



Release Notes for StarOS™ Software Version 21.24.4

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Introduction

This Release Note identifies changes and issues related to this software release. This emergency release is based on release 21.24.3. 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 | 21.24.4, build 89584 |

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.

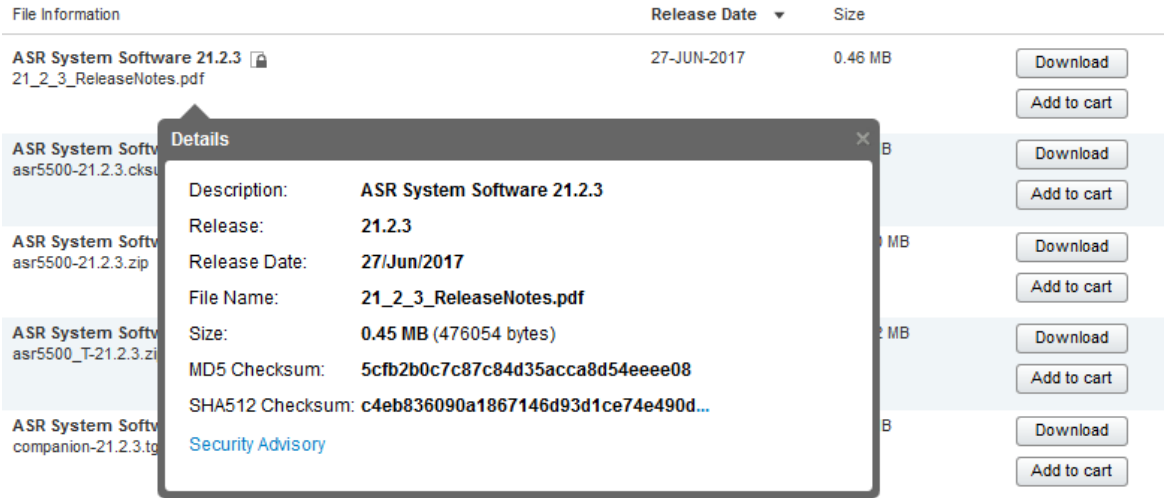
Firmware Updates

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 <pre>> certutil.exe -hashfile <filename>.<extension> SHA512</pre> |
| Apple MAC | Open a terminal window and type the following command <pre>\$ shasum -a 512 <filename>.<extension></pre> |
| Linux | Open a terminal window and type the following command <pre>\$ sha512sum <filename>.<extension></pre> <p>Or</p> <pre>\$ shasum -a 512 <filename>.<extension></pre> |
| NOTES: | |
| <i><filename></i> is the name of the file. | |
| <i><extension></i> is the file extension (e.g. .zip or .tgz). | |

Open Bugs in this Release

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* |
|------------|--|----------------|
| CSCvz44140 | [BP-CPUS] mostly all aaamgr goes in warn state while running call model | cups-cp |
| CSCwa32380 | Crash seen on CP while executing UE initiated dedicated bearer scenario | cups-cp |
| CSCvy87185 | [CUPS] CP is not creating PDR for predefined rules when PCRF not returning any BCM | cups-cp |
| CSCvy06009 | [BP-CUPS] crash acsmgr_vogx_fill_and_associate_urrs_for_existing_pdrs observed in Longevity run | cups-cp |
| CSCvy95443 | Memory leak observed upon session reconnection radius off / on" ; resiliency tes | cups-cp |
| CSCvz49026 | [BP-CUPS] sessmgr restart @ sn_memblock_memcache_alloc() | cups-up |
| CSCvy67623 | [BP-CUPS] gtpu disconnects reported as remote-disconnect at UP | cups-up |
| CSCwa72377 | Multiple crashes with UP reboot | cups-up |
| CSCvy57500 | [BP-PCT] Incorrect bytes and pkts seen for http analyzer stats. | cups-up |
| CSCvz41620 | Assertion failure at sess/sctrl/sessctrl_uplane_cfg_sync | cups-up |
| CSCvz74194 | Frequent task restart in vEPDG after upgrade for function tacacs_common_event_timeout_handler() | epdg |
| CSCwb42809 | Nat call object list length going wrong when Insertion failed on NAT call obj list | pdn-gw |
| CSCvz68424 | 21.25:DNS Resolver statistics -overall attempts count is NOT matching with sum of success + failures | pdn-gw |

Resolved Bugs in this Release

| Bug ID | Headline | Product Found* |
|---|--|----------------|
| CSCwa54994 | BP-ICUPS: sm reload at sn_memblock_cache_block_flush.part.1() | pdn-gw |
| CSCwb66185 | Document: Removal of Step2 under the Generating SSH Client Key Pair | pdn-gw |
| CSCvy79548 | bfdmgr does not send keepalive - Intermittent | rcm |
| CSCwa64779 | RCM HA failing after controller restart | rcm |
| CSCvy53051 | New CLI to manually set AVP cisco-mpc-protocol-interface | samog |
| CSCvz94977 | Maximum number of NTP servers | staros |
| CSCwa37867 | GRE Tunnel with KA not coming up after Card Migration | staros |
| CSCvx98820 | [CUPS-TACACS-IPsec] TCP connection failure with second tacacs server during failover | staros |
| CSCvy77792 | vpnmgr restart seen @ sn_slist_lookup_by_key() | 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 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* |
|------------|---|----------------|
| CSCwa92055 | Session is established on busy-out UP under UP re-selection algorithm. | cups-cp |
| CSCwc39963 | [Smoke2-Legacy] S8HR Intercepted calls not established after bbiff_trigger | cups-cp |
| CSCwa19731 | UP in busyout state get sessions assigned | cups-cp |
| CSCwc20916 | [CUPS CP] Assertion Failure @ sn_slist_lookup_by_key() | cups-cp |
| CSCwa75114 | Cache not cleared when association of all UPs | cups-cp |
| CSCwa79275 | CUPS CP Sending GoR name in absence of Ruledef in Rulebase and no Ruledef installed for subscriber. | cups-up |
| CSCwb25436 | [CUPS UP] sm restart at uplane_update_packet_stats_chunk() | cups-up |
| CSCwb65384 | pre-allocated calls becomes 0 in standby UP after user plane service restart | cups-up |
| CSCwc26563 | [CUPS-UP] standby SessMgr memory leak at sessmgr_uplane_allocate_dupl_param | cups-up |
| CSCwb27606 | [CUPS-UP]Crash at sx_tun_fsm_handle_sess_mod_rsp_evt | cups-up |
| CSCvx13009 | "In CUPS nodes IMS subs facing one way audio , intermittently" | cups-up |
| CSCvz92880 | vpp thread/memif mapping issue after (double) sessmgr restart | cups-up |

Operator Notes

| Bug ID | Headline | Product Found* |
|---|---|----------------|
| CSCvz97499 | Sessmgr stuck in SERVER mode | cups-up |
| CSCwa77273 | wrong detection for whatsapp traffic | cups-up |
| CSCwb71454 | RCM Scripts apply_config.sh and apply_config_v2.sh permissions changed. | rcm |
| CSCwc53741 | Checkpointed information lost after checkpointmgr pod restart | rcm |
| CSCwa81196 | Externally exposed HTTP ports on RCM | rcm |
| CSCwb42558 | Upgrade Spring Framework to version 5.2.20 | rcm |
| CSCwb61900 | SSH is sometimes not accessible after RCM VM boot | rcm |
| CSCwa79949 | [soltest]: M6 UPF Sessmgr instances stuck in SERVER Mode after SWO | rcm |
| CSCwa05016 | [CUPS-UP] :SessMgr restart during SRP checkpointing with RCM. | rcm |
| CSCwb19420 | [PLT-RCM] RCM apply_config script giving errors | rcm |
| CSCwd89468 | Cisco StarOS Software Key-based SSH Authentication Privilege Escalation Vulnerability | staros |
| CSCvz28910 | Supporting 25G link speed in staros linux kernel code for drivers(i40evf) | staros |
| CSCwa92472 | Packet drop at sessmgr after atomic frag header removal | upf |
| * Information in the "Product Found" column identifies the product in which the bug was initially identified. | | |

Operator Notes

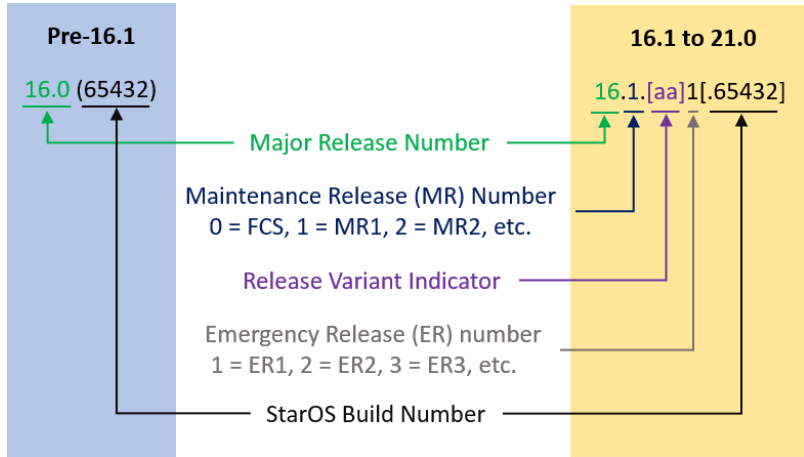
StarOS Version Numbering System

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.

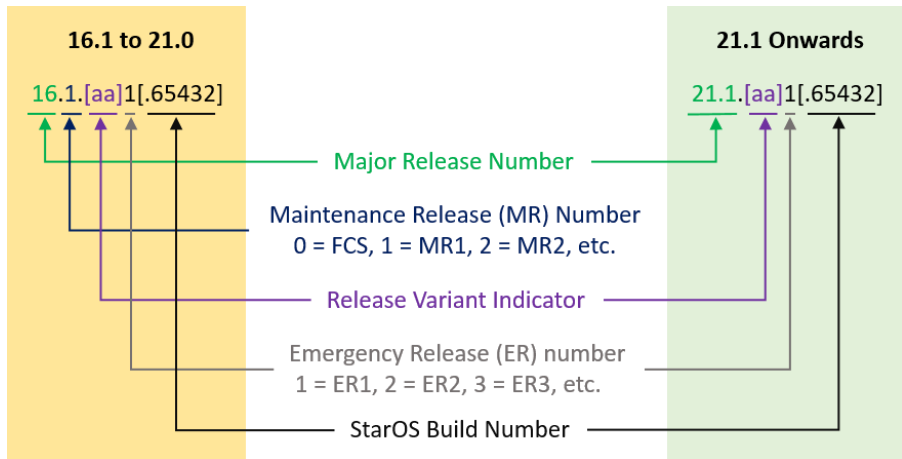
Prior to release 16.1, the *Image Version* field displayed a branch of software including the build number, for example "16.0 (55435)". Subsequent releases of software for the major release differed only in build number. Lab Quality/EFT releases versus deployment releases also differed only in build 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 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 | <p>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.</p> <p>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.</p> |
| VPC-DI | | |
| qvm-di-<release>.bin.zip | qvm-di-<release>.bin | <p>Contains the VPC-DI binary software image that is used to replace a previously deployed image on the flash disk in existing installations.</p> <p>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.</p> |
| qvm-di_T-<release>.bin.zip | qvm-di_T-<release>.bin | <p>Contains the trusted VPC-DI binary software image that is used to replace a previously deployed image on the flash disk in existing installations.</p> <p>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.</p> |
| qvm-di-<release>.iso.zip | qvm-di-<release>.iso | <p>Contains the VPC-DI ISO used for new deployments, a new virtual machine is manually created and configured to boot from a CD image.</p> <p>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.</p> |
| qvm-di_T-<release>.iso.zip | qvm-di_T-<release>.iso | <p>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.</p> <p>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.</p> |

| In 21.12.0 and later Releases | In pre-21.12.0 Releases | Description |
|--|--|---|
| qvmc-di-template-vmware-<release>.zip | qvmc-di-template-vmware-<release>.tgz | <p>Contains the VPC-DI binary software image that is used to on-board the software directly into VMware.</p> <p>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.</p> |
| qvmc-di-template-vmware_T-<release>.zip | qvmc-di-template-vmware_T-<release>.tgz | <p>Contains the trusted VPC-DI binary software image that is used to on-board the software directly into VMware.</p> <p>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.</p> |
| qvmc-di-template-libvirt-kvm-<release>.zip | qvmc-di-template-libvirt-kvm-<release>.tgz | <p>Contains the same VPC-DI ISO identified above and additional installation files for using it on KVM.</p> <p>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.</p> |
| qvmc-di-template-libvirt-kvm_T-<release>.zip | qvmc-di-template-libvirt-kvm_T-<release>.tgz | <p>Contains the same trusted VPC-DI ISO identified above and additional installation files for using it on KVM.</p> <p>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.</p> |
| qvmc-di-<release>.qcow2.zip | qvmc-di-<release>.qcow2.tgz | <p>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.</p> <p>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.</p> |
| qvmc-di_T-<release>.qcow2.zip | qvmc-di_T-<release>.qcow2.tgz | <p>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.</p> <p>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.</p> |
| VPC-SI | | |
| qvmc-si-<release>.bin.zip | qvmc-si-<release>.bin | <p>Contains the VPC-SI binary software image that is used to replace a previously deployed image on the flash disk in existing installations.</p> <p>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.</p> |

Operator Notes

| In 21.12.0 and later Releases | In pre-21.12.0 Releases | Description |
|--|--|--|
| qvmc-si_T-<release>.bin.zip | qvmc-si_T-<release>.bin | <p>Contains the trusted VPC-SI binary software image that is used to replace a previously deployed image on the flash disk in existing installations.</p> <p>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.</p> |
| qvmc-si-<release>.iso.zip | qvmc-si-<release>.iso | <p>Contains the VPC-SI ISO used for new deployments, a new virtual machine is manually created and configured to boot from a CD image.</p> <p>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.</p> |
| qvmc-si_T-<release>.iso.zip | qvmc-si_T-<release>.iso | <p>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.</p> <p>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.</p> |
| qvmc-si-template-vmware-<release>.zip | qvmc-si-template-vmware-<release>.ova | <p>Contains the VPC-SI binary software image that is used to on-board the software directly into VMware.</p> <p>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.</p> |
| qvmc-si-template-vmware_T-<release>.zip | qvmc-si-template-vmware_T-<release>.ova | <p>Contains the trusted VPC-SI binary software image that is used to on-board the software directly into VMware.</p> <p>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.</p> |
| qvmc-si-template-libvirt-kvm-<release>.zip | qvmc-si-template-libvirt-kvm-<release>.tgz | <p>Contains the same VPC-SI ISO identified above and additional installation files for using it on KVM.</p> <p>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.</p> |
| qvmc-si-template-libvirt-kvm_T-<release>.zip | qvmc-si-template-libvirt-kvm_T-<release>.tgz | <p>Contains the same trusted VPC-SI ISO identified above and additional installation files for using it on KVM.</p> <p>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.</p> |
| qvmc-si-<release>.qcow2.zip | qvmc-si-<release>.qcow2.gz | <p>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.</p> <p>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.</p> |

| In 21.12.0 and later Releases | In pre-21.12.0 Releases | Description |
|------------------------------------|----------------------------------|---|
| qypc-si_T- <release>.qcow2.zip | qypc-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 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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