Cisco Ultra Cloud Core Serving Gateway Control Plane Function, Release 2022.04 - Release Change Reference

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Americas Headquarters
Cisco Systems, Inc.
170 West Tasman Drive
San Jose, CA 95134-1706
USA
http://www.cisco.com
Tel: 408 526-4000
800 553-NETS (6387)
Fax: 408 527-0883

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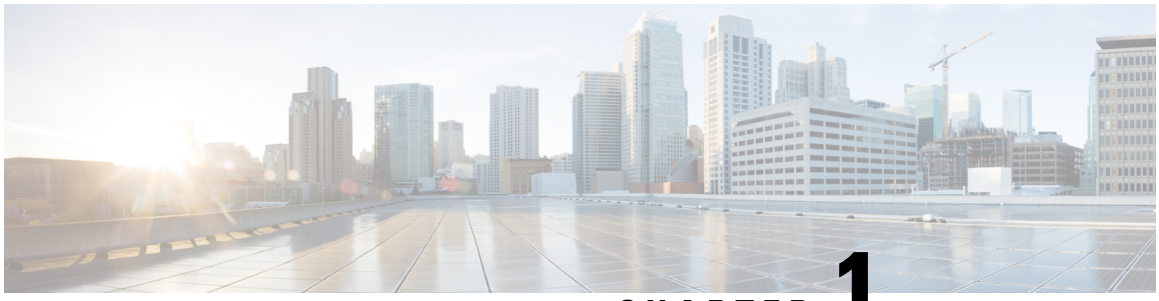

CHAPTER 1

UCC cnSGW-C - Release Change Reference

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Features and Behavior Change Quick Reference

Features / Behavior Changes	Release Introduced / Modified
Batch ID Allocation, Release, and Reconciliation Support	2022.04.0
CDL Flush Interval and Session Expiration Tuning Configuration	2022.04.0
Edge Echo Implementation	2022.04.0
ETCD Peer Optimization Support	2022.04.0
Flag DB Database Updates	2022.04.0
Interservice Pod Communication	2022.04.0
IPv6 Support for Bulk Statistics, Journal Logs, and Panic Logs	2022.04.0

Features / Behavior Changes	Release Introduced / Modified
SMF and cnSGW Optimization for GTPC IPC Cross-rack Support Messages—CSCwb88088, on page 9	2022.04.0
Support for CSFB Procedures Suspend and Resume	2022.04.0
Support IPv6 on all Interfaces	2022.04.0
TCP-based Lawful Interface Solutions	2022.04.0

Feature Defaults Quick Reference

The following table indicates what features are enabled or disabled by default.

Feature	Default
Batch ID Allocation, Release, and Reconciliation Support	Disabled - Configuration required to enable
CDL Flush Interval and Session Expiration Tuning Configuration	Enabled – Configuration required to disable
Edge Echo Implementation	Enabled – Always-on
ETCD Peer Optimization Support	Enabled – Always-on
Flag DB Database Updates	Enabled – Always-on
Interservice Pod Communication	Disabled - Configuration required to enable
IPv6 Support for Bulk Statistics, Journal Logs, and Panic Logs	Enabled – Always-on
SMF and cnSGW Optimization for GTPC IPC Cross-rack Support Messages—CSCwb88088	GTPC IPC Cross-rack Support: Disabled – Configuration required to enable
Support for CSFB Procedures Suspend and Resume	Enabled – Always-on
Support IPv6 on all Interfaces	Enabled – Always-on
TCP-based Lawful Interface Solutions	Disabled - Configuration required to enable

Batch ID Allocation, Release, and Reconciliation Support

Feature Summary and Revision History

Summary Data

Table 1: Summary Data

Applicable Products or Functional Area	cnSGW-C, SMF
Applicable Platforms	SMI
Feature Default Setting	Disabled – Configuration required to enable
Related Documentation	*UCC Serving Gateway Control Plane Function - Configuration and Administration Guide* and *UCC 5G SMF Configuration and Administration Guide*

Revision History

Table 2: Revision History

Revision Details	Release
First introduced.	2022.04.0

Feature Description

The nodemgr allocates a unique ID to the subscriber that is in the attached state. When the subscriber detaches, the unique ID is released to the nodemgr. If the allocation and deallocation procedures increase, the nodemgr performance is impacted and the sgw-service continues to wait longer to complete these procedures.

The Batch ID Allocation, Release, and Reconciliation Support feature provide a mechanism to reduce the interaction between the sgw-service and nodemgr, which in turn optimizes the nodemgr's performance.

CDL Flush Interval and Session Expiration Tuning Configuration

Feature Summary and Revision History

Summary Data

Table 3: Summary Data

Applicable Products or Functional Area	cnSGW-C, SMF

Applicable Platforms	SMI
Feature Default Setting	Enabled – Configuration required to disable
Related Documentation	*UCC Serving Gateway Control Plane Function - Configuration and Administration Guide* and *UCC 5G SMF Configuration and Administration Guide*

Revision History

Table 4: Revision History

Revision Details	Release
First introduced.	2022.04.0

Feature Description

You can modify the default service-pod parameters to fine-tune the throughput performance and optimize the load performance.

For more information, refer to the UCC 5G SMF Configuration and Administration Guide > Performance Optimization Support chapter.

Configuring the DDN Failure Timer—CSCwb82936

Behavior Change Summary and Revision History

Summary Data

Table 5: Summary Data

Applicable Product(s) or Functional Area	cnSGW-C
Applicable Platform(s)	SMI
Feature Default Setting	DDN Message Handling Support: Enabled - Always-on Control Messages Triggered DDN Support: Disabled - Configuration that is required to enable DDN Advance Features: Enabled - Always-on
Related Changes in this Release	New CLI introduced as an enhancement. The DDN Failure Timer is configured under the `sgw-profile` in the Downlink Data Notification feature.

Related Documentation	*UCC 5G cnSGWc Configuration and Administration Guide*

Revision History

Table 6: Revision History

Revision Details	Release
Behavior changes introduced. CDETS ID: CSCwb82936 Configuring the DDN Failure Timer > [cnSGW] CLI-based customized handling for DDN Timeout or Peer Not Responding	2022.04.0
Enhancement introduced. Added support for DDN Advance Features.	2021.02.00
First introduced.	2021.01.00

Behavior Change

Previous Behavior:

In the previous releases, the DDN Timeout or the Peer was not responding to the clear call option with the local purge.

New Behavior:

With this release, the cnSGW-C allows the DDN Timeout or the Peer option for the DDN Failure Timer configuration in the Downlink Data Notification feature. A new command line added now in the `sgw-profile` to ease this failed scenario.

Customer Impact:

The change enhances the feature with the DDN Timeout or the Peer option for the DDN Failure Timer configuration in the Downlink Data Notification.

Feature Description

This is an enhancement to optimize the feature with DDN Timeout or Peer option for the DDN Failure Timer configuration in the Downlink Data Notification.

The DDN Failure Timer is configured under the `sgw-profile` in the Downlink Data Notification feature. The CLI-based customized handling for DDN Failure Timer was not getting executed and the configuration for the DDN Failure Timer or Timeout or Peer was not responding. A new command line is now added in the `sgw-profile` to mitigate this risk.

Configuring the DDN Failure Timer

DDN Failure Timer is configured under the `sgw-profile`.

For more information, see the UCC 5G cnSGWc Configuration and Administration Guide > Downlink Data Notification chapter.

Edge Echo Implementation

Feature Summary and Revision History

Summary Data

Table 7: Summary Data

Applicable Products or Functional Area	cnSGW-C, SMF
Applicable Platforms	SMI
Feature Default Setting	Enabled – Always-on
Related Documentation	*UCC Serving Gateway Control Plane Function - Configuration and Administration Guide* and *UCC 5G SMF Configuration and Administration Guide*

Revision History

Table 8: Revision History

Revision Details	Release
First introduced.	2022.04.0

Feature Description

In a nonmerged mode, the udp-proxy pod acts as an endpoint, and the gtpc-ep responds to the Echo Requests from the peer node.

The gtpc-ep experiences traffic when the system receives a high number of inputs CEPS leading to a discrepancy between the rate at which gtpc-ep picks up the messages from udp-proxy and the rate at which udp-proxy gets the messages.

If the gtpc-ep is loaded, the queue between the udp-proxy and gtpc-ep gets full, and some of the messages at udp-proxy might get dropped. The peer detects path failure if these are Echo Request messages because an Echo Response is not received. Further, the peer clears all the sessions sent to the sgw-service.

For more information, refer to the UCC 5G SMF Configuration and Administration Guide > Performance Optimization Support chapter.

ETCD Peer Optimization Support

Feature Summary and Revision History

Summary Data

Table 9: Summary Data

Applicable Products or Functional Area	cnSGW-C, SMF
Applicable Platforms	SMI
Feature Default Setting	Enabled – Always-on
Related Documentation	*UCC Serving Gateway Control Plane Function - Configuration and Administration Guide* and *UCC 5G SMF Configuration and Administration Guide*

Revision History

Table 10: Revision History

Revision Details	Release
First introduced.	2022.04.0

Feature Description

When large numbers of GTPC peers are connected with SMF or cnSGW-C, the performance of ETCD is impacted. Each peer is a considered as a record in the ETCD, and the timestamp is updated every 30 seconds for each peer. This causes continuous updates on ETCD and generates huge traffic that impacts the overall system performance.

The ETCD Peer Optimization feature facilitates optimization in peer management and enables reduced performance impact on ETCD.

For more information, refer to the UCC 5G SMF Configuration and Administration Guide > Performance Optimization Support chapter.

Flag DB Database Updates

Feature Summary and Revision History

Summary Data

Table 11: Summary Data

Applicable Products or Functional Area	cnSGW-C, SMF
Applicable Platforms	SMI
Feature Default Setting	Enabled – Always-on
Related Documentation	*UCC Serving Gateway Control Plane Function - Configuration and Administration Guide* and *UCC 5G SMF Configuration and Administration Guide*

Revision History

Table 12: Revision History

Revision Details	Release
First introduced.	2022.04.0

Feature Description

cnSGW-C and SMF update the CDL whenever the subscriber state changes from idle to active, and the ULI, UeTz, UCI, or the serving network is modified.

When the transaction requests driven to CDL increases, cnSGW-C and SMF incur a higher CPU utilization. To prevent the needless CPU utilization, cnSGW-C and SMF update only a subset of the CDL with the changed attributes.

Flag DB Database for the DDN Procedure

When the DDN procedure completes, sgw-service updates the CDL which impacts the CPU utilization. To optimize the CPU usage, the CDL is notified about the DDN only with the partial updates.

DDN Internal timer

cnSGW-C and SMF implement the DDN Retry Timer by applying the CDL's timer functionality. Every DDN transaction starts the DDN Retry Timer that requires the complete CDL instance to be updated, which results in an increase in the CPU usage of the CDL and sgw-service.

cnSGW-C is modified to have an integrated DDN Retry Timer that is configurable from sgw-profile. With this approach, the performance is improved because the cnSGW-C and SMF do not communicate with the

CDL for starting the DDN Retry Timer as it is an internal timer. The DDN Retry Timer is started for a duration of 10 seconds.

For more information, refer to the UCC 5G SMF Configuration and Administration Guide > Performance Optimization Support chapter.

SMF and cnSGW Optimization for GTPC IPC Cross-rack Support Messages—CSCwb88088

Behavior Change Summary and Revision History

Summary Data

Table 13: Summary Data

Applicable Product(s) or Functional Area	SMF cnSGW-C
Applicable Platform(s)	SMI
Feature Default Setting	GTPC IPC Cross-rack Support: Disabled – Configuration required to enable
Related Changes in this Release	New feature as an enhancement
Related Documentation	*UCC 5G SMF Configuration and Administration Guide* *UCC 5G cnSGWc Configuration and Administration Guide*

Revision History

Table 14: Revision History

Revision Details	Release
First introduced. CDETS ID: CSCwb88088	2022.04.0

Behavior Change

Previous Behavior:

There is no previous behavior history.

New Behavior:

This is a new feature that is presented as an enhancement under the performance optimization feature.

Customer Impact:

No impact.

Feature Description

This is an enhancement to optimize GTPC messages between SMF and cnSGW-C across IMS and data racks clusters.

When you perform GR-setup activities with SMF and cnSGW-C, the GTPC message handling can be optimized between these two racks, as in the following scenarios:

- The set of IPC messages from cnSGW-C to SMF service pods flow over `gtpc-ep` pods twice leading to message encoding and decoding overheads.
- Within a GR pair, these IPC messages can avoid one more processing step, if service pods such as cnSGW-C and SMF can route messages to the corresponding peer GTPC nodes directly.

Before applying the configuration for enabling GTPC IPC on cnSGW or SMF interfaces, you must apply inter-rack routing networks using cluster sync. More configuration required to add BGP routes for supporting new routable networks across rack servers.

For more information, see the UCC cnSGWc Configuration and Administration Guide > Performance Optimization Support chapter.

Interservice Pod Communication

Feature Summary and Revision History

Summary Data

Table 15: Summary Data

Applicable Products or Functional Area	cnSGW-C
Applicable Platforms	SMI
Feature Default Setting	Disabled – Configuration required to enable
Related Documentation	*UCC Serving Gateway Control Plane Function - Configuration and Administration Guide*

Revision History

Table 16: Revision History

Revision Details	Release
First introduced.	2022.04.0

Feature Description

When the IMS PDN sgw-service and smf-service selected for a subscriber are on the same cluster and same RACK, the following message flow occurs when sgw-service sends a message to smf-service:

- The message is sent from S5e gtpc-ep interface to network interface.
- The message returns to the S5 interface from gtpc-ep to smf-service.

For the subscribers that are collocated, the communication happens between the sgw-service and the smf-service. This approach reduces the processing load on the gtpc-ep.

IPv6 Support for Bulk Statistics, Journal Logs, and Panic Logs

Feature Summary and Revision History

Summary Data

Table 17: Summary Data

Applicable Products or Functional Area	cnSGW-C
Applicable Platforms	SMI
Feature Default Setting	Enabled – Always-on
Related Documentation	*UCC Serving Gateway Control Plane Function - Configuration and Administration Guide*

Revision History

Table 18: Revision History

Revision Details	Release
First introduced.	2022.04.0

Feature Description

cnSGW-C provides support for IPv6-based logging. cnSGW-C also provides IPv6 support for bulk statistics, journal logs, and panic logs, for identifying and troubleshooting issues.

Support for CSFB Procedures Suspend and Resume

Feature Summary and Revision History

Summary Data

Table 19: Summary Data

Applicable Products or Functional Area	cnSGW-C
Applicable Platforms	SMI
Feature Default Setting	Enabled – Always-on
Related Documentation	*UCC Serving Gateway Control Plane Function - Configuration and Administration Guide*

Revision History

Table 20: Revision History

Revision Details	Release
First introduced.	2022.04.0

Feature Description

Circuit Switched Fall Back (CSFB) enables the UE to camp on an EUTRAN cell and originate or terminate voice calls through a forced switchover to the circuit-switched (CS) domain or other CS-domain services, such as Location Services (LCS) and supplementary services. Also, SMS delivery through the CS core network is realized without CSFB. As LTE EPC networks are not meant to directly anchor CS connections, when any CS voice services are initiated, any PS-based data activities on the EUTRAN network get suspended (that is, either the data transfer is suspended, or the packet switched connection is handed over to the 2G/3G network). The data activities can further be resumed to enable telephony and SMS services for LTE operators that do not plan to deploy IMS packet switched services at the initial service launch.

cnSGW-C supports the following CSFB Messaging services on an S11 interface over GTPC:

- Suspend Notification
- Suspend Acknowledgment
- Resume Notification

- Resume Acknowledgment

Along with the Resume procedure, it is possible that MME can send a nonempty Modify Bearer Request. In the suspended state, cnSGW-C supports handling the Modify Bearer Request by considering it as an implicit resume procedure.

Support IPv6 on all Interfaces

Feature Summary and Revision History

Summary Data

Table 21: Summary Data

Applicable Products or Functional Area	cnSGW-C
Applicable Platforms	SMI
Feature Default Setting	Enabled – Always-on
Related Documentation	*UCC Serving Gateway Control Plane Function - Configuration and Administration Guide*

Revision History

Table 22: Revision History

Revision Details	Release
First introduced.	2022.04.0

Feature Description

cnSGW-C extends support for Internet Protocol Version 6 (IPv6) addresses, which includes a broader address range (128 bit). You can configure the IPv6 addresses for the GTPC interfaces, including the S5e and S11 and SXA interfaces. cnSGW-C supports dual stack for Sxa and GTPC interfaces. With the dual stack implementation, you can configure the interfaces to the IPv4 network or the IPv6 network, or both.

TCP-based Lawful Interface Solutions

Feature Summary and Revision History

Summary Data

Table 23: Summary Data

Applicable Products or Functional Area	cnSGW-C
Applicable Platforms	SMI
Feature Default Setting	Disabled – Configuration required to enable
Related Documentation	*UCC Serving Gateway Control Plane Function - Configuration and Administration Guide*

Revision History

Table 24: Revision History

Revision Details	Release
Added the TCP LI support.	2022.04.0

Feature Description

SMF supports LI in two ways—3GPP-compliant LI and non-3GGP LI. With this feature, the non-3GGP LI is supported through TCP, along with the earlier supported UDP.

Note This feature is backward-compatible and supports both the TCP and the UDP.

For more information on Lawful Intercept (LI) feature, contact your Cisco account representative.