Release Notes for UCC 5G SMF, Release 2025.04.0

Ultra Cloud Core - Session Management Function, Release 2025.04.0

This Release Notes identifies changes and issues related to the software release of 5G Converged Core Session Management Function (SMF).

The key highlights of this release include:

- Enhanced roaming QoS control: Visited network operators gain comprehensive control over QoS for inbound roamers, effectively safeguarding the quality of experience for local users.
- vSMF selection control for Roaming: Network operators achieve granular control over roaming subscriber management, enabling optimized resource allocation and ensuring high-quality user experience.
- N10 registration enhancement: Modifies the N10 registration timing in the session creation call flow to align with later 3GPP releases, ensuring the SMF obtains subscribed slices from the UDM before registration for accurate slice determination.
- Low footprint deployments for SMF: Introduces AIO models designed to support resource-optimized, high-capacity SMF deployments.

For more information about Ultra Cloud Core - Session Management Function, see the Related resources section.

Release lifecycle milestones

The following table provides EoL milestones for Cisco UCC SMF software:

Table 1. EoL milestone information for Ultra Cloud Core - Session Management Function, Release 2025.04.0

Milestone	Date
First Customer Ship (FCS)	31-Oct-2025
End of Life (EoL)	31-Oct-2025
End of Software Maintenance (EoSM)	01-May-2027
End of Vulnerability and Security Support (EoVSS)	01-May-2027
Last Date of Support (LDoS)	30-Apr-2028

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.

New software features

This section provides a brief description of the new software features introduced in this release.

Table 2. New software features for Ultra Cloud Core - Session Management Function, Release 2025.04.0

Product impact	Feature	Description
Software Reliability	Quality of Service (QoS) control for inbound roamers	The Roaming Quality of Service (QoS) Control feature gives operators in a visited network full control to manage and enforce QoS for inbound roamers, protecting local user experience from being degraded by visiting users. Command introduced: **profile qos** vplmn_qos **{ ambr ul** *ambr_ul* **| ambr dl** *ambr_dl* **| qi5** *qci_value* **| arp priority-level** *priority_value* **| arp preempt-cap { not_preempt | may_preempt } | arp preempt-vuln { not_preemptable | preemptable} }** – Used to configure a QoS profile with specific AMBR, QCI, and ARP parameters. **Default Setting**: Disabled – Configuration required to enable the feature
Software Reliability	Enhanced N10 UDM registration	The N10 Registration Enhancement modifies the timing of N10 registration within the session creation call flow. This enhancement addresses changes introduced in later 3GPP releases, moving the N10 registration from an initial step to the final step in the call flow. The N10 Registration Enhancement addresses a specific problem in 5G networks where the SMF needs to determine the correct slice for N10 registration. The enhancement ensures that the SMF first obtains the subscribed slices from the UDM via an N10 subscription and then uses this information to perform N10 registration as the last step in the call flow. This is particularly relevant for 5G UEs connecting via 5G/Wi-Fi RAT. Command Introduced: profile dnn *dnn-profile-name* n10 delay-registration rat-type [NR | WIFI | NR-REDCAP | all] **Default Setting**: Disabled – Configuration required to enable the feature
Software Reliability	Configurable vSMF support indication	This feature enables the SMF to explicitly indicate to the NRF when it should not be selected as a visited SMF (vSMF) for roaming scenarios by setting the vsmfSupportInd flag to false in NFRegister and NFUpdate messages. This behavior is configurable and can be enabled at runtime, allowing precise control over SMF selection as vSMF without impacting system performance, ensuring seamless network operation and compatibility. Command introduced: supported-features [suppress-vsmf] - Enable this configuration to include vsmfSupportInd IE in smfInfo in NfProfile **Default Setting**: Disabled – Configuration required to enable the feature
Upgrade	Low footprint deployments for SMF using AIO models	AIO models are designed to support low footprint deployments for SMF. Deploying the AIO models allows the network operators to deploy high-capacity deployments in a resource-optimized manner.

Product impact	Feature	Description
Software Reliability	Real-time location reporting for 5G SA and 4G voice call setup	The SMF now supports fetching real-time user location and notifying the PCF before a 5G SA or 4G voice call is established. This feature allows the SMF to retrieve the latest user location from the AMF using the Namf_EventExposure service. It installs a new rule on the default bearer/flow for location fetching and then moves this rule to the voice bearer/flow for subsequent voice call setup, ensuring accurate location reporting and seamless voice call establishment. **NOTE**: This feature is not fully qualified in this release. For more information, contact your Cisco account representative.
Software Reliability	IPv6 support for SMF	This release supports the deployment and configuration of SMF on IPv6 network through SMI.
Hardware Reliability	Supermicro server validation	SMF has been tested and validated for deployment on the Supermicro server.

Changes in behavior

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

Table 3. Behavior changes for Ultra Cloud Core - Session Management Function, Release 2025.04.0

Description	Behavior changes
N26 IDFT False prevents R15 DFT enablement [CSCwq54957]	**Previous Behavior**: Direct data forwarding was not supported in prior releases because specific changes were introduced to enable Release 16's data forwarding behavior during 4G to 5G handovers. Due to which SMF incorrectly processed handover requests where both DFT and IDFT flags were false, treating them as if DFT was true. **New Behavior**: Direct data forwarding is supported in all releases, aligning with the 3GPP specification for 4G to 5G handovers.
BGP server operation on IPv6-only interfaces [CSCwq86050]	**Previous Behavior**: To run a BGP server on an interface with IPv6, both IPv6 and IPv4 addresses were required. The IPv4 address on that interface served as both the GRPC endpoint IP and the Router ID. **New Behavior**: BGP servers can now operate on interfaces configured with only IPv6 addresses. In this setup, the IPv6 address will be used for the GRPC endpoint. For the Router ID, a new IPv4 address must be added to the loopback (lo) interface, and this loopback IP will then function as the Router ID.
New CLI parameters for route update failure handling [CSCwr07151]	**Previous Behavior**: The failure handling of route update (chunk information) was enabled or disabled through a single configuration command " failure-handling route-updates deactivate". **New Behavior**: SMF provides these additional configuration options to monitor the failure handling of route updates: • timeout: Sets the maximum wait time (in seconds) for a route update confirmation. If exceeded, the route chunk transitions from Init to Failed state and enters quarantine. • timeout-monitor-frequency: Defines how often (in seconds) the system checks for route chunks stuck in the Init state. • chunk-quarantine-timer: Specifies the duration (in seconds) a failed route chunk remains in quarantine before being released and re-attempted.

Description	Behavior changes
	• chunk-quarantine-limit: Limits the maximum number of failed IP chunks per UPF that can be in quarantine, preventing indefinite looping of failed updates. **Customer Impact**: The customer will have better control over route update failure handling, enhancing network stability and resource management.
BGP neighbor reset behavior for dynamic policy changes [CSCwq91862]	**Previous Behavior**: Whenever a new dynamic policy is added or an existing one is updated, the system performed a BGP hard reset. This caused BGP sessions to restart, cleared all learned routes, and required the system to relearn them after re-establishing connections. In some cases, this reset happened twice during policy or interface updates. **New Behavior**: All dynamic policy additions, updates, or deletions now trigger only a BGP soft reset, eliminating hard resets for these operations. **Customer Impact**: Network stability is improved as disruptive hard resets are no longer triggered during dynamic policy operations. Policy changes are applied more quickly through BGP soft resets, with minimal impact on routing. Downtime is reduced by eliminating session flaps and avoiding unnecessary route withdrawal or additional cycles.
Standardized error cause values for VSMF rejections during 4G to 5G handover [CSCwr59317]	**Previous Behavior**: When the VSMF rejected a create request during a 4G home-routed to 5G roamer Handover (HO), it returned a non-standard cause value in the error response. The cause field contained a specific but non-standardized string detailing the rejection reason, rather than a 3GPP-compliant cause code. This behavior was prevalent across all vSMF/hSMF procedures, where non-standard cause values were consistently returned in failure responses. **New Behavior**: The VSMF now returns standardized 3GPP-compliant cause values in its failure responses, aligning SMF failure handling with 3GPP standards. Specifically, for rejections due to insufficient resources during a 4G to 5G roamer HO, the cause field will now explicitly reflect " INSUFFICIENT_RESOURCES" . The detailed, specific reason for the rejection will be provided in the detail field. This change ensures adherence to 3GPP specifications and improves interoperability, clarity for troubleshooting, and overall system compliance**.**
5QI rejection during VSMF modification not working as expected [CSCwr67543]	**Previous Behavior**: During VSMF modification, if 5QI rejection occurred, the UE still created QoS flows before receiving the rejection. These rejected flows were visible in N1 messages, causing confusion and delayed rejection handling. The system effectively performed post-creation rejection, which was not ideal. **New Behavior**: With the recent feature enhancement, rejected 5QI flows are now rejected upfront during the modification process. No QoS flows are created at the UE when rejection occurs. Rejected flows are no longer included in N1 messages, ensuring clean signaling and proper synchronization between network and UE. This behavior aligns with the updated VSMF design and 3GPP-compliant modification flow handling.
Improved handling of QoS override procedures in VSMF [CSCwq95221]	**Previous Behavior**: When the VSMF overrides the default QoS for a session, it triggered an unexpected VSMF modify procedure, even if the change did not require notifying the HSMF. As a result, the system generated additional modify messages that did not include any relevant Information Element (IE) reflecting what was overridden. This led to increased signaling traffic and potential confusion during message analysis, as the specific change was not clear. **New Behavior**: If the VSMF overrides the default QoS, it no longer initiates a new modify procedure towards the HSMF unless it is necessary. This change ensures that only meaningful modifications result in signaling updates, reducing unnecessary message exchanges. Consequently, signaling becomes more efficient, and operators can more easily interpret the purpose of modifying messages, leading to streamlined operations and improved system performance.

Resolved issues

This table lists the resolved issues in this specific software release.

Note: This software release may contain bug fixes first introduced in other releases. To see additional information, click the bug ID to access the Cisco Bug Search Tool. To search for a documented Cisco product issue, type in the browser: <bug_number> site:cisco.com

Table 4. Resolved issues for Ultra Cloud Core – Session Management Function, Release 2025.04.0

Bug ID	Description
SMF	
CSCwp96694	With cilium we see high response times for S11/S5 request and high message processing time for host n/w pods
CSCwq54957	N26 IDFT false – R15 DFT not getting enabled
CSCwq56686	PCSCF restoration in between Idle exit not handled
CSCwq61695	For half attach scenarios for 2g/3g over 5g, SmContextCreateReq is treated as HO request
CSCwq70425	Collision – wifi-lteHO with Rule deletion not successful
CSCwq70437	Collision – LTE-NR with IMexit and UE_init modify – – Rule delete not successful
CSCwq81955	VONR multi-party call failure after chf disabled
CSCwq83659	SMF not sending Query URR after AMBR change after updating version spec under profile compliance
CSCwq85844	Multiple network element pcf – expedite response not working
CSCwq98304	Multiple disconnect reasons pegged for the same session when PDU session is denied due to PDU type mismatch.
CSCwr10440	AMF-SET – SMF sending request to deregistered AMF
CSCwr32559	N4 Wrong ULI format error logs – when the session/bearer is without ULI
CSCwr35761	SMF is sending ratType as empty in lower compliance for the NR_redcap towards CHF and PCF
CSCwr49713	XnHO triggered while 5G to 4G HO after retrieve complete
CSCwr51838	Incorrect NotificationURI format for N7 and N40
CSCwr63968	VSMF sending EBI 0, resulting in Handover failure
CSCwr68259	VSMF not sending mapped slice information to UE
CSCwr69644	VSMF is not sending hoPreparationIndication during 4G to 5G Handover
CSCwr72442	SMF-restart seen with AMF sending complete in s11create
CSCwr72478	SMF-REDCAP – Lower-compliance – RATTYPE sent empty in 4G to 5G for REDCAP
CSCwr75437	EPSFB – DLDR collision – invalid_rat_type for DLDR getting pegged

Bug ID	Description
CSCwr77014	SMF sending 404 - Retrieve and N1N2failurenotification collision
CSCwr77921	SMF fails to process the addition of pccrule belonging to default flow with packetFilterUsage true post N2 failure
CSCwr83436	SMF-Service restart when 5ql is missing in policy create response
IoT	
CSCwr13366	SMF Missing IEs in N40 Update/Terminate Messages after MBR when using CHF 15.3.0.std version

Open issues

There are no open bugs in this specific software release.

Compatibility

This section lists compatibility information of the Cisco UCC software products that are verified to work with this version of the UCC SMF software.

Table 5. Compatibility information for Ultra Cloud Core - Session Management Function, Release 2025.04.0

Product	Supported Release
Ultra Cloud Core SMI	2025.04.1.15
Ultra Cloud CDL	1.12.3
Ultra Cloud Core UPF	2025.04.0.i5
Ultra Cloud cnSGWc	2025.04.0

Supported software packages

This section provides information about the release packages associated with UCC SMF software.

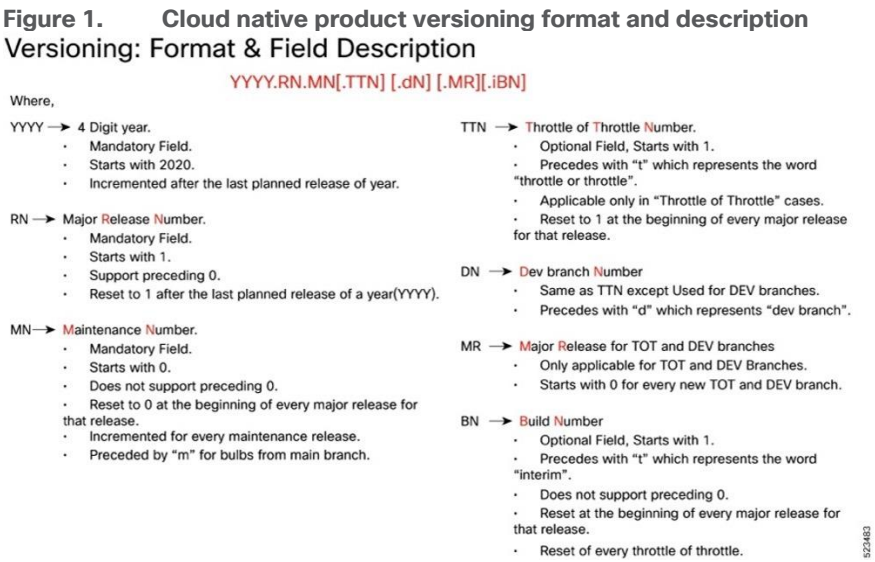
Table 6. Software packages for Ultra Cloud Core - Session Management Function, Release 2025.04.0

Software Package	Description	Release
ccg-2025.04.0.SPA.tgz	The SMF offline release signature package. This package contains the SMF deployment software, NED package, as well as the release signature, certificate, and verification information.	2025.04.0
ncs-6.4.8-ccg-nc-2025.04.0.tar.gz	The NETCONF NED package. This package includes all the yang files that are used for NF configuration. Note that NSO is used for the NED file creation.	6.4.8.1
ncs-6.1.14-ccg-nc-2025.04.0.tar.gz		6.1.14

Cloud native product version numbering system

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

Figure 1. Cloud native product versioning format and description



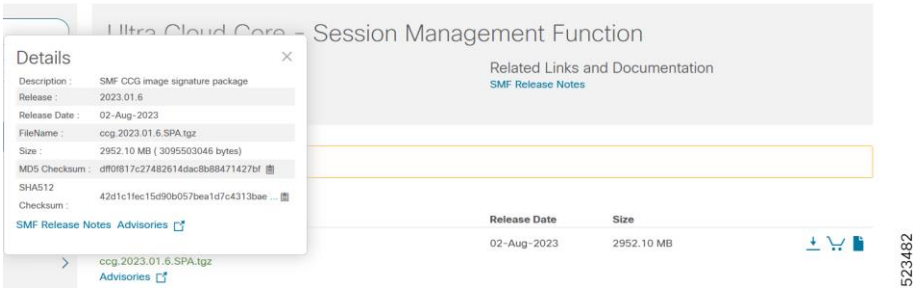
The appropriate version number field increments after a version has been released. The new version numbering format is a contiguous sequential number that represents incremental changes between releases. This format facilitates identifying the changes between releases when using Bug Search Tool to research software releases.

Software integrity version

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.

Figure 2. Sample of converged core gateway software image



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 the following table and verify that it matches the one provided on the software download page.

To calculate a SHA512 checksum on your local desktop, see this table.

Table 7. 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>`

Note: <filename> is the name of the file. <extension> is the file type 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 not to 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

SMF 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.

Related resources

This table provides key resources and links to the support information and essential documentation for SMF and other Ultra Cloud Core (UCC) products.

Table 8. Related resources and additional information

Resource	Link
SMF documentation	Session Management Function
cnSGWc documentation	Serving Gateway Function
SMI documentation	Subscriber Microservices Infrastructure
UPF documentation	User Plane Function
Service request and additional information	Cisco Support

Legal information