



Introduction

This release notes contain information about the Cisco ASR 920 Series Aggregation Services Routers, provides new and changed information for these routers, hardware support, limitations and restrictions, and caveats.



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This release notes provides information for these variants of the Cisco ASR 920 Series Routers:

- ASR-920-12CZ-A
- ASR-920-12CZ-D
- ASR-920-4SZ-A
- ASR-920-4SZ-D
- ASR-920-10SZ-PD
- ASR-920-24SZ-IM
- ASR-920-24SZ-M
- ASR-920-24TZ-M
- ASR-920-20SZ-M
- ASR-920-12SZ-IM
- ASR-920-12SZ-A
- ASR-920-12SZ-D
- ASR 920-8S4Z-PD

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Documentation Updates

Rearrangement in the Configuration Guides

- The following are the modifications in the CEM guides.
 - Introduction of the Alarm Configuring and Monitoring Guide:

This guide provides the following information:

 - Alarms supported for SONET and SDH, and their maintenance
 - Alarm profiling feature
 - Auto In-Service States for cards, ports, and transceivers
- For more information, see the [Alarm Configuring and Monitoring Guide, Cisco IOS XE 17 \(Cisco ASR 920 Series\)](#).
- Rearrangement of Chapter and Topics in the Alarm Configuring and Monitoring Guide:
 - The Auto In-Service States Guide is now a chapter inside the Alarms Configuring and Monitoring Guide.
 - Alarms at SONET Layers topic in the following CEM guides, is added to the Alarms Configuring and Monitoring Guide:
 - 1-Port OC-48/STM-16 or 4 port OC-12/OC-3 / STM-1/STM-4 + 12 port T1/E1 + 4 port T3/E3 CEM Interface Module Configuration Guide
 - The Alarm History and Alarm Profiling chapters are removed from the below CEM Technology guides, and added into the Alarm Configuring and Monitoring Guide:
 - 1-Port OC-48/STM-16 or 4 port OC-12/OC-3 / STM-1/STM-4 + 12 port T1/E1 + 4 port T3/E3 CEM Interface Module Configuration Guide
- Configuring IEEE 802.3ad Link Bundling is now available in [Etherchannel Configuration Guide, Cisco IOS XE 17 \(Cisco ASR 920 Series\)](#).

Feature Matrix

The feature matrix lists the features supported for each platform. For more information, see the [Cisco ASR 920 Series Aggregation Services Routers Feature Compatibility Matrix](#).

The cumulative [Feature Compatibility Release Matrix](#) is available on Content Hub.

Cisco ASR 920 Series Routers Overview

The Cisco ASR 920 Series Aggregation Services Routers provide a comprehensive and scalable set of Layer 2 and Layer 3 VPN services in a compact package. They are temperature-hardened, small form factor, with high throughput and low power consumption ideal for mobile backhaul, business services and residential voice, video, and data ("triple-play") applications.

Feature Navigator

Use the Cisco Feature Navigator to find information about feature, platform, and software image support. To access the Cisco Feature Navigator, go to <http://www.cisco.com/go/cfn>. An account on cisco.com is not required.

Determining the Software Version

Use the following commands to verify your software version:

- Consolidated Package— **show version**

Table 1: ROMMON Version

PIDs	ROMMON
ASR-920-12SZ-A , ASR-920-12SZ-D	15.6(43r)S
ASR-920-12SZ-IM	15.6(43r)S
ASR-920-12CZ-A, ASR-920-12CZ-D, ASR-920-4SZ-A, ASR-920-4SZ-D, ASR-920-10SZ-PD,ASR-920-24SZ-IM, ASR-920-24SZ-M, ASR-920-24TZ-M, ASR920-8S4Z-PD, and ASR-920-20SZ-M	15.6(43r)S

Upgrading to a New Software Release

Only the latest consolidated packages can be downloaded from Cisco.com; users who want to run the router using individual subpackages must first download the image from Cisco.com and extract the individual subpackages from the consolidated package.

For information about upgrading to a new software release, see the [Upgrading the Software on the Cisco ASR 920 Series Routers](#).

Upgrading the FPD Firmware

FPD Firmware packages are bundled with the software package. FPD upgrade is automatically performed on the router.

If you like to manually change the FPD Firmware software, use the **upgrade hw-module subslot 0/0 fpd bundle** to perform FPD firmware upgrade.

Supported HoFPGA and ROMMON Versions

The tables below list the HoFPGA and ROMMON version of the software releases.

Table 2: HoFPGA and ROMMON Versions for the Cisco ASR-920-12CZ-A, ASR-920-12CZ-D, ASR-920-4SZ-A, ASR-920-4SZ-D, ASR-920-10SZ-PD, and ASR 920-8S4Z-PD

Release	HoFPGA Version	ROMMON Version
Cisco IOS XE Gibraltar 16.12.1	0X00040043	15.6(32r)S
Cisco IOS XE Gibraltar 16.12.2a	0x00040043 (BFD/default template) 0x00020009 (Netflow template)	15.6(32r)S
Cisco IOS XE Amsterdam 17.1.x	0X00040043 (BFD/default template) 0x00020009 (Netflow template)	15.6(32r)S
Cisco IOS XE Amsterdam 17.3.1	0X00020009	15.6(43r)S
Cisco IOS XE Amsterdam 17.3.2	0X00020009	15.6(43r)S
Cisco IOS XE Amsterdam 17.3.3	0X00020009	15.6(43r)S
Cisco IOS XE Amsterdam 17.3.4	0X00040044	15.6(43r)S
Cisco IOS XE Amsterdam 17.3.5	0X00040044	15.6(43r)S
Cisco IOS XE Amsterdam 17.3.6	0X00040044	15.6(43r)S
Cisco IOS XE Amsterdam 17.3.7	0X00040044	15.6(43r)S
Cisco IOS XE Amsterdam 17.3.8	0X00040044	15.6(43r)S

Release	HoFPGA Version	ROMMON Version
Cisco IOS XE Amsterdam 17.3.8a	0X00040044	15.6(43r)S

Table 3: HoFPGA and ROMMON Versions for the Cisco ASR-920-24SZ-IM, ASR-920-24SZ-M, and ASR-920-24TZ-M

Release	HoFPGA Version	ROMMON Version
Cisco IOS XE Gibraltar 16.12.1	0X00030014	15.6(32r)S
Cisco IOS XE Gibraltar 16.12.2a	0x00030014 (BFD/default template) 0x00030014 (Netflow template)	15.6(32r)S
Cisco IOS XE Amsterdam 17.1.x	0x00030014 (BFD/default template) 0x00030014 (Netflow template)	15.6(32r)S
Cisco IOS XE Amsterdam 17.3.1	0X00030014	15.6(43r)S
Cisco IOS XE Amsterdam 17.3.2	0X00030014	15.6(43r)S
Cisco IOS XE Amsterdam 17.3.3	0X00030015	15.6(43r)S
Cisco IOS XE Amsterdam 17.3.4	0X00030014	15.6(43r)S
Cisco IOS XE Amsterdam 17.3.5	0X0004001b	15.6(43r)S
Cisco IOS XE Amsterdam 17.3.6	0X0004001b	15.6(43r)S
Cisco IOS XE Amsterdam 17.3.7	0X0004001b	15.6(43r)S
Cisco IOS XE Amsterdam 17.3.8	0X0004001b	15.6(43r)S
Cisco IOS XE Amsterdam 17.3.8a	0X0004001b	15.6(43r)S

Table 4: HoFPGA and ROMMON Versions for the Cisco ASR-920-12SZ-IM

Release	HoFPGA Version	ROMMON Version
Cisco IOSXE Gibraltar 16.12.1	0X0003001B	15.6(24r)S
Cisco IOS XE Gibraltar 16.12.2a	0x0003001B (BFD/default template) 0x00020008 (Netflow template)	15.6(24r)S
Cisco IOS XE Amsterdam 17.1.x	0x0003001B (BFD/default template) 0x00020008 (Netflow template)	15.6(24r)S
Cisco IOS XE Amsterdam 17.3.1	0X0003001b	15.6(43r)S

Release	HoFPGA Version	ROMMON Version
Cisco IOS XE Amsterdam 17.3.2	0X0003001b	15.6(43r)S
Cisco IOS XE Amsterdam 17.3.3	0X0003001e	15.6(43r)S
Cisco IOS XE Amsterdam 17.3.4	0X0003001e	15.6(43r)S
Cisco IOS XE Amsterdam 17.3.5	0X0003001e	15.6(43r)S
Cisco IOS XE Amsterdam 17.3.6	0X0003001e	15.6(43r)S
Cisco IOS XE Amsterdam 17.3.7	0X0003001e	15.6(43r)S
Cisco IOS XE Amsterdam 17.3.8	0X0003001e	15.6(43r)S
Cisco IOS XE Amsterdam 17.3.8a	0X0003001e	15.6(43r)S

Table 5: HoFPGA and ROMMON Versions for the Cisco ASR-920-12SZ-A and ASR-920-12SZ-D

Release	HoFPGA Version	ROMMON Version
Cisco IOS XE Gibraltar 16.12.1	0X00010039	15.6(29r)S
Cisco IOS XE Gibraltar 16.12.2a	0x00010039 (BFD/default template) 0x10000007 (Netflow template)	15.6(29r)S
Cisco IOS XE Amsterdam 17.1.x	0x00010039 (BFD/default template) 0x10000007 (Netflow template)	15.6(29r)S
Cisco IOS XE Amsterdam 17.3.1	0X10000008	15.6(43r)S
Cisco IOS XE Amsterdam 17.3.2	0X10000008	15.6(43r)S
Cisco IOS XE Amsterdam 17.3.3	0X10000008	15.6(43r)S
Cisco IOS XE Amsterdam 17.3.4	0X10000008	15.6(43r)S
Cisco IOS XE Amsterdam 17.3.5	0X00020043	15.6(43r)S
Cisco IOS XE Amsterdam 17.3.6	0X00020043	15.6(43r)S
Cisco IOS XE Amsterdam 17.3.7	0X00020043	15.6(43r)S
Cisco IOS XE Amsterdam 17.3.8	0X00020043	15.6(43r)S
Cisco IOS XE Amsterdam 17.3.8a	0X00020043	15.6(43r)S

Table 6: IM FPGA Versions for the Cisco ASR-920-24SZ-IM

Release	Gigabit Ethernet Interface Module (Phase 1) FPGA	Gigabit Ethernet Interface Module (Phase2) FPGA	8 T1/E1	16 T1/E1	32 T1/E1
Cisco IOS XE Amsterdam 17.1.x	0.49	69.24	0.54	0.54	0.46
Cisco IOS XE Amsterdam 17.3.1	0.49	69.24	0.54	0.54	0.46
Cisco IOS XE Amsterdam 17.3.2	0.75	N/A	N/A	0.54	0.46
Cisco IOS XE Amsterdam 17.3.3	0.75	N/A	N/A	0.54	0.46
Cisco IOS XE Amsterdam 17.3.4	0.75	69.24	0.54	0.54	0.46
Cisco IOS XE Amsterdam 17.3.5	0.75	69.24	0.54	0.54	0.46
Cisco IOS XE Amsterdam 17.3.6	0.75	69.24	0.54	0.54	0.46
Cisco IOS XE Amsterdam 17.3.7	0.75	69.24	0.54	0.54	0.46
Cisco IOS XE Amsterdam 17.3.8	0.75	69.24	0.54	0.54	0.46
Cisco IOS XE Amsterdam 17.3.8a	0.75	69.24	0.54	0.54	0.46

Table 7: IM FPGA Versions for the Cisco ASR-920-12SZ-IM

Release	Gigabit Ethernet Interface Module (Phase 1) FPGA	Gigabit Ethernet Interface Module (Phase2) FPGA	8 T1/E1	16 T1/E1	32 T1/E1
Cisco IOS XE Amsterdam 17.1.x	0.49	69.24	0.54	0.54	0.46
Cisco IOS XE Amsterdam 17.3.1	0.49	69.24	0.54	0.54	0.46
Cisco IOS XE Amsterdam 17.3.2	0.75	N/A	N/A	0.54	0.46
Cisco IOS XE Amsterdam 17.3.3	0.75	N/A	N/A	0.54	0.46
Cisco IOS XE Amsterdam 17.3.4	0.75	69.24	0.54	0.54	0.46
Cisco IOS XE Amsterdam 17.3.5	0.75	69.24	0.54	0.54	0.46
Cisco IOS XE Amsterdam 17.3.6	0.75	69.24	0.54	0.54	0.46
Cisco IOS XE Amsterdam 17.3.7	0.75	69.24	0.54	0.54	0.46
Cisco IOS XE Amsterdam 17.3.8	0.75	69.24	0.54	0.54	0.46
Cisco IOS XE Amsterdam 17.3.8a	0.75	69.24	0.54	0.54	0.46

Software Licensing Overview

Starting with Cisco IOS XE Cupertino 17.7.1, PAK licenses are no longer available. When you purchase the Cisco IOS XE Cupertino 17.7.1 release or later, Smart Licensing is enabled by default. We recommend that

you move to Smart Licensing before upgrading to Cisco IOS XE Cupertino 17.7.1 or a higher release, for a seamless experience.

If you are using Cisco IOS XE Bengaluru 17.6.1 or an earlier release version, Smart Licensing is not enabled by default. To enable Smart Licensing, see [Software Activation Configuration Guide \(Cisco IOS XE ASR 920 Routers\)](#).

The router offers the following base licenses:

- Metro Services
- Metro IP Services
- Advanced Metro IP access
 - SDM Video Template

Table 8: Cisco ASR 920 Software Licenses Feature Set

Metro Services	Metro IP Services	Metro Aggregation Services
—	Includes all features in Metro Services	Includes all features in Metro IP Services
QoS, with deep buffers and hierarchical QoS (HQoS)	IP routing (RIP, OSPF, EIGRP, BGP, IS-IS)	MPLS (LDP and VPN)
Layer 2: 802.1d, 802.1q	PIM (SM, DM, SSM), SSM mapping	MPLS TE and FRR
Ethernet Virtual Circuit (EVC)	BFD	MPLS OAM
Ethernet OAM (802.1ag, 802.3ah)	Multi-VRF CE (VRF lite) with service awareness (ARP, ping, SNMP, syslog, trace-route, FTP, TFTP)	MPLS-TP
Multiple Spanning Tree (MST) and Resilient Ethernet Protocol (REP)	IEEE 1588-2008 Ordinary Slave Clock and Transparent Clock	Pseudowire emulation (EoMPLS, CESoPSN, and SAToP)
Synchronous Ethernet	—	VPLS and HVPLS
IPv4 and IPv6 host connectivity	—	Pseudowire redundancy
—	—	MR-APS and mLACP

The router offers the following additional feature licenses:

- ATM
- IEEE 1588-2008 Boundary Clock/Master Clock
- OC-x Port License

Limitations and Restrictions on the Cisco ASR 920 Series Routers



Note The error message "PLATFORM-1-NOSPACE: SD bootflash : no space alarm assert" may occur in the following scenarios:

- Any sector of SD Card gets corrupted
- Improper shut down of router
- power outage.

This issue is observed on platforms which use EXT2 file systems.

We recommend performing a reload of the router. As a result, above alarm will not be seen during the next reload due to FSCK(file systems check) execution.

However, If the error persists after a router reload, we recommend to format the bootflash or FSCK manually from IOS.

- The **default** *command-name* command is used to default the parameters under that interface. However, when speed is configured on the interface, the following error is displayed:

```
Speed is configured. Remove speed configuration before enabling auto-negotiation
```

- Adding or deleting the Trunk Ethernet flow points (TEFPs) with scaled bridge-domain, without delay causes the Cisco ASR 920 Series router to crash.
- Virtual services should be deactivated and uninstalled before performing replace operations.
- The Cisco ASR920 Series Routers no longer support the controller and nid-controller commands for the Cisco ME1200 switch.
- The following interface modules (IMs) do not require the activation command for IM boot up, provided no other IM is activated in subslot 0/1 before.

However, if an IM was activated in the system earlier, deactivate the previously-activated IM before inserting a new IM in system.

- 16-Port T1/E1 Interface Module
- 32-Port T1/E1 Interface Module
- 8-Port T1/E1 Interface Module
- 4-port OC3/STM-1 (OC-3) or 1-port OC12/STM-4 (OC-12) Interface Module
- 14-Port Serial Interface Module
- 6-Port E and M Interface Module
- 4-Port C37.94 Interface Module
- RS422 works on ports from 0 to 7 only.
- The following restriction is applicable only to:

- Cisco ASR-920-24SZ-IM, Cisco ASR-920-24SZ-M, and Cisco ASR-920-24TZ-M
- Cisco ASR-920-20SZ-M
 - Traffic is dropped when packets of size 64 to 100 bytes are sent on 1G and 10G ports.
 - For 64-byte packets, traffic drop is seen at 70% and beyond of the line rate.
 - For 90-byte packets, traffic drop is seen at 90% and beyond of the line rate.
 - For 95-byte packets, traffic drop is seen at 95% and beyond of the line rate.
 - Traffic is dropped when:
 - Traffic is sent on a VRF interface.
 - Traffic is sent across layer 2 and layer 3.

However, traffic is not dropped when the packet size is greater than 100 bytes, even if the packets are sent bidirectionally at the line rate.

- MPLS VC label packet with time-to-live (TTL) value of 2 is dropped at egress MPLS PE device due to ASIC limitations. During PHP process, MPLS TTL value for the VC label is decremented by one with implicit-null. The VC label-related TTL value is set to 255 while imposing the VC label due to multiple VC switching scenarios.

Use the **no mpls ip propagate-ttl** command as the Short Pipe mode for the required label.

- Interface naming is from right to left. For more information, see the Cisco ASR 920 Software Configuration Guide .
- Packet size greater than 1460 is not supported over IPsec Tunnel.
- Minimal traffic drop might be seen for a moment when higher rate traffic is sent through the IPsec tunnels for the first time.
- Before installing the Cisco IOS XE Amsterdam 17.3.1, you *must* upgrade the ROMMON to version 15_6_43r_s or higher to avoid bootup failure. This is applicable to Cisco ASR-920-12SZ-IM, Cisco ASR-920U-12SZ-IM, and Cisco ASR-920U-12SZ-IM-CC. For Cisco ASR-920-12SZ-A and Cisco ASR-920-12SZ-D, Cisco IOS XE Amsterdam 17.3.1 has to be installed in sub packages mode. Booting in sub package mode takes care of auto upgrade to ROMMON version 15_6_43r_s on bootup. This workaround is not applicable to devices installed with ROMMON version 15.6(9r)S.
- One Ternary Content-Addressable Memory (TCAM) entry is utilized for Segment Routing Performance Measurement. This is required for the hardware timestamping to function.
- While performing an auto upgrade of ROMMON, only primary partition is upgraded. Use the **upgrade rom-mon filename** command to upgrade the secondary partition of the ROMMON. However, the router can be reloaded during the next planned reload to complete the secondary ROMMON upgrade.
- For Cisco IOS XE Amsterdam 17.3.x , a minimum disk space of 2 MB is required in the boot flash memory file system for a successful ROMMON auto upgrade process. For a disk space lesser than 2 MB, ROMMON auto upgrade fails and the router reboots.
- Some router models are not fully compliant with all IETF guidelines as exemplified by running the pyang tool with the lintflag. The errors and warnings exhibited by running the pyang tool with the lint flag are currently non-critical as they do not impact the semantic of the models or prevent the models from being

used as part of the toolchains. A script is provided, **check-models.sh**, which runs pyang with lint validation enabled, but ignoring certain errors. This allows the developer to determine what issues may be present.

As part of the model validation for this Cisco IOS XE Amsterdam 17.3.1 release, "LEAFREF_IDENTIFIER_NOT_FOUND" and "STRICT_XPATH_FUNCTIONS" error types are ignored.

- Starting with Cisco IOS XE Bengaluru Release 17.5.1, secondary ROMMON partition is also auto upgraded after a successful primary ROMMON partition upgrade is complete. You can reload the router at the next planned reload to complete the secondary ROMMON upgrade.
- For Cisco IOS XE Amsterdam Release 17.3.x, Cisco IOS XE Bengaluru Release 17.4.x, and earlier, the secondary ROMMON partition is not auto upgraded. You must manually upgrade it using the **upgrade rom-mon filename** command.
- Starting with ROMMON release version 15.6(43r)S, ROMMON version is secure. Once the ROMMON version is upgraded, it cannot be downgraded to a non-secure ROMMON version.
- Secure ROMMON is supported from Cisco IOS XE Amsterdam Release 17.3.1 onwards. However, it is compatible with all the releases.

Any future secure ROMMON upgrade or downgrade is only possible from Cisco IOS XE Amsterdam Release 17.3.1 onwards.

- Starting with Cisco IOS XE Bengaluru Release 17.4.1, Cisco ASR-920-24SZ-IM, Cisco ASR-920-24SZ-M, Cisco ASR-920-24TZ-M, Cisco ASR 920-10SZ-PD, Cisco ASR-920-12CZ-A/ASR-920-12CZ-D, Cisco ASR-920-4SZ-A/ASR-920-4SZ-D, and Cisco ASR-920-20SZ-M routers are auto upgraded to ROMMON version 15_6_44r_s.
- Any non-secure FPGA bundled releases moving to Cisco IOS XE Bengaluru Release 17.3.x or future releases can result in an FPGA upgrade and a ROMMON upgrade. If FPGA upgrade happens parallelly with the ROMMON upgrade, you can only expect a single reload. If FPGA upgrade gets delayed and happens post ROMMON upgrade, two reloads are expected to complete both the upgrade processes. This is followed by a successful bootup of the target release image.

However, starting with Cisco IOS XE Bengaluru Release 17.5.1, Cisco ASR-920-12SZ-IM, Cisco ASR-920U-12SZ-IM, Cisco ASR-920U-12SZ-IM-CC, Cisco ASR-920-12SZ-A and Cisco ASR-920-12SZ-D, ROMMON and FPGA upgrade are synchronized to happen in a single reload.

Additional References

Product Information

- [Cisco ASR 920 Series Aggregation Services Router Data Sheets](#)

Hardware Installation Guides

- [Cisco ASR 920 Series Aggregation Services Router Hardware Guides](#)

Software Configuration Guides

- [Cisco ASR 920 Series Aggregation Services Router Configuration Guides](#)

Regulatory Compliance and Safety Information

- [Regulatory Compliance and Safety Information for the Cisco ASR 920 Series Aggregation Services Routers](#)

Field Notices and Bulletins

- Field Notices—We recommend that you view the field notices for this release to determine whether your software or hardware platforms are affected. You can find field notices at http://www.cisco.com/en/US/support/tsd_products_field_notice_summary.html.
- Bulletins—You can find bulletins at http://www.cisco.com/en/US/products/sw/iosswrel/ps5012/prod_literature.html.

MIB Support

To view supported MIB, go to <http://tools.cisco.com/ITDIT/MIBS/MainServlet>.

Accessibility Features in the Cisco ASR 920 Series Routers

For a list of accessibility features in Cisco ASR 920 Series Routers, see the [Voluntary Product Accessibility Template \(VPAT\)](#) on the Cisco website, or contact accessibility@cisco.com.

All product documents are accessible except for images, graphics, and some charts. If you would like to receive the product documentation in audio format, braille, or large print, contact accessibility@cisco.com.

End-of-Life and End-of-Sale Notices

For End-of-Life and End-of-Sale Notices for the Cisco ASR 920 Series Routers, see <http://www.cisco.com/c/en/us/products/routers/asr-920-series-aggregation-services-router/eos-eol-notice-listing.html>.

