# Release Notes for StarOS™ Software Version 21.23.yn12

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## Introduction

This Release Note identifies changes and issues related to this software release. These Release Notes identify changes and issues based on 21.23.n11

## Release Package Version Information

**Table 1 - Release Package Version Information**

| Software Packages | Version |
|---|---|
| StarOS packages | 21.23.yn12, build 87336 |

Descriptions for the various packages provided with this release are located in Release Package Descriptions.

## Feature and Behavior Changes

Please contact the Account team for the documentation related to 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 http://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 installation and upgrade instructions. Refer to the existing installation documentation for specific installation and upgrade considerations.

## Firmware Updates

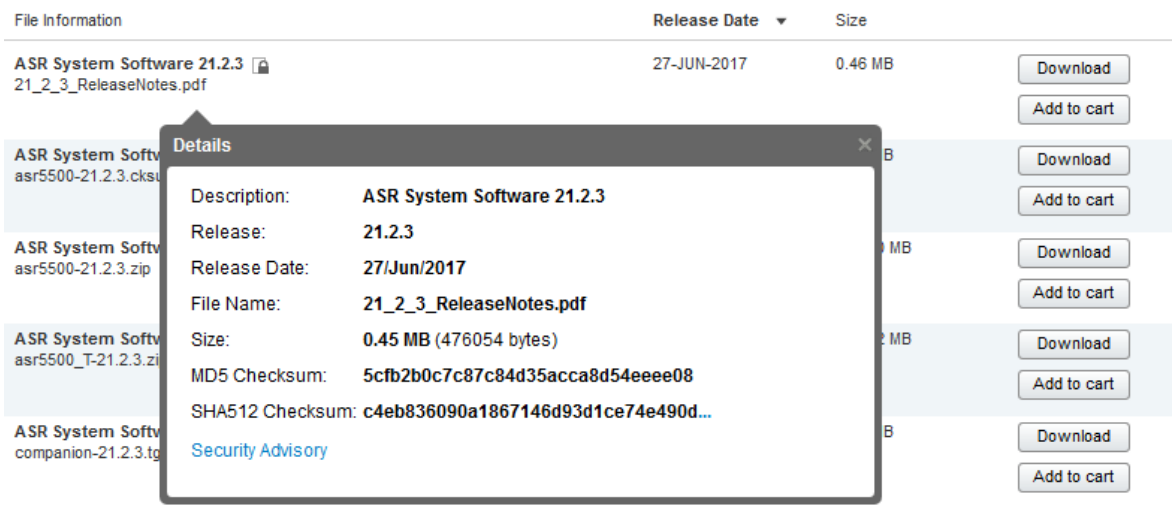
There are no firmware upgrades required for this release.

# 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 the following mechanisms:

- **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.

- **.cksums file:** A file containing software image checksum information is distributed with the image files. The naming convention for this file is:

  `<product>-<version>.cksums`

  Example: `asr5500-21.4.0.cksums`

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 please see the table below.

**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<br><br>> certutil.exe -hashfile *<filename>.<extension>* SHA512 |
| Apple MAC | Open a terminal window and type the following command<br><br>$ shasum -a 512 *<filename>.<extension>* |

| Operating System | SHA512 checksum calculation command examples |
|---|---|
| Linux | Open a terminal window and type the following command<br><br>$ sha512sum *<filename>.<extension>*<br><br>Or<br><br>$ shasum -a 512 *<filename>.<extension>* |
| **NOTES:**<br><br>*<filename>* is the name of the file.<br><br>*<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/or that 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 BYT call model | cups-cp |
| CSCvz46195 | sessmgr restart seein in Function: sessmgr_pgw_handle_pcc_intf_evt_modify_rsp() | cups-cp |
| CSCvv13409 | [BP-CUPS]URR node not found at CP for URR-id: 0x82 received in Usage Report | cups-cp |
| CSCvz92617 | [BP-CUPS]:Huge number of error logs observed acsmgr_populate_chrg_info_from_urr failure | cups-cp |
| CSCwc00980 | [CUPS-CP] Task restart at acs_bb_req_cache_alloc() | cups-cp |
| CSCwb26190 | session manager crash at sess/smgr/sessmgr_snx.c | cups-cp |
| CSCwd28140 | QER update for AMBR not received by UP from CP | cups-cp |

| Bug ID | Headline | Product Found* |
|---|---|---|
| CSCwa83375 | [BP-CUPS] Observed sessmgr restart : snx_sgw_driver_handle_modify_rsp on CP in Longevity setup | cups-cp |
| CSCvx73208 | [BP-CUPS] SessMgr restart at acs_cups_fill_bucket_id_type() while recovering null variable | cups-cp |
| CSCwc34314 | [CUPS UP] Firewall NAT port release behaviour change between legacy and CUPS | cups-cp |
| CSCwc88588 | CUPS-CP - After quota holding timer expiry, CP doesn't invoke Gy | cups-cp |
| CSCwc97995 | [CUPS CP ]: WIFI to LTE handoff failure due to EBI mixing with dedicated bearer | cups-cp |
| CSCvy80968 | [BP-CUPS]:[N-1][N-2]Downgraded new standBy UP leads to all call loss once performed UP switchover | cups-up |
| CSCvz41620 | Assertion failure at sess/sctrl/sessctrl_uplane_cfg_sync | cups-up |
| CSCwa46923 | CUPS UP sessmgr restart at uplane_decode_tcp_shallow | cups-up |
| CSCwc55681 | CUPS CP Usage Report Failure. Received URR : 0x80000xxx not requested | cups-up |
| CSCwc63061 | sessmgr restart during egtp signalling procedure | cups-up |
| CSCwc17339 | show ssd npu-vpn in UP leaves cli session in unusable state | cups-up |
| CSCwb07879 | LCI/OCI changes CUPS-UP | cups-up |
| CSCwb52197 | "[CUPS UP] VPP/hatsystem restart clib_memcpy_fast() during IP routes consolidation in BGP, " | cups-up |
| CSCwb78943 | [CUPS] Fatal signal 11 - sess_get_next_pdr_info() - smgr_match_pdr | cups-up |
| CSCwc54584 | [CUPS][npumgr-drv 185001 error vpp_tcp_conn_bind_cb_v6_v4: VPP-LI: Fail to add socket with dhost | cups-up |
| CSCwd16366 | LI IPSec tunnel flaps intermittently due to SA Collision | epdg |
| CSCwc69907 | ePDG sessmgr crash on Assertion failure at sess/egtp/egtpc/egtpc_evt_handler_func.c:7048 | epdg |
| CSCvy33441 | sessmgr restart is seen in Function: mme_x2_ho_process_path_sw_req_msg() | mme |
| CSCwb53675 | [MME] release-due-to-pre-emption (39) S1AP radio network cause not implemented | mme |
| CSCwa36635 | MME crashes after upgrade to v21.23.6_21_mme_fsm_event_handler() | mme |
| CSCwa51122 | sessmgr restart seen in Function: egtpc_handle_delete_bearer_rsp_evt() | mme |
| CSCwc83863 | Assertion failure at sess/mme/mme-app/app/mme_app_util.c:18558 | mme |
| CSCwd15146 | Additional logging to find reason for S6a notify req with wrong realm | mme |
| CSCwc80299 | "CBC , MME send Write Replace Warning Indication before Write Replace Warning Response" | mme |
| CSCwa31319 | sessmgr restart mme_app_fill_delete_sess_req() | mme |
| CSCwc65963 | sessmgr restart is seen when configuring and unconfiguring Lawful intercept CLIs multiple times | mme |
| CSCwa93249 | MME sessmgr restart seen in Function: mme_app_egtpc_abort_low_priority_trans() | mme |
| CSCvz90152 | SessMgr restart during X2 Handover | mme |
| CSCwb58470 | Clear subscriber not working with service still running | mme |

| Bug ID | Headline | Product Found* |
|---|---|---|
| CSCwa55894 | sessmgr restart at egtpc_handle_abort_suspended_proc_cmd_evt | mme |
| CSCvy67528 | [MME Admin guide] Typo in SRVCC config | mme |
| CSCvz97127 | Session manager restart due to an Resource temporarily unavailable on __kernel_vsyscall() | mme |
| CSCwc43059 | sessmgr restart at mme_hss_get_user_data | mme |
| CSCwc66208 | Assertion failure at sess/egtp/egtpc/egtpc_validate_evt.c:1907 | mme |
| CSCwa92153 | Corruption in vpnmgr when large amount of data gets dumped | mme |
| CSCwc51275 | Assertion failure at snutil/sn_memblock.c:310 on vMME | mme |
| CSCwc59471 | sessmgr in warn/over state due to mme_app_allocate_s1nas_msg and SN_cmAlloc() | mme |
| CSCvz36326 | qci arp-priority-level not updated in config | pdn-gw |
| CSCwa52583 | ICUPS : Session Manager restarts on PGW | pdn-gw |
| CSCwa59860 | Sessmgr crashes after p2p plugin update v2.67.1490 | pdn-gw |
| CSCwc26728 | Final cdr with wrong timeOfFirst/LastUsage when “egcdr final-record include-content-ids all” | pdn-gw |
| CSCvx61024 | sessmgr restart observed at “sn_ext_process_packet” | pdn-gw |
| CSCwa52782 | Node reloaded after LAG group port reconfiguration | pdn-gw |
| CSCwc53423 | Sessmgr task restart on sess/egtp/egtpc/egtpc_evt_handler_func | pdn-gw |
| CSCwb06949 | sessmgr restart on sessmgr_clp_filter function | pdn-gw |
| CSCwd32146 | ?Update Bearer Request? is send PGW->SGW without EPS Bearer QoS, which is not aligned with 3GPP | pdn-gw |
| CSCwa36871 | ADC detection degraded for Youtube | pdn-gw |
| CSCwa39302 | sessmgr crashes sessmgr_rf_fill_service() Assertion failure at sess/smgr/sessmgr_rf.c | pdn-gw |
| CSCwb81718 | CCR-U/CCR-T for Non-WPS session going through WPS channel | pdn-gw |
| CSCwa50873 | Many session disconnect reasons are not documented | pdn-gw |
| CSCwb23785 | Corrupted values of total/output octets displayed in CDR for Ga interface | pdn-gw |
| CSCwb42809 | Nat call object list length going wrong when Insertion failed on NAT call obj list | pdn-gw |
| CSCwb34009 | Fatal Signal 11 in acsmgr_destroy_recorded_adc_flows_list() | pdn-gw |
| CSCwa69995 | "Duplicated CLI logs with 'user unknown' when CLI is level debug, and grep is being used" | pdn-gw |
| CSCvy05622 | Missing documenation on RCM - host-id | rcm |
| CSCwa49484 | RCM workaround for unreliable alert-forwarder | rcm |
| CSCwb12055 | CLI to prevent multiple config push notifications towards NSO | rcm |
| CSCvy86141 | Add timeout for NSOSim HTTP POST notification [BEMS01305755] | rcm |
| CSCvz70919 | RCM OVF deployment for 21.25.x image is not succeeding | rcm |

| Bug ID | Headline | Product Found* |
|---|---|---|
| CSCwa58920 | sessmgr process restarted at egtpc_handle_user_sap_event | sae-gw |
| CSCwa99907 | sessmgr process restarted at acsmgr_dcca_send_ccr_terminate() | sae-gw |
| CSCwb58018 | Description of IDFT-support in sgw-service configuration document missing | sae-gw |
| CSCwd17939 | "In sGWRecord, changeTime appearing as before time from recordOpeningTime and duration showing zero" | sae-gw |
| CSCvy78942 | With WPS3B configuration GW use secondary PAS during mid-session | sae-gw |
| CSCwa23914 | sessmgr restart due Fatal Sig PC: [09fd165b/X] acsmgr_sess_sr_uchkpt_delete_all_accnt_mscc_bucket() | sae-gw |
| CSCwb58656 | sessmgr restart due to Assertion failure at sess/smgr/sessmgr_hlcom.c:467 | sae-gw |
| CSCwa54898 | Sessmgr restart - Fatal Signal 6: PC: [09ed1233/X] acsmgr_adc_dispatch_event() | sae-gw |
| CSCwb55423 | [VPC-DI] Sessmgr process restart at sessmgr_pgw_fill_event_record_csr | sae-gw |
| CSCvy09744 | [CP-SGSN] sessmgr restart seen with function egtpc_handle_del_bearer_cmd_req_evt | sgsn |
| CSCvz16012 | GMPC event not triggering with reporting action for 3g Detach | sgsn |
| CSCwc42261 | SGW is rejecting the attach even it is emergency apn/subscriber. | sgw |
| CSCwc95110 | [RCM-VM]: Nessus scan vulnerabilities on RCM-VM build 21.23.27 (20220825-090648Z) | smi |
| CSCvw48686 | k8s-ss-mismatch | smi |
| CSCwd36804 | [CP-MME] Observed multiple vpnmgr taskcore generation with TCP DNS | staros |
| CSCvz94977 | Maximum number of NTP servers | staros |
| CSCwa37867 | GRE Tunnel with KA  not coming up after Card Migration | staros |
| CSCwb41992 | MACs algorithm configuration does not operate as expected | staros |
| CSCwd07968 | aaamgr going to warn/over state again and again | staros |
| CSCvy44932 | DPC2 card may be marked offline following DDF2 FPGA reporting an error | staros |
| CSCwa40585 | Vpnmgr restart @ vpnmgr_check_addr_conflict() | staros |
| CSCwc69905 | Active/active LAG traffic unbalanced after NPUMGR recovery #02 | staros |
| CSCwd36796 | [CP-MME] vpnmgr going to warn/over with TCP DNS | staros |
| CSCwb90690 | Doc for “show subscribers summary apn 'apn-name' connected-time .... “ to be added | staros |
| CSCwb21297 | Sx TX HB Request count not increasing on CNDP DATA UPFs | 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* |
|---|---|---|
| CSCwc66274 | [CUPS-CP] "Requested-Service-Unit" AVP missing after receiving CCRI with 0 GSU and Redirection | cups-cp |
| CSCwc28234 | CUPS - ./sess/aaamgr/aaamgr_api_new_acct.c:282 | cups-cp |
| CSCwc87274 | CUPS,VPP restart in vlan_ip4_qos_mark_node_fn_avx2 | cups-cp |
| CSCwc50029 | CUPS-CP sessmgr_sgw_handle_delete_req() | cups-cp |
| CSCwc84548 | [CPUS-CP] [ICSR] SRP Standby CP sending Sx Session Delete Request which is not expected | cups-cp |
| CSCwd33488 | [CUPS UP] Large sx messages retransmission from CP if ipsec is used in Sx | cups-up |
| CSCwc44211 | CUPS UP - Upgrade from 21.23.n9 to 21.23.n10 observed higher RTT/delay between S1U/SGi | cups-up |
| CSCwc76586 | IPv6 src IP corruption for UDP LI in CUPS | cups-up |
| CSCwc44036 | EDR printing wrong end time | cups-up |
| CSCwc36141 | MME SON Procedure not working for X2 Configuration Transfer | mme |
| CSCwb38857 | Release 21.26 removes (link-profile max-rate) config under (traffic-optimization-policy) | pdn-gw |
| * Information in the "Product Found" column identifies the product in which the bug was initially identified. | | |

# Operator Notes

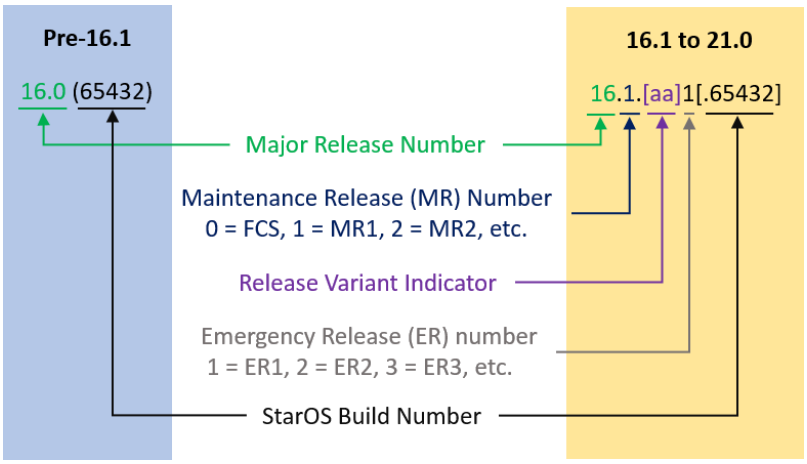
## StarOS Version Numbering System

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.

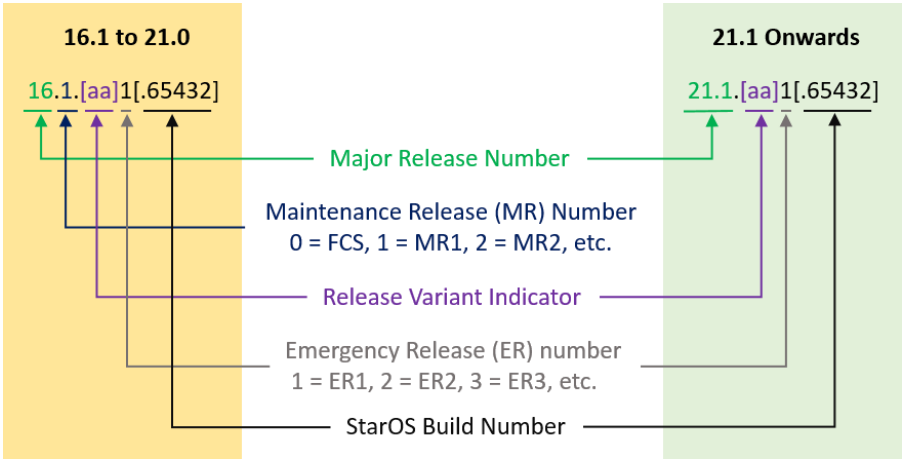
Prior to release 16.1, the *Image Version* field displayed a branch of software including the build number, for example "16.0 (55435)". Subsequent releases of software for the major release differed only in build number. Lab Quality/EFT releases versus deployment releases also differed only in build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

| In 21.12.0 and later Releases | In pre-21.12.0 Releases | Description |
|---|---|---|
| **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.<br><br>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.<br><br>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.<br><br>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.<br><br>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.<br><br>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.<br><br>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.<br><br>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.<br><br>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.<br><br>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.<br><br>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.<br><br>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.<br><br>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.<br><br>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>.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.<br><br>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_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.<br><br>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.<br><br>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.<br><br>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.<br><br>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.<br><br>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.<br><br>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.<br><br>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** | | |

| In 21.12.0 and later Releases | In pre-21.12.0 Releases | Description |
|---|---|---|
| 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.<br><br>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. |

# 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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