



# UCC 5G UPF Release Notes, Release 2024.04.0

First Published: 2024-10-28

## Ultra Cloud Core User Plane Function

### Introduction

This Release Notes identifies changes and issues related to this software release.

### Release Lifecycle Milestones

Release Lifecycle Milestone	Milestone	Date
First Customer Ship	FCS	30-Oct-2024
End of Life	EoL	30-Oct-2024
End of Software Maintenance	EoSM	30-Apr-2026
End of Vulnerability and Security Support	EoVSS	30-Apr-2026
Last Date of Support	LDoS	30-Apr-2027

These milestones and the intervals between them are defined in the [Cisco Ultra Cloud Core \(UCC\) Software Release Lifecycle Product Bulletin](#) available on [cisco.com](#).

### Release Package Version Information

Software Packages	Version
companion-vpc-2024.04.0.zip.SPA.tar.gz	2024.04.0 (21.28.m30.95656)
qvpc-si-2024.04.0.bin.SPA.tar.gz	2024.04.0 (21.28.m30.95656)
qvpc-si-2024.04.0.qcow2.zip.SPA.tar.gz	2024.04.0 (21.28.m30.95656)
NED package	ncs-6.1.12-cisco-staros-5.53.1
NSO	6.1.12

Use this [link](#) to download the NED package associated with the software.

Descriptions for the various packages provided with this release are available in the [Release Package Descriptions, on page 10](#) section.

## Verified Compatibility

Products	Version
ADC Plugin	2.74.3.2488
RCM	2024.04.0
Ultra Cloud Core SMI	2024.04.1.14
Ultra Cloud Core SMF	2024.04.0

## What's New in this Release

### Features and Enhancements

This section covers a brief description of the features and enhancements introduced in this release. It also includes links to detailed documentation, where available.

Feature	Description
Enhanced IoT Call Model Support on UCS M7 Server	The UCS 220 M7 server now supports the same IoT call model for sessions as the UCS M6 server, ensuring seamless 7M session support with UPF.
<a href="#">IPv6 Prefix Delegation Support to the requesting UE or CPE</a>	<p>UPF supports IPv6 Prefix Delegation to the requesting User Equipment (UE) or Customer Premises Equipment (CPE).</p> <p>This feature ensures efficient and dynamic allocation of IPv6 prefixes, facilitating seamless connectivity and address management for devices within the network.</p> <p>This feature requires a valid license. Contact your Cisco account representative for more information.</p> <p><b>Command Introduced:</b> The existing CLI <b>ipv6 address alloc-method no-dynamic allow-prefix-delegation pd-alloc-method no-dynamic</b> in the APN Configuration mode must be configured to enable this feature. Additionally, DHCP service should also be associated to the APN configuration.</p> <p><b>Default Setting:</b> Disabled – Configuration Required to Enable</p>
<a href="#">Power Management using VRCC</a>	<p>The Variable Relinquishing of CPU Cycles (VRCC) feature in 5G UPF introduces a dynamic CPU management system to reduce power consumption in packet processing systems based on traffic demands. This feature allows the CPU to reduce its clock frequency during low traffic periods and engage the power saving mode.</p> <p>This feature requires a valid license and is supported on VPP instances of VPC-SI for 5G UPF only.</p> <p><b>Command Introduced:</b> <b>require power-saving vpp</b> in Global Configuration mode</p> <p><b>Default Setting:</b> Disabled – Configuration Required to Enable</p>

## Behavior Changes

This section covers a brief description of behavior changes introduced in this release.

Behavior Change	Description
Accurate Reporting of Time and Volume Thresholds during Sx/N4 Modify Request Process	<p>As part of the N4/Sx modification process, UPF reports various trigger IEs during Update URR. In this report, UPF contains information about usage of traffic and resources based on time and volume thresholds.</p> <p><b>Previous Behavior:</b> If Update URR does not have the time and volume threshold values for a specific URR, the old threshold values were retained. It causes UPF to send an incorrect usage report to SMF.</p> <p><b>New Behavior:</b> As part of Update URR processing, UPF replaces the old time and volume thresholds with the new values. UPF only processes the latest values. If Update URR does not contain any time or volume threshold values, then that threshold is not monitored after that point.</p>
Increased BGP Monitoring Capacity in RCM	<p>This release supports the following enhancements for BGP monitoring in RCM:</p> <ul style="list-style-type: none"> <li>• Configurable number of BGP monitors is increased from 16 to 26</li> <li>• Configurable number of BGP monitor groups is increased from 10 to 13</li> </ul> <p><b>Previous Behavior:</b> You were allowed to configure a maximum number of 16 BGP monitors and 10 BGP monitor groups in RCM.</p> <p><b>New Behavior:</b> You can now configure up to 26 BGP monitors and 13 BGP monitor groups in RCM. Use the <b>monitor bgp context context_name peer-ip [ group group_number ]</b> CLI command in RCM Config mode to enable the configuration.</p>
Management of Subscriber Traces Exclusively on CUPS CP	<p><b>Previous Behavior:</b> The "W - UP PCAP Trace (ON)" option was visible on both the CUPS CP and UP when running the <b>monitor subscriber</b> command. However, the upcoming call and IMSI monitoring outputs were not captured.</p> <p><b>New Behavior:</b> The "W - UP PCAP Trace (ON)" option is now visible and manageable only on the CUPS CP. Users cannot toggle the "W - UP PCAP Trace" option (ON/OFF) on the CUPS UP.</p> <p><b>Customer Impact:</b> This change allows subscribers to capture traces on the CP independently from the UP, eliminating the need to start traces on both planes.</p> <p><b>Important</b> When the "W - UP PCAP Trace" is enabled on the CP, do not run the <b>monitor subscriber</b> command on the UP.</p>

Behavior Change	Description
Reject Update FAR with Cause IE	<p><b>Previous Behavior:</b> The session manager on UPF used to crash when SMF sends Update FAR for any FAR without an associated PDR.</p> <p><b>New Behavior:</b> When SMF sends Update FAR for an unassociated FAR, UPF will now reject it with the MANDATORY_IE_INCORRECT (69) PFCP cause.</p> <p><b>Customer Impact:</b> UPF will handle Update FAR gracefully and reject Sx Modify Request, while SMF is expected to tear down the session.</p>
UPF Drop Statistics for Flow Termination	<p><b>Previous Behavior:</b> When a packet triggered a flow action to terminate, the packet was dropped. The drop statistics were not incremented and led to incomplete and inaccurate statistics. This behavior impacted network performance monitoring, effectiveness of flow control mechanisms, and troubleshooting of network events.</p> <p><b>New Behavior:</b> The packet that causes the flow to terminate is counted in the drop statistics. The drop statistics display the accurate number of packets dropped due to flow action termination.</p> <p>The <b>show user-plane-service statistics drop-counter</b> and <b>show subscribers user-plane-only callid <i>callid</i> drop-statistics</b> commands are enhanced to include a new "Terminate Flow" field. This counter displays the number of packets dropped due to flow action termination.</p>

## 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.

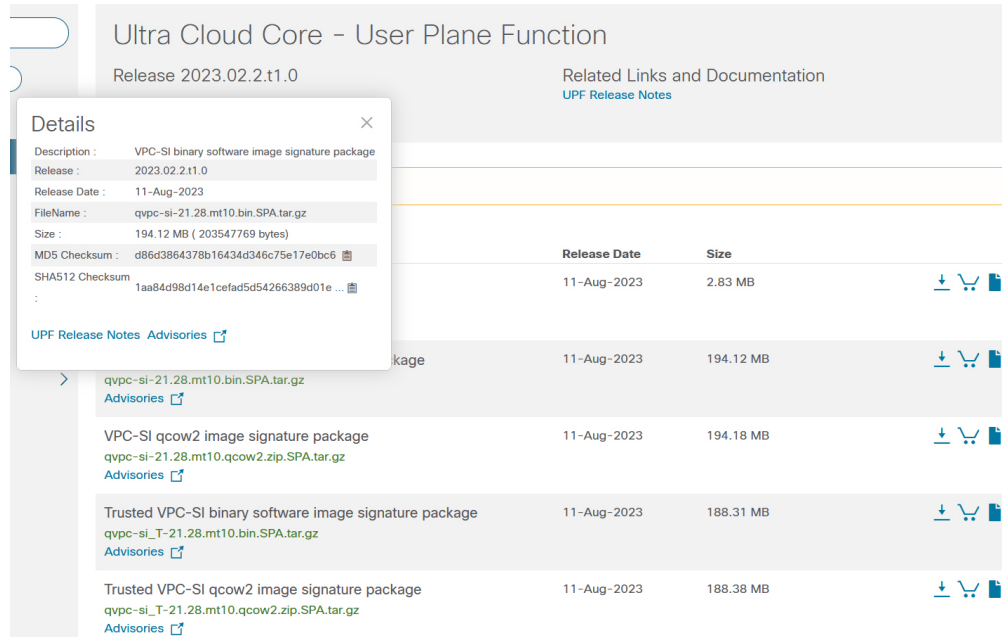
## Software Integrity Verification

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.

The following screenshot is an example of a UPF release posted in the Software Download page.

Figure 1:



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

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

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

Table 1: Checksum Calculations per Operating System

Operating System	SHA512 checksum calculation command examples
Microsoft Windows	Open a command line window and type the following command: <b>&gt; certutil.exe -hashfile filename.extension SHA512</b>
Apple MAC	Open a terminal window and type the following command: <b>\$ shasum -a 512 filename.extension</b>
Linux	Open a terminal window and type the following command: <b>\$ sha512sum filename.extension</b> OR <b>\$ shasum -a 512 filename.extension</b>
<b>NOTES:</b> <i>filename</i> is the name of the file. <i>extension</i> is the file extension (for example, .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

UPF software images are signed via x509 certificates. Please view the .README file packaged with the software for information and instructions on how to validate the certificates.

## Open Bugs for this Release

The following table lists the open bugs in this specific software release.



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

Bug ID	Headline
<a href="#">CSCwk79042</a>	SX path failure is not leading to SRP switchover with Sx monitor enabled
<a href="#">CSCwm29667</a>	Monitor Subscriber pcaps are not getting generated when monsub is started on UPF
<a href="#">CSCwm38232</a>	npumgr restarted at ld-linux.so.2/_dl_sysinfo_int80()
<a href="#">CSCwm47441</a>	Usage Report for Sxa bearer URR is incorrect, urr full all numbers are intact
<a href="#">CSCwm59995</a>	sessmgr restart function sessmgr_uplane_gtpu_tx_setup_n4
<a href="#">CSCwm66357</a>	sessmgr restart at sessmgr_uplane_process_sx_sess_modify_request()
<a href="#">CSCwm66366</a>	aaamgr restart at PC: [ffffe430/X] <unknown>()
<a href="#">CSCwm71360</a>	Packets dropped in sessmgr are not intercepted
<a href="#">CSCwm73448</a>	aamgr restart at sn_slist_dnode_alloc
<a href="#">CSCwm73454</a>	UPF allowing UL packet form delegated ip when request is discarded by UPF
<a href="#">CSCwm75200</a>	After 24hrs run the TCP/TLS connection still exists though the LServer is stopped
<a href="#">CSCwm76599</a>	NPU Prefix delegation flow is not getting deleted on dhcp service going down.
<a href="#">CSCwm77558</a>	UPF discrepancy in IA_PD timers sent for various DHCP reply messages
<a href="#">CSCwm78602</a>	No of streams are 5MB, active flows less in "show user-plane-service statistics all" in longevity.
<a href="#">CSCwm78879</a>	DHCP solicit from UE is NOT honoured by vrf dnm
<a href="#">CSCwm83862</a>	Standby UPF showing higher CPU

Bug ID	Headline
<a href="#">CSCwm84724</a>	Seen call-recovery-uplane-flow-filter-failure on N:M UPF during back to back SWO for upgrade test
<a href="#">CSCwm89079</a>	sessmgr restart at sessmgr_process_init_config()
<a href="#">CSCwm92737</a>	UPF processes DHCPv6 Solicit without IA_PD option and sends DIPR Session Request to SMF
<a href="#">CSCwm94407</a>	bulkstats process restart in xdr_vector
<a href="#">CSCwm97810</a>	sessmgr restart at sn_memblock_memcache_alloc()free()   sessmgr_initiate_epfar_sess_report_req()
<a href="#">CSCwm97939</a>	Sessmgr restarts seen on RCM swo without DHCP config on UPF
<a href="#">CSCwm99642</a>	aaamgr restart @ aaamgr_clean_up_uplane_far_chkpts on Standby UPF
<a href="#">CSCwm99909</a>	Radius Stat Name mismatch under "show dhcpv6 statistics" CLI
<a href="#">CSCwn02384</a>	Multiple sessmgr restarts on upf leading to N4 Association loss thereby leading to call loss

## Resolved Bugs for this Release

The following table lists the resolved bugs in this specific software release.



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

Bug ID	Headline	Behavior Change
<a href="#">CSCwj98482</a>	IP chunks not cleared post association release when sxdemux/sessmgr recovery is there.	No
<a href="#">CSCwk27555</a>	Incorrect reporting when reporting trigger is changed for a URR.	Yes
<a href="#">CSCwk30363</a>	Error log: Sessmgr-1: [CDR 1966 - URR ID -2147483646] seen while Usage updation on Session delete	No
<a href="#">CSCwk67358</a>	UPF Monitor Subscriber logs are unavailable when W - UP PCAP Trace (ON) is enabled at CP	Yes
<a href="#">CSCwk71300</a>	Flow action terminated packets are not pegged as drop	Yes
<a href="#">CSCwm14726</a>	sessmgr restart @ sessmgr_uplane_process_sx_update_far	Yes
<a href="#">CSCwm26664</a>	M6 migrating vpp-cpu-worker-cnt from 24 to 14 from July'24 to Oct'24, cluster sync failure	No
<a href="#">CSCwm27041</a>	Logging lines for vpn chunk update/Released Prefix/Allocated Prefix are not in-line	No

Bug ID	Headline	Behavior Change
<a href="#">CSCwm40737</a>	sessmgr gives error at sessmgr_uplane_cleanup_clp_data()	No
<a href="#">CSCwm57176</a>	With rolling upgrade observed continuous restart for gtpc-ep and gtpc-ep-s11	No
<a href="#">CSCwm62779</a>	Additional XID is not sent over X3 interface when max xids is configured	No
<a href="#">CSCwm66388</a>	sessmgr restart at sessmgr_uplane_periodic_reset_counter_values ()	
<a href="#">CSCwm66576</a>	5G to WifiN3IWF handover is failing with N11 Sm Context Update Failure	No
<a href="#">CSCwm69975</a>	Half flavor sizing spawning all 60 vcpus workers, it should allocate 20 workers	No
<a href="#">CSCwm71644</a>	UPF sends DHCPv6 Advertise for DHCPv6 Solicit received over incorrect UE IP address	No
<a href="#">CSCwm71985</a>	On session manager recovery- Used ipchunks are not reconciled on vpnmgr.	No
<a href="#">CSCwm73736</a>	Payload direction is set incorrectly in x3 PDU header.	No
<a href="#">CSCwm75503</a>	Prefix delegation ipv6 chunks handling has concerns in ICSR.	No

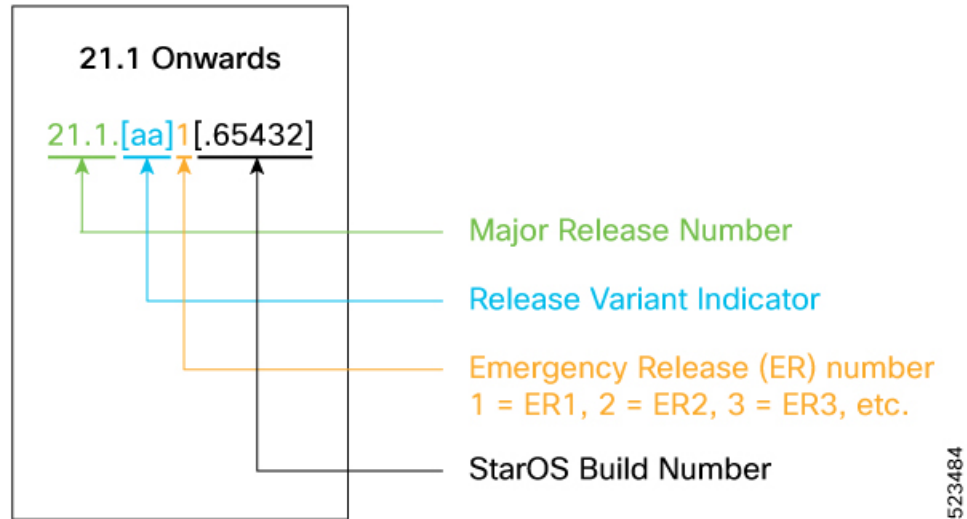
## Operator Notes

### 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.

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





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 facilitates identifying the changes between releases when using Bug Search Tool to research software releases.



**Note** The 5G UPF software is based on StarOS and implements the version numbering system described in this section. However, as a 5G network function (NF), it is posted to Cisco.com under the Cloud Native Product Numbering System as described in [Cloud Native Product Version Numbering System, on page 9](#).

## Cloud Native Product Version Numbering System

The show helm list command displays detailed information about the version of the cloud native product currently deployed.

## Versioning: Format & Field Description

YYYY.RN.MN[.TTN] [.dN] [.MR][.iBN]

Where,

YYYY → 4 Digit year.

- Mandatory Field.
- Starts with 2020.
- Incremented after the last planned release of year.

RN → Major Release Number.

- Mandatory Field.
- Starts with 1.
- Support preceding 0.
- Reset to 1 after the last planned release of a year(YYYY).

MN → Maintenance Number.

- Mandatory Field.
- Starts with 0.
- Does not support preceding 0.
- Reset to 0 at the beginning of every major release for that release.
- Incremented for every maintenance release.
- Preceded by "m" for bulbs from main branch.

TTN → Throttle of Throttle Number.

- Optional Field, Starts with 1.
- Precedes with "t" which represents the word "throttle or throttle".
- Applicable only in "Throttle of Throttle" cases.
- Reset to 1 at the beginning of every major release for that release.

DN → Dev branch Number

- Same as TTN except Used for DEV branches.
- Precedes with "d" which represents "dev branch".

MR → Major Release for TOT and DEV branches

- Only applicable for TOT and DEV Branches.
- Starts with 0 for every new TOT and DEV branch.

BN → Build Number

- Optional Field, Starts with 1.
- Precedes with "t" which represents the word "interim".
- Does not support preceding 0.
- Reset at the beginning of every major release for that release.
- Reset of every throttle of throttle.

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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 facilitates identifying the changes between releases when using Bug Search Tool to research software releases.

## Release Package Descriptions

The following table provides descriptions for the packages that are available with this release.

Software Packages	Description
companion-vpc-<staros_version>.zip.SPA.tar.gz	Contains files pertaining to VPC, including SNMP MIBs, RADIUS dictionaries, ORBEM clients, etc. These files pertain to both trusted and non-trusted build variants. The VPC companion package also includes the release signature file, a verification script, the x.509 certificate, and a README file containing information on how to use the script to validate the certificate.
qvpc-si-<staros_version>.bin.SPA.tar.gz	The UPF release signature package. This package contains the VPC-SI deployment software for the UPF as well as the release signature, certificate, and verification information.  Files within this package are nested under a top-level folder pertaining to the corresponding StarOS build.

Software Packages	Description
qvpc-si-<staros_version>.qcow2.zip.SPA.tar.gz	<p>The UPF release signature package. This package contains the VPC-SI deployment software for the UPF as well as the release signature, certificate, and verification information.</p> <p>Files within this package are nested under a top-level folder pertaining to the corresponding StarOS build.</p>
ncs-<nso_version>-cisco-staros-<version>.signed.bin	<p>The NETCONF NED package. This package includes all the files that are used for NF configuration.</p> <p>Note that NSO is used for NED file creation.</p>

## 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, refer to <https://www.cisco.com/c/en/us/support/index.html>.

