Release Notes for StarOS™ Software Version 21.12.9 and Ultra Service Platform Version N6.6.3

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Introduction

This Release Note identifies changes and issues related to this software release. This emergency release is based on StarOS release 21.12.8 and USP release N6.6.2. These release notes are applicable to the ASR5500, VPC-SI and VPC-DI platforms.

Release Package Version Information

Table 1 - Release Package Version Information

Software Packages	Version
StarOS packages	21.12.9 build 72306
Ultra Service Platform ISO	6_6_3, Epoch 9293
usp-em-bundle*	6.6.0, Epoch 5879
usp-ugp-bundle*	21.12.9, build 72306, Epoch 7148
usp-yang-bundle	1.0.0, Epoch 5784
usp-uas-bundle	6.6.0, Epoch 7070
usp-auto-it-bundle	5.8.0, Epoch 5996
usp-vnfm-bundle	4.4.0.88, Epoch 5785
USP RPM Verification Utilities	6.6.3
* These bundles are also distributed separately from the ISO.	

Descriptions for the various packages provided with this release are located in Table 3.

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 UltraM 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 Version Information

Table 2 - Ultra M Hyper-Converged Model Component Version Information

HW	SW	6.1	6.2	6.3	6.4	6.5	6.6
	StarOS	68897	69296	69977	70597	70741	71244
	ESC	3.1.0.145	4.0.0.104	4.2.0.74	4.3.0.121	4.3.0.121	4.4.0.88
	RH Kernel	7.3	7.4	7.5	7.5	7.5	7.5
	OSP	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.	10 or 13 **NOTE**: OpenStack Platform 13 with RHEL 7.5 is validated only for standalone AutoVNF-based deployments of the UGP VNF.
UCS C240 M4S SFF (NFVI)	BIOS	3.0(3c)	3.0(4a)	3.0(4a)	3.0(4a)	3.0(4a)	3.0(4a)
	CIMC (BMC)	3.0(3e)	3.0(4a)	3.0(4d)	3.0(4d)	3.0(4d)	3.0(4d)
	MLOM	4.1 (3a)	4.1 (3a)	4.1 (3f)	4.1 (3f)	4.1 (3f)	4.1 (3f)

HW	SW	6.1	6.2	6.3	6.4	6.5	6.6
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)I7(3)	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)I7(3)	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)

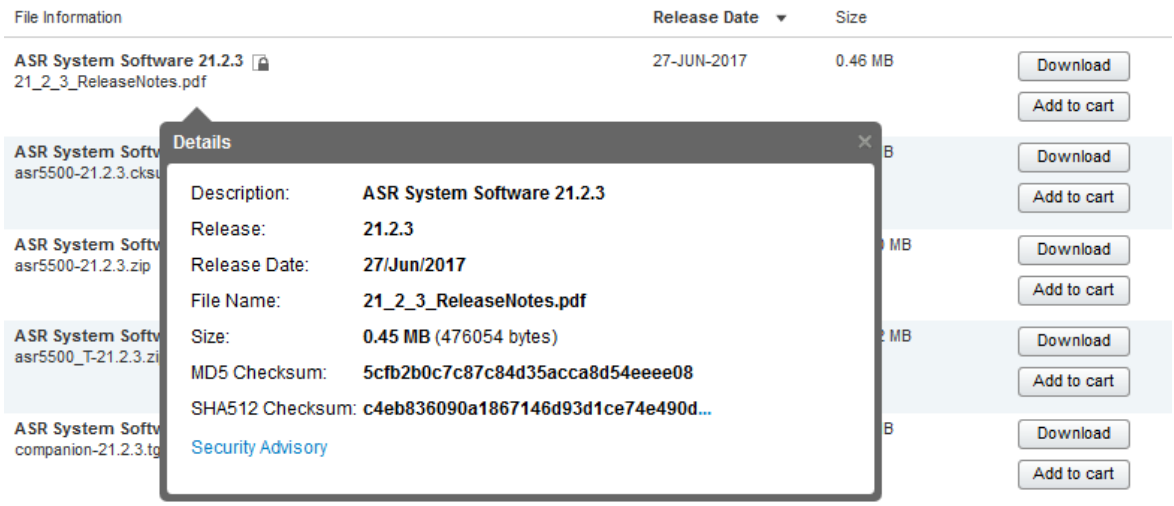
Firmware Updates

There are no firmware 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 3 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 3.

Table 3 - 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 4 - Open Bugs in this Release

Bug ID	Headline	Product Found*
CSCvm83524	[BP-CUPS] Assert failure at egtpc_handle_user_sap_event()	cups-cp
CSCvn80152	[BP-CUPS] Observing new IE Interface: SXa wrongly sent in PFCP Heartbeat Request/Response	cups-cp
CSCvo13488	[BP-CUPS] Sessctrl in 'Over' state with 10k calls	cups-up
CSCvn60293	flow-add-failed count is increased while make and break call is running	cups-up
CSCvn75110	[BP-CUPS] High memory utilization by sessmgr - probable memory leak	cups-up
CSCvo01375	[CUPS] VPP restart observed with stack libvlib.so.0/unix_cli_file_welcome_timer()	cups-up
CSCvo07207	[BP-CUPS] sessctrl restart in UP	cups-up
CSCvn46872	[BP-CUPS] UP gets stuck when disassociated and associated with new CP with different ECS config	cups-up
CSCvo48775	MME: MEC - Inter-MME S1 HO trigger unexpected detach	mme
CSCvo55100	clear mme-service statistics not clearing Dual Connectivity with NR Subscribers stats	mme
CSCvo15422	mmemgr task restart due to a segmentation in S1ap	mme
CSCvp76784	"MME does not take into account NOTE 5 of 3GPP 24.008, Table 10.5.5.32 Extended DRX parameters"	mme
CSCvo85261	[BP-ICUPS]:sessmgr restart observed at acsmgr_fp_handle_stream_state_change()	pdn-gw
CSCvn55676	[BP-CUPS]:Uplink Stream remain in Config state after Flow status change	pdn-gw
CSCvo20908	[PLT-ICUPS-VPP]:VPP Main in memory over state	pdn-gw
CSCvo31100	[BP-ICUPS]X3 table entries absent post DMX migration	pdn-gw
CSCvo32237	[BP-ICUPS]: some UDP streams going to passive post ICSR switchover	pdn-gw
CSCvp05331	[BP-ICUPS] PGWCDR is not generated with dynamic DDL config	pdn-gw
CSCvn75072	[BP:ICUPS]:Sessmgr restart@fapi_tp_process_incoming_local_row_req on DPC2 card reboot.	pdn-gw
CSCvo30174	[BP-ICUPS]Unable to get over 4.3 Gbps on HSLI without fifo Q full on threads	pdn-gw
CSCvo37441	wrong firewall Ruledef stats shown in 'show active-charging ruledef statistics all firewall wide'.	pdn-gw
CSCvo49917	[BP-ICUPS] sessctrl in Over state on 21.12.0.71244 EFT	sae-gw
CSCvo32889	"[BP-ICUPS]:sessmgr 0 error fastpath_stream_add(): Stream [Ver: 0, locus: 2, client_id: 8, stats_tabl"	sae-gw
CSCvo36105	[BP-ICUPS]: acsmgr 91369 error Error: Client-Server API: Add conneciton request to Dhost failed	sae-gw

Bug ID	Headline	Product Found*
CSCvo45264	[BP-ICUPS]: Data is not proper for 5G UE of ipv6 pdntype	sae-gw
CSCvo82068	[BP-ICUPS]: 4G sub with NAT44 fragmented traffic NOT getting charged to Dynamic rule	sae-gw
CSCvi12541	bfdlc facility instances in warn state on active and standby chassis	sae-gw
CSCvo31408	saegw-service stats not updating for CSRsp denied due to license exceeded	sae-gw
CSCvo47301	[BP-ICUPS]Quota_Exhaust not triggered for pipelined request packet	sae-gw
CSCvp10744	[BP-ICUPS] SGW CDR shows double value in dataVolumeGPRSDownlink for buffered data after Re-establish	sgw
CSCvn79019	[BP-ICUPS] Streams are not getting recovered after Planned DPC2 Migration with 5g calls	staros
CSCvo04967	StarOS cannot assign multiple IPv6 address for diameter peer	staros
CSCvo20944	[BP-ICUPS]: starOS CLI commands are NOT getting logged into configured syslog	staros
CSCvp47435	ipv4 reassembly timeout - vpp restart	staros
CSCvn81354	EM triggers the deployment of 1 CF only - intermittent and occurances started Dec 14	usp-uas
CSCvo84219	multi-vnfd generation fails when using different pools of same net	usp-uas
CSCvo95462	Same virtual_router_id for all UEM deployments	usp-uas
CSCvo08737	ETSI MANO: EM does not handle service start and service stop	usp-usf
CSCvo20436	Descriptor version and version fields is displayed as unknown	usp-usf
* 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 5 - Resolved Bugs in this Release

Bug ID	Headline	Product Found*
CSCvp69273	Voice call is dropped when MME cancels SRVCC after receiving Delete Bearer request for QCI1	mme
CSCvk58720	Handover rejected (S10 HO) - After congestion is cleared	mme
CSCvm53127	unidirectional VLR association	mme
CSCvn96853	Imsimgr Restart at xdr_evlog_trap_mme_new_conn_info_t	mme

Bug ID	Headline	Product Found*
CSCvp32860	SM restarts due to Segmentation fault at egtpc_get_ebi_info_from_pdu during S1 HO in 21.11.Ax	mme
CSCvp55960	5G UE Radio capability change update not occuring	mme
CSCvn62920	LTE - Wifi - LTE HO fails when ULA does not include MIP6-Agent-Info	mme
CSCvo13661	cc overwrite apn remap is case sensitive	mme
CSCvo33689	inter-rat-nnsf mme-codes parameter missing after reload	mme
CSCvo57948	Very inbalanced sessmgr distribution after enabling sgsn-mme subscriber-data-optimization	mme
CSCvp83866	CCR-U after SRP switchover doesn't contain Destination-Host AVP even when session is bound to OCS	pdn-gw
CSCvp35767	SRP connection fluctuations and continuous restart of Orbs task	pdn-gw
CSCvq00562	[VPC-DI] Demux IPv6 TCP large packet handling broken.	pdn-gw
CSCvp32975	PCC provisioned dynamic rule not enforced when FAPA/TRM activated	pdn-gw
CSCvp63862	PGW keeps on sending Gy CCR-T in a loop to OCS during LTE to WIFI Handover	pdn-gw
CSCvp83881	PGW CDR is missing byte count in uplink direction during big file transfer due to low Gy quotas	pdn-gw
CSCvp91000	SM fail due to Fatal Signal on s4_smn_handle_srns_new_sgsn_abort_mbr	sgsn
CSCvq03750	MSK/ULTRAM/MAG-MME-4 Sessmgr restarts while processing delete sub session	sgsn
CSCvj51716	Task restart on modify bearer request	sgsn
CSCvj89699	sessmgr Assertion failure in pmm_ms_fsm_invalid_event_handler	sgsn
CSCvk05536	SM fail due to Assertion failure on egtpc_handle_update_bearer_rsp_evt	sgsn
CSCvm74886	bulkstat process restart at PC: [0480526e/X] mgmt_sctrl_add_sgsn_gmm_sm_stats()	sgsn
CSCvm93457	Assertion failure in Function: egtpc_handle_create_sess_rsp_msg	sgsn
CSCvn78512	Session manager restarted Fatal Signal 6: Aborted	sgsn
CSCvo04661	sessmgr restart- Assertion failure	sgsn
CSCvo55588	Session Manager assert during S4 SRNS	sgsn
CSCvo60264	sessmgr: DATACORRUPTION-AVERTED: Attempt to strncat 3 bytes limited to 10 bytes	sgsn
CSCvo64397	Invalid Event NTWK-MODIFY-REQUEST from SM-APP in NTWK-REMOTE-HANDOFF-IN-PROGRESS-IN-INACTIVE state	sgsn
CSCvo65976	Rcvd Invalid Event NTWK-INTRA-SGSN-HANDOFF-REQUEST from SM-APP in NTWK-INTER-SGSN-RAU-BEGIN state	sgsn

Bug ID	Headline	Product Found*
CSCvo94363	Headers needs to be updated for the new fields added as part of EDR Enhancement	sgsn
CSCvo83261	sessmgr assertion: Rcvd Invalid Event NTWK-HANDOFF-CANCEL from SM-APP in NTWK-SUSPENDED state	sgsn
CSCvp47158	Assertion failure at function egtpc_abort_active_proc_on_brec_v2	sgsn
CSCvp21372	Lawful-Intercept commands and their args are not segregated properly	staros
CSCvo35624	new unexpected diamproxy instance spawned	staros
CSCvo70530	SAEGW-VPC-DI- Sw Version 21.12.0 - MTU higher than Default value not working correctly	staros
* Information in the "Product Found" column identifies the product in which the bug was initially identified.		

Operator Notes

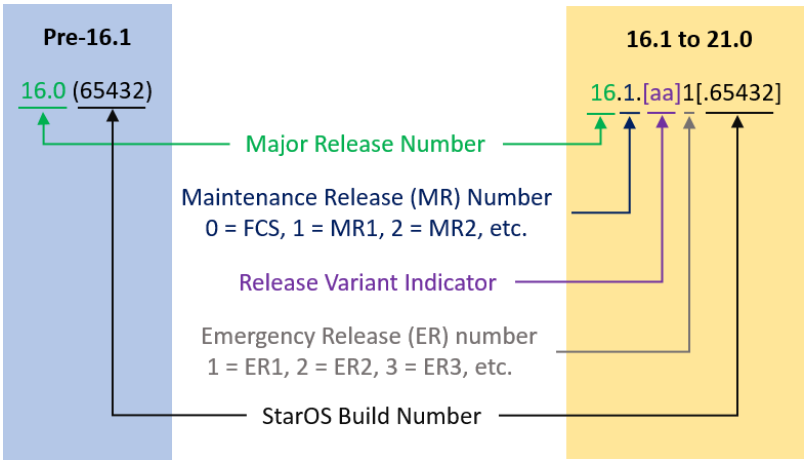
StarOS Version Numbering System

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.

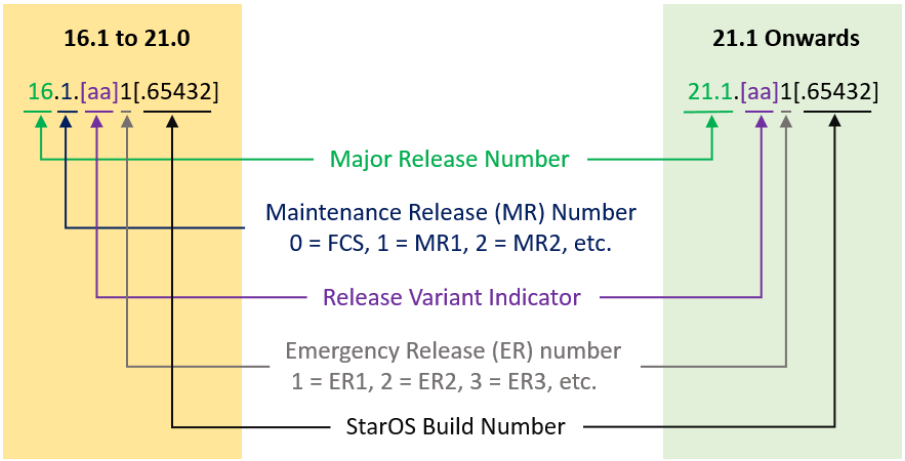
Prior to release 16.1, the *Image Version* field displayed a branch of software including the build number, for example "16.0 (55435)". Subsequent releases of software for the major release differed only in build number. Lab Quality/EFT releases versus deployment releases also differed only in build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

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

Table 6 - 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		

In 21.12.0 and later Releases	In pre-21.12.0 Releases	Description
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.
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.

In 21.12.0 and later Releases	In pre-21.12.0 Releases	Description
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.

In 21.12.0 and later Releases	In pre-21.12.0 Releases	Description
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.
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 7 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 7 for descriptions of the specific bundles.
usp_rpm_verify_utils-<version>.tar		Contains information and utilities for verifying USP RPM integrity.

Table 7 - 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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