Cisco ASR 901 Series Aggregation Services Routers

The Cisco® ASR 901 Series Aggregation Services Routers are hardened, high-speed, low-power-consumption routers optimized for any-generation cell-site Radio Access Network (RAN) backhaul and Ethernet access. By using Cisco ASR 901 routers, operators can reduce backhaul operating costs, simplify and converge their RAN and Ethernet access networks, and enhance their profit opportunities with mobile and premium Ethernet services.

RAN cell sites are places of transformation between mobile radio and mobile transport networks. Cost-effective RAN backhaul requires the ability to securely aggregate the transport of traffic from both traditional and next-generation radios across multiple transport options available at the cell site, be they macro, pico, or enterprise small cells. The Cisco ASR 901 routers are designed to minimize operating costs and optimize this radio-to-transport transformation through scalable time-division multiplexing (TDM) and IP/Ethernet interfaces for any combination of multivendor, multigeneration radios and transport networks.

Product Overview

The Cisco ASR 901 Series Aggregation Services Routers are compact cell-site and Ethernet access routers specifically designed to clock, aggregate, and backhaul mixed-generation RAN traffic. Cisco ASR 901 routers prioritize and process cell-site voice, data, and signaling traffic as part of the Cisco Unified RAN Backhaul solution for reliable transport across any available backhaul networks, including T1/E1, ATM, Carrier Ethernet, microwave, WiMAX, and service provider Wi-Fi networks.

Designed for cell sites and Carrier Ethernet access, the Cisco ASR 901 differentiating features include:

- Low power consumption
- Line rate performance for all Layer 2 and Layer 3 interfaces
- Flexible clocking options: TDM, Building Integrated Timing Supply (BITS), GPS (10Mhz, 1PPS/ToD),1588v2, and Synchronous Ethernet (SyncE)
- Secure Mobile Transport: with IPSec and Network Address Port Translation (NAPT)
- Extended operating temperatures
- Small form factor: 1 rack unit (RU) with 8.3 - 9.1 in. depth
- Redundant power and cooling
- Pay-as-you-grow investment model

Figures 1 and 2 show the two basic 1-Gigabit Ethernet models of the Cisco ASR 901 Series routers.

Figure 1.   Cisco ASR 901-12C-FT-D and ASR 901-4C-FT-D Routers

Figure 2.   Cisco ASR 901-12C-F-D and ASR 901-4C-F-D Routers

Figures 3 through 6 show the six basic 10-Gigabit Ethernet models of the Cisco ASR 901 Series routers.

Figure 3.   Cisco ASR 901-6CZ-FT-D Router

Figure 4.   Cisco ASR 901-6CZ-F-D and ASR 901-6CZ-FS-D Routers (with Secure Mobile Transport)

Figure 5.   Cisco ASR 901-6CZ-FT-A Router

Figure 6.   Cisco ASR 901-6CZ-F-A and ASR 901-6CZ-FS-A Routers (with Secure Mobile Transport)

Major Applications

Cell-Site Backhaul for Mobile Applications

Deployed as cell-site routers for mobile backhaul, the Cisco ASR 901 routers can aggregate multiple base stations through multiple TDM, Ethernet, and IP interfaces, and can use Multiprotocol Label Switching (MPLS), Resilient Ethernet Protocol (REP), Multilink Point-to-Point Protocol (MLPPP), Layer 2 VPN (L2VPN), Layer 3 VPN (L3VPN), and other common transport protocols for RAN backhaul. Essentially, the routers prioritize, differentiate, and segment any combination of 2G, 3G, or 4G traffic for backhaul over any combination of IP/Ethernet and TDM (E1/T1) infrastructures (copper, microwave, or optical).

Enterprise Small Cell Backhaul

Mobile traffic will now traverse from enterprise networks across public networks, so it is essential to protect the integrity of both enterprise and carrier data. To provide secure transport across any enterprise network, a high-performance IPSec acceleration engine is required. At the same time, it is important to be able to manage both public and private networks through support for NAPT. The Cisco ASR 901 provides secure mobile transport to satisfy the evolving backhaul requirements of deploying enterprise small cells.

Metro Ethernet Access

Cisco ASR 901 routers allow service providers to simultaneously manage and operate Pseudowire Emulation Edge to Edge (PWE3) and Carrier Ethernet environments by supporting line-rate Layer 2 Ethernet operations, administration, and maintenance (EOAM), including Connectivity Fault Management (CFM), Ethernet Local Management Interface (E-LMI), REP, QinQ, and link aggregation.

Business Access Device

Cisco ASR 901 routers are optimized for remote-access and small aggregation sites where a fully featured, compact access platform is needed. The routers offer business service flexibility using an Ethernet virtual circuit (EVC) infrastructure and deliver Layer 2, IP, and MPLS transport for advanced Layer 2 and Layer 3 VPN services.

Benefits

Cisco ASR 901 routers help service providers deliver advanced services and reduce operating costs for mobile backhaul and Carrier Ethernet access solutions. Highlights include the following.

Network Simplification

Cisco network virtualization technology can simplify network operations by reducing the number of components that must be managed, supporting easier configuration. The Cisco ASR 901 supports Zero Touch Provisioning (ZTP) and autonomic networking and service activation to accelerate network deployment and service turn-up. The result is increased network scalability, improved service velocity, and lower operating costs. Capable of network virtualization, Cisco ASR 901 routers can be deployed as satellites of a Cisco ASR 9000 Series system to reduce the complexity of today's mobile Internet networks.

Service Scalability

Cisco ASR 901 routers deliver line-rate performance and flexible service scalability in a compact form factor. With support for up to 32,000 MAC addresses, up to 4000 bridge domains, and multiple hierarchical queues, the routers deliver high performance and scale for all mobile and Carrier Ethernet services.

Comprehensive Services

With Cisco ASR 901 routers, services can be prioritized and differentiated through hierarchical quality of service (HQoS) and security attributes. The routers offer advanced traffic analytics and performance monitoring and control, including per-traffic-class metering, bidirectional packets, and byte statistics. The service offering is enhanced with comprehensive OAM functionality, including Layer 2 CFM, IP service-level agreements (SLAs) for Layer 3, IPSec and NAPT for enterprise small cell backhaul, and MPLS OAM and TDM advanced timing and synchronization.

Advanced Timing

Cisco ASR 901 routers provide the timing services required in today's converged access networks by offering integrated support for the BITS, 10-MHz, 1 pulse-per-second (PPS), and time-of-day (ToD) interfaces. The routers support SyncE on copper and optical ports and IEEE1588v2 Precision Time Protocol (PTP) clock recovery from T1 and E1 ports.

Reliable Deployment

A Cisco end-to-end mobile backhaul solution offers the carrier greater confidence in the delivery of a truly carrier-class mobile backhaul network. Through transport and service redundancy, the Cisco architecture helps assure network availability, resiliency, and best-in-class performance.

Pay-as-You-Grow Investment Model

The use of licensing to activate features and ports on the Cisco ASR 901 Series allows service providers to customize and schedule investments in their networks for a time when network growth and customer demand justify the investment. Unlike investments in the core and edge, where the physical location of network assets has minimal impact on their accessibility and usage, the ROI on an access element is heavily influenced by its location in the network and proximity to customers. With little or any need for service calls, the Cisco ASR 901 Series can be deployed, and later, features and ports can be activated as demand, growth, or service activation dictate. This delivers significant investment protection and allows flexible timing for migrating from 1 Gbps to 10 Gbps, deploying MPLS, TDM, clocking, security services, and boosting service capacity.

"Green" Hardware

Cisco ASR 901 routers help service providers reduce operating costs by optimizing energy efficiency, allowing cost-effective and responsible resource management. The routers are designed for low power consumption with Reduction of Hazardous Substances (RoHS) compliant, lead-free components. An indirect benefit is a significant reduction of carbon emissions.

Components and Options

Table 1 lists the hardware parts available for the Cisco ASR 901 Series.

Table 1.　　Hardware Components for the Cisco ASR 901 Series

Part Number	Description
A901-12C-F-D	Cisco ASR 901 Series Aggregation Services Router Chassis, Ethernet-only interfaces, DC power
A901-12C-FT-D	Cisco ASR 901 Series Aggregation Services Router Chassis, Ethernet and TDM interfaces, DC power
A901-4C-F-D	Cisco ASR 901 Series Aggregation Services Router Chassis, PAYG 4 GE Port, Ethernet-only interfaces, DC power
A901-4C-FT-D	Cisco ASR 901 Series Aggregation Services Router Chassis, PAYG 4 GE Port, Ethernet and TDM interfaces, DC power
A901-6CZ-F-D	Cisco ASR 901 Series Aggregation Services Router Chassis, Ethernet-only interfaces, 10 GE, DC power, USB
A901-6CZ-FT-D	Cisco ASR 901 Series Aggregation Services Router Chassis, Ethernet and TDM interfaces, 10 GE, DC power, USB
A901-6CZ-F-A	Cisco ASR 901 Series Aggregation Services Router Chassis, Ethernet-only interfaces, 10 GE, AC power, USB
A901-6CZ-FT-A	Cisco ASR 901 Series Aggregation Services Router Chassis, Ethernet and TDM interfaces, 10 GE, AC power, USB
A901-6CZ-FS-D	Cisco ASR 901 Series Aggregation Services Router Chassis, Ethernet-only interfaces, 10 GE, IPSec/NAPT, DC power, USB
A901-6CZ-FS-A	Cisco ASR 901 Series Aggregation Services Router Chassis, Ethernet-only interfaces, 10 GE, IPSec/NAPT, AC power, USB
Cisco ASR 901 Accessories	
CAB-CONSOLE-RJ45	Console cable: 6 ft with RJ-45 and DB9F
CAB-CONSOLE-RJ45=	Console cable: 6 ft with RJ-45 and DB9F (spare)
Cisco ASR 901 Rack Mount Kits	
A901-RCKMNT-19IN	Cisco ASR 901 Router 19-in. Rack Mount Kit
A901-RCKMNT-19IN=	Cisco ASR 901 Router 19-in. Rack Mount Kit, spare
A901-RCKMNT-23IN	Cisco ASR 901 Router 23-in. Rack Mount Kit
A901-RCKMNT-23IN=	Cisco ASR 901 Router 23-in. Rack Mount Kit, spare
A901-RCKMNT-R19	Cisco ASR 901 Router Recessed Rack Mount Kit for 19-in. cabinet
A901-RCKMNT-R19=	Cisco ASR 901 Router Recessed Rack Mount Kit for 19-in. cabinet, spare
A901Z-RCKMNT-19IN	Cisco ASR 901 10GE Router 19-in. Rack Mount Kit
A901Z-RCKMNT-19IN=	Cisco ASR 901 10GE Router 19-in. Rack Mount Kit, spare

Part Number	Description
A901Z-RCKMNT-23IN	Cisco ASR 901 10GE Router 23-in. Rack Mount Kit
A901Z-RCKMNT-23IN=	Cisco ASR 901 10GE Router 23-in. Rack Mount Kit, spare
A901Z-RCKMNT-ETSI	Cisco ASR 901 10GE Router ETSI Rack Mount Kit
A901Z-RCKMNT-ETSI=	Cisco ASR 901 10GE Router ETSI Rack Mount Kit, spare
A901Z-RCKMNT-R19	Cisco ASR 901 10GE Router Recessed Rack Mount Kit for 19-in. cabinet
A901Z-RCKMNT-R19=	Cisco ASR 901 10GE Router Recessed Rack Mount Kit for 19-in. cabinet, spare
A901Z-RCKMNT-R23	Cisco ASR 901 10GE Router Recessed Rack Mount Kit for 23-in. cabinet
A901Z-RCKMNT-R23=	Cisco ASR 901 10GE Router Recessed Rack Mount Kit for 23-in. cabinet, spare
A901Z-RCKMNT-RETS	Cisco ASR 901 10GE Router Recessed Rack Mount Kit for ETSI cabinet
A901Z-RCKMNT-RETS=	Cisco ASR 901 10GE Router Recessed Rack Mount Kit for ETSI cabinet, spare
A901Z-RCKMNT-WALL	Cisco ASR 901 10GE Router Wall Mount Kit
A901Z-RCKMNT-WALL=	Cisco ASR 901 10GE Router Wall Mount Kit, spare

The Cisco ASR 901 Series supports a wide range of Small Form-Factor Pluggable (SFP) and enhanced SFP (SFP+) optics modules. Table 2 lists their part numbers. The operational temperatures supported for the optics are defined by individual SFP or SFP+ modules.

Table 2.   SFP and SFP+ Modules Supported with the Cisco ASR 901 Series

Type	Part Number
Ethernet SFP	GLC-LH-SMD, GLC-EX-SMD, GLC-ZX-SMD, GLC-LX-SM-RGD, GLC-SX-MMD, GLC-SX-MM-RGD, GLC-ZX-SM, GLC-ZX-SM-RGD, GLC-T, GLC-BX-U, GLC-BX-D, SFP-GE-L, SFP-GE-S, SFP-GE-Z, SFP-GE-T, CWDM-SFP-1470, CWDM-SFP-1490, CWDM-SFP-1510, CWDM-SFP-1530, CWDM-SFP-1550, CWDM-SFP-1570, CWDM-SFP-1590, CWDM-SFP-1610, Ranging from DWDM-SFP-3033 to DWDM-SFP-6141 (40 wavelengths), GLC-BX40-D-I, GLC-BX40-U-I, GLC-BX40-DA-I, GLC-BX80-D-I, GLC-BX80-U-I
Ethernet SFP+	SFP-10G-SR, SFP-10G-LR, SFP-10G-ER, SFP-10G-ZR, SFP-10G-LRM, SFP-10G-SR-X, SFP-10G-LR-X, DWDM-SFP+, SFP-H10GB-CU1M, SFP-H10GB-CU3M, SFP-H10GB-CU5M, SFP-H10GB-ACU7M, SFP-H10GB-ACU10M

Flexible Software Options

The Cisco ASR 901 Series is supported in Cisco IOS® Software. Table 3 describes the Cisco IOS Software feature licenses that are supported, allowing service providers the flexibility to invest in software resources only when their businesses need it. The Cisco ASR 901 Series offers five different Cisco IOS Software feature licenses. Each license enables features on a per-chassis basis.

- The Base license includes support for Layer 2 and Layer 3 features, Sync-E, and 1588 Ordinary Clock.

- The Advanced IP Metro license adds the following capabilities to the Base license: TDM, MPLS, CESoPSN pseudowires, MPLS VPN support, Ethernet pseudowires, and pseudowire redundancy.

- The Advanced Timing license adds support for IEEE IEEE 1588v2 Boundary Clock.

- The IP Security License adds Secure Mobile Transport for IPSec/NAPT.

- The Network Virtualization License support adds support for nV Satellite.

Table 3.   Descriptions of Cisco IOS Software Feature Licenses for Cisco ASR 901 Series

Cisco IOS Software Feature License	Part Number	Description
Base	SL-A901-B	Base feature license supports: • Layer 2: EVC Infra, 802.1Q, 802.1ad, QinQ, 802.3ah, Y.1564/RFC 2544 GEN, Storm Control, REP over LAG/LACP, Dual RENN, SPAN, and REP • QoS,2 Level H-QoS and Egress Policing • Layer 3: IPv4 static routes, BGPv4, IS-IS, OSPFv2, BFD, Multi-Virtual Route Forwarding (VRF) (VRF-lite), host connectivity, HSRP,VRRP, and IPv4/IPv6 PIM • IPv6 static routes, Multiprotocol BGP, IS-IS, OSPFv3, BFDv6 • E-OAM: CFM (BD, port level), IP SLA, Y.1731 FM, Y.1731 PM, Y.1731 SLM • Clocking: SyncE with SSM and ESMC, 1588v2 OC, Microwave ACM, Hybrid Clocking, Redundant PTP instances(G.8265.1) • Security: Port ACL and Router ACL • Management: SNMP, SSH, Telnet, DOM, Autonomic Networking
Advanced IP Metro	SL-A901-A L-SL-A901-A=	Advanced IP Metro feature license supports: • Base features (above) • MPLS: MPLS using Label Distribution Protocol (LDP), EoMPLS, L3VPN, MPLS OAM, pseudowire redundancy, TE FRR, Labeled BGP (RFC3107), Remote LFA FRR, Y.1564 over PW and EVC Xconnect • E-OAM: CFM over pseudowire, IP SLA (LSP), Y.1731 PM over Pseudowire • TDM: T1/E1, Circuit Emulation Service over Packet Switched Network (CESoPSN) over MPLS and User Datagram Protocol (UDP), Structure Agnostic TDM over Packet (SAToP) over MPLS and UDP, PPP High-Level Data Control (HDLC) over MPLS, IP over PPP, HDLC, MLPPP, QoS over MLPPP, TDM Pseudowire redundancy, TDM Local Switching, ATM-IMA PW Redundancy • Management: Y.1731 PM on the EVC Xconnect, Ethernet terminal loopback over Xconnect
Advanced Timing	SL-A901-T L-SL-A901-T=	Advanced Timing Services for IEEE 1588v2 Boundary Clock
IP Security	SL-A901-I L-SL-A901-I=	Secure Mobile Transport for IPSec/NAPT
Network Virtualization	SL-A901-NV SL-A901-NV=	Network Virtualization (nV) Satellite Services

Table 4 provides brief descriptions of the Cisco ASR 901 port upgrade options for the 1-Gigabit Ethernet models.

Table 4.   Cisco ASR 901 Series Port Upgrade Options

Part Number	Product Name
GE Port Upgrade License Options	
FLS-A901-4S	ASR 901 4 Port SFP GE Upgrade License
FLS-A901-4T	ASR 901 4 Port Copper GE Upgrade License
GE Port Upgrade License Options (Spares)	
FLS-A901-4S=	ASR 901 4 Port SFP GE Upgrade License: Paper License
L-FLS-A901-4S=	ASR 901 4 Port SFP GE Upgrade License: e-Delivery License
FLS-A901-4T=	ASR 901 4 Port Copper GE Upgrade License: Paper License
L-FLS-A901-4T=	ASR 901 4 Port Copper GE Upgrade License: e-Delivery License

Table 5 provides brief descriptions of the Cisco ASR 901 port upgrade options for the 10-Gigabit Ethernet models.

Table 5.   Cisco ASR 901 Series Port Upgrade Options for the 10-Gigabit Ethernet Models

Part Number	Product Name
GE Port Upgrade License Options	
FLS-A901-4	ASR 901 4 Port GE Upgrade License
FLS-A901-2Z	ASR 901 2x 10GE Port SFP Upgrade License
GE Port Upgrade License Options (Spares)	
FLS-A901-4=	ASR 901 4 Port GE Upgrade License: Paper License
L-FLS-A901-4=	ASR 901 4 Port GE Upgrade License: e-Delivery License
FLS-A901-2Z=	ASR 901 2x 10 GE Port SFP Upgrade License: Paper License
L-FLS-A901-2Z=	ASR 901 2x 10 GE Port SFP Upgrade License: e-Delivery License

Major Features

Table 6 lists the features of the Cisco ASR 901 routers.

Table 6.   Cisco ASR 901 Routers Features

Features
Ethernet Services
- EVCs for: 802.1q   802.1ad (QinQ)   - Selective QinQ   - Inner and outer VLAN classification   - IEEE bridging   - REP   - MSTP   802.3ad Link Aggregation Bundles   - EoMPLS   - EoMPLS pseudowire redundancy   - Dynamic Host Configuration Protocol (DHCP) Client for Switch Virtual Interface(SVI)   - Link Layer Discovery Protocol (LLDP)   - L2 Protocol Peering, Forwarding, and Tunneling   - Ethernet Loopback
TDM
- T1/E1   - Pseudowire setup and maintenance using the LDP: RFC 4447   - Structure-Aware TDM CESoPSN: RFC 5086   - Structure-Aware TDM Circuit Emulation Service over UDP (CESoUDP): RFC 5086   - SAToP: RFC 4553   - Structure-Agnostic TDM over UDP: RFC 4553   - Pseudowire redundancy for CESoPSN and SAToP over MPLS   - IP over HDLC, PPP, and MLPPP   - QoS   - ANSI T1.403 Remote Loopback   - Bit Error Rate Test (BERT)   - ATM-IMA   - Per VC level shaping, CBR, UBR, UBR+, VBR-RT, VBR-nRT   - TDM Local Switching

Features
Layer 3 and MPLS Services

- Layer 3 routing
- Cisco Express Forwarding (CEF) Load Sharing of Equal Cost Paths (ECMP)
- Open Shortest Path First (OSPF)
- Border Gateway Protocol (BGP)
- Intermediate System-to-Intermediate System (IS-IS)
- Bidirectional Forwarding Detection (BFD) support for OSPF, IS-IS, BGP, and static routes
- MPLS
- LDP with Label Edge Router (LER) and Label Switch Router (LSR) support
- Equal Cost Multiple Path (ECMP) support
- MPLS L3VPN
- IPv6 routing (BGP, OSPF, ISIS, static routes), BFDv6
- Two-Way Active Measurement Protocol (TWAMP)
- Labeled BGP (RFC 3107)
- Hot Standby Router Protocol (HSRP)
- Virtual Router Redundancy Protocol (VRRP)
- Multi-hop BFD
- MPLS Traffic Engineering/Fast Reroute (TE/FRR)

QoS

- IEEE 802.1p QoS
- IP Precedence Type of Service (ToS)
- Differentiated Services Code Point (DSCP) traffic shaping and policing
- Class-Based Weighted Fair Queuing (CBWFQ)
- Weighted Random Early Detection (WRED)
- Priority queuing
- 2-rate 3-color (2R3C) policing
- Egress shaping per queue
- Modular QoS CLI (MQC)
- Hierarchical QoS (HQoS)
- Classification based on class of service (CoS), VLAN ID, DSCP, or IP precedence
- QoS ingress and egress statistics
- ACL QoS on IPv4
- IPv6 QoS

Multicast

- IPv4 Multicast: Source Specific Multicast
- IPv4 Multicast: Source Specific Multicast (SSM) Mapping
- IPv4 Multicast: Internet Group Management Protocol Versions 1, 2, and 3 (IGMPv1, v2, and v3)
- IPv4 Multicast: IGMP Snooping
- IPv6 Multicast: Multicast Listener Discovery (MLD) Protocol, Versions 1 and 2
- IPv6 Multicast: PIM Source-Specific Multicast (PIM-SSM)
- IPv6 Multicast: MLD Snooping

Timing

- IEEE1588-2008 Ordinary Clock
- IEEE1588-2008 Boundary Clock
- Hybrid Clocking
- T1/E1 line timing
- Time of Day (ToD), 10 MHz, 1 (PPS)
- BITS
- ITU-T SyncE support on copper and fiber

Features
OAM
• IEEE 802.1ag Connectivity Fault Management (CFM)   • Ethernet Local Management Interface (ELMI)   • IEEE 802.3ah Link OAM   • MPLS OAM   • IP SLA   • Y.1731 Fault and Performance Management   • Dying Gasp
Security
• Authentication, authorization, and accounting (AAA) with TACACS+ and RADIUS   • Secure Shell (SSH) Protocol v2   • Layer 3 ACLs   • IPSec   • NAPT
Availability
• REP   • Cisco Express Forwarding Load Sharing of Equal Cost Paths   • IEEE 802.1s MSTP   • Bidirectional Forwarding Detection (BFD) support for OSPF, IS-IS, BGP, and static routes   • Multi Hop BFD   • HSRP and VRRP   • Pseudowire redundancy   • TE/FRR
Manageability
• Simple Network Management Protocol (SNMP)   • SSH, Telnet   • Command Line Interface (CLI)   • Cisco Prime™ Network: fault, provisioning, and performance management   • Remote Monitoring (RMON)   • Embedded Event Manager (EEM) Script   • Data Collection Manager (DCM)   • Zero Touch Provisioning   • Autonomic Networking   • Service Activation

Product Specifications

Tables 7, 8, and 9 list product, power, and environmental specifications for the Cisco ASR 901 routers. Table 12 provides safety and compliance information.

Table 7.   Cisco ASR 901 Series System Specifications

Description	Cisco ASR 901 Series Specification
Dimensions (H x W x D)	A901-12C-FT-D, A901-4C-FT-D: 1.7 x 17.5 x 8.3 in. (43.2 x 444.5 x 211 mm), 1 RU A901-12C-F-D, A901-4C-F-D: 1.7 x 17.5 x 8.3 in. (43.2 x 444.5 x 211 mm), 1 RU A901-6CZ-FT-D: 1.7 x 17.5 x 9.1 in. (43.2 x 444.5 x 231 mm), 1RU A901-6CZ-F-D: 1.7 x 17.5 x 9.1 in. (43.2 x 444.5 x 231 mm), 1RU A901-6CZ-FS-D: 1.7 x 17.5 x 9.1 in. (43.2 x 444.5 x 231 mm), 1RU A901-6CZ-FT-A: 1.7 x 17.5 x 9.1 in. (43.2 x 444.5 x 231 mm), 1RU A901-6CZ-F-A: 1.7 x 17.5 x 9.1 in. (43.2 x 444.5 x 231 mm), 1RU A901-6CZ-FS-A: 1.7 x 17.5 x 9.1 in. (43.2 x 444.5 x 231 mm), 1RU

Description	Cisco ASR 901 Series Specification
Weight	A901-12C-FT-D, A901-4C-FT-D: 8.15 lb (3.7 kg)
	A901-12C-F-D, A901-4C-F-D: 7.93 lb (3.6 kg)
	A901-6CZ-FT-D: 8.15 lb (3.7 kg)
	A901-6CZ-F-D: 7.93 lb (3.6 kg)
	A901-6CZ-FS-D: 7.93 lb (3.6 kg)
	A901-6CZ-FT-A: 8.15 lb (3.7 kg)
	A901-6CZ-F-A: 7.93 lb (3.6 kg)
	A901-6CZ-FS-A: 7.93 lb (3.6 kg)
Memory	Flash memory:
	A901-12C-FT-D, A901-4C-FT-D: 128 MB (onboard flash)
	A901-12C-F-D, A901-4C-F-D: 128 MB (onboard flash)
	A901-6CZ-FT-D: 128 MB (onboard flash)
	A901-6CZ-F-D: 128 MB (onboard flash)
	A901-6CZ-FS-D: 256 MB (onboard flash)
	A901-6CZ-FT-A: 128 MB (onboard flash)
	A901-6CZ-F-A: 128 MB (onboard flash)
	A901-6CZ-FS-A: 256 MB (onboard flash)
	System memory:
	A901-12C-FT-D, A901-4C-FT-D: 1 GB (DDR3)
	A901-12C-F-D, A901-4C-F-D: 1 GB (DDR3)
	A901-6CZ-FT-D: 1 GB (DDR3)
	A901-6CZ-F-D: 1 GB (DDR3)
	A901-6CZ-FS-D: 1 GB (DDR3)
	A901-6CZ-FT-A: 1 GB (DDR3)
	A901-6CZ-F-A: 1 GB (DDR3)
	A901-6CZ-FS-A: 1 GB (DDR3)
Rack mounts	1 GE models:
	• 19-in. rack mount option
	• 23-in. rack mount option
	• Recessed rack mount option for 19-in. cabinets
	10 GE models:
	• 19-in. rack mount option
	• 23-in. rack mount option
	• ETSI rack mount option
	• Recessed rack mount option for 19-in. cabinets
	• Recessed rack mount option for 23-in. cabinets
	• Recessed rack mount option for ETSI cabinets
	• Wall mount option
Ethernet ports	4 100/1000 RJ-45 Gigabit Ethernet ports
	4 x 1 SFP Gigabit Ethernet ports[1]
	4 x 1 Gigabit Ethernet Combo ports[1]
	2 x 10 Gigabit Ethernet ports (10 GE models only)
TDM ports	A901-12C-FT-D: 16 T1/E1
	A901-4C-FT-D: 16 T1/E1
	A901-6CZ-FT-D: 8 T1/E1
	A901-6CZ-FT-A: 8 T1/E1
Console port	1 (up to 115.2 Kbps)

Description	Cisco ASR 901 Series Specification
USB port	1 supported on the following chassis models: • A901-6CZ-FT-D • A901-6CZ-F-D • A901-6CZ-FS-D • A901-6CZ-FT-A • A901-6CZ-F-A • A901-6CZ-FS-A
External timing ports	BITS input, 10-MHz input/output, 1 PPS input/output, ToD interface, and SyncE
Fans	1 GE models: dual fan, 1+1 redundancy 10 GE models: three fans, with redundancy
Air flow	Left to right airflow
Cabling	Front-panel access cabling and LED indicators
Power supplies	2 power supplies (DC only); module redundancy: 1:1 1 power supply (AC only)
Mean Time Between Failure (MTBF)	A901-12C-F-D: 614,790 hours A901-4C-F-D: 614,790 hours A901-12C-FT-D: 378,310 hours A901-4C-FT-D: 378,310 hours A901-6CZ-F-D: 491,160 hours A901-6CZ-FS-D: 478,460 hours A901-6CZ-FT-D: 378,490 hours A901-6CZ-FT-A: 383,220 hours A901-6CZ-F-A: 499,660 hours A901-6CZ-FS-A: 480,050 hours

[1] Fiber ports can operate at 100 M with 100-M FX SFP.

Table 8.   Power Specifications

Description	Cisco ASR 901 Specifications
Power consumption	1 GE models: dual DC DC-input power and power dissipation: • A901-12C-F-D: 40W • A901-4C-F-D: 40W • A901-12C-FT-D: 50W • A901-4C-FT-D: 50W 10 GE models: dual DC Maximum DC-input power and power dissipation at 48V supply: • A901-6CZ-F-D: 58W • A901-6CZ-FS-D: 59W • A901-6CZ-FT-D: 67W 10 GE models: single AC only AC-input power and power dissipation: • A901-6CZ-F-A: 57W • A901-6CZ-FS-A: 58W • A901-6CZ-FT-A: 65W
AC input voltage and frequency	AC-input voltage rating: 100V-240V 1A-0.5A, 50-60Hz

Description	Cisco ASR 901 Specifications
Power rating	1 GE models: • DC-input voltage rating: 24 VDC, -48 VDC, -60 VDC • DC-input current rating: 2.5A maximum for non-TDM variants and 3.0A maximum for TDM variants 10 GE models: • DC-input voltage rating: 24 VDC, -48 VDC, -60 VDC DC-input current rating: 4A maximum
Power connector	6-position 2-tier stacked connector comprising two feeds, A and B DC power (AMPHENOL ELVA06100), and 3-position mating connectors for each feed (AMPHENOL ELVP03100)

- AC power: AC voltage = 220V, Temp = 65C, Traffic -> 8 copper (1 GE) port + 4 SFP (GE) +2 SFP+ (10 GE) + 8 TDM ports

- DC power: DC voltage = 48V, Temp = 65C, Traffic -> 8 copper (1 GE) port + 4 SFP (GE) +2 SFP+ (10 GE) + 8 TDM ports

- Traffic conditions are the same for the AC and DC chassis. In the case of Ethernet-only chassis, TDM, traffic is not present

Table 9.   Environmental Specifications

Description	Cisco ASR 901
Operating temperature[1]	-40 to 149°F (-40 to 65°C)
Nonoperating temperature	-40 to 158°F (-40 to 70°C)
Relative humidity	10% to 85%, noncondensing, ±5 %
Operational altitude	13,000 ft (4000m) maximum 104°F (40°C) ambient
Acoustic noise[2]	1 GE models: 66 dBA with 23 cfm fan 10 GE models: 61 dBA with 19 cfm fan
Air flow	1 GE models: 46 cfm 10 GE models: 57 cfm

[1] Optics used may limit the temperature range.
[2] The above are for normal (nonfailure) operation. When operating with a fan failure, the above may be exceeded.

Table 10.   Safety and Compliance

Type	Standards
Safety	• UL/CSA 60950-1 • IEC/EN 60950-1 • AS/NZS 60950.1
EMC emissions	• FCC 47CFR15, Class A • EN55022, Class A • CISPR 22, Class A • AS/NZS CISPR 22, Class A • ICES 003, Class A • VCCI, Class A • KN 22, Class A
EMC immunity	• EN/IEC61000-4-2 Electrostatic Discharge Immunity - Enclosure • EN/IEC61000-4-3 Radiated Immunity - Enclosure • EN/IEC61000-4-4 Electrical Fast Transient Immunity • EN/IEC61000-4-5 Surge • EN/IEC61000-4-6 Immunity to Conducted Disturbances

Type	Standards
Network Equipment Building Standards (NEBS)[2]	This product is designed to meet the following requirements • GR-63-CORE • GR-1089-CORE • GR-3108-CORE
ETSI/EN	• EN 300 386 Telecommunications Network Equipment (EMC) • EN55022 Information Technology Equipment (Emissions) • EN55024 Information Technology Equipment (Immunity) • EN61000-6-1 Generic Immunity Standard
Network synchronization	• GR-1244-CORE • ITU-T G.813 • ITU-T G.703 clause 5 • ITU-T G.703 clause 9 • ITU-T G.8261/Y.1361 • ITU-T G.781 • ITU-T G.8264 • IEEE1588-2008
E1	• AS/ACIF S016: 2001 • ITU.G.703: 1998 • ITU I.431: 1993 • TBR13: 1996 • TBR12:1996: A1 1996 • RRA No. 2009-38 • ITU G.704
T1	• IC CS-03: 2004 • DSPR Technical Condition 2004 • TIA-968B • ID0002: 2007 • HKTA 2028: Edition 2010
Ethernet: 1000Base-T 100Base-T 100Base-FX 1000Base-S 1000BaseL 1000Base-Z 1000Base-E 1000Base-BX-U 1000Base-BX-D DWDM-SFP-GE: CWDM-SFP-GE: 10000Base-S 10000Base-L 10000Base-Z 10000Base-E	DSPR Technical Requirement 2005 • IEEE 802.3 • IEEE 802.3ae DSPR Technical Condition 2004 • IEEE-802.3ah • ANSI X3.263-1995 • ISO/IEC 9314-3

[1] The TDM ports (A901-12C-FT-D, A901-4C-FT-D, A901-6CZ-FT-D, and A901-6CZ-FT-A) and BITS ports require the use of shielded twisted pair cabling (STP) for EMC emissions.

[2] The copper Ethernet ports require the use of STP cabling for NEBS EMC compliance. The TDM ports (A901-12C-FT-D, A901-4C-FT-D, A901-6CZ-FT-D, and A901-6CZ-FT-A) and BITS ports are Type-2 and Type-4 NEBS compliant.

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 accelerate customer success. These innovative services programs are delivered through a unique combination of people, processes, tools, and partners, resulting in 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 minimizing 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 13 are available as part of the Cisco Carrier Ethernet Switching Service and Support solution and are available directly from Cisco and through resellers.

Table 11. 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 • Minimize network downtime

For More Information

For more information about the Cisco Unified RAN Backhaul solution, visit Unified RAN Backhaul. For more information about the Cisco Small Cell Solution, visit cisco.com/go/smallcell or contact your local account representative.

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Printed in USA

C78-686453-03   02/14