-AMP64	3.18.1SP	48 x 120 ohm E1/110 ohm DS1 termination, 4 x AMP 64-pin
CABLE-16TDM-C	3.18.1SP	16 port cable for TDM CEM IM, no red, 10 Feet
CABLE-16TDM-L1	3.18.1SP	16 port cable for TDM CEM IM, no red, 56" / 4.7 ft / 1.4 m
CABLE-16TDM-L2	3.18.1SP	16 port cable for TDM CEM IM, no red, 63" / 5.3 ft / 1.6 m
CABLE-16TDM-L3	3.18.1SP	16 port cable for TDM CEM IM, no red, 85" / 7.1ft / 2.2 m
CABLE-16TDM-L4	3.18.1SP	16 port cable for TDM CEM IM, no red, 96" / 8 ft / 2.4 m
CABLE-16TDM-C-R	16.7.1	16 port cable for TDM CEM IM, red, 10 Feet
CABLE-16TDM-C-RL1	16.7.1	16 port cable for TDM CEM IM, red, 56" / 4.7 ft / 1.4 m
CABLE-16TDM-C-RL2	16.7.1	16 port cable for TDM CEM IM, red, 63" / 5.3 ft / 1.6 m
CABLE-16TDM-C-RL3	16.7.1	16 port cable for TDM CEM IM, red, 85" / 7.1ft / 2.2 m
CABLE-16TDM-C-RL4	16.7.1	16 port cable for TDM CEM IM, red, 96" / 8 ft / 2.4 m

Cisco ASR 900 series 48-Port T3/E3 module (A900-IMA48T-C)

This interface module delivers 48 ports of T3 or E3 connectivity on ASR 900 Series systems with RSP3. The module can be software configured as either T3 mode or E3 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 48 T3 or 48 E3 ports. Mixing T3 and E3 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.

Figure 5. Supported CEM types for T3/E3

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

Table 13 lists the cables and patch panels that are required with the Cisco ASR 900 Series 48-Port T3/E3 Module on the Cisco IOS Software releases for ASR 900 Series systems.

Table 13. Accessories required with ASR 900 series 48-Port E3/T3 module

Product ID	Supported as of Cisco IOS Software Release	Description
PANEL-48-3-DIN	3.18.1SP	48 x 75 ohm E3/DS3 termination, thru DIN 1.0/2.3 connectors[1]
PANEL-48-3-HDBNC	3.18.1SP	48 x 75 ohm E1/110 ohm DS1 termination, HD BNC connectors[1]
CABLE-16TDM-C	3.18.1SP	16 port cable for TDM CEM IM, no red, 10 Feet
CABLE-16TDM-L1	3.18.1SP	16 port cable for TDM CEM IM, no red, 56" / 4.7 ft / 1.4 m
CABLE-16TDM-L2	3.18.1SP	16 port cable for TDM CEM IM, no red, 63" / 5.3 ft / 1.6 m
CABLE-16TDM-L3	3.18.1SP	16 port cable for TDM CEM IM, no red, 85" / 7.1ft / 2.2 m
CABLE-16TDM-L4	3.18.1SP	16 port cable for TDM CEM IM, no red, 96" / 8 ft / 2.4 m
CABLE-16TDM-C-R	16.7.1	16 port cable for TDM CEM IM, red, 10 Feet
CABLE-16TDM-C-RL1	16.7.1	16 port cable for TDM CEM IM, red, 56" / 4.7 ft / 1.4 m
CABLE-16TDM-C-RL2	16.7.1	16 port cable for TDM CEM IM, red, 63" / 5.3 ft / 1.6 m
CABLE-16TDM-C-RL3	16.7.1	16 port cable for TDM CEM IM, red, 85" / 7.1ft / 2.2 m
CABLE-16TDM-C-RL4	16.7.1	16 port cable for TDM CEM IM, red, 96" / 8 ft / 2.4 m

[1] T3/E3 DIN/HDBNC ports can support up to 450 ft cable length with 75 Ohm 734A coaxial cable.

Cisco ASR 900 series 4-Port OC3/STM-1 or 1-Port OC12/STM-4 module (A900-IMA4OS)

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 with RSP2. 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 with RSP2 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 multi-rate 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.

- **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).

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 14 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 14.   Optics supported in the 4-Port OC3/STM1 or 1-Port OC12/STM4 module

Optic Product ID	Supported As of Cisco IOS XE 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
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

Optic Product ID	Supported As of Cisco IOS XE Release	Description
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

Cisco ASR 900 series 12-Port T1/E1 + 4-port DS3/E3 + 4-port OC3/STM-1 or 4-port OC12/STM-4 or 1-Port OC48/STM-16 module (A900-IMA3G-IMSG)

This interface module delivers up to 12 active ports of T1/E1 plus up to 4 active ports of DS3/E3 connectivity, plus 4 active ports of OC3/STM-1, or 4 active ports of OC12/STM-1, or 1 active port of OC48/STM-16 connectivity on ASR 900 Series Router with RSP2A-128 and RSP3C-400.

This Interface Module supports:

- Clear Channel (SAToP) and Channelized T1/E1 (CESoP)

- Channelized OC-3/STM-1 to clear channel T1/E1 (SAToP), clear channel DS3/E3 (SAToP) and Channelized T1/E1 (CESoP)

- Channelized OC-12/STM-4 to clear channel T1/E1 (SAToP)

- Clear channel OC-3/STM-1 (CEP)

- Clear Channel OC12/STM-4 (CEP)

- Clear Channel OC48/STM-16 (CEP)

The module is supported in interface module slots 2-5 on ASR 903 Series routers with RSP2A-128 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 multi-rate 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.

- **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, STM-4 or OC48, STM-16 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, STM-4 or OC48, STM-16 combination interface module).

- **OC-48 port license:** Allows service providers to activate one OC-48/STM-16 port, supporting a pay-as-you-grow strategy and simplified spare part management. One license is required for the OC-48/STM-16 port that needs to be activated on the ASR 900 Series router (requires the purchase of a combined OC-3, STM-1, OC-12, STM-4 or OC48, STM-16 combination interface module).

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 15 lists the pluggable optics that are supported in the Cisco ASR 900 Series 12-port T1/E1 + 4port DS3/E3 + 4-Port OC3/STM1 or 4-Port OC12/STM4 Module or 1-port OC48/STM-16 Interface Module on the Cisco IOS XE Software releases for ASR 900 Series routers.

Table 15. Optics supported in the Cisco ASR 900 12-port T1/E1 + 4port DS3/E3 + 4-Port OC3/STM1 or 4-Port OC12/STM4 module or 1-port OC48/STM-16 interface module

Optic Product ID	Supported As of Cisco IOS XE Release	Description
ONS-SI-155-SR-MM	16.7.1	OC-3/STM-1, short reach (SR), 1310 nm, multimode (MM), SFP, industrial temperature range
ONS-SI-155-I1	16.7.1	OC-3/STM-1 intermediate reach (IR), 1310 nm, SFP, industrial temperature range
ONS-SI-155-L1	16.7.1	OC-3/STM-1 long reach (LR), 1310 nm, SFP, industrial temperature range
ONS-SI-155-L2	16.7.1	OC-3/STM-1 LR, 1550 nm, SFP, industrial temperature range
ONS-SC-155-EL	16.7.1	STM-1 Electrical SFP, Commercial temperature range
ONS-SI-622-SR-MM	16.7.1	OC-12/STM-4, SR, 1310 nm, MM, SFP, industrial temperature range
ONS-SI-622-I1	16.7.1	OC-12/STM-4 IR, 1310 nm, SFP, industrial temperature range
ONS-SI-622-L1	16.7.1	OC-12/STM-4 LR, 1310 nm, SFP, industrial temperature range
ONS-SI-622-L2	16.7.1	OC-12/STM-4 LR, 1550 nm, SFP, industrial temperature range
ONS-SI-2G-I1	16.7.1	OC-48/STM-16 IR, 1310 nm, SFP, industrial temperature range
ONS-SI-2G-L1	16.7.1	OC-48/STM-16 LR, 1310 nm, SFP, industrial temperature range
ONS-SI-2G-L2	16.7.1	OC-48/STM-16 LR, 1550 nm, SFP, industrial temperature range
ONS-SI-2G-S1	16.7.1	OC-48/STM-16 SR, 1310 nm, SFP, industrial temperature range

The module requires an external patch panel and a breakout cable to deliver RJ48 (T1/E1) or HDBNC (T3/E3) ports for the user application.

Table 16 lists the cables and patch panels required with the Cisco ASR 900 12-port T1/E1 + 4port DS3/E3 + 4-Port OC3/STM1 or 4-Port OC12/STM4 Module or 1-port OC48/STM-16 Interface Module on the Cisco IOS Software releases for ASR 900 Series systems.

Table 16. Accessories required with the Cisco ASR 900 12-port T1/E1 + 4port DS3/E3 + 4-Port OC3/STM1 or 4-Port OC12/STM4 module or 1-port OC48/STM-16 interface module

Product ID	Supported as of Cisco IOS Software Release	Description
PANEL-3G-COMBO-1	16.7.1	Single 12 x E1 + 4 x DS3 Patch panel for 3G CEM/IMSG interface module
PANEL-3G-COMBO-2	16.7.1	Double 12 x E1 + 4 x DS3 Patch panel for 3G CEM/IMSG interface module
P3G1-RCKMNT-19IN	16.7.1	EIA 19 Inch mounting brackets for single 3G CEM/IMSG IM patch panel
P3G1-RCKMNT-ETSI	16.7.1	ETSI 21 Inch mounting brackets for single 3G CEM/IMSG IM patch panel
P3G1-RCKMNT-23IN	16.7.1	EIA 23 Inch mounting brackets for single 3G CEM/IMSG IM patch panel
P3G2-RCKMNT-19IN	16.7.1	EIA 19 Inch mounting brackets for double 3G CEM/IMSG IM patch panel
P3G2-RCKMNT-ETSI	16.7.1	ETSI 21 Inch mounting brackets for double 3G CEM/IMSG IM patch panel
P3G2-RCKMNT-23IN	16.7.1	EIA 23 Inch mounting brackets for double 3G CEM/IMSG IM patch panel
CABLE-16TDM-C	16.7.1	16 port cable for TDM CEM IM, no red, 10 Feet
CABLE-16TDM-C-L1	16.7.1	16 port cable for TDM CEM IM, no red, 56" / 4.7 ft / 1.4 m
CABLE-16TDM-C-L2	16.7.1	16 port cable for TDM CEM IM, no red, 63" / 5.3 ft / 1.6 m
CABLE-16TDM-C-L3	16.7.1	16 port cable for TDM CEM IM, no red, 85" / 7.1ft / 2.2 m
CABLE-16TDM-C-L4	16.7.1	16 port cable for TDM CEM IM, no red, 96" / 8 ft / 2.4 m

Product ID	Supported as of Cisco IOS Software Release	Description
CABLE-16TDM-C-R	16.7.1	16 port cable for TDM CEM IM, red, 10 Feet
CABLE-16TDM-C-RL1	16.7.1	16 port cable for TDM CEM IM, red, 56" / 4.7 ft / 1.4 m
CABLE-16TDM-C-RL2	16.7.1	16 port cable for TDM CEM IM, red, 63" / 5.3 ft / 1.6 m
CABLE-16TDM-C-RL3	16.7.1	16 port cable for TDM CEM IM, red, 85" / 7.1ft / 2.2 m
CABLE-16TDM-C-RL4	16.7.1	16 port cable for TDM CEM IM, red, 96" / 8 ft / 2.4 m

Cisco ASR 900 series 1-Port OC192/STM-64 or 8-Port OC3/12/48/STM-1/-4/-16 module (A900-IMA1Z8S-CX)

This interface module delivers one active port of OC192 or STM-64 connectivity, or up to eight ports of OC3/12 or STM-1/-4 or up to 4 ports of OC48 or STM-16 connectivity on ASR 900 Series systems with RSP3.

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

This module delivers true high density, multiservice and multi-rate capabilities in a small form factor. 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.

Figure 6. Supported CEM types for OCn/STM-n 1)
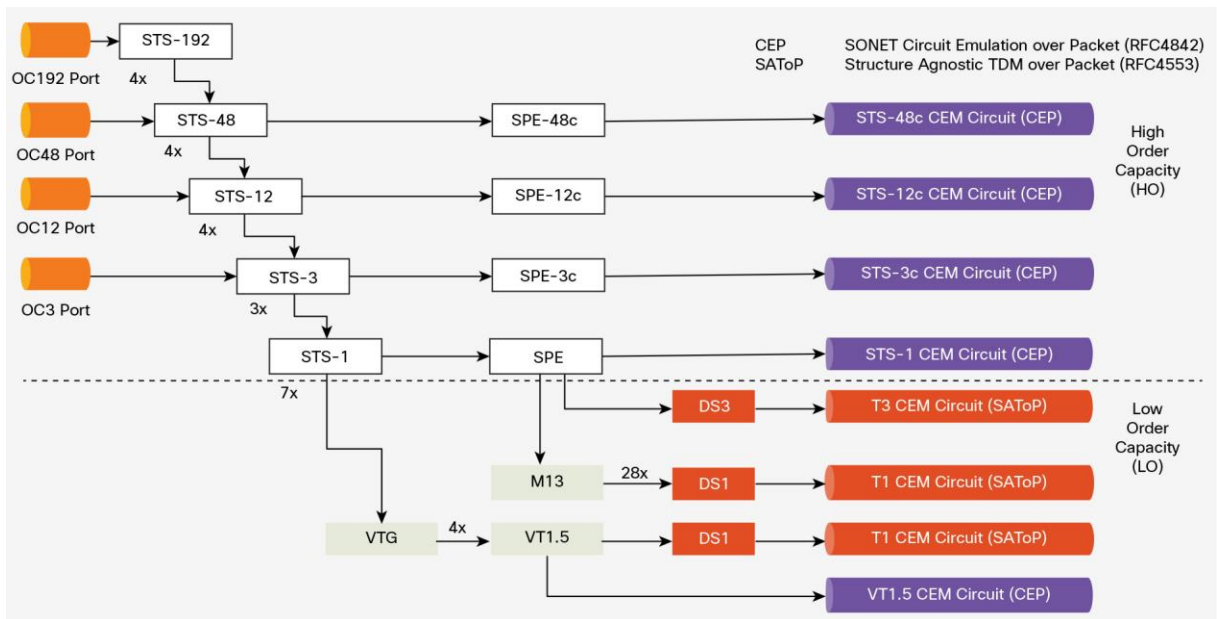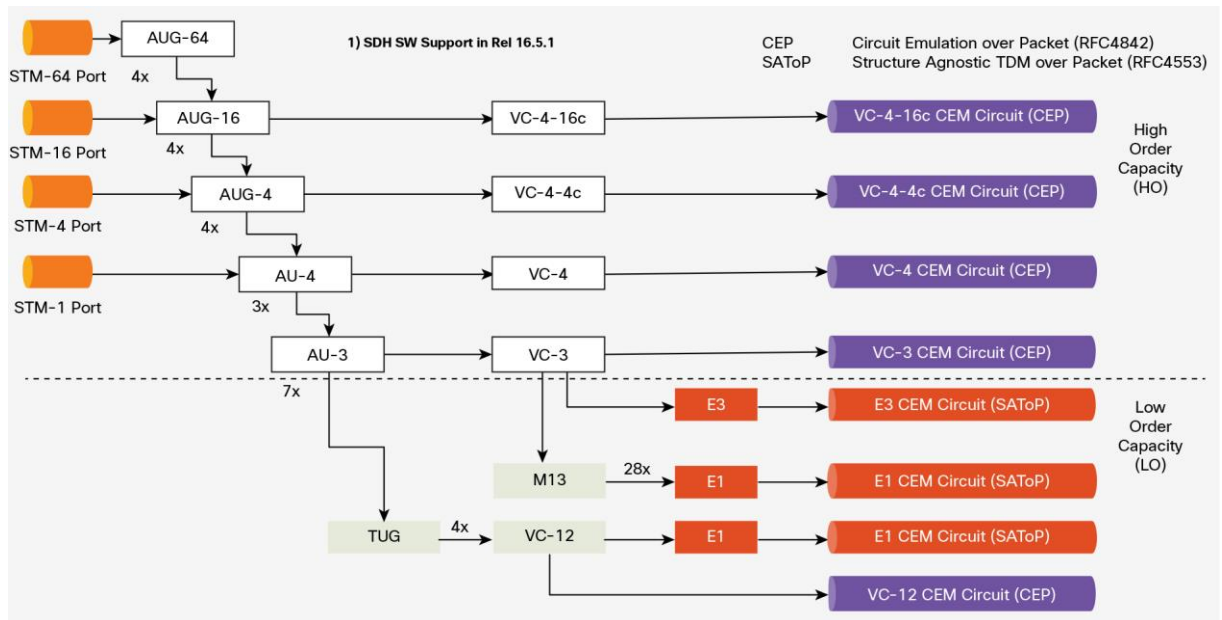
STM-64 Port → AUG-64
4x
STM-16 Port → AUG-16 → VC-4-16c → VC-4-16c CEM Circuit (CEP)
4x
STM-4 Port → AUG-4 → VC-4-4c → VC-4-4c CEM Circuit (CEP)
4x
STM-1 Port → AU-4 → VC-4 → VC-4 CEM Circuit (CEP)
3x
AU-3 → VC-3 → VC-3 CEM Circuit (CEP)
7x

1) SDH SW Support in Rel 16.5.1

CEP — Circuit Emulation over Packet (RFC4842)
SAToP — Structure Agnostic TDM over Packet (RFC4553)

High Order Capacity (HO)

Low Order Capacity (LO)

E3 → E3 CEM Circuit (SAToP)
M13 28x → E1 → E1 CEM Circuit (SAToP)
TUG 4x → VC-12 → E1 → E1 CEM Circuit (SAToP)
VC-12 → VC-12 CEM Circuit (CEP)

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 Software for Cisco ASR 900 Series systems data sheet.

This interface module provides physical connectivity using pluggable SFP optics. Table 17 lists the pluggable optics that are supported in the Cisco ASR 900 Series 1-Port OC192/STM-64 or 8-Port OC3/12/48/STM-1/-4/-16 module on the Cisco IOS Software releases for ASR 900 Series systems.

Table 17.   Optics supported in 1-port OC192/STM-64 or 8-Port OC3/12/48/STM-1/-4/-16 module

Optic Product ID	Supported as of Cisco IOS XE Software Release	Description
ONS-SI-155-SR-MM	3.18.1SP	OC-3/STM-1, short reach (SR), 1310 nm, multimode (MM), SFP, industrial temperature range
ONS-SI-155-I1	3.18.1SP	OC-3/STM-1 Intermediate Reach (IR), 1310 nm, SFP, industrial temperature range
ONS-SI-155-L1	3.18.1SP	OC-3/STM-1 Long Reach (LR), 1310 nm, SFP, industrial temperature range
ONS-SI-155-L2	3.18.1SP	OC-3/STM-1 LR, 1550 nm, SFP, industrial temperature range
ONS-SC-155-EL	16.5.1	OC-3/STM-1, Electrical SFP, Standard Coaxial Connector 75 Ohm, commercial temperature range
ONS-SI-622-SR-MM	3.18.1SP	OC-12/STM-4, SR, 1310 nm, MM, SFP, industrial temperature range
ONS-SI-622-I1	3.18.1SP	OC-12/STM-4 IR, 1310 nm, SFP, industrial temperature range
ONS-SI-622-L1	3.18.1SP	OC-12/STM-4 LR, 1310 nm, SFP, industrial temperature range
ONS-SI-622-L2	3.18.1SP	OC-12/STM-4 LR, 1550 nm, SFP, industrial temperature range
ONS-SI-2G-I1	3.18.1SP	OC-48/STM-16 IR, 1310 nm, SFP, industrial temperature range
ONS-SI-2G-L1	3.18.1SP	OC-48/STM-16 LR, 1310 nm, SFP, industrial temperature range
ONS-SI-2G-L2	3.18.1SP	OC-48/STM-16 LR, 1550 nm, SFP, industrial temperature range
ONS-SI-2G-S1	16.5.1	OC-48/STM-16 SR, 1310 nm, SFP, industrial temperature range
ONS-SC+-10G-SR	3.18.1SP	OC-192/STM-64 SR, 850 nm, SFP+, commercial temperature range
ONS-SC+-10G-LR	3.18.1SP	OC-192/STM-64 SR1, 1310 nm, SFP+, commercial temperature range
ONS-SC+-10G-ER	3.18.1SP	OC-192/STM-64 IR2, 1550 nm, SFP+, commercial temperature range

Multiservice (IoT) interface modules

Cisco ASR 900 Series 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 (A900-IMA6EM)

This interface module delivers 6 ports of Ear and Mouth (E&M) interfaces. The design emphasizes Smart-Grid and low-latency applications environments. Typical uses cases for this module are Teleprotection and Land Mobile Radio applications. The module supports E&M type 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 is using 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 (A900-IMASER14A/S)

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 18.

Table 18. Asynchronous RS-232 cables supported in the 14-Port Serial interface module

Cable Product ID	Supported as of Cisco IOS XE 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 4-port C37.94 Interface module (A900-IMA4C3794)

This interface module is designed for Connected Energy or Smart Grid (Utility) applications. This interface module delivers four optical interfaces conforming to the IEEE C37.94 standard, and processing functionality that allow C37.94 connections to be carried transparently over an IP/MPLS network using CESoPSN. This capability enables Utilities to migrate their communication networks from TDM to IP/MPLS, using the C37.94 as a standard interface for Tele-protection relays. Tele-protection schemes employ protection relays that sense anomalies in power line current, phase or voltage, and signal between geographically separate substations to protect grid infrastructure such as transformers and circuit breakers, as depicted in Figure 7.

Figure 7.   Smart grid tele-protection
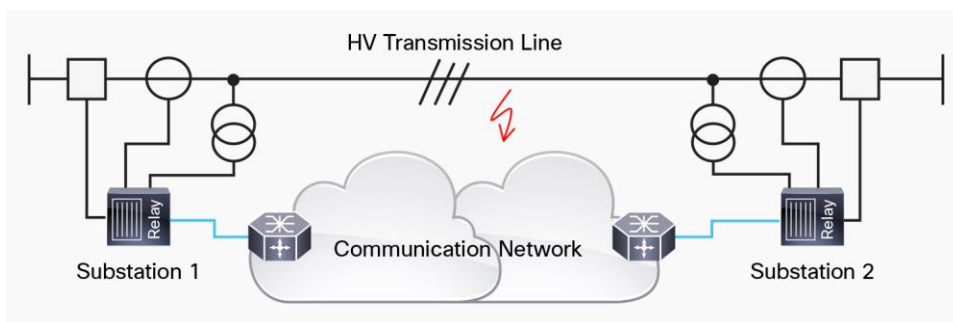
Product specifications

Table 19 shows the Cisco ASR 914 Series platform and interface module compatibility matrix.

Table 20 shows the Cisco ASR 907 Series platform and interface module compatibility matrix.

Table 21 shows the Cisco ASR 903 Series with RSP3C Interface Module Compatibility Matrix.

Table 22 shows the Cisco ASR 903 Series with RSP2A Interface Module Compatibility Matrix.

Table 23 shows the Cisco ASR 903 Series with RSP1A/B Interface Module Compatibility Matrix.

Table 24 shows the Cisco ASR 902 Series with RSP3C Interface Module Compatibility Matrix.

Table 25 shows the Cisco ASR 902 Series with RSP2A Interface Module Compatibility Matrix.

Table 26 shows the Cisco ASR 902 Series with RSP1A/B Interface Module Compatibility Matrix.

Table 27 provides Cisco ASR 900 Series interface module specifications, and Table 28 lists the safety and compliance specifications.

Table 19.   Cisco ASR 914 series interface module compatibility matrix – RSP3C

	A900-IMA1Z8S-CX	A900-IMA48D-C A900-IMA48T-C	A900-IMA8S A900-IMA8T	A900-IMA8S1Z A900-IMA8T1Z	A900-IMA8CS1Z-M	A900-IMA8Z A900-IMA2F A900-IMA2Z	A900-IMA1C	A900-IMA3G-IMSG
Slot 0	–	–	16.5.1[19]	–	16.7.1[12, 13]	–	–	–
Slot 1	–	–	16.5.1[18]	–	16.7.1[12, 13]	–	–	–
Slot 2	16.5.1[7]	16.5.1[9]	16.5.1[19]	16.5.1[4,11]	16.7.1[13, 17]	–	–	16.9.1
Slot 3	16.5.1	16.5.1	–	–	16.7.1[14]	16.5.1[3,8]	–	16.9.1

Slot	A900-IMA1Z8S-CX	A900-IMA48D-C A900-IMA48T-C	A900-IMA8S A900-IMA8T	A900-IMA8S1Z A900-IMA8T1Z	A900-IMA8CS1Z-M	A900-IMA8Z A900-IMA2F A900-IMA2Z	A900-IMA1C	A900-IMA3G-IMSG
Slot 4	16.5.1	16.5.1	–	–	16.7.1[14]	16.5.1[4,9]	–	16.9.1
Slot 5	16.5.1[7]	16.5.1[8]	16.5.1[18]	16.5.1[3,10,18]	16.7.1[13,16]	–	–	16.9.1
Slot 6	–	16.5.1[9]	16.5.1[19]	16.5.1[4,11,19]	16.7.1[13,17]	–	–	16.9.1
Slot 7	16.5.1	16.5.1	–	–	16.7.1[14]	16.5.1	16.5.1[1]	16.9.1
Slot 8	16.5.1	16.5.1	–	–	16.7.1[14]	16.5.1	16.5.1[2]	16.9.1
Slot 9	–	16.5.1[8]	16.5.1[18]	16.5.1[3,10,18]	16.7.1[13,16]		–	16.9.1
Slot 10	16.5.1[7]	16.5.1[9]	16.5.1[19]	16.5.1[4,11,19]	16.7.1[13,17]	–	–	16.9.1
Slot 11	16.5.1	16.5.1[10]	–	–	16.7.1[15,16,18]	16.5.1[1,5]	–	16.9.1
Slot 12	16.5.1	16.5.1	–	–	16.7.1[15,17]	16.5.1[2,6]	–	16.9.1
Slot 13	16.5.1[7]	16.5.1[8]	16.5.1[18]	16.5.1[3,10,18]	16.7.1[13,16]	–	–	16.9.1
Slot 14	–	16.5.1[9]	16.5.1[19]	16.5.1[4,11,19]	16.7.1[13,17]	–	–	16.9.1
Slot 15	–	16.5.1[8]	16.5.1[18]	16.5.1[3,10,18]	16.7.1[13,16]	–	–	16.9.1

[1] A900-IMA8Z cannot be in slot 11 when A900-IMA1C is present in slot 7.

[2] A900-IMA8Z cannot be in slot 12 when A900-IMA1C is present in slot 8.

[3] A900-IMA8S1Z or A900-IMA1Z8S-CX cannot be in slot 5, 9, 13, or 15 when A900-IMA8Z or A900-IMA2F is present in slot 3.

[4] A900-IMA8S1Z or A900-IMA1Z8S-CX cannot be in slot 2, 6, 10, or 14 when 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-IMA8Z or A900-IMA2F is present in slot 11.

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

[7] A900-IMA1Z8S-CX could be used in slot 2, 5, 10, or 13 when configured on 5G mode to be supported with Release 16.5.1.

[8] A900-IMA48D-C or A900-IMA48T-C cannot be in slots 5, 9, 13 and 15 when A900-IMA8Z or A900-IMA2F is present in slot 3.

[9] A900-IMA48D-C or A900-IMA48T-C cannot be in slots 2, 6, 10, and 14 when A900-IMA8Z or A900-IMA2F is present in slot 4.

[10] A900-IMA8S1Z cannot be in slots 5, 9, 13 and 15 when A900-IMA48D-C or A900-IMA48T-C is present in slot 11.

[11] A900-IMA8S1Z cannot be in slots 2, 6, 10, and 14 when A900-IMA48D-C or A900-IMA48T-C is present in slot 12.

[12] A900-IMA8CS1Z-M cannot be in slots 0 and 1 if A900-IMA8S, A900-IMA8T, A900-IMA8S1Z or A900-IMA8T1Z are present in the system, and no Y.1564/SADT is used.

[13] A900-IMA8CS1Z-M in slots 0, 1, 2, 5, 6, 9, 10, 13, 14 and 15 can be configured in 8 x Gigabit Ethernet (SFP) full subscription mode, or 16 x Gigabit Ethernet (C-SFP) oversubscription mode, or 18 x Gigabit Ethernet (C-SFP) oversubscription mode.

[14] A900-IMA8CS1Z-M in slots 3, 4, 7 and 8 can be configured in 8 x Gigabit Ethernet (SFP) + 1 x Ten Gigabit Ethernet (SFP+) full subscription mode, or 16 x Gigabit Ethernet (C-SFP) + 1 x Ten Gigabit Ethernet (SFP+) full subscription mode, or 16 x Gigabit Ethernet (C-SFP) oversubscription mode, or 18 x Gigabit Ethernet (C-SFP) oversubscription mode.

[15] A900-IMA8CS1Z-M in slots 11 and 12 can be configured in 8 x Gigabit Ethernet (SFP) + 1 x Ten Gigabit Ethernet (SFP+) full subscription mode, or 16 x Gigabit Ethernet (C-SFP) + 1 x Ten Gigabit Ethernet (SFP+) full subscription mode, or 16 x Gigabit Ethernet (C-SFP) oversubscription mode, or 18 x Gigabit Ethernet (C-SFP) oversubscription mode.

[16] A900-IMA8CS1Z-M cannot be used in slots 5, 9, 13 and 15 if A900-IMA8Z or A900-IMA2F are present in slot 3, and A900-IMA8S, A900-IMA8T, A900-IMA8S1Z or A900-IMA8T1Z are present in the system.

[17] A900-IMA8CS1Z-M cannot be used in slots 2, 6, 10 and 14 if A900-IMA8Z or A900-IMA2F are present in slot 4 and A900-IMA8S, A900-IMA8T, A900-IMA8S1Z or A900-IMA8T1Z are present in the system.

[18] A900-IMA8S, A900-IMA8T, A900-IMA8S1Z or A900-IMA8T1Z cannot be used in slots 1, 5, 9, 13 and 15 if A900-IMA8CS1Z-M is present in slot 11.

[19] A900-IMA8S, A900-IMA8T, A900-IMA8S1Z or A900-IMA8T1Z cannot be used in slots 0, 2, 6, 10 and 14 if A900-IMA8CS1Z-M is present in slot 12.

Table 20.   Cisco ASR 907 series interface module compatibility matrix – RSP3C

	A900-IMA1Z8S-CX	A900-IMA48D-C A900-IMA48T-C	A900-IMA8S A900-IMA8T	A900-IMA8S1Z A900-IMA8T1Z	A900-IMA8CS1Z-M	A900-IMA8Z A900-IMA2F A900-IMA2Z	A900-IMA1C	A900-IMA3G-IMSG
Slot 0	–	3.18.1SP[9]	3.16.1S[19]	–	16.7.1[12, 13]	–	–	–
Slot 1	–	3.18.1SP[9]	3.16.1S[18]	–	16.7.1[12, 13]	–	–	–
Slot 2	–	3.18.1SP	3.16.1S[19]	3.16.1S[4, 19]	16.7.1[13, 17]	–	–	16.9.1
Slot 3	3.18.1SP	3.18.1SP	–	–	16.7.1[14]	3.16.1S[3, 7, 16]	–	16.9.1
Slot 4	3.18.1SP	3.18.1SP	–	–	16.7.1[14]	3.16.1S[4, 8, 17]	–	16.9.1
Slot 5	–	3.18.1SP	3.16.1S[18]	3.16.1S[3, 18]	16.7.1[13, 16]	–	–	16.9.1
Slot 6	–	3.18.1SP	3.16.1S[19]	3.16.1S[4, 19]	16.7.1[13, 17]	–	–	16.9.1
Slot 7	3.18.1SP	3.18.1SP	–	–	16.7.1[14]	3.16.1S	3.16.1S[1]	16.9.1
Slot 8	3.18.1SP	3.18.1SP	–	–	16.7.1[14]	3.16.1S	3.16.1S[2]	16.9.1
Slot 9	–	3.18.1SP	3.16.1S[18]	3.16.1S[3, 18]	16.7.1[13, 16]		–	16.9.1
Slot 10	–	3.18.1SP	3.16.1S[19]	3.16.1S[4, 19]	16.7.1[13, 17]	–	–	16.9.1
Slot 11	3.18.1SP[5]	16.5.1[10]	–	–	16.7.1[15, 16]	3.16.1S[1,5]	–	16.9.1
Slot 12	3.18.1SP[6]	16.5.1[11]	–	–	16.7.1[15, 17]	3.16.1S[2,6]	–	16.9.1
Slot 13	–	3.18.1SP	3.16.1S[18]	3.16.1S[3, 18]	16.7.1[13, 16]	–	–	16.9.1
Slot 14	–	3.18.1SP	3.16.1S[19]	3.16.1S[4, 19]	16.7.1[13, 17]	–	–	16.9.1
Slot 15	–	3.18.1SP	3.16.1S[18]	3.16.1S[3, 18]	16.7.1[13, 16]	–	–	16.9.1

[1] A900-IMA8Z, A900-IMA2F, A900-IMA2Z cannot be in slot 11 when A900-IMA1C is present in slot 7.

[2] A900-IMA8Z, A900-IMA2F, A900-IMA2Z cannot be in slot 12 when A900-IMA1C is present in slot 8.

[3] A900-IMA8S1Z, A900-IMA8T1Z cannot be in slot 5, 9, 13, or 15 when A900-IMA8Z or A900-IMA2F is present in slot 3.

[4] A900-IMA8S1Z, A900-IMA8T1Z cannot be in slot 2, 6, 10, or 14 when 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-IMA8Z, A900-IMA2F, A900-IMA2Z or A900-IMA1Z8S-CX is present in slot 11.

[6] No IM could be used in slot 0, 2, 6, 10, or 14 when A900-IMA8Z, A900-IMA2F, A900-IMA2Z or A900-IMA1Z8S-CX is present in slot 12.

[7] A900-IMA48D-C or A900-48T-C cannot be in slots 5, 9, 13 and 15 when A900-IMA8Z or A900-IMA2F is present in slot 3.

[8] A900-IMA48D-C or A900-48T-C cannot be in slots 2, 6, 10, and 14 when A900-IMA8Z or A900-IMA2F is present in slot 4.

[9] A900-IMA48D-C or A900-48T-C can be in slots 0 and 1 ONLY with 3.18SP and higher releases.

[10] A900-IMA8S1Z or A900-IMA8T1Z cannot be in slots 5, 9, 13 and 15 when A900-IMA48D-C or A900-IMA48T-C is present in slot 11.

[11] A900-IMA8S1Z or A900-IMA8T1Z cannot be in slots 2, 6, 10, and 14 when A900-IMA48D-C or A900-IMA48T-C is present in slot 12.

[12] A900-IMA8CS1Z-M cannot be in slots 0 and 1 if A900-IMA8S, A900-IMA8T, A900-IMA8S1Z or A900-IMA8T1Z are present in the system, and no Y.1564/SADT is used.

[13] A900-IMA8CS1Z-M in slots 0, 1, 2, 5, 6, 9, 10, 13, 14 and 15 can be configured in 8 x Gigabit Ethernet (SFP) full subscription mode, or 16 x Gigabit Ethernet (C-SFP) oversubscription mode, or 18 x Gigabit Ethernet (C-SFP) oversubscription mode.

[14] A900-IMA8CS1Z-M in slots 3, 4, 7 and 8 can be configured in 8 x Gigabit Ethernet full subscription mode (SFP), or 16 x Gigabit Ethernet (C-SFP) + 1 x Ten Gigabit Ethernet (SFP+) full subscription mode, or 16 x Gigabit Ethernet (C-SFP) oversubscription mode, or 18 x Gigabit Ethernet (C-SFP) oversubscription mode.

[15] A900-IMA8CS1Z-M in slots 11 and 12 can be configured in 8 x Gigabit Ethernet (SFP) + 1 x Ten Gigabit Ethernet (SFP+) full subscription mode, or 16 x Gigabit Ethernet (C-SFP) + 1 x Ten Gigabit Ethernet (SFP+) full subscription mode, or 16 x Gigabit Ethernet (C-SFP) oversubscription mode, or 18 x Gigabit Ethernet (C-SFP) oversubscription mode.

[16] A900-IMA8CS1Z-M cannot be used in slots 5, 9, 13 and 15 if A900-IMA8Z or A900-IMA2F are present in slot 3.

[17] A900-IMA8CS1Z-M cannot be used in slots 2, 6, 10 and 14 if A900-IMA8Z or A900-IMA2F are present in slot 4.

[18] A900-IMA8S, A900-IMA8T, A900-IMA8S1Z or A900-IMA8T1Z cannot be used in slots 1, 5, 9, 13 and 15 if A900-IMA8CS1Z-M is present in slot 11.

[19] A900-IMA8S, A900-IMA8T, A900-IMA8S1Z or A900-IMA8T1Z cannot be used in slots 0, 2, 6, 10 and 14 if A900-IMA8CS1Z-M is present in slot 12.

Table 21. Cisco ASR 903 series with RSP3C interface module compatibility matrix

Platform		Slot 0	Slot 1	Slot 2	Slot 3	Slot 4	Slot 5
Cisco ASR 903 with A900-RSP3C-400-S	A900-IMA8T	3.16.1S[3,4]	3.16.1S[3,4]	3.16.1S[3,4]	3.16.1S[3,4]	3.16.1S[3,4]	3.16.1S[3,4]
	A900-IMA8T1Z	3.16.1S[3,4]	3.16.1S[3,4]	3.16.1S[3,4]	3.16.1S[3,4]	3.16.1S[3,4]	3.16.1S[3,4]
	A900-IMA8S	3.16.1S[3,4]	3.16.1S[3,4]	3.16.1S[3,4]	3.16.1S[3,4]	3.16.1S[3,4]	3.16.1S[3,4]
	A900-IMA8S1Z	3.16.1S[3,4]	3.16.1S[3,4]	3.16.1S[3,4]	3.16.1S[3,4]	3.16.1S[3,4]	3.16.1S[3,4]
	A900-IMA8CS1Z-M	16.7.1[10,11]	–	–	16.7.1[11]	16.7.1[11]	16.7.1[11]
	A900-IMA1X	3.16.1S[1]	3.16.1S[2,4]	3.16.1S[3,4]	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[1]	3.16.1S[2]	3.16.1S[3]	3.16.1S	3.16.1S	3.16.1S
	A900-IMA2F	–	–	–	–	3.16.1S	3.16.1S
	A900-IMA1C	–	–	–	–	3.16.1S[1]	3.16.1S[2]
	A900-IMA48D-C	3.18.1SP	3.18.1SP	3.18.1SP	3.18.1SP	3.18.1SP	3.18.1SP
	A900-IMA48T-C	3.18.1SP	3.18.1SP	3.18.1SP	3.18.1SP	3.18.1SP	3.18.1SP
	A900-IMA1Z8S-CX	–	–	3.18.1SP[4]	3.18.1SP	3.18.1SP	3.18.1SP
	A900-IMA3G-IMSG	–	–	16.9.1	16.9.1	16.9.1	16.9.1
Cisco ASR 903 with A900-RSP3C-200-S	A900-IMA8T	3.18.0S[8]	3.18.0S8	3.18.0S[8]	3.18.0S[8]	3.18.0S[8]	3.18.0S[8]
	A900-IMA8T1Z	3.18.0S[8]	3.18.0S8	3.18.0S[8]	3.18.0S[8]	3.18.0S[8]	3.18.0S[8,6]
	A900-IMA8S	3.18.0S[8]	3.18.0S8	3.18.0S[8]	3.18.0S[8]	3.18.0S[8]	3.18.0S[8]
	A900-IMA8S1Z	3.18.0S[8]	3.18.0S8	3.18.0S[8]	3.18.0S[8]	3.18.0S[8]	3.18.0S[8,6]
	A900-IMA8CS1Z-M	–	–	–	–	–	–
	A900-IMA1X	3.18.0S[5]	–	3.18.0S[8]	–	3.18.0S	–
	A900-IMA2Z	3.18.0S	3.18.0S	3.18.0S	3.18.0S	3.18.0S	3.18.0S[6]
	A900-IMA8Z	3.18.0S[7,9]	–	–	–	3.18.0S[7]	–
	A900-IMA2F	–	–	–	–	3.18.0S	–
	A900-IMA1C	–	–	–	–	3.18.0SP[5,6,7]	–
	A900-IMA48D-C	–	–	–	–	–	–
	A900-IMA48T-C	–	–	–	–	–	–
	A900-IMA1Z8S-CX	–	–	–	–	–	–
	A900-IMA3G-IMSG	–	–	–	–	–	–

[1] A900-IMA8Z or A900-IMA1X could not be in slot 0 when A900-IMA1C is present in slot 4.

[2] A900-IMA8Z or A900-IMA1X could not be in slot 1 when A900-IMA1C is present in slot 5.

[3] A900-IMA8Z or A900-IMA1X in slot 2 are incompatible with the support for A900-IMA8S, A900-IMA8T, A900-IMA8S1Z or A900-IMA8T1Z in all slots.

[4] A900-IMA1Z8S-CX in slot 2 is incompatible with the support for A900-IMA8S, A900-IMA8T, A900-IMA8S1Z or A900-IMA8T1Z in all slots.

[5] A900-IMA1X could not be in slot 0 when A900-IMA1C is present in slot 4.

[6] A900-IMA2Z, A900-IMA8S1Z or A900-IMA8T1Z could not be in slot 5 when A900-IMA1C is present in slot 4.

[7] A900-IMA8Z could not be in any slot when A900-IMA1C is present in slot 4.

[8] A900-IMA1X in slot 2 is incompatible with the support for A900-IMA8S, A900-IMA8T, A900-IMA8S1Z or A900-IMA8T1Z in all slots.

[9] A900-IMA8Z in slot 0 with A900-RSP3C-200-S supports maximum 6 ports at 10GE speed; requires explicit enablement using a CLI command.

[10] A900-IMA8CS1Z-M could not be in slot 0 when A900-IMA1C is present in slot 4.

[11] A900-IMA8CS1Z-M in slots 0, 3, 4 and 5 can be configured in 8 x Gigabit Ethernet (SFP) + 1 x Ten Gigabit Ethernet (SFP+) full subscription mode (SFP), or in 16 x Gigabit Ethernet (C-SFP) + 1 x Ten Gigabit Ethernet (SFP+) full subscription mode.

Table 22. Cisco ASR 903 series RSP2A interface module compatibility matrix

Platform		Slot 0	Slot 1	Slot 2	Slot 3	Slot 4	Slot 5
Cisco ASR 903 with A900-RSP2A-128	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-IMA8CS1Z-M	–	–	–	–	–	–
	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-IMA4C3794	3.18.1SP	3.18.1SP	3.18.1SP	3.18.1SP	3.18.1SP	3.18.1SP
	A900-IMASER14A/S	3.16.0S	3.16.0S	3.16.0S	3.16.0S	3.16.0S	3.16.0S
	A900-IMA8D	3.15.0S	3.15.0S	3.15.0S	3.15.0S	3.15.0S	3.15.0S
	A900-IMA16D	3.14.0S	3.14.0S	3.14.0S	3.14.0S	3.14.0S	3.14.0S
	A900-IMA32D	3.14.0S	3.14.0S	3.14.0S	3.14.0S	3.14.0S	3.14.0S
	A900-IMA4OS	3.14.0S	3.14.0S	3.14.0S	3.14.0S	3.14.0S	3.14.0S
	A900-IMA3G-IMSG	–	–	16.7.1	16.7.1	16.7.1	16.7.1
	A900-IMA48D-C	–	–	–	–	–	–
	A900-IMA48T-C	–	–	–	–	–	–
	A900-IMA1Z8S-CX	–	–	–	–	–	–
Cisco ASR 903 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-IMA8CS1Z-M	–	–	–	–	–	–
	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-IMA4C3794	–	–	–	3.18.1SP	3.18.1SP	3.18.1SP
	A900-IMASER14A/S	–	–	–	3.16.0S	3.16.0S	3.16.0S
	A900-IMA8D	–	–	–	3.15.0S	3.15.0S	3.15.0S
	A900-IMA16D	–	–	–	3.14.0S	3.14.0S	3.14.0S
	A900-IMA32D	–	–	–	3.14.0S	3.14.0S	3.14.0S
	A900-IMA4OS	3.14.0S	3.14.0S	3.14.0S	–	–	–
	A900-IMA3G-IMSG	–	–	–	–	–	–
	A900-IMA48D-C	–	–	–	–	–	–
	A900-IMA48T-C	–	–	–	–	–	–
	A900-IMA1Z8S-CX	–	–	–	–	–	–

Table 23.   Cisco ASR 903 series RSP1A/B interface module compatibility matrix

Platform		Slot 0	Slot 1	Slot 2	Slot 3	Slot 4	Slot 5
Cisco ASR 903 with A903-RSP1A-55 or A900-RSP1B-55	A900-IMA8T	3.12.0S	3.12.0S	3.12.0S	3.12.0S	3.12.0S	3.12.0S
	A900-IMA8T1Z	–	–	–	–	–	–
	A900-IMA8S	3.12.0S	3.12.0S	3.12.0S	3.12.0S	3.12.0S	3.12.0S
	A900-IMA8S1Z	–	–	–	–	–	–
	A900-IMA8CS1Z-M	–	–	–	–	–	–
	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-IMA4C3794	–	–	–	–	–	–
	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	–	–
	A900-IMA48D-C	–	–	–	–	–	–
	A900-IMA48T-C	–	–	–	–	–	–
	A900-IMA1Z8S-CX	–	–	–	–	–	–

Table 24.   Cisco ASR 902 series with RSP3C interface module compatibility matrix

Platform		Slot 0	Slot 1	Slot 2	Slot 3
Cisco ASR 902 with A900-RSP3C-200-S	A900-IMA8T	3.18.0S[2]	3.18.0S[2]	3.18.0S[2]	3.18.0S[2]
	A900-IMA8T1Z	3.18.0S[2]	3.18.0S[2]	3.18.0S[1, 2, 3]	3.18.0S[2]
	A900-IMA8S	3.18.0S[2]	3.18.0S[2]	3.18.0S	3.18.0S[2]
	A900-IMA8S1Z	3.18.0S[2]	3.18.0S[2]	3.18.0S[1, 2, 3]	3.18.0S[2]
	A900-IMA8CS1Z-M	–	–	–	–
	A900-IMA1X	3.18.0S[1]	3.12.0S[2]	–	–
	A900-IMA2Z	3.18.0S	3.18.0S	3.18.0S	3.18.0S
	A900-IMA8Z	3.18.0S[3]	–	–	–
	A900-IMA2F	3.18.0S[3]	–	–	–
	A900-IMA1C	–	–	–	–
	A900-IMA8D	–	–	–	–
	A900-IMA16D	–	–	–	–
	A900-IMA32D	–	–	–	–
	A900-IMA4OS	–	–	–	–
	A900-IMA48D-C	–	–	–	–
	A900-IMA48T-C	–	–	–	–
	A900-IMA1Z8S-CX	–	–	–	–
	A900-IMA3G-IMSG	–	–	–	–

[1] A900-IMA1X in slot 0 are incompatible with the support for A900-IMA2Z, A900-IMA8S1Z or A900-IMA8T1Z in slot 2.

[2] A900-IMA1X in slot 1 are incompatible with the support for A900-IMA8S, A900-IMA8T, A900-IMA8S1Z, A900-IMA8T1Z in all slots.

[3] A900-IMA8S1Z or A900-IMA8T1Z in slot 2 are incompatible with A900-IMA2F or A900-IMA8Z in slot 0.

Table 25. Cisco ASR 902 series RSP2A interface module compatibility matrix

Platform		Slot 0	Slot 1	Slot 2	Slot 3
Cisco ASR 902 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-IMA8CS1Z-M	–	–	–	–
	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	3.17.0S	3.17.0S	3.17.0S	3.17.0S
	A900-IMA4C3794	3.18.1SP	3.18.1SP	3.18.1SP	3.18.1SP
	A900-IMASER14A/S	3.16.0S	3.16.0S	3.16.0S	3.16.0S
	A900-IMA8D	3.15.0S	3.15.0S	3.15.0S	3.15.0S
	A900-IMA16D	3.14.0S	3.14.0S	3.14.0S	3.14.0S
	A900-IMA32D	3.14.0S	3.14.0S	3.14.0S	3.14.0S
	A900-IMA4OS	3.14.0S	3.14.0S	3.14.0S	3.14.0S
	A900-IMA48D-C	–	–	–	–
	A900-IMA48T-C	–	–	–	–
	A900-IMA1Z8S-CX	–	–	–	–
	A900-IMA3G-IMSG	–	–	–	–
Cisco ASR 902 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-IMA8CS1Z-M	–	–	–	–
	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-IMA4C3794	3.18.1SP	–	3.18.1SP	3.18.1SP
	A900-IMASER14A/S	3.16.0S	–	3.16.0S	3.16.0S
	A900-IMA8D	3.15.0S	–	3.15.0S	3.15.0S
	A900-IMA16D	3.14.0S	–	3.14.0S	3.14.0S
	A900-IMA32D	3.14.0S	–	3.14.0S	3.14.0S
	A900-IMA4OS	3.14.0S	3.14.0S	3.14.0S	–
	A900-IMA48D-C	–	–	–	–
	A900-IMA48T-C	–	–	–	–
	A900-IMA1Z8S-CX	–	–	–	–
	A900-IMA3G-IMSG	–	–	–	–

Table 26. Cisco ASR 902 Series RSP1A/B Interface Module Compatibility Matrix

Platform		Slot 0	Slot 1	Slot 2	Slot 3
Cisco ASR 902 with A903-RSP1A-55 or A900-RSP1B-55	A900-IMA8T	3.12.0S	3.12.0S	3.12.0S	3.12.0S
	A900-IMA8T1Z	–	–	–	–
	A900-IMA8S	3.12.0S	3.12.0S	3.12.0S	3.12.0S
	A900-IMA8S1Z	–	–	–	–
	A900-IMA8CS1Z-M	–	–	–	–
	A900-IMA1X	3.12.0S	3.12.0S	3.12.0S	3.12.0S
	A900-IMA2Z	–	–	–	–

Platform		Slot 0	Slot 1	Slot 2	Slot 3
	A900-IMA8Z	–	–	–	–
	A900-IMA2F	–	–	–	–
	A900-IMA1C	–	–	–	–
	A900-IMA6EM	–	–	–	–
	A900-IMA4C3794	–	–	–	–
	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
	A900-IMA48D-C	–	–	–	–
	A900-IMA48T-C	–	–	–	–
	A900-IMA1Z8S-CX	–	–	–	–
	A900-IMA3G-IMSG	–	–	–	–

Table 27.   Cisco ASR 900 Series Interface Module Specifications

Features	Description
Port density	8-port Gigabit Ethernet SFP 8-port Gigabit Ethernet RJ45 8-port Gigabit Ethernet SFP and 1-port 10 Gigabit Ethernet SFP+ 8-port Gigabit Ethernet RJ45 and 1-port 10 Gigabit Ethernet SFP+ 8/16-port Gigabit Ethernet SFP/C-SFP and 1-port 10 Gigabit Ethernet SFP+ / 2-port Gigabit Ethernet C-SFP 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 8-port T1/E1 TDM 16-port T1/E1 TDM 32-port T1/E1 TDM 48-port T1/E1 TDM 48-port T3/E3 TDM 8-port OC3/12/48/STM-1/-4/-16 SFP or 1-Port OC192/STM-64 SFP+ 6-port 2-wire/4-wire E&M 4-port C37.94 14-port Serial Asynchronous Serial RS-232/X.21 4-port OC3/STM-1 or 1-port OC12/STM-4 TDM 12-port T1/E1 + 4-port DS3/E3 + 4-port OC3/STM-1 or 4-port OC12/STM-4 or 1-port OC48/STM-16
Power draw	8-port Gigabit Ethernet SFP: 17W maximum 8-port Gigabit Ethernet RJ45: 17W maximum 8-port Gigabit Ethernet SFP and 1-port 10 Gigabit Ethernet SFP+: 15W typical, 29W maximum 8-port Gigabit Ethernet RJ45 and 1-port 10 Gigabit Ethernet SFP+: 27W maximum 8/16-port Gigabit Ethernet SFP/C-SFP and 1-port 10 Gigabit Ethernet SFP+ / 2-port Gigabit Ethernet C-SFP: 42W typical, 54W 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+: 53W typical, 57W maximum 2-port 40 Gigabit Ethernet QSFP: 45W typical, 53W maximum 1-port 100 Gigabit Ethernet CPAK: 50W maximum 8-port T1/E1 TDM: 14W typical, 18W maximum 16-port T1/E1 TDM: 14W typical, 18W maximum 32-port T1/E1 TDM: 14W typical, 18W maximum 48-port T1/E1 TDM: 30W typical, 35W maximum 48-port T3/E3 TDM: 44W typical, 52W maximum 8-port OC3/12/48/STM-1/-4/-16 SFP or 1-Port OC192/STM-64 SFP+: 78W typical, 92W maximum

Features	Description
	● 6-port 2-wire/4-wire E&M: 33W maximum
	● 4-port C37.94: 18W maximum
	● 14-port Serial Asynchronous Serial RS-232/X.21: 31W maximum
	● 4-port OC3/STM-1 or 1-port OC12/STM-4 TDM: 30W maximum
	● 12-port T1/E1 + 4-port DS3/E3 + 4-port OC3/STM-1 or 4-port OC12/STM-4 or 1-port OC48/STM-16: 54W maximum
Module shipment weight	● 8-port Gigabit Ethernet SFP: 2.18 lbs
	● 8-port Gigabit Ethernet RJ45: 2.15 lbs
	● 8-port Gigabit Ethernet SFP and 1-port 10 Gigabit Ethernet SFP+: 3.4 lbs
	● 8/16-port Gigabit Ethernet SFP/C-SFP and 1-port 10 Gigabit Ethernet SFP+ / 2-port Gigabit Ethernet C-SFP: 3.5 lbs
	● 1-port 10 Gigabit Ethernet, XFP: 2.03 lbs
	● 2-port 10 Gigabit Ethernet, SFP+/XFP: 1.8 lbs
	● 8-port 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
	● 8-port T1/E1 TDM: 2.13 lbs
	● 16-port T1/E1 TDM: 2.13 lbs
	● 32-port T1/E1 TDM: 1.91 lbs
	● 48-port T1/E1 TDM: 2.1 lbs
	● 48-port T3/E3 TDM: 2.1 lbs
	● 8-port OC3/12/48/STM-1/-4/-16 SFP or 1-Port OC192/STM-64 SFP+: 2.5 lbs
	● 6-port 2-wire/4-wire E&M: 2.1 lbs
	● 4-port C37.94: 1.48 lbs
	● 14-port Serial Asynchronous Serial RS-232/X.21: 2.1 lbs
	● 4-port OC3/STM-1 or 1-port OC12/STM-4 TDM: 2.1 lbs
	● 12-port T1/E1 or 4-port DS3/E3 + 4-port OC3/STM-1 or 4-port OC12/STM-4 or 1-port OC48/STM-16: 3 lbs
Module shipment package size (LxWxH)	15.44 x 9.44 x 4.31 inches
Environmental specifications[1]	–40 to 65ºC (–40 to 149ºF) operating temperature (using Industrial temperature XFP, SFP, and SFP+ optics)
	0 to 40ºC (32 to 104ºF) operating temperature (CPAK and QSFP optics)
Relative humidity	5 to 95%, noncondensing
Storage environment	Temperature: –40 to 70ºC (–40 to 158ºF) altitude: 4570 m (15,000 ft)
MTBF at 40ºC (104ºF) operating temperature	● 8-port Gigabit Ethernet SFP: 2,987,310 hours
	● 8-port Gigabit Ethernet RJ45: 3,262,980 hours
	● 8-port Gigabit Ethernet SFP and 1-port 10 Gigabit Ethernet SFP+: 2,257,780 hours
	● 8/16-port Gigabit Ethernet SFP/C-SFP and 1-port 10 Gigabit Ethernet SFP+ / 2-port Gigabit Ethernet C-SFP: 1,256,050 hours
	● 8-port Gigabit Ethernet RJ45 and 1-port 10 Gigabit Ethernet SFP+: 2,346,710 hours
	● 1-port 10 Gigabit Ethernet, XFP: 3,604,370 hours
	● 2-port 10 Gigabit Ethernet, SFP+/XFP: 2,574,880 hours
	● 8-port 10 Gigabit Ethernet SFP/SFP+: 1,661,460 hours
	● 2-port 40 Gigabit Ethernet QSFP: 1,926,830 hours
	● 1-port 100 Gigabit Ethernet CPAK: 1,715,860 hours
	● 8-port T1/E1 TDM: 1,164,010 hours
	● 16-port T1/E1 TDM: 787,060 hours
	● 32-port T1/E1 TDM: 445,660 hours
	● 48-port T1/E1 TDM: 674,640 hours
	● 48-port T3/E3 TDM: 654,090 hours
	● 8-port OC3/12/48/STM-1/-4/-16 SFP or 1-Port OC192/STM-64 SFP+: 918,850 hours
	● 6-port 2-wire/4-wire E&M: 418,750 hours
	● 4-port C37.94: 1,493,730 hours
	● 14-port Serial Asynchronous Serial RS-232/X.21: 1.420,010 hours
	● 4-port OC3/STM-1 or 1-port OC12/STM-4 TDM: 1,493,730 hours
	● 12-port T1/E1 + 4-port DS3/E3 + 4-port OC3/STM-1 or 4-port OC12/STM-4 or 1-port OC48/STM-16: 945,140 hours

Features	Description
Reliability and availability	OIR field-replaceable SFP optics modules
	Support for both 1+1 SONET Automatic Protection Switching (APS) and SDH Linear Multiplexer Section Protection (MSP) protocols
	Single interface module software reset
	Rolling software upgrade, interface module by interface module

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

Table 28. Safety and compliance

Type	Standards	
Safety	- 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	● FCC CFR47 Part 15, Class A	
Emissions compliance	- 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	- 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]	This product is designed to meet the following requirements (qualification in progress) - GR-63-CORE[2] - GR-1089-CORE[2]	
Power substation system standards	- IEC 61850-3 (2002) - IEEE 1613 (2009)	
ETSI	- 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	
Telecom	T1: - ITU-T G.703 - ITU-T G.824 - TIA-968-B - IC CS-03 - HKTA 2028 - ID0002 - DSPR Technical Conditions - ANSI T1.403 E1: - ITU-T G.703/G.704 - ITU-T G.823 - AS/ACIF S016	SONET/SDH subrate: - GR-253-CORE - ANSI T1.105 - ITU G.957 - ITU G.783 - ITU G.707 OTN: - ITU G.709 Ethernet: - DSPR Technical Conditions - RRA 2009-38 (RRL 2005-96) - IEEE 802.3-2005 - IEEE 802.3z

Type	Standards	
	• ETSI TBR12/13 • RRA 2009-38 (RRL 2005-96) • IDA TS DLCN	• IEEE 802.3ab • IEEE 802.3ae
Network synchronization	• 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.

[2] Contact your local Cisco Sales and Marketing for the NEBS report.

Ordering information

Tables 29 lists the key system components for the Cisco ASR 900 Series interface modules.

Table 29.   Cisco ASR 900 series interface modules

Part Number	Description
A900-IMA8S	ASR 900 8 port SFP Gigabit Ethernet Interface Module
A900-IMA8S=	ASR 900 8 port SFP Gigabit Ethernet Interface Module, Spare
A900-IMA8T	ASR 900 Combo 8 port 10/100/1000 Interface Module
A900-IMA8T=	ASR 900 Combo 8 port 10/100/1000 Interface Module, Spare
A900-IMA8S1Z	ASR 900 Combo 8 port SFP GE and 1 port 10GE SFP+ Interface Module
A900-IMA8S1Z=	ASR 900 Combo 8 port SFP GE and 1 port 10GE SFP+ Interface Module, Spare
A900-IMA8CS1Z-M	ASR 900 Combo 8/16 port GE SFP/C-SFP and 1 port 10GE SFP+ / 2 port 1GE C-SFP Interface Module
A900-IMA8CS1Z-M=	ASR 900 Combo 8/16 port GE SFP/C-SFP and 1 port 10GE SFP+ / 2 port 1GE C-SFP Interface Module, Spare
A900-IMA8T1Z	ASR 900 Combo 8 port 10/100/1000 and 1 port 10GE SFP+ Interface Module
A900-IMA8T1Z=	ASR 900 Combo 8 port 10/100/1000 and 1 port 10GE SFP+ Interface Module, 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 XFP/SFP+ Interface Module
A900-IMA2Z=	ASR 900 2 port 10GE XFP/SFP+ 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 module
A900-IMA6EM=	ASR 900 6 port E&M module, Spare
A900-IMA4C3794	ASR 900 4 port C37.94 Interface Module

Part Number	Description
A900-IMA4C3794=	ASR 900 4 port C37.94 Interface Module, Spare
A900-IMASER14A/S	ASR 900 14 port Sync/Async Interface Module
A900-IMASER14A/S=	ASR 900 14 port Sync/Async Interface Module, Spare
A900-IMA8D	ASR 900 8 port RJ48C T1/E1 Interface Module
A900-IMA8D=	ASR 900 8 port RJ48C T1/E1 Interface Module, Spare
A900-IMA16D	ASR 900 16 port T1/E1 Interface Module, Requires patch panel
A900-IMA16D=	ASR 900 16 port T1/E1 Interface Module, Spare, Requires patch panel
A900-IMA32D	ASR 900 32 port T1/E1 Interface Module, Requires patch panel
A900-IMA32D=	ASR 900 32 port T1/E1 Interface Module, Spare, Requires patch panel
A900-IMA4OS	ASR 900 4 port OC3/STM1 or 1 port OC12/STM4 Interface Module
A900-IMA4OS=	ASR 900 4 port OC3/STM1 or 1 port OC12/STM4 Interface Module, Spare
A900-IMA3G-IMSG	ASR 900 12 port T1/E1 + 4 port DS3/E3 + 4 port OC3/STM-1 or 4 port OC12/STM-4 or 1 port OC48/STM16 Interface Module
A900-IMA3G-IMSG=	ASR 900 12 port T1/E1 + 4 port DS3/E3 + 4 port OC3/STM-1 or 4 port OC12/STM-4 or 1 port OC48/STM16 Interface Module, Spare
A900-IMA48D-C	ASR 900 48 port T1/E1 Interface Module, Requires patch panel
A900-IMA48D-C=	ASR 900 48 port T1/E1 Interface Module, Spare, Requires patch panel
A900-IMA48T-C	ASR 900 48 port DS3/E3 Interface Module, Requires patch panel
A900-IMA48T-C=	ASR 900 48 port DS3/E3 Interface Module, Spare, Requires patch panel
A900-IMA1Z8S-CX	ASR 900 Combo 8 port SFP GE and 1 port 10GE IM with CEM, 10G
A900-IMA1Z8S-CX=	ASR 900 Combo 8 port SFP GE and 1 port 10GE IM with CEM, 10G, Spare
PANEL-16-BNC	Breakout panel with 16 T1/E1 75-ohm BNC ports
PANEL-32-RJ48	Breakout panel with 32 T1/E1 100/120- ohm RJ48 ports
CABLE-16T1E1	Cable for 16-Port T1/E1 Interface Module, 12 feet
PANEL-32-RJ48	Breakout panel with 32 T1/E1 100/120- ohm RJ48 ports
CABLE-32T1E1	Cable for 32 Port T1/E1 Interface Module
PANEL-48-1-DIN	48 x 75 ohm E1/DS1 termination, thru DIN 1.0/2.3 connectors
PANEL-48-1-RJ48	48 x 120 ohm E1/110 ohm DS1 termination, thru RJ 48C connectors
PANEL-48-1-AMP64	48 x 120 ohm E1/110 ohm DS1 termination, 4 x AMP 64-pin
PANEL-48-3-DIN	48 x 75 ohm E3/DS3 termination, thru DIN 1.0/2.3 connectors
PANEL-48-3-HDBNC	48 x 75 ohm E1/110 ohm DS1 termination, HD BNC connectors
CABLE-16TDM-C	16 port cable for TDM CEM IM, no red, 10 Feet
CABLE-16TDM-L1	16 port cable for TDM CEM IM, no red, 56" / 4.7 ft / 1.4 m
CABLE-16TDM-L2	16 port cable for TDM CEM IM, no red, 63" / 5.3 ft / 1.6 m
CABLE-16TDM-L3	16 port cable for TDM CEM IM, no red, 85" / 7.1ft / 2.2 m
CABLE-16TDM-L4	16 port cable for TDM CEM IM, no red, 96" / 8 ft / 2.4 m
PANEL-3G-COMBO-1	Single 12 x E1 + 4 x DS3 Patch panel for 3G CEM/IMSG interface module
PANEL-3G-COMBO-2	Double 12 x E1 + 4 x DS3 Patch panel for 3G CEM/IMSG interface module
P3G1-RCKMNT-19IN	EIA 19 Inch mounting brackets for single 3G CEM/IMSG IM patch panel
P3G1-RCKMNT-ETSI	ETSI 21 Inch mounting brackets for single 3G CEM/IMSG IM patch panel
P3G1-RCKMNT-23IN	EIA 23 Inch mounting brackets for single 3G CEM/IMSG IM patch panel
P3G2-RCKMNT-19IN	EIA 19 Inch mounting brackets for double 3G CEM/IMSG IM patch panel
P3G2-RCKMNT-ETSI	ETSI 21 Inch mounting brackets for double 3G CEM/IMSG IM patch panel
P3G2-RCKMNT-23IN	EIA 23 Inch mounting brackets for double 3G CEM/IMSG IM patch panel

Warranty information

Warranty information is available 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 7 are available as part of the Cisco Carrier Ethernet Switching Service and Support solution and are available directly from Cisco and through resellers.

Table 30. Service and support

Advanced Services	Features	Benefits
Cisco Total Implementation Solutions (TIS), available directly from Cisco **Cisco Packaged TIS, available through resellers**	● Project management ● Site survey, configuration, and deployment ● Installation, text, and cutover ● Training ● Major moves, adds, and changes ● Design review and product staging	● Supplement existing staff ● Help ensure functions meet needs ● Mitigate risk
Cisco SP Base Support and Service Provider-Based Onsite Support, available directly from Cisco **Cisco Packaged Service Provider- Based Support, available through resellers**	● 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	● 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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