Release Notes for StarOS™ Software Version 21.27.4

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Introduction

This Release Note identifies changes and issues related to this software release. This planned maintenance release is based on release 21.27.3. These release notes are applicable to the ASR5500, VPC-SI ,VPC-DI platforms and RCM platform.

Release Package Version Information

Table 1 - Release Package Version Information

Software Packages	Version
StarOS packages	21.27.4, build 86426

Feature and Behavior Changes

For information on feature and behavior changes associated with this release, refer to the *CUPS Release Change Reference*, and the corresponding *StarOS Release Change Reference*.

Related Documentation

For the complete list of CUPS documentation available for this release, go to https://www.cisco.com/c/en/us/support/wireless/virtual-packet-core/products-installation-and-configuration-guides-list.html.

For the complete list of the corresponding StarOS documentation, go to https://www.cisco.com/c/en/us/support/wireless/asr-5000-series/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.

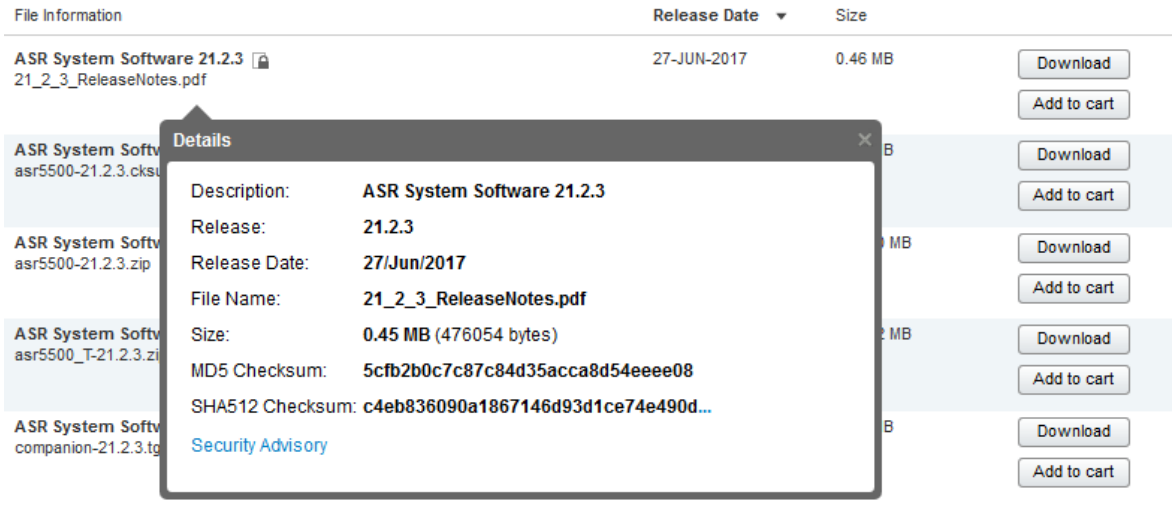
Firmware Updates

There are no firmware upgrades 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 2 and verify that it matches either the one provided on the software download page.

To calculate a SHA512 checksum on your local desktop see Table 2.

Table 2 - Checksum Calculations per Operating System

Operating System	SHA512 checksum calculation command examples
Microsoft Windows	Open a command line window and type the following command > certutil.exe -hashfile *<filename>.<extension>* SHA512
Apple MAC	Open a terminal window and type the following command $ shasum -a 512 *<filename>.<extension>*

Linux	Open a terminal window and type the following command
	
	$ sha512sum *<filename>.<extension>*
	
	Or
	
	$ shasum -a 512 *<filename>.<extension>*

NOTES: *<filename>* is the name of the file. *<extension>* 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

In 21.12.0 and later releases, software images for StarOS, VPC-DI, and VPC-SI, and the companion software packages for StarOS and VPC are signed via x509 certificates. In pre-21.12.0 releases, image signing is not supported for VPC-DI and VPC-SI images, and for StarOS and VPC companion software packages.

USP ISO images are signed with a GPG key.

For more information and instructions on how to validate the certificates, refer to the README file available with the respective software packages.

Open Bugs in this Release

The following table lists the 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.

Table 3 - Open Bugs in this Release

Bug ID	Headline	Product Found*
CSCwc29508	[BP-CUPS][sessmgr 12341 error][essmgr_uplane.c:36574][SXAB] UE IP Address is different in Traffic	cups-up
CSCwa83375	[BP-CUPS] Observed sessmgr restart : snx_sgw_driver_handle_modify_rsp on CP in Longevity setup	cups-cp
CSCvz92617	[BP-CUPS]:Huge number of error logs observed acsmgr_populate_chrg_info_from_urr failure	cups-cp
CSCvz03179	[BP-CUPS] Assertion failure @ func sessmgr_uplane_check_calls_on_rulebases	cups-up
CSCwb47036	Unexpected SX_SESSION_REPORT_REQUEST while running tc related to TEACAT_CSCvy16459	cups-up
CSCwa79744	BP-ICUPS : CUSP Feature not working in 21.27.x builds	pdn-gw
CSCwa75121	[UPF-VoN7] UPF doesn't trigger Sx Session Report for Volume Threshold breach intermittently	upf
* 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 the 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.

Table 4 - Resolved Bugs in this Release

Bug ID	Headline	Product Found*
CSCwb45094	SX_ASSOCIATION_SETUP_REQUEST is rejected by CP after Demux SF unavailability	cups-cp
CSCwb53858	ACSMGR 91432 Error	cups-cp
CSCwb57352	[CUPS] Sx-Modify containing Usage-Report failed. Cause=64 OffendingIE Type=131	cups-cp
CSCwb65661	[CUPS] Fatal signal 6 - sgwdrv_process_egtpc_change_notification_ind	cups-cp
CSCwb69920	FHT is disappeared after removing diameter host-select table from ims-auth-service config	cups-cp
CSCwb87081	[CUPS-CP] Discrepancy between Gy and Gz reporting when “exclude-packet-causing-trigger” configured	cups-cp
CSCwb94772	session manager restart due to forwarding epsb request	cups-cp
CSCwb94932	Sessmgr task restart on egtpc_release_pdn_conn_rec()	cups-cp
CSCwb95670	[CUPS] Uplane received invalid far id in PDU	cups-cp
CSCwc00858	CP is not sending CCR-U during QHT expiry	cups-cp
CSCwc12794	[BP-CUPS] Observed sessmgr restart : snx_sgw_driver_handle_modify_rsp on CP in Longevity setup	cups-cp
CSCwc15578	[CUPS CP] Sx Mod for Li Dup FAR missing when using GGSN Service and Selective LI Encryption	cups-cp
CSCwc18836	[CUPS-CP] CP losing VoGx URR 0x8000000a after ICSR switchover.	cups-cp
CSCwc19603	Lower log level for “sessmgr 12241 error”	cups-cp
CSCwc20916	[CUPS CP] Assertion Failure @ sn_slist_lookup_by_key()	cups-cp
CSCwc21399	[BP-CUPS][sx 221332error][<sessmgr:23>sx_db.c:1238]Tunnel_record local seid and Packet seid does not	cups-cp
CSCwc28234	CUPS - ./sess/aaamgr/aaamgr_api_new_acct.c:282	cups-cp
CSCwc30297	"after initial chunk assinment to UPs, more chunks are assigned to UPs unexpectedly"	cups-cp
CSCwc39963	[Smoke2-Legacy] S8HR Intercepted calls not established after bbiff_trigger	cups-cp
CSCwc20048	Data browsing issue faced after CSFB	cups-cp
CSCwc18750	ARP Request have wrong Sender IP set to network address instead of interface address	cups-up
CSCwa85071	sessmgr restart while parsing uplane http header	cups-up
CSCwb17799	Pure-S call is not terminated by UP busy-out inactive-timeout option if configure APN-Profile.	cups-up
CSCwb22363	CUPS UP stuck ICMP NAT port chunks during TOPUP(rulebase change) 21.23.19	cups-up
CSCwb23704	QCI-QOS Mapping Table Copy-Outer Option for Pure-S Calls	cups-up
CSCwb34949	[CUPS UP]: sessmgr restart seen in uplane_populate_nbr_field_edr_charging_id()	cups-up
CSCwb54746	Sessmgr restarted on UP at uplane_check_modify_copy_orig_ip_packet()	cups-up
CSCwb65384	pre-allocated calls becomes 0 in standby UP after user plane service restart	cups-up

Bug ID	Headline	Product Found*
CSCwb93743	CUPS UP sesmgr restarted at specific time after timedef added on CP	cups-up
CSCwc07806	[CUPS-UP] SRP standby SessMgr memory leak	cups-up
CSCwc07936	CUPS “pending-traffic-treatment quota-exhausted pass” is not working after back to back pfd push	cups-up
CSCwc25704	[CUPS-UP] Some UP does not activate VPP correctly after upgrade or reload	cups-up
CSCwc26563	[CUPS-UP] standby SessMgr memory leak at sessmgr_uplane_allocate_dupl_param	cups-up
CSCwc30341	[CUPS UP] quota-exhausted pass is not applied if UP sessmgr has other session with other cc group	cups-up
CSCvz74194	Frequent task restart in vEPDG after upgrade for function tacacs_common_event_timeout_handler()	epdg
CSCwc08120	Incorrect Message Level [ipsec 55609 critical] [4/0/10468 <ipsecmgr:284> ipsecmgr_msg.c:1449]	epdg
CSCwb99104	Multiple Sessmgr are in warn state due high memory usage by “epdg_allocate_uli_storage_in_sess” fun	epdg
CSCwb88450	Assertion failure at ../ipm/ipm/ipm_sad.c:	epdg
CSCwb53675	[MME] release-due-to-pre-emption (39) S1AP radio network cause not implemented	mme
CSCwa92047	MME: Authentication info to UE not sent during TAU when decor enabled.	mme
CSCwb90376	MMEs is generating 00 values on the bulkstat for one of the VLRs	mme
CSCwb51664	Need associating SMSC Service from specific context support under MME Service.	mme
CSCwb83204	APN+TAC basic CLI for IMSI clearance.	mme
CSCwc17331	LI encoding issue on HI2 IRI with location of target.	pdn-gw
CSCwb71744	Assume Positive (AP) files not generated when AP properly goes into effect due to any CCA-I failure	pdn-gw
CSCwb38857	Release 21.26 removes (link-profile max-rate) config under (traffic-optimization-policy)	pdn-gw
CSCwc46023	CLI for Gy failure is not working for all offline cases	pdn-gw
CSCwa52782	Node reloaded after LAG group port reconfiguration	pdn-gw
CSCwc35815	acsmge error DNS snooping: unexpectedly p_hentry is NULL	sae-gw
CSCwb65556	Observing sessmgr crash:: sessmgr_get_num_mnc_digits	samog
CSCwb26816	vPC-DI: show card hardware <> does not show cpbond0 details	staros
CSCwc40876	NPU Utilization unevenness after MIO switchover and sessmgr restarts	staros
CSCwb79049	Handover :Frozen sessions seen in SGSN after 2g-4g handover	sgsn
CSCwc42261	SGW is rejecting the attach even it is emergency apn/subscriber.	sgw
CSCwb35998	[UPF-SVI] :sessmgr restarted at sessmgr_uplane_set_teid_pdr_binding_info()	upf

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

Operator Notes

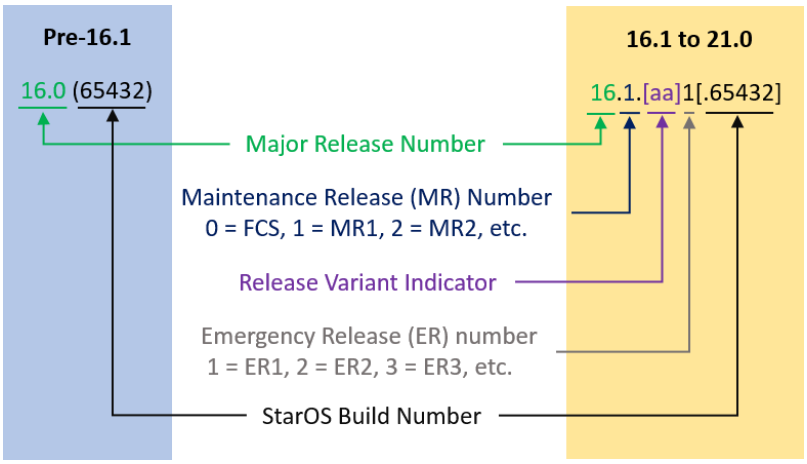
StarOS Version Numbering System

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.

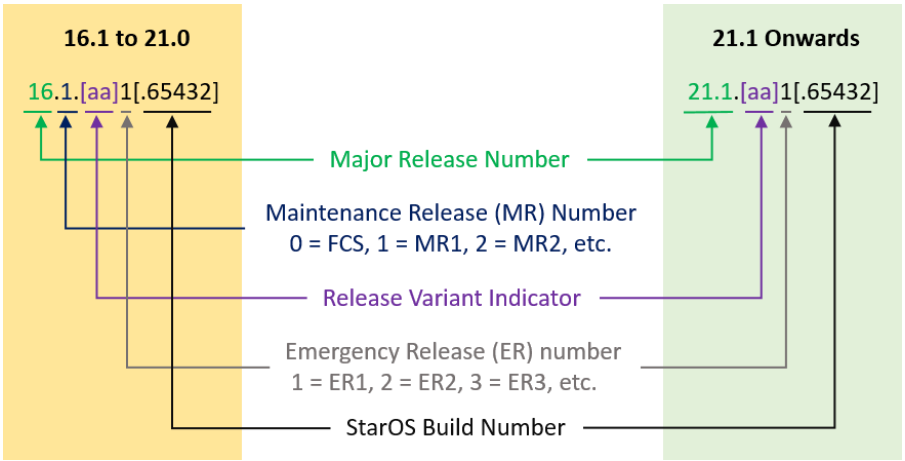
Prior to release 16.1, the *Image Version* field displayed a branch of software including the build number, for example "16.0 (55435)". Subsequent releases of software for the major release differed only in build number. Lab Quality/EFT releases versus deployme nt releases also differed only in build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

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 identifyi ng the changes between releases when using Bug Search Tool to research software releases.

Release Package Descriptions

Table 5 provides descriptions for the packages that are available with this release.

Table 5 - Release Package Information

In 21.12.0 and later Releases	In pre-21.12.0 Releases	Description
ASR 5500		
asr5500-<release>.zip	asr5500-<release>.bin	Contains 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>.zip	asr5500_T-<release>.bin	Contains 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.
StarOS Companion Package		
companion-<release>.zip	companion-<release>.tgz	Contains 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. In 21.12.0 and later releases, the StarOS companion package also includes 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		
qvpc-di-<release>.bin.zip	qvpc-di-<release>.bin	Contains the VPC-DI binary software image that is used to replace a previously deployed image on the flash disk in existing installations. In 21.12.0 and later releases, this package also includes 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.
qvpc-di_T-<release>.bin.zip	qvpc-di_T-<release>.bin	Contains the trusted VPC-DI binary software image that is used to replace a previously deployed image on the flash disk in existing installations. In 21.12.0 and later releases, this package also includes 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.
qvpc-di-<release>.iso.zip	qvpc-di-<release>.iso	Contains the VPC-DI ISO used for new deployments, a new virtual machine is manually created and configured to boot from a CD image. In 21.12.0 and later releases, this package also includes 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.
qvpc-di_T-<release>.iso.zip	qvpc-di_T-<release>.iso	Contains the trusted VPC-DI ISO used for new deployments, a new virtual machine is manually created and configured to boot from a CD image. In 21.12.0 and later releases, this package also includes 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.

In 21.12.0 and later Releases	In pre-21.12.0 Releases	Description
qvpc-di-template-vmware-<release>.zip	qvpc-di-template-vmware-<release>.tgz	Contains the VPC-DI binary software image that is used to on-board the software directly into VMware. In 21.12.0 and later releases, this package also includes 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.
qvpc-di-template-vmware_T-<release>.zip	qvpc-di-template-vmware_T-<release>.tgz	Contains the trusted VPC-DI binary software image that is used to on-board the software directly into VMware. In 21.12.0 and later releases, this package also includes 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.
qvpc-di-template-libvirt-kvm-<release>.zip	qvpc-di-template-libvirt-kvm-<release>.tgz	Contains the same VPC-DI ISO identified above and additional installation files for using it on KVM. In 21.12.0 and later releases, this package also includes 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.
qvpc-di-template-libvirt-kvm_T-<release>.zip	qvpc-di-template-libvirt-kvm_T-<release>.tgz	Contains the same trusted VPC-DI ISO identified above and additional installation files for using it on KVM. In 21.12.0 and later releases, this package also includes 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.
qvpc-di-<release>.qcow2.zip	qvpc-di-<release>.qcow2.tgz	Contains the VPC-DI binary software image in a format that can be loaded directly with KVM using an XML definition file, or with OpenStack. In 21.12.0 and later releases, this package also includes 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.
qvpc-di_T-<release>.qcow2.zip	qvpc-di_T-<release>.qcow2.tgz	Contains 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. In 21.12.0 and later releases, this package also includes 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-SI		
qvpc-si-<release>.bin.zip	qvpc-si-<release>.bin	Contains the VPC-SI binary software image that is used to replace a previously deployed image on the flash disk in existing installations. In 21.12.0 and later releases, this package also includes 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.
qvpc-si_T-<release>.bin.zip	qvpc-si_T-<release>.bin	Contains the trusted VPC-SI binary software image that is used to replace a previously deployed image on the flash disk in existing installations. In 21.12.0 and later releases, this package also includes 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.

In 21.12.0 and later Releases	In pre-21.12.0 Releases	Description
qvpc-si-<release>.iso.zip	qvpc-si-<release>.iso	Contains the VPC-SI ISO used for new deployments, a new virtual machine is manually created and configured to boot from a CD image. In 21.12.0 and later releases, this package also includes 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.
qvpc-si_T-<release>.iso.zip	qvpc-si_T-<release>.iso	Contains the trusted VPC-SI ISO used for new deployments a new virtual machine is manually created and configured to boot from a CD image. In 21.12.0 and later releases, this package also includes 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.
qvpc-si-template-vmware-<release>.zip	qvpc-si-template-vmware-<release>.ova	Contains the VPC-SI binary software image that is used to on-board the software directly into VMware. In 21.12.0 and later releases, this package also includes 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.
qvpc-si-template-vmware_T-<release>.zip	qvpc-si-template-vmware_T-<release>.ova	Contains the trusted VPC-SI binary software image that is used to on-board the software directly into VMware. In 21.12.0 and later releases, this package also includes 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.
qvpc-si-template-libvirt-kvm-<release>.zip	qvpc-si-template-libvirt-kvm-<release>.tgz	Contains the same VPC-SI ISO identified above and additional installation files for using it on KVM. In 21.12.0 and later releases, this package also includes 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.
qvpc-si-template-libvirt-kvm_T-<release>.zip	qvpc-si-template-libvirt-kvm_T-<release>.tgz	Contains the same trusted VPC-SI ISO identified above and additional installation files for using it on KVM. In 21.12.0 and later releases, this package also includes 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.
qvpc-si-<release>.qcow2.zip	qvpc-si-<release>.qcow2.gz	Contains the VPC-SI binary software image in a format that can be loaded directly with KVM using an XML definition file, or with OpenStack. In 21.12.0 and later releases, this package also includes 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.
qvpc-si_T-<release>.qcow2.zip	qvpc-si_T-<release>.qcow2.gz	Contains 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. In 21.12.0 and later releases, this package also includes 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.

In 21.12.0 and later Releases	In pre-21.12.0 Releases	Description
VPC Companion Package		
companion-vpc-<release>.zip	companion-vpc-<release>.tgz	Contains numerous files pertaining to this version of the VPC including SNMP MIBs, RADIUS dictionaries, ORBEM clients. These files pertain to both VPC-DI and VPC-SI, and for trusted and non-trusted build variants. In 21.12.0 and later releases, the VPC companion package also includes 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.
Ultra Service Platform		
usp-<version>.iso		The USP software package containing component RPMs (bundles). Refer to Table 6 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 6 for descriptions of the specific bundles.
usp_rpm_verify_utils-<version>.tar		Contains information and utilities for verifying USP RPM integrity.

Table 6 - 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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