Ultra Cloud Core 5G Access and Mobility Management Function, Release 2022.04 - Release Change Reference

First Published: 2022-10-14

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

THE SPECIFICATIONS AND INFORMATION REGARDING THE PRODUCTS IN THIS MANUAL ARE SUBJECT TO CHANGE WITHOUT NOTICE. ALL STATEMENTS, INFORMATION, AND RECOMMENDATIONS IN THIS MANUAL ARE BELIEVED TO BE ACCURATE BUT ARE PRESENTED WITHOUT WARRANTY OF ANY KIND, EXPRESS OR IMPLIED. USERS MUST TAKE FULL RESPONSIBILITY FOR THEIR APPLICATION OF ANY PRODUCTS.

THE SOFTWARE LICENSE AND LIMITED WARRANTY FOR THE ACCOMPANYING PRODUCT ARE SET FORTH IN THE INFORMATION PACKET THAT SHIPPED WITH THE PRODUCT AND ARE INCORPORATED HEREIN BY THIS REFERENCE. IF YOU ARE UNABLE TO LOCATE THE SOFTWARE LICENSE OR LIMITED WARRANTY, CONTACT YOUR CISCO REPRESENTATIVE FOR A COPY.

The Cisco implementation of TCP header compression is an adaptation of a program developed by the University of California, Berkeley (UCB) as part of UCB's public domain version of the UNIX operating system. All rights reserved. Copyright © 1981, Regents of the University of California.

NOTWITHSTANDING ANY OTHER WARRANTY HEREIN, ALL DOCUMENT FILES AND SOFTWARE OF THESE SUPPLIERS ARE PROVIDED “AS IS" WITH ALL FAULTS. CISCO AND THE ABOVE-NAMED SUPPLIERS DISCLAIM ALL WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING, WITHOUT LIMITATION, THOSE OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE AND NONINFRINGEMENT OR ARISING FROM A COURSE OF DEALING, USAGE, OR TRADE PRACTICE.

IN NO EVENT SHALL CISCO OR ITS SUPPLIERS BE LIABLE FOR ANY INDIRECT, SPECIAL, CONSEQUENTIAL, OR INCIDENTAL DAMAGES, INCLUDING, WITHOUT LIMITATION, LOST PROFITS OR LOSS OR DAMAGE TO DATA ARISING OUT OF THE USE OR INABILITY TO USE THIS MANUAL, EVEN IF CISCO OR ITS SUPPLIERS HAVE BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES.

Any Internet Protocol (IP) addresses and phone numbers used in this document are not intended to be actual addresses and phone numbers. Any examples, command display output, network topology diagrams, and other figures included in the document are shown for illustrative purposes only. Any use of actual IP addresses or phone numbers in illustrative content is unintentional and coincidental.

All printed copies and duplicate soft copies of this document are considered uncontrolled. See the current online version for the latest version.

Cisco has more than 200 offices worldwide. Addresses and phone numbers are listed on the Cisco website at www.cisco.com/go/offices.

Cisco and the Cisco logo are trademarks or registered trademarks of Cisco and/or its affiliates in the U.S. and other countries. To view a list of Cisco trademarks, go to this URL: https://www.cisco.com/c/en/us/about/legal/trademarks.html. Third-party trademarks mentioned are the property of their respective owners. The use of the word partner does not imply a partnership relationship between Cisco and any other company. (1721R)

© 2022 Cisco Systems, Inc. All rights reserved.

CONTENTS

CHAPTER 1 **UCC 5G AMF - Release Change Reference** 1

Features and Behavior Change Quick Reference 1

Feature Defaults Quick Reference 2

Attach Rate Throttling 3

Feature Summary and Revision History 3

Summary Data 3

Revision History 3

Feature Description 3

Emergency Voice Fallback 4

Feature Summary and Revision History 4

Summary Data 4

Revision History 4

Feature Description 4

Inter-AMF Idle Handover Scenario for Emergency Calls—CSCwd08192 5

Feature Summary and Revision History 5

Summary Data 5

Revision History 5

Feature Description 5

Lawful Intercept Interface Support 6

Feature Summary and Revision History 6

Summary Data 6

Revision History 6

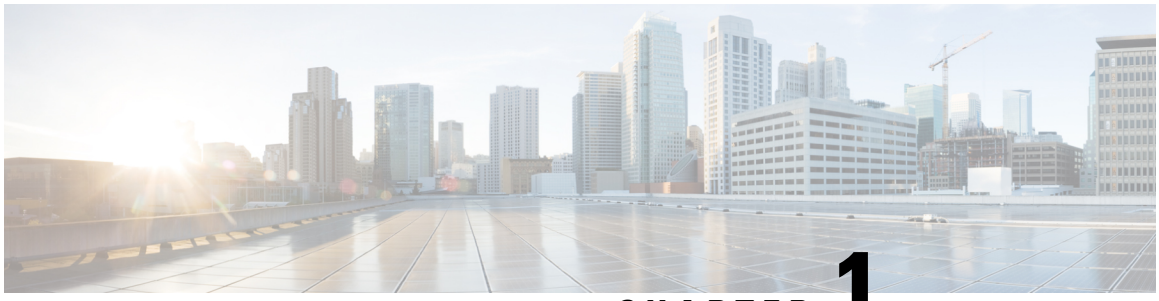
Feature Description 6

Mobility Handover (Xn/N2) Collision Control 6

Feature Summary and Revision History 6

Summary Data 6

Revision History 7
Feature Description 7
Mutual TLS (mTLS) Support and Validation 7
Feature Summary and Revision History 7
Summary Data 7
Revision History 7
Feature Description 8
OAuth2 Client Authorization Support to NRF 8
Feature Summary and Revision History 8
Summary Data 8
Revision History 8
Feature Description 8
Overload Control for N2 and NAS 9
Feature Summary and Revision History 9
Summary Data 9
Revision History 9
Feature Description 9
Paging Overload Protection 10
Feature Summary and Revision History 10
Summary Data 10
Revision History 10
Feature Description 10
Relative Capacity Configuration Update 10
Feature Summary and Revision History 10
Summary Data 10
Revision History 11
Feature Description 11
AMF sends UE context release command and then Registration reject for AUSF 403 failure—CSCwc44093 11
Behavior Change Summary and Revision History 11
Summary Data 11
Revision History 11
Behavior Change 12



CHAPTER 1

UCC 5G AMF - Release Change Reference

- Features and Behavior Change Quick Reference, on page 1
- Feature Defaults Quick Reference, on page 2
- Attach Rate Throttling, on page 3
- Emergency Voice Fallback, on page 4
- Inter-AMF Idle Handover Scenario for Emergency Calls—CSCwd08192, on page 5
- Lawful Intercept Interface Support, on page 6
- Mobility Handover (Xn/N2) Collision Control, on page 6
- Mutual TLS (mTLS) Support and Validation, on page 7
- OAuth2 Client Authorization Support to NRF, on page 8
- Overload Control for N2 and NAS, on page 9
- Paging Overload Protection, on page 10
- Relative Capacity Configuration Update, on page 10
- AMF sends UE context release command and then Registration reject for AUSF 403 failure—CSCwc44093, on page 11

Features and Behavior Change Quick Reference

Features / Behavior Changes	Release Introduced / Modified
Attach Rate Throttling	2022.04.0
Emergency Voice Fallback	2022.04.0
Inter-AMF Idle Handover Scenario for Emergency Calls—CSCwd08192, on page 5	2022.04.0
Lawful Intercept Interface Support, on page 6	2022.04.0
Mobility Handover (Xn/N2) Collision Control	2022.04.0
Mutual TLS (mTLS) Support and Validation	2022.04.0
OAuth2 Client Authorization Support to NRF, on page 8	2022.04.0
Overload Control for N2 and NAS	2022.04.0

Features / Behavior Changes	Release Introduced / Modified
Paging Overload Protection	2022.04.0
Relative Capacity Configuration Update, on page 10	2022.04.0
AMF sends UE context release command and then Registration reject for AUSF 403 failure—CSCwc44093	2022.04.0

Feature Defaults Quick Reference

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

Feature	Default
Attach Rate Throttling	Disabled – Configuration required to enable
Emergency Voice Fallback	Disabled – Configuration required to enable
Inter-AMF Idle Handover Scenario for Emergency Calls—CSCwd08192	Enabled – Always-on
Lawful Intercept Interface Support	Disabled – Configuration required to enable
Mobility Handover (Xn/N2) Collision Control	Disabled – Configuration required to enable
Mutual TLS (mTLS) Support and Validation	Disabled – Configuration required to enable
OAuth2 Client Authorization Support to NRF	Disabled – Configuration required to enable
Overload Control for N2 and NAS	Disabled – Configuration required to enable
Paging Overload Protection	Disabled – Configuration required to enable
Relative Capacity Configuration Update	Enabled – Always-on
AMF sends UE context release command and then Registration reject for AUSF 403 failure—CSCwc44093	Enabled – Always-on

Attach Rate Throttling

Feature Summary and Revision History

Summary Data

Table 1: Summary Data

Applicable Products or Functional Area	AMF
Applicable Platforms	SMI
Feature Default Setting	Disabled – Configuration required to enable
Related Documentation	*UCC 5G Access and Mobility Management Function - Configuration and Administration Guide*

Revision History

Table 2: Revision History

Revision Details	Release
First introduced.	2022.04.0

Feature Description

Attach rate limit is the maximum number of new connections that AMF can process. The new connections include Initial Registration Request, Namf_Communication_CreateUEContext Request, and N26 Forward Relocation Request.

Setting the rate limit enables the operators to manage the traffic and reduce the signaling on the external nodes.

Note AMF does not throttle emergency, periodic, and mobility registration.

Emergency Voice Fallback

Feature Summary and Revision History

Summary Data

Table 3: Summary Data

Applicable Products or Functional Area	AMF
Applicable Platforms	SMI
Feature Default Setting	Disabled – Configuration required to enable
Related Documentation	*UCC 5G Access and Mobility Management Function - Configuration and Administration Guide*

Revision History

Table 4: Revision History

Revision Details	Release
First introduced.	2022.04.0

Feature Description

The Emergency Services Fallback feature allows the UE to reconnect to EUTRAN either through 5GC (4G radio, 5G core) or EPC (4G radio, 4G core). The fallback occurs when the 5G radio does not support the NR. Depending on the network capabilities, the UE selects 5GC or EPC. If the 5G core is unable to support emergency services, the UE falls back on 4G radio on the 4G core.

AMF supports UE Context Transfer messages for subscribers that are registered for emergency services or nonemergency services with emergency PDU sessions.

Inter-AMF Idle Handover Scenario for Emergency Calls—CSCwd08192

Feature Summary and Revision History

Summary Data

Table 5: Summary Data

Applicable Product(s) or Functional Area	AMF
Applicable Platform(s)	SMI
Feature Default Setting	Enabled – Always-on
Related Changes in this Release	Not Applicable
Related Documentation	Not Applicable

Revision History

Table 6: Revision History

Revision Details	Release
First introduced. CDETS ID: CSCwd08192	2022.04

Feature Description

AMF treats a subscriber session as an emergency call if any of the following conditions were met:

- only IMEI is present in N14 response message, and the UE is in the same PLMN unauthenticated SUPI is present in the N14 response message

Lawful Intercept Interface Support

Feature Summary and Revision History

Summary Data

Table 7: Summary Data

Applicable Product(s) or Functional Area	AMF
Applicable Platform(s)	SMI
Feature Default Setting	Disabled – Configuration required to enable
Related Documentation	Contact your Cisco account representative, for your documentation needs.

Revision History

Table 8: Revision History

Revision Details	Release
Enhancements introduced.	2022.04.0
First introduced.	2021.04.0

Feature Description

The lawful interception (LI) on AMF supports multiple enhancements, including parity features to cater to the user requirements.

For more information on LI interface, contact your Cisco account representative.

Mobility Handover (Xn/N2) Collision Control

Feature Summary and Revision History

Summary Data

Table 9: Summary Data

Applicable Products or Functional Area	AMF
Applicable Platforms	SMI

Feature Default Setting	Disabled – Configuration required to enable
Related Documentation	*UCC 5G Access and Mobility Management Function - Configuration and Administration Guide*

Revision History

Table 10: Revision History

Revision Details	Release
First introduced.	2022.04.0

Feature Description

AMF interacts with multiple nodes, such as UE/GNB, UDM, AUSF, and SMF. When multiple nodes send simultaneous request toward AMF, there is a possibility of collision at the AMF node. The AMF Collision Support feature supports handling the collision between different procedures at the AMF node.

Mutual TLS (mTLS) Support and Validation

Feature Summary and Revision History

Summary Data

Table 11: Summary Data

Applicable Products or Functional Area	AMF
Applicable Platforms	SMI
Feature Default Setting	Disabled – Configuration required to enable
Related Documentation	*UCC 5G Access and Mobility Management Function - Configuration and Administration Guide*

Revision History

Table 12: Revision History

Revision Details	Release
First introduced.	2022.04.0

Feature Description

AMF supports mutual TLS secure channel for SBI interfaces. With the mTLS Support for SBI interfaces, AMF handles mutual TLS requests from the server and the client, and supports HTTP2 over TLS secure channel for all NF interfaces.

This feature also supports in generating alarms when the certificates expire within a configured threshold period.

OAuth2 Client Authorization Support to NRF

Feature Summary and Revision History

Summary Data

Table 13: Summary Data

Applicable Products or Functional Area	AMF
Applicable Platforms	SMI
Feature Default Setting	Disabled – Configuration required to enable
Related Documentation	*UCC 5G Access and Mobility Management Function - Configuration and Administration Guide*

Revision History

Table 14: Revision History

Revision Details	Release
First introduced.	2022.04.0

Feature Description

This feature describes the authorization controls that are required for implementing all the network functions. The OAuth2 client authorization to NRF supports the AMF application-side changes and its integration with nrf-lib and app-infra APIs.

For more information, see the UCC 5G AMF Configuration and Administration Guide > OAuth2 Client Authorization Support to NRF chapter.

Overload Control for N2 and NAS

Feature Summary and Revision History

Summary Data

Table 15: Summary Data

Applicable Products or Functional Area	AMF
Applicable Platforms	SMI
Feature Default Setting	Disabled – Configuration required to enable
Related Documentation	*UCC 5G Access and Mobility Management Function - Configuration and Administration Guide*

Revision History

Table 16: Revision History

Revision Details	Release
First introduced.	2022.04.0

Feature Description

The congestion control feature lets you define the system conditions which when matched impacts the system's performance. To prevent an impact of the congestion on the subscriber sessions, you can configure the system policies that are to be invoked when facing congestion.

Congestion control monitors the system to detect situations that match the conditions which may potentially degrade the system's performance when it is under heavy load. Typically, these conditions are transient (for example, high CPU or memory utilization) and gets resolved faster. However, if these conditions persist longer or they occur frequently during the specific time interval, a severe congestion occurs.

The congestion control feature monitors the system resources, such as CPU usage, memory, the number of active sessions, and the number of Go routines.

Paging Overload Protection

Feature Summary and Revision History

Summary Data

Table 17: Summary Data

Applicable Products or Functional Area	AMF
Applicable Platforms	SMI
Feature Default Setting	Disabled – Configuration required to enable
Related Documentation	*UCC 5G Access and Mobility Management Function - Configuration and Administration Guide*

Revision History

Table 18: Revision History

Revision Details	Release
First introduced.	2022.04.0

Feature Description

Congestion control is a proactive mechanism where AMF lets you configure the number of paging requests that are sent for each gNB. When a congestion is detected, AMF drops the new paging requests.

Relative Capacity Configuration Update

Feature Summary and Revision History

Summary Data

Table 19: Summary Data

Applicable Products or Functional Area	AMF
Applicable Platforms	SMI
Feature Default Setting	Enabled – Always-on

Related Documentation	*UCC 5G Access and Mobility Management Function - Configuration and Administration Guide*

Revision History

Table 20: Revision History

Revision Details	Release
First introduced.	2022.04.0

Feature Description

The AMF supports modification of relative AMF capacity and notifies to the connected gNodeBs. The AMF also provides an option to control the rate at which existing sessions can be cleared in the AMF.

For more information, see the > UCC 5G AMF Configuration and Administration Guide > Relative Capacity Configuration Update chapter.

AMF sends UE context release command and then Registration reject for AUSF 403 failure—CSCwc44093

Behavior Change Summary and Revision History

Summary Data

Table 21: Summary Data

Applicable Product(s) or Functional Area	AMF
Applicable Platform(s)	SMI
Feature Default Setting	Enabled – Always-on
Related Changes in this Release	Not Applicable
Related Documentation	Not Applicable

Revision History

Table 22: Revision History

Revision Details	Release
First introduced. CDETS ID: CSCwc44093	2022.04

Behavior Change

Previous Behavior: In some cases of rejection of initial registration (received in NGAP initial UE message) due to AUSF 403 failure, AMF was sending the UE context release command prior to the registration reject message.

New Behavior: AMF now sends the registration reject message and then the UE context release command.

Customer Impact: No impact.