



Release Notes for StarOS™ Software Version 21.11.0 and Ultra Service Platform Version 6.5

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Introduction

This Release Note identifies changes and issues related to this software release. This release is the next major feature release since 21.10/N6.4.

Release Package Version Information

Software Packages	Version
StarOS packages	21.11, build 70741
Ultra Service Platform ISO	6_5_0-7121
usp-em-bundle*	6.5.0, Epoch 5171
usp-ugp-bundle*	21.11.0, build 70741, Epoch 5109
usp-yang-bundle	1.0.0, Epoch 5074
usp-uas-bundle	6.5.0, Epoch 5174
usp-auto-it-bundle	5.8.0, Epoch 5282
usp-vnfm-bundle	4.3.0.121, Epoch 5075
ultram-manager RPM*	2.3.0, Epoch 307
USP RPM Verification Utilities	6.5.0
* These bundles are also distributed separately from the ISO.	

Descriptions for the various packages provided with this release are located in [Release Package Descriptions](#).

Feature and Behavior Changes

Refer to the [Release Change Reference](#) for a complete list of feature and behavior changes associated with this software release.

Related Documentation

For a complete list of documentation available for this release, go to:

- StarOS: <https://www.cisco.com/c/en/us/support/wireless/asr-5000-series/products-installation-and-configuration-guides-list.html>
- Ultra Gateway Platform (including the Ultra M Solution): <https://www.cisco.com/c/en/us/support/wireless/ultra-gateway-platform/products-installation-and-configuration-guides-list.html>
- Ultra Automation Services: <https://www.cisco.com/c/en/us/support/wireless/ultra-automation-services/products-installation-and-configuration-guides-list.html>
- Virtual Packet Core (including VPC-SI and VPC-DI): <https://www.cisco.com/c/en/us/support/wireless/virtual-packet-core/products-installation-and-configuration-guides-list.html>

Installation and Upgrade Notes

This Release Note does not contain general installation and upgrade instructions. Refer to the existing installation documentation for specific installation and upgrade considerations.

Ultra M Hyper-Converged Model Component Versions

HW	SW	6.0	6.1	6.2	6.3	6.4	6.5
	StarOS	21.6.0, Build 68695	21.7.0, Build 68897	21.8.0, Build 69296	21.9.0, Build 69977	21.10.0, Build 70597	21.11.0, Build 70741
	ESC	3.1.0.145	3.1.0.145	4.0.0.104	4.2.0.74	4.3.0.121	4.3.0.121
	RH Kernel	7.3	7.3	7.4	7.5	7.5	7.5
	OSP	10	10	10	10	10	10 or 13 NOTE: OpenStack Platform 13 with RHEL 7.5 is validated only for standalone AutoVNF- based deployments of the UGP VNF.

Installation and Upgrade Notes

UCS C240 M4S SFF (NFVI)	BIOS	3.0(3c)	3.0(3c)	3.0(4a)	3.0(4a)	3.0(4a)	3.0(4a)
	CIMC (BMC)	3.0(3e)	3.0(3e)	3.0(4a)	3.0(4d)	3.0(4d)	3.0(4d)
	MLOM	4.1(3a)	4.1(3a)	4.1(3a)	4.1(3f)	4.1(3f)	4.1(3f)
C2960XR-48TD-I (Management)	Boot Loader	15.2(3r)E1	15.2(3r)E1	15.2(3r)E1	15.2(3r)E1	15.2(3r)E1	15.2(3r)E1
	IOS	15.2.(2) E5	15.2.(2) E5	15.2.(2) E5	15.2.(2) E5	15.2.(2) E5	15.2.(2) E5
C3850-48T-S (Management)	Boot Loader	3.58	3.58	3.58	3.58	3.58	3.58
	IOS	03.06.06E	03.06.06E	03.06.06E	03.06.06E	03.06.06E	03.06.06E
Nexus 93180-YC-EX (Leafs)	BIOS	7.59	7.59	7.59	7.59	7.59	7.59
	NX-OS	7.0(3)I5(2)	7.0(3)I7(3)	7.0(3)I7(3)	7.0(3)I7(3)	7.0(3)I7(3)	7.0(3)I7(3)
Nexus 9236C (Spines)	BIOS	7.59	7.59	7.59	7.59	7.59	7.59
	NX-OS	7.0(3)I5(2)	7.0(3)I7(3)	7.0(3)I7(3)	7.0(3)I7(3)	7.0(3)I7(3)	7.0(3)I7(3)

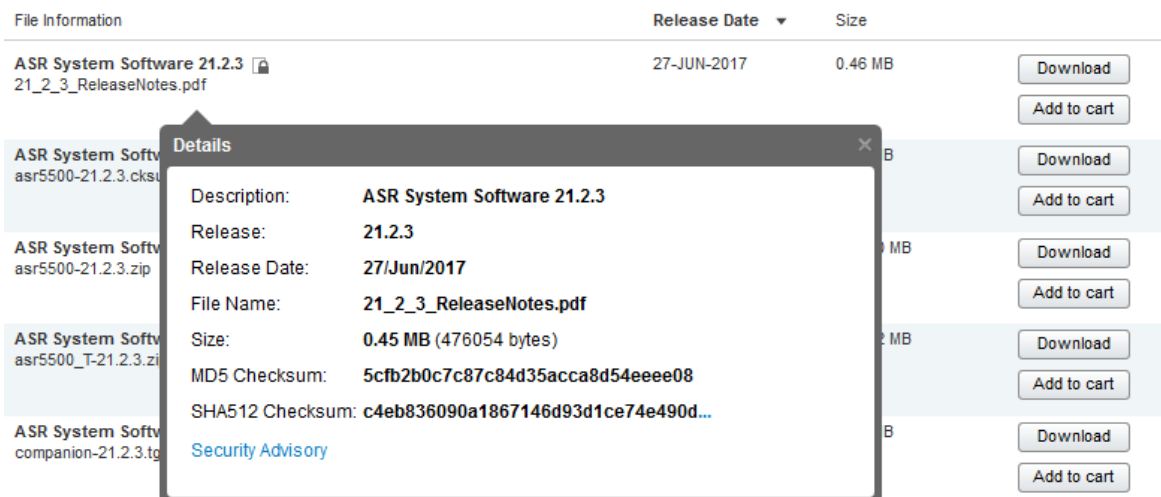
Firmware Updates

There are no firmware updates required for this release.

Software Integrity Verification

To verify the integrity of the software image you have from Cisco, you can validate the SHA512 checksum information against the checksum identified by Cisco for the software.

Image checksum information is available through **Cisco.com Software Download Details**. To find the checksum, hover the mouse pointer over the software image you have downloaded.



At the bottom you find the SHA512 checksum, if you do not see the whole checksum you can expand it by pressing the "... " at the end.

To validate the information, calculate a SHA512 checksum using the information in [Table 1](#) and verify that it matches either the one provided on the software download page.

To calculate a SHA512 checksum on your local desktop, see the following table.

Table 1 - Checksum Calculations per Operating System

Operating System	SHA512 checksum calculation command examples
Microsoft Windows	Open a command line window and type the following command <code>> certutil.exe -hashfile <filename>.<extension> SHA512</code>
Apple MAC	Open a terminal window and type the following command <code>\$ shasum -a 512 <filename>.<extension></code>
Linux	Open a terminal window and type the following command <code>\$ sha512sum <filename>.<extension></code> Or <code>\$ shasum -a 512 <filename>.<extension></code>
NOTES: <code><filename></code> is the name of the file. <code><extension></code> is the file extension (e.g. .zip or .tgz).	

If the SHA512 checksum matches, you can be sure that no one has tampered with the software image or the image has not been corrupted during download.

If the SHA512 checksum does not match, we advise you to not attempt upgrading any systems with the corrupted software image. Download the software again and verify the SHA512 checksum again. If there is a constant mismatch, please open a case with the Cisco Technical Assistance Center.

Certificate Validation

StarOS software images are signed via x509 certificates. USP ISO images are signed with a GPG key. Please view the .README file packaged with the software for information and instructions on how to validate the certificates.

NOTE: Image signing is not currently supported for VPC-SI and/or VPC-DI software packages.

Open Bugs in this Release

The following table lists known bugs that were found in, and remain open in this software release.

NOTE: This software release may contain open bugs first identified in other releases. Additional information for all open bugs for this release are available in the [Cisco Bug Search Tool](#).

Bug ID	Headline	Product Found*
CSCvk63958	[PLT-CUPS-ICUPS-VPP]Single user performance blocked due to VPP_MAIN is in over state	cups-up
CSCvn11848	[PLT-ICUPS] Config fails to load on an upgrade to ASR5500 drop4 21.11.M0.70588	pdn-gw
CSCvn12875	[PLT-ICUPS] VPP sockets error with "Connection refused";	pdn-gw
CSCvn28046	[BP-ICUPS]:streams stuck in passive state in case of 2g to lte and 3g to lte handover scenario	pdn-gw
CSCvn28544	[PLT-ICUPS] Post MIO switchover most CLI commands are not working. SSD not generated.	sae-gw
CSCvn28897	[PLT-ICUPS] ADC plugin upgrade failure 21.11.M0.70654	sae-gw
CSCvm82008	[BP-ICUPS]:HTTP volume based offload is not happening after PDN update	sae-gw
CSCvi12541	bfdlc facility instances in warn state on active and standby chassis	sae-gw
CSCvn31717	sessmgr restart on s4_smn_send_egtpc_pdn_local_purge	sgsn
CSCvn23275	[PLT-ICUPS] Both DPC2 rebooted upon planned migration	staros
CSCvn32499	[PLT-ICUPS] DPC2 busy out test case results in NO_RESOURCES even with 1 Active DPC2 available	staros
CSCvm98426	[PLT-ICUPS-VPP] Not able to send fragmented packet through VPP.	staros
CSCvn14127	[BP-ICUPS]vpp restart followed by sessmgr/npumgr crash with ~7K colocated calls w/ udp http traffic	staros
* Information in the "Product Found" column identifies the product in which the bug was initially identified.		

Resolved Bugs in this Release

The following table lists known bugs that are resolved in this specific software release.

NOTE: This software release may contain bug fixes first introduced in other releases. Additional information for all resolved bugs for this release are available in the [Cisco Bug Search Tool](#).

Bug ID	Headline	Product Found*
CSCvk05490	[PLT-CUPS-VPP]: [sessmgr 0 error] Timeout Processing: Time out, MSG ID: 8790, wheel Slot Id: 68	cups-up
CSCvm56058	[BP-ICUPS]: Streams created with state PASSIVE and packets pass through slow path.	cups-up
CSCvm56190	[BP-ICUPS]: packets sent through slow path after PDN-UPDATE.	cups-up

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Bug ID	Headline	Product Found*
CSCvm63590	[PLT-ICUPS-VPP]: Update to DCCA triggered 1 pkt later than expected.	pdn-gw
CSCvm79365	[BP-ICUPS]: Data over new dedicated bearer after gngp-collapsed HO sent through slow path.	pdn-gw
CSCvm81755	[BP-ICUPS]: Bandwidth Policy Flow Id change after Rulebase change is not getting applied	pdn-gw
CSCvm93977	Inconsistency between AAAAccServerUnreachable and AAAAccSvrUnreachable causing SNMP trap issues	pdn-gw
CSCvn16987	[BP-ICUPS]:Packets going through slow path after LTE to 3g handover.	pdn-gw
CSCvn13953	[BP-ICUPS-saegw]: ASR5500-flows are stuck in passive state	sae-gw
CSCvm84934	[PLT-CUPS-ICUPS]multiple sessmgr crashes on 21.10.M0.70425 sessmgr_sgw_gtpp_sess_acct_conf_cb()	sae-gw
CSCvm87477	[BP-ICUPS] clear sub qci does not work as expected	sae-gw
CSCvk36855	Sessmgr Restart at access_get_nw_to_ms_gmm_stats_type	sgsn
CSCvm99381	[BP-ICUPS-]sessmgr restart during overnight longevity run with 10 K calls and UDP data on TMO setup.	staros
CSCvi12895	FloatingIP assignment should be unique across VMs of VNFs	usp-uas
CSCvj85201	ultram-health uas report Authentication failed	usp-uas
CSCvn10787	Fault Management is not working for 3rd VNF	usp-uas
CSCvk60364	Deactivation failure due to timeout at AutoVNF	usp-uas
CSCvm91778	AutoVNF NETCONF trace has passwords in the clear	usp-uas
CSCvm98462	Stale ports left behind mapped to floating ips on activate failure	usp-uas
CSCvk56974	CUPS: Simultaneous undeployment for multiple vnfds leaves vnf in Stopping state.	usp-usf
CSCvm03898	VnfDiags not working correctly	usp-usf

* Information in the "Product Found" column identifies the product in which the bug was initially identified.

Operator Notes

StarOS Version Numbering System

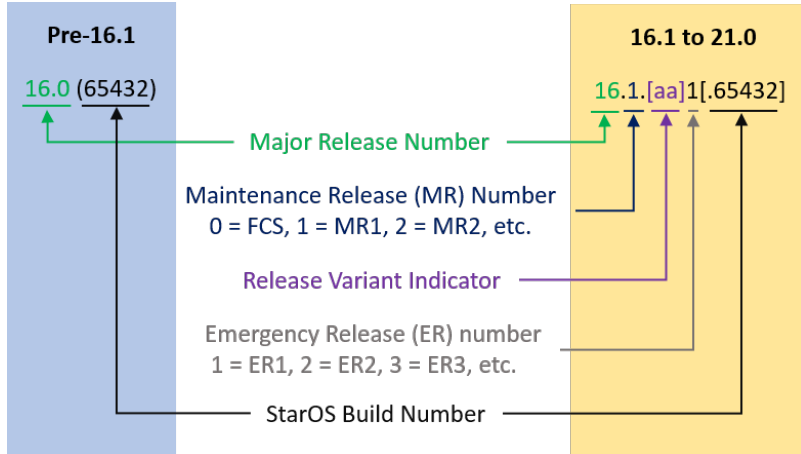
The output of the **show version** command displays detailed information about the version of StarOS currently running on the ASR 5x00 or Cisco Virtualized Packet Core platform.

Prior to release 16.1, the *Image Version* field displayed a branch of software including the build number, for example "16.0 (55435)". Subsequent releases of software for the major release differed only in build number. Lab Quality/EFT releases versus deployment releases also differed only in build number.

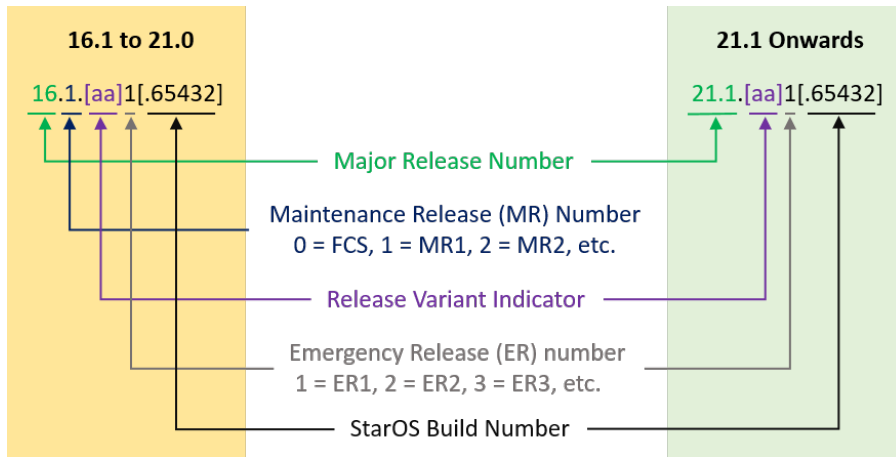
Operator Notes

From release 16.1 onwards, the output of the **show version** command, as well as the terminology used to describe the Build Version Number fields, has changed. Additionally, **show version** will display slightly different information depending on whether or not a build is suitable for deployment.

The Version Build Number for releases between 16.1 and 21.0 include a major, maintenance, and emergency release number, for example “16.1.2”.



The Version Build Number for releases 21.1 and later include a major and emergency release number, for example, “21.1.1”.



In either scenario, the appropriate version number field increments after a version has been released. The new version numbering format is a contiguous sequential number that represents incremental changes between releases. This format will facilitate identifying the changes between releases when using Bug Search Tool to research software releases.

Release Package Descriptions

[Table 2](#) lists provides descriptions for the packages that are available with this release.

Table 2 - Release Package Information

Package	Description
ASR 5500	
asr5500-<release>.bin	A zip file containing the signed ASR 5500 software image, the signature file, a verification script, the x509 certificate, and a README file containing information on how to use the script to validate the certificate.
asr5500_T-<release>.bin	A zip file containing the signed, trusted ASR 5500 software image, the signature file, a verification script, the x509 certificate, and a README file containing information on how to use the script to validate the certificate.
VPC-DI	
qvmc-di-<release>.bin	The VPC-DI binary software image which is used to replace a previously deployed image on the flash disk in existing installations.
qvmc-di_T-<release>.bin	The trusted VPC-DI binary software image which is used to replace a previously deployed image on the flash disk in existing installations.
qvmc-di-<release>.iso	The VPC-DI ISO used for new deployments a new virtual machine is manually created and configured to boot from a CD image.
qvmc-di_T-<release>.iso	The trusted VPC-DI ISO used for new deployments a new virtual machine is manually created and configured to boot from a CD image.
qvmc-di-template-vmware-<release>.tgz	The VPC-DI binary software image that is used to on-board the software directly into Vmware.
qvmc-di-template-vmware_T-<release>.tgz	The trusted VPC-DI binary software image that is used to on-board the software directly into Vmware.
qvmc-di-template-libvirt-kvm-<release>.tgz	This is an archive that includes the same VPC-DI ISO identified above, but additional installation files for using it on KVM.
qvmc-di-template-libvirt-kvm_T-<release>.tgz	This is an archive that includes the same trusted VPC-DI ISO identified above, but additional installation files for using it on KVM.
qvmc-di-<release>.qcow2.tgz	The VPC-DI binary software image in a format that can be loaded directly with KVM using an XML definition file, or with OpenStack.
qvmc-di_T-<release>.qcow2.tgz	The trusted VPC-DI binary software image in a format that can be loaded directly with KVM using an XML definition file, or with OpenStack.
VPC-SI	
qvmc-si-<release>.bin	The VPC-SI binary software image which is used to replace a previously deployed image on the flash disk in existing installations.

Operator Notes

Package	Description
qvpc-si_T- <release>.bin	The trusted VPC-SI binary software image which is used to replace a previously deployed image on the flash disk in existing installations.
qvpc-si-<release>.iso	The VPC-SI ISO used for new deployments a new virtual machine is manually created and configured to boot from a CD image.
qvpc-si_T- <release>.iso	The trusted VPC-SI ISO used for new deployments a new virtual machine is manually created and configured to boot from a CD image.
qvpc-si-template- vmware-<release>.ova	The VPC-SI binary software image that is used to on-board the software directly into Vmware.
qvpc-si-template- vmware_T- <release>.ova	The trusted VPC-SI binary software image that is used to on-board the software directly into Vmware.
qvpc-si-template- libvirt-kvm- <release>.tgz	This is an archive that includes the same VPC-SI ISO identified above, but additional installation files for using it on KVM.
qvpc-si-template- libvirt-kvm_T- <release>.tgz	This is an archive that includes the same trusted VPC-SI ISO identified above, but additional installation files for using it on KVM.
qvpc-si-<release>. qcow2.gz	The VPC-SI binary software image in a format that can be loaded directly with KVM using an XML definition file, or with OpenStack.
qvpc-si_T-<release>. qcow2.gz	The trusted VPC-SI binary software image in a format that can be loaded directly with KVM using an XML definition file, or with OpenStack.
StarOS Companion Package	
companion- <release>.tgz	An archive containing numerous files pertaining to this version of the StarOS including SNMP MIBs, RADIUS dictionaries, ORBEM clients. These files pertain to both trusted and non-trusted build variants.
Ultra Service Platform	
usp-<version>.iso	The USP software package containing component RPMs (bundles). Refer to Table 3 for descriptions of the specific bundles.
usp_T-<version>.iso	The USP software package containing component RPMs (bundles). This bundle contains trusted images. Refer to Table 3 for descriptions of the specific bundles.
usp_rpm_verify_utils- <version>.tar	This package contains information and utilities for verifying USP RPM integrity.

Table 3 - USP ISO Bundles

USP Bundle Name	Description
usp-em-bundle- <version>- 1.x86_64.rpm*	The Element Manager (EM) Bundle RPM containing images and metadata for the Ultra Element Manager (UEM) module.
usp-ugp-bundle- <version>- 1.x86_64.rpm*	The Ultra Gateway Platform (UGP) Bundle RPM containing images for Ultra Packet core (VPC-DI). There are trusted and non-trusted image variants of this bundle.
usp-yang-bundle- <version>- 1.x86_64.rpm	The Yang Bundle RPM containing YANG data models including the VNFD and VNFR.
usp-uas-bundle- <version>- 1.x86_64.rpm	The Ultra Automation Services Bundle RPM containing AutoVNF, Ultra Web Services (UWS), and other automation packages.
usp-auto-it-bundle- <version>- 1.x86_64.rpm	The bundle containing the AutoIT packages required to deploy the UAS.
usp-vnfm-bundle- <version>- 1.x86_64.rpm	The VNFM Bundle RPM containing an image and a boot-up script for ESC (Elastic Service Controller).
ultram-manager- <version>- 1.x86_64.rpm	This package contains the script and relevant files needed to deploy the Ultra M Manager Service.
* These bundles are also distributed separately from the ISO.	

Obtaining Documentation and Submitting a Service Request

For information on obtaining documentation, using the Cisco Bug Search Tool (BST), submitting a service request, and gathering additional information, see *What's New in Cisco Product Documentation*, at: <http://www.cisco.com/c/en/us/td/docs/general/whatsnew/whatsnew.html>.

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