**3GPP TSG-CT WG1 Meeting #129-eC1-21xxxx was C1-212127**

**Electronic meeting, 19-23 April 2021**

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| *CR-Form-v12.0* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
|  | | | | | | | | |
|  | **24.501** | **CR** | **3109** | **rev** | **1** | **Current version:** | **17.2.0** |  |
|  | | | | | | | | |
| *For* [***HE******LP***](http://www.3gpp.org/3G_Specs/CRs.htm#_blank)*on using this form: comprehensive instructions can be found at* [*http://www.3gpp.org/Change-Requests*](http://www.3gpp.org/Change-Requests)*.* | | | | | | | | |
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| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| ***Proposed change affects:*** | UICC apps |  | ME | **x** | Radio Access Network |  | Core Network | **x** |

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|  | | | | | | | | | | |
| ***Title:*** | UE ProSe capability negotiation with 5GC | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Source to WG:*** | CATT | | | | | | | | | |
| ***Source to TSG:*** | C1 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | 5G\_ProSe | | | | |  | ***Date:*** | | | 2021-04-06 |
|  |  | | | |  | |  | | |  |
| ***Category:*** | **B** |  | | | | | ***Release:*** | | | Rel-17 |
|  | *Use one of the following categories:* ***F*** *(correction)* ***A*** *(mirror corresponding to a change in an earlier release)* ***B*** *(addition of feature),* ***C*** *(functional modification of feature)* ***D*** *(editorial modification)*  Detailed explanations of the above categories can be found in 3GPP [TR 21.900](http://www.3gpp.org/ftp/Specs/html-info/21900.htm). | | | | | | | | *Use one of the following releases: Rel-8 (Release 8) Rel-9 (Release 9) Rel-10 (Release 10) Rel-11 (Release 11) Rel-12 (Release 12) Rel-13 (Release 13) Rel-14 (Release 14) Rel-15 (Release 15) Rel-16 (Release 16) Rel-17 (Release 17)* | |
|  |  | | | | | | | | | |
| ***Reason for change:*** | | In subclause 6.7.2, TS 23.304, the UE’s ProSe capability is indicated in the Registration Request procedue. And AMF determine whether the UE is authorized to use ProSe service based on UE’s ProSe capacity and ProSe Service Authorization in the UE’s subscription information. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Summary of change:*** | | 1. Add the indication of UE ProSe capability in registration procedure. 2. Specify the coding of UE ProSe capability. 3. Termilologies and references relating to 5G ProSe. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Consequences if not approved:*** | | The UE ProSe capability indication and handling are missing in TS | | | | | | | | |
|  | |  | | | | | | | | |
| ***Clauses affected:*** | | 2, 3.1, 3.2, 5.3.1.3, 5.5.1.2.2, 5.5.1.2.4, 5.5.1.3.2, 5.5.1.3.4, 9.11.3.1 | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **Y** | **N** |  | | | |  | | |
| ***Other specs*** | |  | **X** | Other core specifications | | | | TS/TR ... CR ... | | |
| ***affected:*** | |  | **X** | Test specifications | | | | TS/TR ... CR ... | | |
| ***(show related CRs)*** | |  | **X** | O&M Specifications | | | | TS/TR ... CR ... | | |
|  | |  | | | | | | | | |
| ***Other comments:*** | |  | | | | | | | | |
|  | |  | | | | | | | | |
| ***This CR's revision history:*** | |  | | | | | | | | |

\*\*\*\*\* change \*\*\*\*\*

# 2 References

The following documents contain provisions which, through reference in this text, constitute provisions of the present document.

- References are either specific (identified by date of publication, edition number, version number, etc.) or non‑specific.

- For a specific reference, subsequent revisions do not apply.

- For a non-specific reference, the latest version applies. In the case of a reference to a 3GPP document (including a GSM document), a non-specific reference implicitly refers to the latest version of that document in the same Release as the present document.

[1] 3GPP TR 21.905: "Vocabulary for 3GPP Specifications".

[1A] 3GPP TS 22.011: "Service accessibility".

[2] 3GPP TS 22.101: "Service aspects; Service principles".

[3] 3GPP TS 22.261: "Service requirements for the 5G system; Stage 1".

[4] 3GPP TS 23.003: "Numbering, addressing and identification".

[4A] 3GPP TS 23.040: "Technical realization of Short Message Service (SMS)".

[5] 3GPP TS 23.122: "Non-Access-Stratum functions related to Mobile Station (MS) in idle mode".

[6] 3GPP TS 23.167: "IP Multimedia Subsystem (IMS) emergency sessions".

[6A] 3GPP TS 23.216: "Single Radio Voice Call Continuity (SRVCC); Stage 2".

[6B] 3GPP TS 23.273: "5G System (5GS) Location Services (LCS); Stage 2".

[6C] 3GPP TS 23.287: "Architecture enhancements for 5G System (5GS) to support Vehicle-to-Everything (V2X) services".

[6D] 3GPP TS 23.316: "Wireless and wireline convergence access support for the 5G System (5GS)".

[6E] 3GPP TS 23.304: "Proximity based Services (ProSe) in the 5G System (5GS)".

[7] 3GPP TS 23.401: "GPRS enhancements for E-UTRAN access".

[8] 3GPP TS 23.501: "System Architecture for the 5G System; Stage 2".

[9] 3GPP TS 23.502: "Procedures for the 5G System; Stage 2".

[10] 3GPP TS 23.503: "Policy and Charging Control Framework for the 5G System; Stage 2".

[11] 3GPP TS 24.007: "Mobile radio interface signalling layer 3; General aspects".

[12] 3GPP TS 24.008: "Mobile Radio Interface Layer 3 specification; Core Network Protocols; Stage 3".

[13] 3GPP TS 24.011: "Point-to-Point Short Message Service (SMS) support on mobile radio interface".

[13A] 3GPP TS 24.080: "Mobile radio interface layer 3 Supplementary services specification; Formats and coding".

[13B] 3GPP TS 24.193: "Access Traffic Steering, Switching and Splitting; Stage 3".

[14] 3GPP TS 24.229: "IP multimedia call control protocol based on Session Initiation Protocol (SIP) and Session Description Protocol (SDP); Stage 3".

[14A] 3GPP TS 24.250: "Protocol for Reliable Data Service; Stage 3".

[15] 3GPP TS 24.301: "Non-Access-Stratum (NAS) protocol for Evolved Packet System (EPS); Stage 3".

[16] 3GPP TS 24.302: "Access to the 3GPP Evolved Packet Core (EPC) via non-3GPP access networks; Stage 3"

[17] 3GPP TS 24.368: "Non-Access Stratum (NAS) configuration Management Object (MO)".

[18] 3GPP TS 24.502: "Access to the 3GPP 5G System (5GS) via non-3GPP access networks; Stage 3".

[19] 3GPP TS 24.526: "UE policies for 5G System (5GS); Stage 3".

[19A] 3GPP TS 24.535: "Device-Side Time-Sensitive Networking (TSN) Translator (DS-TT) to Network-Side TSN Translator (NW-TT) protocol aspects; Stage 3".

[19B] 3GPP TS 24.587: "Vehicle-to-Everything (V2X) services in 5G System (5GS); Protocol aspects; Stage 3"

[19C] 3GPP TS 24.588: "Vehicle-to-Everything (V2X) services in 5G System (5GS); User Equipment (UE) policies; Stage 3"

[19D] 3GPP TS 24.519: "Time-Sensitive Networking (TSN) Application Function (AF) to Device-Side TSN Translator (DS-TT) and Network-Side TSN Translator (NW-TT) protocol aspects; Stage 3".

[19E] 3GPP TS 24.554: "Proximity-service (ProSe) in 5G System (5GS) protocol aspects; Stage 3".[20] 3GPP TS 24.623: "Extensive Markup Language (XML) Configuration Access Protocol (XCAP) over the Ut interface for Manipulating Supplementary Services".

[20AA] 3GPP TS 29.500: "5G System; Technical Realization of Service Based Architecture; Stage 3".

[20A] 3GPP TS 29.502: "5G System; Session Management Services; Stage 3".

[20AB] 3GPP TS 29.503: "5G System; Unified Data Management Services; Stage 3".

[20B] 3GPP TS 29.518: "5G System; Access and Mobility Management Services; Stage 3".

[21] 3GPP TS 29.525: "5G System; UE Policy Control Service; Stage 3".

[21A] 3GPP TS 29.526: "5G System; Network Slice-Specific Authentication and Authorization (NSSAA) services; Stage 3".

[22] 3GPP TS 31.102: "Characteristics of the Universal Subscriber Identity Module (USIM) application".

[22A] 3GPP TS 31.111: "USIM Application Toolkit (USAT)".

[22B] 3GPP TS 31.115: "Secured packet structure for (Universal) Subscriber Identity Module (U)SIM Toolkit applications".

[23] 3GPP TS 33.102: "3G security; Security architecture".

[23A] 3GPP TS 33.401: "3GPP System Architecture Evolution; Security architecture".

[24] 3GPP TS 33.501: "Security architecture and procedures for 5G System".

[24A] 3GPP TS 33.535: "Authentication and Key Management for Applications (AKMA) based on 3GPP credentials in the 5G System (5GS)".

[25] 3GPP TS 36.323: "NR; Packet Data Convergence Protocol (PDCP) specification".

[25A] 3GPP TS 36.331: "Evolved Universal Terrestrial Radio Access (E-UTRA); Radio Resource Control (RRC) protocol specification".

[25B] 3GPP TS 36.300: "Evolved Universal Terrestrial Radio Access (E-UTRA) and Evolved Universal Terrestrial Radio Access Network (E-UTRAN); Overall description".

[25C] 3GPP TS 36.304: "Evolved Universal Terrestrial Radio Access (E-UTRA); User Equipment (UE) procedures in idle mode".

[25D] 3GPP TS 36.306: "Evolved Universal Terrestrial Radio Access (E-UTRA); User Equipment (UE) radio access capabilities".

[25E] 3GPP TS 36.321: "Evolved Universal Terrestrial Radio Access (E-UTRA); Medium Access Control (MAC) protocol specification".

[26] 3GPP TS 36.355: "Evolved Universal Terrestrial Radio Access (E-UTRA); LTE Positioning Protocol (LPP)".

[27] 3GPP TS 38.300: "NR; NR and NG-RAN Overall Description; Stage 2".

[28] 3GPP TS 38.304: "New Generation Radio Access Network; User Equipment (UE) procedures in Idle mode".

[29] 3GPP TS 38.323: "Evolved Universal Terrestrial Radio Access (E-UTRA); Packet Data Convergence Protocol (PDCP) specification".

[30] 3GPP TS 38.331: "NR; Radio Resource Control (RRC); Protocol Specification".

[31] 3GPP TS 38.413: "NG Radio Access Network (NG-RAN); NG Application Protocol (NGAP)".

[31A] IEEE Std 802.3™-2018: "Ethernet".

[31AA] 3GPP TS 38.509: "Special conformance testing functions for User Equipment (UE)".

[32] IETF RFC 768: "User Datagram Protocol".

[33] IETF RFC 793: "Transmission Control Protocol."

[33A] IETF RFC 3095: "RObust Header Compression (ROHC): Framework and four profiles: RTP, UDP, ESP and uncompressed".

[33B] Void.

[33C] Void.

[33D] IETF RFC 8415: "Dynamic Host Configuration Protocol for IPv6 (DHCPv6)".

[34] IETF RFC 3748: "Extensible Authentication Protocol (EAP)".

[34A] IETF RFC 3843: "RObust Header Compression (ROHC): A Compression Profile for IP".

[35] Void.

[35A] IETF RFC 4122: "A Universally Unique IDentifier (UUID) URN Namespace".

[36] IETF RFC 4191: "Default Router Preferences and More-Specific Routes".

[37] IETF RFC 7542: "The Network Access Identifier".

[38] IETF RFC 4303: "IP Encapsulating Security Payload (ESP)".

[38A] IETF RFC 4815: "RObust Header Compression (ROHC): Corrections and Clarifications to RFC 3095".

[38B] IETF RFC 4861: "Neighbor Discovery for IP version 6 (IPv6)".

[39] IETF RFC 4862: "IPv6 Stateless Address Autoconfiguration".

[39A] IETF RFC 5225: "RObust Header Compression (ROHC) Version 2: Profiles for RTP, UDP, IP, ESP and UDP Lite".

[39B] IETF RFC 5795: "The RObust Header Compression (ROHC) Framework".

[40] IETF RFC 5448: "Improved Extensible Authentication Protocol Method for 3rd Generation Authentication and Key Agreement (EAP-AKA')".

[40A] IETF RFC 6603: "Prefix Exclude Option for DHCPv6-based Prefix Delegation".

[40B] IETF RFC 6846: "RObust Header Compression (ROHC): A Profile for TCP/IP (ROHC-TCP)".

[41] IETF RFC 7296: "Internet Key Exchange Protocol Version 2 (IKEv2)".

[42] ITU-T Recommendation E.212: "The international identification plan for public networks and subscriptions", 2016-09-23.

[43] IEEE Std 802-2014: "IEEE Standard for Local and Metropolitan Area Networks: Overview and Architecture" (30 June 2014).

[43A] IEEE Std 802.1AS-2020: "IEEE Standard for Local and metropolitan area networks--Timing and Synchronization for Time-Sensitive Applications".

[43B] IEEE Std 1588™-2008: "IEEE Standard for a Precision Clock Synchronization Protocol for Networked Measurement and Control Systems".

[43C] Void.

[43D] Void.

[43E] Void.

[44] Void.

[45] Void.

[46] Void.

[47] Void.

[48] IEEE "Guidelines for Use of Extended Unique Identifier (EUI), Organizationally Unique Identifier (OUI), and Company ID (CID)".

[49] BBF TR-069: "CPE WAN Management Protocol".

[50] BBF TR-369: "User Services Platform (USP)".

[51] 3GPP TS 37.340: "Evolved Universal Terrestrial Radio Access (E-UTRA) and NR; Multi-connectivity; Stage 2".

\*\*\*\*\* change \*\*\*\*\*

## 3.1 Definitions

\*\*\*\*\*\*skipped for clarity\*\*\*\*\*\*

For the purposes of the present document, the following terms and definitions given in 3GPP TS 38.413 [31] apply:

**NG connection**

For the purposes of the present document, the following terms and definitions given in 3GPP TS 24.587 [19B] apply:

**E-UTRA-PC5**

**NR-PC5**

**V2X**

For the purposes of the present document, the following terms and definitions given in 3GPP TS 24.554 [19E] apply:

**ProSe**

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## 3.2 Abbreviations

For the purposes of the present document, the abbreviations given in 3GPP TR 21.905 [1] and the following apply. An abbreviation defined in the present document takes precedence over the definition of the same abbreviation, if any, in 3GPP TR 21.905 [1].

4G-GUTI 4G-Globally Unique Temporary Identifier

5GCN 5G Core Network

5G-GUTI 5G-Globally Unique Temporary Identifier

5GMM 5GS Mobility Management

5G-RG 5G Residential Gateway

5G-BRG 5G Broadband Residential Gateway

5G-CRG 5G Cable Residential Gateway

5GS 5G System

5GSM 5GS Session Management

5G-S-TMSI 5G S-Temporary Mobile Subscription Identifier

5G-TMSI 5G Temporary Mobile Subscription Identifier

5QI 5G QoS Identifier

ACS Auto-Configuration Server

AKA Authentication and Key Agreement

AKMA Authentication and Key Management for Applications

A-KID AKMA Key Identifier

A-TID AKMA Temporary Identifier

AMBR Aggregate Maximum Bit Rate

AMF Access and Mobility Management Function

APN Access Point Name

ATSSS Access Traffic Steering, Switching and Splitting

AUSF Authentication Server Function

CAG Closed access group

CHAP Challenge Handshake Authentication Protocol

DDX Downlink Data Expected

DL Downlink

DN Data Network

DNN Data Network Name

eDRX Extended DRX cycle

DS-TT Device-Side TSN Translator

EUI Extended Unique Identifier

E-UTRAN Evolved Universal Terrestrial Radio Access Network

EAP-AKA' Improved Extensible Authentication Protocol method for 3rd generation Authentication and Key Agreement

ECIES Elliptic Curve Integrated Encryption Scheme

EPD Extended Protocol Discriminator

EMM EPS Mobility Management

EPC Evolved Packet Core Network

EPS Evolved Packet System

ESM EPS Session Management

FN-RG Fixed Network RG

FN-BRG Fixed Network Broadband RG

FN-CRG Fixed Network Cable RG

Gbps Gigabits per second

GFBR Guaranteed Flow Bit Rate

GUAMI Globally Unique AMF Identifier

IAB Integrated access and backhaul

IMEI International Mobile station Equipment Identity

IMEISV International Mobile station Equipment Identity and Software Version number

IMSI International Mobile Subscriber Identity

IP-CAN IP-Connectivity Access Network

KSI Key Set Identifier

LADN Local Area Data Network

LCS LoCation Services

LMF Location Management Function

LPP LTE Positioning Protocol

MAC Message Authentication Code

MA PDU Multi-Access PDU

Mbps Megabits per second

MFBR Maximum Flow Bit Rate

MICO Mobile Initiated Connection Only

N3IWF Non-3GPP Inter-Working Function

N5CW Non-5G-Capable over WLAN

N5GC Non-5G Capable

NAI Network Access Identifier

NITZ Network Identity and Time Zone

NR New Radio

ngKSI Key Set Identifier for Next Generation Radio Access Network

NPN Non-public network

NSSAA Network slice-specific authentication and authorization

NSSAAF NSSAA Function

NSSAI Network Slice Selection Assistance Information

OS Operating System

OS Id OS Identity

PAP Password Authentication Protocol

PCO Protocol Configuration Option

PEI Permanent Equipment Identifier

PNI-NPN Public Network Integrated Non-Public Network

ProSe Proximity based Services

PTI Procedure Transaction Identity

QFI QoS Flow Identifier

QoS Quality of Service

QRI QoS Rule Identifier

RACS Radio Capability Signalling Optimisation

(R)AN (Radio) Access Network

RFSP RAT Frequency Selection Priority

RG Residential Gateway

RPLMN Registered PLMN

RQA Reflective QoS Attribute

RQI Reflective QoS Indication

RSNPN Registered SNPN

S-NSSAI Single NSSAI

SA Security Association

SDF Service Data Flow

SMF Session Management Function

SGC Service Gap Control

SNN Serving Network Name

SNPN Stand-alone Non-Public Network

SOR Steering of Roaming

SUCI Subscription Concealed Identifier

SUPI Subscription Permanent Identifier

TA Tracking Area

TAC Tracking Area Code

TAI Tracking Area Identity

Tbps Terabits per second

TNGF Trusted Non-3GPP Gateway Function

TSC Time Sensitive Communication

TWIF Trusted WLAN Interworking Function

TSN Time-Sensitive Networking

UDM Unified Data Management

UL Uplink

UPDS UE policy delivery service

UPF User Plane Function

UPSC UE Policy Section Code

UPSI UE Policy Section Identifier

URN Uniform Resource Name

URSP UE Route Selection Policy

V2X Vehicle-to-Everything

V2XP V2X policy

W-AGF Wireline Access Gateway Function

WLAN Wireless Local Area Network

WUS Wake-up signal

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#### 5.3.1.3 Release of the N1 NAS signalling connection

The signalling procedure for the release of the N1 NAS signalling connection is initiated by the network.

In N1 mode, upon indication from lower layers that the access stratum connection has been released, the UE shall enter 5GMM-IDLE mode and consider the N1 NAS signalling connection released.

If the UE in 3GPP access is configured for eCall only mode as specified in 3GPP TS 31.102 [22] then:

- if the N1 NAS signalling connection that was released had been established for eCall over IMS, the UE shall start timer T3444; and

- if the N1 NAS signalling connection that was released had been established for a call to an HPLMN designated non-emergency MSISDN or URI for test or terminal reconfiguration service, the UE shall start timer T3445.

The UE shall start the timer T3447 if not already running when the N1 NAS signalling connection is released as specified in subclause 5.3.17.

To allow the network to release the N1 NAS signalling connection, the UE:

a) shall start the timer T3540 if the UE receives any of the 5GMM cause values #7, #11, #12, #13, #15, #27, #31, #62, #72, #73, #74, #75, #76;

b) shall start the timer T3540 for a UE in 3GPP access if:

1) the UE receives a REGISTRATION ACCEPT message which does not include a Pending NSSAI IE or UE radio capability ID deletion indication IE;

2) the UE has set the Follow-on request indicator to "No follow-on request pending" in the REGISTRATION REQUEST message;

3) the UE has not included the Uplink data status IE in the REGISTRATION REQUEST message, or the UE has included the Uplink data status IE in the REGISTRATION REQUEST message but the REGISTRATION ACCEPT message indicates that no user-plane resources of any PDU sessions are to be re-established;

4) the UE has not included the Allowed PDU session status IE or has included the Allowed PDU session status IE indicating there is no PDU session(s) for which the UE allowed the user-plane resource to be re-established over 3GPP access in the REGISTRATION REQUEST message, or the UE has included the Allowed PDU session status IE in the REGISTRATION REQUEST message but the REGISTRATION ACCEPT message does not indicate that any user-plane resources of any PDU sessions are to be re-established;

5) the registration procedure has been initiated in 5GMM-IDLE mode;

6) the user-plane resources for PDU sessions have not been set up;

7) the UE need not request resources for V2X communication over PC5 reference point (see 3GPP TS 23.287 [6C]); and

8) the UE need not request resources for ProSe communications over PC5 reference point (see 3GPP TS 23.304 [6E]);

NOTE 1: The lower layers indicate when the user-plane resources for PDU sessions are successfully established or released.

c) shall start the timer T3540 if the UE receives a REGISTRATION REJECT message indicating:

the 5GMM cause value #9 or #10;

d) shall start the timer T3540 if the UE receives a SERVICE REJECT message indicating:

the 5GMM cause value #9, #10 or #28;

e) shall start the timer T3540 if:

1) the UE receives a CONFIGURATION UPDATE COMMAND message containing the Configuration update indication IE with the Registration bit set to "registration requested" and with:

i) either new allowed NSSAI information or new configured NSSAI information or both included;

ii) the network slicing subscription change indication; or

iii) no other parameters;

2) the user-plane resources for PDU sessions have not been set up; and

3) no emergency PDU session has been established;

f) shall start the timer T3540 if:

1) the UE receives a SERVICE ACCEPT message;

2) the UE did not set the Service type IE to "signalling" or "high priority access", the UE has not included the Uplink data status IE in the SERVICE REQUEST message, or the UE has included the Uplink data status IE in the SERVICE REQUEST message but the SERVICE REQUEST message indicates that no user-plane resources of any PDU sessions are to be re-established;

3) the UE has not included the Allowed PDU session status IE or has included the Allowed PDU session status IE indicating there is no PDU session(s) for which the UE allowed the user-plane resource to be re-established over 3GPP access in the SERVICE ACCEPT message, or the UE has included the Allowed PDU session status IE in the SERVICE REQUEST message but the SERVICE ACCEPT message does not indicate that any user-plane resources of any PDU sessions are to be re-established;

4) the service request procedure has been initiated in 5GMM-IDLE mode;

5) the user-plane resources for PDU sessions have not been set up;

6) the UE need not request resources for V2X communication over PC5 reference point (see 3GPP TS 23.287 [6C]); and

7) the UE need not request resources for ProSe communications over PC5 reference point (see 3GPP TS 23.304 [6E]);

NOTE 2: The lower layers indicate when the user-plane resources for PDU sessions are successfully established or released.

g) may start the timer T3540 if the UE receives any of the 5GMM cause values #3 or #6 or if it receives an AUTHENTICATION REJECT message; or

h) shall start the timer T3540 upon completion of the configuration update procedure or the registration procedure if the UE does not have an emergency PDU session and:

1) the UE received a CONFIGURATION UPDATE COMMAND message or a REGISTRATION ACCEPT message while camping on a CAG cell and the entry for the current PLMN in the received "CAG information list" does not include any of the CAG-ID(s) supported by the current CAG cell;

2) the UE received a CONFIGURATION UPDATE COMMAND message or a REGISTRATION ACCEPT message while camping on a non-CAG cell and the entry for the current PLMN in the received "CAG information list" includes an "indication that the UE is only allowed to access 5GS via CAG cells"; or

3) the UE received a CONFIGURATION UPDATE COMMAND message while camping on a CAG cell and the entry for the current PLMN in not included in the received "CAG information list".

Upon expiry of T3540,

- in cases a), b), f), g) and h) the UE shall locally release the established N1 NAS signalling connection;

- in cases c) and d) the UE shall locally release the established N1 NAS signalling connection and the UE shall initiate the registration procedure as described in subclause 5.5.1.3 or  5.6.1.5; or

- in case e), the UE shall locally release the established N1 NAS signalling connection and perform a new registration procedure as specified in subclause 5.5.1.3.2.

In case a),

- upon receiving a request from the upper layers to perform emergency services fallback only for a UE in 3GPP access or establishing an emergency PDU session, the UE shall stop timer T3540 and shall locally release the N1 NAS signalling connection, before proceeding as specified in subclause 5.5.1.

In case b) and f),

- upon an indication from the lower layers that the user-plane resources for PDU sessions are set up, the UE shall stop timer T3540 and may send uplink signalling via the existing N1 NAS signalling connection or user data via user plane. If the uplink signalling is associated with emergency services fallback only for a UE in 3GPP access or establishing an emergency PDU session, the UE shall stop timer T3540 and send the uplink signalling via the existing N1 NAS signalling connection;

- upon receipt of a DEREGISTRATION REQUEST message, the UE shall stop timer T3540 and respond to the network-initiated de-registration request via the existing N1 NAS signalling connection as specified in subclause 5.5.2.3;

- upon receipt of a message of a network-initiated 5GMM common procedure, the UE shall stop timer T3540 and respond to the network-initiated 5GMM common procedure via the existing N1 NAS signalling connection as specified in subclause 5.4;

- if there is no user-plane resources established for PDU sessions, upon receiving a request from the upper layers to perform emergency services fallback only for a UE in 3GPP access or establishing an emergency PDU session, the UE shall stop timer T3540 and shall locally release the N1 NAS signalling connection, before proceeding as specified in subclause 5.6.1;

- if there is no user-plane resources established for PDU sessions, upon receiving a request from the upper layers to perform services other than emergency services fallback only for a UE in 3GPP access or establishing an emergency PDU session, the UE shall wait for the local release of the established N1 NAS signalling connection upon expiry of timer T3540 or wait for timer T3540 being stopped, before initiating NAS signalling;

- upon receipt of a DL NAS TRANSPORT message, the UE shall stop timer T3540 and may send uplink signalling via the existing N1 NAS signalling connection; or

- upon initiation of registration procedure for mobility and periodic registration update due to cell change into new tracking area not in the TAI list as specified in subclause 5.5.1.2.7 for cases h), i), j), subclause 5.5.1.3.7 for cases j), k) or subclause 5.5.1.3.2 for case a), the UE shall stop timer T3540.

In case c) and d),

- upon an indication from the lower layers that the access stratum connection has been released, the UE shall stop timer T3540 and perform a new registration procedure as specified in subclause 5.5.1.3.5 or 5.6.1.5.

- upon receiving a request from the upper layers to perform emergency services fallback only for a UE in 3GPP access or establishing an emergency PDU session, the UE shall stop timer T3540 and shall locally release the N1 NAS signalling connection, before proceeding as specified in subclause 5.5.1.

In case e),

- upon an indication from the lower layers that the access stratum connection has been released, the UE shall stop timer T3540 and perform a new registration procedure as specified in subclause 5.5.1.3.2.

- upon an indication from the lower layers that the user-plane resources for PDU sessions are set up, the UE shall stop timer T3540 and may send user data via user plane.

NOTE 3: In this case, the new registration procedure is performed when the UE moves to the 5GMM-IDLE mode.

- upon receiving a request from the upper layers to perform emergency services fallback only for a UE in 3GPP access or establishing an emergency PDU session, the UE shall stop timer T3540 and shall locally release the N1 NAS signalling connection, before proceeding as specified in subclause 5.5.1.

If the UE had set the Follow-on request indicator to "Follow-on request pending" in the REGISTRATION REQUEST message due to pending uplink signalling but cannot send the pending signalling due to new service area restrictions received or due to network not supporting the feature as indicated in the REGISTRATION ACCEPT message (for example UE set the "Follow-on request pending" to send SMS over NAS but AMF notified "SMS over NAS not allowed") and if there is no further pending data or signalling and user plane resources have not been set up, the UE may locally release the established N1 NAS signalling connection upon completion of the registration procedure.

\*\*\*\*\* change \*\*\*\*\*

##### 5.5.1.2.2 Initial registration initiation

\*\*\*\*\*\*skipped for clarify\*\*\*\*\*\*

If the UE initiates an initial registration for emergency services or needs to prolong the established NAS signalling connection after the completion of the initial registration procedure (e.g. due to uplink signalling pending), the UE shall set the Follow-on request indicator to "Follow-on request pending".

NOTE 6: The UE is not required to set the Follow-on request indicator to "Follow-on request pending", even if the UE has to request resources for V2X communication or ProSe communications over PC5 reference point.

If the UE supports S1 mode, the UE shall:

- set the S1 mode bit to "S1 mode supported" in the 5GMM capability IE of the REGISTRATION REQUEST message;

- include the S1 UE network capability IE in the REGISTRATION REQUEST message; and

- if the UE supports sending an ATTACH REQUEST message containing a PDN CONNECTIVITY REQUEST message with request type set to "handover" to transfer a PDU session from N1 mode to S1 mode, set the HO attach bit to "attach request message containing PDN connectivity request with request type set to handover to transfer PDU session from N1 mode to S1 mode supported" in the 5GMM capability IE of the REGISTRATION REQUEST message.

If the UE supports the LTE positioning protocol (LPP) in N1 mode as specified in 3GPP TS 36.355 [26], the UE shall set the LPP bit to "LPP in N1 mode supported" in the 5GMM capability IE of the REGISTRATION REQUEST message.

If the UE supports the Location Services (LCS) notification mechanisms in N1 mode as specified in 3GPP TS 23.273 [6B], the UE shall set the 5G-LCS bit to "LCS notification mechanisms supported" in the 5GMM capability IE of the REGISTRATION REQUEST message.

If the UE is in NB-N1 mode, then the UE shall set the Control plane CIoT 5GS optimization bit to "Control plane CIoT 5GS optimization supported" in the 5GMM capability IE of the REGISTRATION REQUEST message. If the UE is capable of NB-S1 mode, then the UE shall set the Control plane CIoT EPS optimization bit to "Control plane CIoT EPS optimization supported" in the S1 UE network capability IE of the REGISTRATION REQUEST message.

If the UE supports N3 data transfer and multiple user-plane resources in NB-N1 mode (see 3GPP TS 36.306 [25D], 3GPP TS 36.331 [25A]), then the UE shall set the Multiple user-plane resources support bit to "Multiple user-plane resources supported" in the 5GMM capability IE of the REGISTRATION REQUEST message.

If the UE supports 5G-SRVCC from NG-RAN to UTRAN as specified in 3GPP TS 23.216 [6A], the UE shall:

- set the 5G-SRVCC from NG-RAN to UTRAN capability bit to "5G-SRVCC from NG-RAN to UTRAN supported" in the 5GMM capability IE of the REGISTRATION REQUEST message; and

- include the Mobile station classmark 2 IE and the Supported codecs IE in the REGISTRATION REQUEST message.

If the UE supports service gap control, then the UE shall set the SGC bit to "service gap control supported" in the 5GMM capability IE of the REGISTRATION REQUEST message.

If the UE supports the restriction on use of enhanced coverage, the UE shall set the RestrictEC bit to "Restriction on use of enhanced coverage supported" in the 5GMM capability IE of the REGISTRATION REQUEST message.

If the UE supports network slice-specific authentication and authorization, the UE shall set the NSSAA bit to "network slice-specific authentication and authorization supported" in the 5GMM capability IE of the REGISTRATION REQUEST message.

If the UE supports CAG feature, the UE shall set the CAG bit to "CAG Supported" in the 5GMM capability IE of the REGISTRATION REQUEST message.

When the UE is not in NB-N1 mode, if the UE supports RACS, the UE shall:

a) set the RACS bit to "RACS supported" in the 5GMM capability IE of the REGISTRATION REQUEST message;

b) if the UE has an applicable network-assigned UE radio capability ID for the current UE radio configuration in the selected PLMN or SNPN, include the applicable network-assigned UE radio capability ID in the UE radio capability ID IE of the REGISTRATION REQUEST message; and

c) if the UE:

1) does not have an applicable network-assigned UE radio capability ID for the current UE radio configuration in the selected PLMN or SNPN; and

2) has an applicable manufacturer-assigned UE radio capability ID for the current UE radio configuration,

include the applicable manufacturer-assigned UE radio capability ID in the UE radio capability ID IE of the REGISTRATION REQUEST message.

If the UE has one or more stored UE policy sections identified by a UPSI with the PLMN ID part indicating the HPLMN or the selected PLMN, the UE shall set the Payload container type IE to "UE policy container" and include the UE STATE INDICATION message (see annex D) in the Payload container IE of the REGISTRATION REQUEST message.

NOTE 7: In this version of the protocol, the UE can only include the Payload container IE in the REGISTRATION REQUEST message to carry a payload of type "UE policy container".

If the UE does not have a valid 5G NAS security context, the UE shall send the REGISTRATION REQUEST message without including the NAS message container IE. The UE shall include the entire REGISTRATION REQUEST message (i.e. containing cleartext IEs and non-cleartext IEs, if any) in the NAS message container IE that is sent as part of the SECURITY MODE COMPLETE message as described in subclauses 4.4.6 and 5.4.2.3.

If the UE has a valid 5G NAS security context and the UE needs to send non-cleartext IEs, the UE shall send a REGISTRATION REQUEST message including the NAS message container IE as described in subclause 4.4.6. If the UE does not need to send non-cleartext IEs, the UE shall send a REGISTRATION REQUEST message without including the NAS message container IE.

If the UE supports ciphered broadcast assistance data and needs to obtain new ciphering keys, the UE shall include the Additional information requested IE with the CipherKey bit set to "ciphering keys for ciphered broadcast assistance data requested" in the REGISTRATION REQUEST message.

The UE shall set the WUSA bit to "WUS assistance information reception supported" in the 5GMM capability IE if the UE supports WUS assistance information. The UE may include its UE paging probability information in the Requested WUS assistance information IE if the UE has set the WUSA bit to "WUS assistance information reception supported" in the 5GMM capability IE and the UE is not performing the initial registration for emergency services.

If the REGISTRATION REQUEST message includes a NAS message container IE, the AMF shall process the REGISTRATION REQUEST message that is obtained from the NAS message container IE as described in subclause 4.4.6.

If the UE supports V2X as specified in 3GPP TS 24.587 [19B], the UE shall set the V2X bit to "V2X supported" in the 5GMM capability IE of the REGISTRATION REQUEST message. If the UE supports V2X communication over E-UTRA-PC5 as specified in 3GPP TS 24.587 [19B], the UE shall set the V2XCEPC5 bit to "V2X communication over E-UTRA-PC5 supported" in the 5GMM capability IE of the REGISTRATION REQUEST message. If the UE supports V2X communication over NR-PC5 as specified in 3GPP TS 24.587 [19B], the UE shall set the V2XCNPC5 bit to "V2X communication over NR-PC5 supported" in the 5GMM capability IE of the REGISTRATION REQUEST message.

If the UE supports extended rejected NSSAI, then the UE shall set the ER-NSSAI bit to "Extended rejected NSSAI supported" in the 5GMM capability IE of the REGISTRATION REQUEST message.

If the W-AGF acting on behalf of an N5GC device initiates an initial registration as specified in 3GPP TS 23.316 [6D], the W-AGF acting on behalf of the N5GC device shall include the N5GC indication IE with the N5GC device indication bit set to "N5GC device registration is requested" in the REGISTRATION REQUEST message.

If the UE supports ProSe direct discovery as specified in 3GPP TS 24.554 [19E], the UE shall set the ProSe-dd bit to "ProSe direct discovery supported" in the 5GMM capability IE of the REGISTRATION REQUEST message. If the UE supports ProSe direct communications as specified in 3GPP TS 24.554 [19E], the UE shall set the ProSe-dc bit to "ProSe direct communication supported" in the 5GMM capability IE of the REGISTRATION REQUEST message. If the UE supports ProSe UE-to-network relay as specified in 3GPP TS 24.554 [19E], the UE shall set the ProSe-relay bit to "Acting as a ProSe UE-to-network relay supported" in the 5GMM capability IE of the REGISTRATION REQUEST message. If the UE supports ProSe communications over NR-PC5 as specified in 3GPP TS 24.554 [19E], the UE shall set the ProSePC5 bit to "ProSe communications over NR-PC5 supported" in the 5GMM capability IE of the REGISTRATION REQUEST message.



Figure 5.5.1.2.2.1: Registration procedure for initial registration

\*\*\*\*\* change \*\*\*\*\*

##### 5.5.1.2.4 Initial registration accepted by the network

\*\*\*\*\*\*skipped for clarify\*\*\*\*\*\*

If the UE is authorized to use V2X communication over PC5 reference point based on:

a) at least one of the following bits in the 5GMM capability IE of the REGISTRATION REQUEST message set by the UE, or already stored in the 5GMM context in the AMF during the previous registration procedure as follows:

1) the V2XCEPC5 bit to "V2X communication over E-UTRA-PC5 supported"; or

2) the V2XCNPC5 bit to "V2X communication over NR-PC5 supported"; and

b) the user's subscription context obtained from the UDM as defined in 3GPP TS 23.287 [6C];

the AMF should not immediately release the NAS signalling connection after the completion of the registration procedure.

If the UE is authorized to use ProSe communications over PC5 reference point based on:

a) the ProSePC5 bits set to "ProSe communications over NR-PC5 supported" in the 5GMM capability IE of the REGISTRATION REQUEST message by the UE or already stored in the 5GMM context in the AMF during the previous registration procedure; and

b) the user's subscription context obtained from the UDM as defined in 3GPP TS 23.304 [6E];

the AMF should not immediately release the NAS signalling connection after the completion of the registration procedure.

If the Requested DRX parameters IE was included in the REGISTRATION REQUEST message, the AMF shall include the Negotiated DRX parameters IE in the REGISTRATION ACCEPT message. The AMF may set the Negotiated DRX parameters IE based on the received Requested DRX parameters IE and operator policy if available.

If the Requested NB-N1 mode DRX parameters IE was included in the REGISTRATION REQUEST message, the AMF shall include the Negotiated NB-N1 mode DRX parameters IE in the REGISTRATION ACCEPT message. The AMF may set the Negotiated NB-N1 mode DRX parameters IE based on the received Requested NB-N1 mode DRX parameters IE and operator policy if available.

The AMF shall include the Negotiated extended DRX parameters IE in the REGISTRATION ACCEPT message only if the Requested extended DRX parameters IE was included in the REGISTRATION REQUEST message, and the AMF supports and accepts the use of eDRX. The AMF may set the Negotiated extended DRX parameters IE based on the received Requested extended DRX parameters IE, operator policy, and the user's subscription context obtained from the UDM if available.

If:

a) the UE's USIM is configured with indication that the UE is to receive the SOR transparent container IE, the SOR transparent container IE is not included in the REGISTRATION ACCEPT message or the SOR transparent container IE does not successfully pass the integrity check (see 3GPP TS 33.501 [24]); and

b) if the UE attempts obtaining service on another PLMNs as specified in 3GPP TS 23.122 [5] annex C;

then the UE shall locally release the established N1 NAS signalling connection after sending a REGISTRATION COMPLETE message.

If the REGISTRATION ACCEPT message includes the SOR transparent container IE and the SOR transparent container IE successfully passes the integrity check (see 3GPP TS 33.501 [24]), the ME shall store the received SOR counter as specified in annex C and proceed as follows:

a) the UE shall proceed with the behaviour as specified in 3GPP TS 23.122 [5] annex C; and

b) if the registration procedure is performed over 3GPP access and the UE attempts obtaining service on another PLMNs as specified in 3GPP TS 23.122 [5] annex C, then the UE may locally release the established N1 NAS signalling connection after sending a REGISTRATION COMPLETE message. Otherwise the UE shall send a REGISTRATION COMPLETE message and not release the current N1 NAS signalling connection locally. If an acknowledgement is requested in the SOR transparent container IE of the REGISTRATION ACCEPT message, the UE acknowledgement is included in the SOR transparent container IE of the REGISTRATION COMPLETE message.

If the SOR transparent container IE successfully passes the integrity check (see 3GPP TS 33.501 [24]), indicates list of preferred PLMN/access technology combinations is provided and the list type indicates:

a) "PLMN ID and access technology list", then the ME shall replace the highest priority entries in the "Operator Controlled PLMN Selector with Access Technology" list stored in the ME and shall proceed with the behaviour as specified in 3GPP TS 23.122 [5] annex C; or

b) "secured packet", then the ME shall behave as if a SMS is received with protocol identifier set to SIM data download, data coding scheme set to class 2 message and SMS payload as secured packet contents of SOR transparent container IE. The SMS payload is forwarded to UICC as specified in 3GPP TS 23.040 [4A] and the ME shall proceed with the behaviour as specified in 3GPP TS 23.122 [5] annex C.

If required by operator policy, the AMF shall include the NSSAI inclusion mode IE in the REGISTRATION ACCEPT message (see table 4.6.2.3.1 of subclause 4.6.2.3). Upon receipt of the REGISTRATION ACCEPT message:

a) if the message includes the NSSAI inclusion mode IE, the UE shall operate in the NSSAI inclusion mode indicated in the NSSAI inclusion mode IE over the current access within the current PLMN and its equivalent PLMN(s), if any, in the current registration area; or

b) otherwise:

1) if the UE has NSSAI inclusion mode for the current PLMN and access type stored in the UE, the UE shall operate in the stored NSSAI inclusion mode;

2) if the UE does not have NSSAI inclusion mode for the current PLMN and the access type stored in the UE and if the UE is performing the registration procedure over:

i) 3GPP access, the UE shall operate in NSSAI inclusion mode D in the current PLMN and the current access type;

ii) untrusted non-3GPP access, the UE shall operate in NSSAI inclusion mode B in the current PLMN and the current access type; or

iii) trusted non-3GPP access, the UE shall operate in NSSAI inclusion mode D in the current PLMN and the current access type; or

3) if the 5G-RG does not have NSSAI inclusion mode for the current PLMN and wireline access stored in the 5G-RG, and the 5G-RG is performing the registration procedure over wireline access, the 5G-RG shall operate in NSSAI inclusion mode B in the current PLMN and the current access type.

The AMF may include operator-defined access category definitions in the REGISTRATION ACCEPT message.

If the UE receives Operator-defined access category definitions IE in the REGISTRATION ACCEPT message and the Operator-defined access category definitions IE contains one or more operator-defined access category definitions, the UE shall delete any operator-defined access category definitions stored for the RPLMN and shall store the received operator-defined access category definitions for the RPLMN. If the UE receives the Operator-defined access category definitions IE in the REGISTRATION ACCEPT message and the Operator-defined access category definitions IE contains no operator-defined access category definitions, the UE shall delete any operator-defined access category definitions stored for the RPLMN. If the REGISTRATION ACCEPT message does not contain the Operator-defined access category definitions IE, the UE shall not delete the operator-defined access category definitions stored for the RPLMN.

If the UE has indicated support for service gap control in the REGISTRATION REQUEST message and:

- the REGISTRATION ACCEPT message contains the T3447 value IE, then the UE shall store the new T3447 value, erase any previous stored T3447 value if exists and use the new T3447 value with the timer T3447 next time it is started; or

- the REGISTRATION ACCEPT message does not contain the T3447 value IE, then the UE shall erase any previous stored T3447 value if exists and stop the timer T3447 if running.

If the T3448 value IE is present in the received REGISTRATION ACCEPT message and the value indicates that this timer is neither zero nor deactivated, the UE shall:

a) stop timer T3448 if it is running; and

b) start timer T3448 with the value provided in the T3448 value IE.

If the UE is using 5GS services with control plane CIoT 5GS optimization, the T3448 value IE is present in the REGISTRATION ACCEPT message and the value indicates that this timer is either zero or deactivated, the UE shall ignore the T3448 value IE and proceed as if the T3448 value IE was not present.

If the REGISTRATION ACCEPT message contains the Truncated 5G-S-TMSI configuration IE, then the UE shall store the included truncated 5G-S-TMSI configuration and return a REGISTRATION COMPLETE message to the AMF to acknowledge reception of the truncated 5G-S-TMSI configuration.

NOTE 10: The UE provides the truncated 5G-S-TMSI configuration to the lower layers.

If the UE is not in NB-N1 mode, the UE has set the RACS bit to "RACS supported" in the 5GMM Capability IE of the REGISTRATION REQUEST message and the REGISTRATION ACCEPT message includes:

a) a UE radio capability ID deletion indication IE set to "Network-assigned UE radio capability IDs deletion requested", the UE shall delete any network-assigned UE radio capability IDs associated with the RPLMN or RSNPN stored at the UE, then the UE shall, after the completion of the ongoing registration procedure, initiate a registration procedure for mobility and periodic registration update as specified in subclause 5.5.1.3.2 over the existing N1 NAS signalling connection; and

b) a UE radio capability ID IE, the UE shall store the UE radio capability ID as specified in annex C.

\*\*\*\*\* change \*\*\*\*\*

##### 5.5.1.3.2 Mobility and periodic registration update initiation

\*\*\*\*\*\*skipped for clarify\*\*\*\*\*\*

The UE shall set the Follow-on request indicator to "Follow-on request pending", if the UE:

a) initiates the mobility and periodic registration updating procedure upon request of the upper layers to establish an emergency PDU session;

b) initiates the mobility and periodic registration updating procedure upon receiving a request from the upper layers to perform emergency services fallback; or

c) needs to prolong the established NAS signalling connection after the completion of the registration procedure for mobility and periodic registration update (e.g. due to uplink signalling pending but no user data pending).

NOTE 10: The UE is not required to set the Follow-on request indicator to "Follow-on request pending" even if the UE has to request resources for V2X communication or ProSe communications over PC5 reference point.

For case n), the UE shall include the 5GS update type IE in the REGISTRATION REQUEST message with the NG-RAN-RCU bit set to " UE radio capability update needed". Additionally, if the UE is not in NB-N1 mode, the UE supports RACS and the UE has an applicable UE radio capability ID for the new UE radio configuration in the serving PLMN or SNPN, the UE shall include the applicable UE radio capability ID in the UE radio capability ID of the REGISTRATION REQUEST message.

If the UE is in the 5GMM-CONNECTED mode and the UE changes the radio capability for NG-RAN or E‑UTRAN, the UE may locally release the established N1 NAS signalling connection and enter the 5GMM-IDLE mode. Then, the UE shall initiate the registration procedure for mobility and periodic updating including the 5GS update type IE in the REGISTRATION REQUEST message with the NG-RAN-RCU bit set to " UE radio capability update needed".

For case o), the UE shall include the Uplink data status IE in the REGISTRATION REQUEST message indicating the PDU session(s) without active user-plane resources for which the UE has pending user data to be sent, if any, and the PDU session(s) for which user-plane resources were active prior to receiving the fallback indication, if any. If the UE is in a non-allowed area or if the UE is not in allowed area, the UE shall not include the Uplink data status IE in REGISTRATION REQUEST message, except if the PDU session for which user-plane resources were active prior to receiving the fallback indication is an emergency PDU session, or if the UE is configured for high priority access in the selected PLMN as specified in subclause 5.3.5.

For case f), the UE shall include the Uplink data status IE in the REGISTRATION REQUEST message indicating the PDU session(s) for which user-plane resources were active prior to receiving "RRC Connection failure" indication from the lower layers, if any. If the UE is in non-allowed area or not in allowed area, the UE shall not include the Uplink data status IE in REGISTRATION REQUEST message, except that the PDU session(s) for which user-plane resources were active prior to receiving the "RRC Connection failure"indication is emergency PDU session(s), or that the UE is configured for high priority access in selected PLMN, as specified in subclause 5.3.5.

If the UE supports service gap control, then the UE shall set the SGC bit to "service gap control supported" in the 5GMM capability IE of the REGISTRATION REQUEST message.

For case a), x) or if the UE operating in the single-registration mode performs inter-system change from S1 mode to N1 mode, the UE shall:

a) if the UE has an applicable network-assigned UE radio capability ID for the current UE radio configuration in the selected PLMN or SNPN, include the applicable network-assigned UE radio capability ID in the UE radio capability ID IE of the REGISTRATION REQUEST message; and

b) if the UE:

1) does not have an applicable network-assigned UE radio capability ID for the current UE radio configuration in the selected PLMN or SNPN; and

2) has an applicable manufacturer-assigned UE radio capability ID for the current UE radio configuration,

include the applicable manufacturer-assigned UE radio capability ID in the UE radio capability ID IE of the REGISTRATION REQUEST message.

For all cases except cases b and z, if the UE supports ciphered broadcast assistance data and the UE needs to obtain new ciphering keys, the UE shall include the Additional information requested IE with the CipherKey bit set to "ciphering keys for ciphered broadcast assistance data requested" in the REGISTRATION REQUEST message.

For case z, the UE shall include the Additional information requested IE with the CipherKey bit set to "ciphering keys for ciphered broadcast assistance data requested" in the REGISTRATION REQUEST message.

For case a, if the UE supports ciphered broadcast assistance data and the UE detects entering a tracking area for which one or more ciphering keys stored at the UE is not applicable, the UE should include the Additional information requested IE with the CipherKey bit set to "ciphering keys for ciphered broadcast assistance data requested" in the REGISTRATION REQUEST message.

For case b, if the UE supports ciphered broadcast assistance data and the remaining validity time for one or more ciphering keys stored at the UE is less than timer T3512, the UE should include the Additional information requested IE with the CipherKey bit set to "ciphering keys for ciphered broadcast assistance data requested" in the REGISTRATION REQUEST message.

The UE shall set the WUSA bit to "WUS assistance information reception supported" in the 5GMM capability IE if the UE supports WUS assistance information. The UE may include its UE paging probability information in the Requested WUS assistance information IE if the UE has set the WUSA bit to "WUS assistance information reception supported" in the 5GMM capability IE.

If the UE indicates "mobility registration updating" in the 5GS registration type IE and supports V2X as specified in 3GPP TS 24.587 [19B], the UE shall set the V2X bit to "V2X supported" in the 5GMM capability IE of the REGISTRATION REQUEST message. If the UE indicates "mobility registration updating" in the 5GS registration type IE and supports V2X communication over E-UTRA-PC5 as specified in 3GPP TS 24.587 [19B], the UE shall set the V2XCEPC5 bit to "V2X communication over E-UTRA-PC5 supported" in the 5GMM capability IE of the REGISTRATION REQUEST message. If the UE indicates "mobility registration updating" in the 5GS registration type IE and supports V2X communication over NR-PC5 as specified in 3GPP TS 24.587 [19B], the UE shall set the V2XCNPC5 bit to "V2X communication over NR-PC5 supported" in the 5GMM capability IE of the REGISTRATION REQUEST message.

The UE shall send the REGISTRATION REQUEST message including the NAS message container IE as described in subclause 4.4.6:

a) when the UE is sending the message from 5GMM-IDLE mode, the UE has a valid 5G NAS security context, and needs to send non-cleartext IEs; or

b) when the UE is sending the message after an inter-system change from S1 mode to N1 mode in 5GMM-IDLE mode and the UE has a valid 5G NAS security context and needs to send non-cleartext IEs.

The UE with a valid 5G NAS security context shall send the REGISTRATION REQUEST message without including the NAS message container IE when the UE does not need to send non-cleartext IEs and the UE is sending the message:

a) from 5GMM-IDLE mode; or

b) after an inter-system change from S1 mode to N1 mode in 5GMM-IDLE mode.

If the UE is sending the REGISTRATION REQUEST message after an inter-system change from S1 mode to N1 mode in 5GMM-CONNECTED mode and the UE needs to send non-cleartext IEs, the UE shall cipher the NAS message container IE using the mapped 5G NAS security context and send the REGISTRATION REQUEST message including the NAS message container IE as described in subclause 4.4.6. If the UE does not need to send non-cleartext IEs, the UE shall send the REGISTRATION REQUEST message without including the NAS message container IE.

If the REGISTRATION REQUEST message includes a NAS message container IE, the AMF shall process the REGISTRATION REQUEST message that is obtained from the NAS message container IE as described in subclause 4.4.6.

If the UE is in NB-N1 mode, then the UE shall set the Control plane CIoT 5GS optimization bit to "Control plane CIoT 5GS optimization supported" in the 5GMM capability IE of the REGISTRATION REQUEST message. If the UE is capable of NB-S1 mode, then the UE shall set the Control plane CIoT EPS optimization bit to "Control plane CIoT EPS optimization supported" in the S1 UE network capability IE of the REGISTRATION REQUEST message.

If the registration procedure for mobility and periodic registration update is initiated and there is request from the upper layers to perform "emergency services fallback" pending, the UE shall send a REGISTRATION REQUEST message without an Uplink data status IE.

If the UE supports N3 data transfer and multiple user-plane resources in NB-N1 mode (see 3GPP TS 36.306 [25D], 3GPP TS 36.331 [25A]), then the UE shall set the Multiple user-plane resources support bit to "Multiple user-plane resources supported" in the 5GMM capability IE of the REGISTRATION REQUEST message.

If the UE supports extended rejected NSSAI, then the UE shall set the ER-NSSAI bit to "Extended rejected NSSAI supported" in the 5GMM capability IE of the REGISTRATION REQUEST message.

If the UE enters 5GMM-REGISTERED.NO-CELL-AVAILABLE and it has one or more S-NSSAI(s) in pending NSSAI, the UE shall initiate registration procedure for mobility and periodic registration update upon finding a suitable cell according to 3GPP TS 38.304 [28].

If the UE supports ProSe direct discovery as specified in 3GPP TS 24.554 [19E], the UE shall set the ProSe-dd bit to "ProSe direct discovery supported" in the 5GMM capability IE of the REGISTRATION REQUEST message. If the UE supports ProSe direct communications as specified in 3GPP TS 24.554 [19E], the UE shall set the ProSe-dc bit to "ProSe discovery communication supported" in the 5GMM capability IE of the REGISTRATION REQUEST message. If the UE supports ProSe UE-to-network relay as specified in 3GPP TS 24.554 [19E], the UE shall set the ProSe-relay bit to "Acting as a ProSe UE-to-network relay supported" in the 5GMM capability IE of the REGISTRATION REQUEST message. If the UE supports ProSe communications over NR-PC5 as specified in 3GPP TS 24.554 [19E], the UE shall set the ProSePC5 bit to "ProSe communications over NR-PC5 supported" in the 5GMM capability IE of the REGISTRATION REQUEST message.



Figure 5.5.1.3.2.1: Registration procedure for mobility and periodic registration update

\*\*\*\*\* change \*\*\*\*\*

##### 5.5.1.3.4 Mobility and periodic registration update accepted by the network

\*\*\*\*\*\*skipped for clarify\*\*\*\*\*\*

If the UE is authorized to use V2X communication over PC5 reference point based on:

a) at least one of the following bits in the 5GMM capability IE of the REGISTRATION REQUEST message set by the UE, or already stored in the 5GMM context in the AMF during the previous registration procedure as follows:

1) the V2XCEPC5 bit to "V2X communication over E-UTRA-PC5 supported"; or

2) the V2XCNPC5 bit to "V2X communication over NR-PC5 supported"; and

b) the user's subscription context obtained from the UDM as defined in 3GPP TS 23.287 [6C];

the AMF should not immediately release the NAS signalling connection after the completion of the registration procedure.

If the UE is authorized to use ProSe communication over PC5 reference point based on:

a) the ProSePC5 bits set to "ProSe communications over NR-PC5 supported" in the 5GMM capability IE of the REGISTRATION REQUEST message by the UE or already stored in the 5GMM context in the AMF during the previous registration procedure; and

b) the user's subscription context obtained from the UDM as defined in 3GPP TS 23.304 [6E];

the AMF should not immediately release the NAS signalling connection after the completion of the registration procedure.

If the Requested DRX parameters IE was included in the REGISTRATION REQUEST message, the AMF shall include the Negotiated DRX parameters IE in the REGISTRATION ACCEPT message. The AMF may set the Negotiated DRX parameters IE based on the received Requested DRX parameters IE and operator policy if available.

If the Requested NB-N1 mode DRX parameters IE was included in the REGISTRATION REQUEST message, the AMF shall include the Negotiated NB-N1 mode DRX parameters IE in the REGISTRATION ACCEPT message. The AMF may set the Negotiated NB-N1 mode DRX parameters IE based on the received Requested NB-N1 mode DRX parameters IE and operator policy if available.

The AMF shall include the Negotiated extended DRX parameters IE in the REGISTRATION ACCEPT message only if the Requested extended DRX parameters IE was included in the REGISTRATION REQUEST message, and the AMF supports and accepts the use of eDRX. The AMF may set the Negotiated extended DRX parameters IE based on the received Requested extended DRX parameters IE, operator policy, and the user's subscription context obtained from the UDM if available.

If the UE included in the REGISTRATION REQUEST message the UE status IE with the EMM registration status set to "UE is in EMM-REGISTERED state" and the AMF does not support N26 interface, the AMF shall operate as described in subclause 5.5.1.2.4.

If the UE has indicated support for service gap control in the REGISTRATION REQUEST message, a service gap time value is available in the 5GMM context, the AMF may include the T3447 value IE set to the service gap time value in the REGISTRATION ACCEPT message.

If the UE requests ciphering keys for ciphered broadcast assistance data in the REGISTRATION REQUEST message and the AMF has valid ciphering key data applicable to the UE's subscription and current tracking area, then the AMF shall include the ciphering key data in the Ciphering key data IE of the REGISTRATION ACCEPT message.

If the UE supports WUS assistance information and the AMF supports and accepts the use of WUS assistance information for the UE, then the AMF shall determine the negotiated UE paging probability information for the UE, store it in the 5GMM context of the UE, and include it in the Negotiated WUS assistance information IE in the REGISTRATION ACCEPT message. The AMF may consider the UE paging probability information received in the Requested WUS assistance information IE when determining the negotiated UE paging probability information for the UE.

NOTE 11: Besides the UE paging probability information requested by the UE, the AMF can take local configuration or previous statistical information for the UE into account when determining the negotiated UE paging probability information for the UE.

If due to regional subscription restrictions or access restrictions the UE is not allowed to access the TA or due to CAG restrictions the UE is not allowed access the cell, but the UE has an emergency PDU session established, the AMF may accept the REGISTRATION REQUEST message and indicate to the SMF to perform a local release of all non-emergency PDU sessions (associated with 3GPP access if it is due to CAG restrictions) and informs the UE via the PDU session status IE in the REGISTRATION ACCEPT message. The AMF shall not indicate to the SMF to release the emergency PDU session. The network shall behave as if the UE is registered for emergency services.

If the REGISTRATION ACCEPT message includes the PDU session reactivation result error cause IE with the 5GMM cause set to #28 "Restricted service area", the UE shall enter the state 5GMM-REGISTERED.NON-ALLOWED-SERVICE and behave as specified in subclause 5.3.5.

If the REGISTRATION ACCEPT message includes the SOR transparent container IE and:

a) the SOR transparent container IE does not successfully pass the integrity check (see 3GPP TS 33.501 [24]); and

b) if the UE attempts obtaining service on another PLMNs as specified in 3GPP TS 23.122 [5] annex C;

then the UE shall release locally the established NAS signalling connection after sending a REGISTRATION COMPLETE message.

If the REGISTRATION ACCEPT message includes the SOR transparent container IE and the SOR transparent container IE successfully passes the integrity check (see 3GPP TS 33.501 [24]), the ME shall store the received SOR counter as specified in annex C and proceed as follows:

a) the UE shall proceed with the behaviour as specified in 3GPP TS 23.122 [5] annex C; and

b) if the registration procedure is performed over 3GPP access and the UE attempts obtaining service on another PLMNs as specified in 3GPP TS 23.122 [5] annex C then the UE may release locally the established NAS signalling connection after sending a REGISTRATION COMPLETE message. Otherwise the UE shall send a REGISTRATION COMPLETE message and not release the current N1 NAS signalling connection locally. If an acknowledgement is requested in the SOR transparent container IE of the REGISTRATION ACCEPT message, the UE acknowledgement is included in the SOR transparent container IE of the REGISTRATION COMPLETE message.

If the SOR transparent container IE successfully passes the integrity check (see 3GPP TS 33.501 [24]), indicates list of preferred PLMN/access technology combinations is provided and the list type indicates:

a) "PLMN ID and access technology list", then the ME shall replace the highest priority entries in the "Operator Controlled PLMN Selector with Access Technology" list stored in the ME and shall proceed with the behaviour as specified in 3GPP TS 23.122 [5] annex C; or

b) "secured packet", then the ME shall behave as if a SMS is received with protocol identifier set to SIM data download, data coding scheme set to class 2 message and SMS payload as secured packet contents of SOR transparent container IE. The SMS payload is forwarded to UICC as specified in 3GPP TS 23.040 [4A] and the ME shall proceed with the behaviour as specified in 3GPP TS 23.122 [5] annex C.

If required by operator policy, the AMF shall include the NSSAI inclusion mode IE in the REGISTRATION ACCEPT message (see table 4.6.2.3.1 of subclause 4.6.2.3). Upon receipt of the REGISTRATION ACCEPT message:

a) if the message includes the NSSAI inclusion mode IE, the UE shall operate in the NSSAI inclusion mode indicated in the NSSAI inclusion mode IE over the current access within the current PLMN and its equivalent PLMN(s), if any, in the current registration area; or

b) otherwise:

1) if the UE has NSSAI inclusion mode for the current PLMN and access type stored in the UE, the UE shall operate in the stored NSSAI inclusion mode;

2) if the UE does not have NSSAI inclusion mode for the current PLMN and the access type stored in the UE and if the UE is performing the registration procedure over:

i) 3GPP access, the UE shall operate in NSSAI inclusion mode D in the current PLMN and the current access type;

ii) untrusted non-3GPP access, the UE shall operate in NSSAI inclusion mode C in the current PLMN and the current access type; or

iii) trusted non-3GPP access, the UE shall operate in NSSAI inclusion mode D in the current PLMN and the current access type; or

3) if the 5G-RG does not have NSSAI inclusion mode for the current PLMN and wireline access stored in the 5G-RG, and the 5G-RG is performing the registration procedure over wireline access, the 5G-RG shall operate in NSSAI inclusion mode B in the current PLMN and the current access type.

The AMF may include operator-defined access category definitions in the REGISTRATION ACCEPT message.

If there is a running T3447 timer in the AMF and the Uplink data status IE is included or the Follow-on request indicator is set to "Follow-on request pending" in the REGISTRATION REQUEST message, the AMF shall ignore the Uplink data status IE or that the Follow-on request indicator is set to "Follow-on request pending" and proceed as if the Uplink data status IE was not received or the Follow-on request indicator was not set to "Follow-on request pending" except for the following case:

- the PDU session(s) indicated by the Uplink data status IE is emergency PDU session(s);

- the UE is configured for high priority access in selected PLMN;

- the REGISTRATION REQUEST message is as a paging response; or

- the UE is establishing an emergency PDU session or performing emergency services fallback.

If the UE receives Operator-defined access category definitions IE in the REGISTRATION ACCEPT message and the Operator-defined access category definitions IE contains one or more operator-defined access category definitions, the UE shall delete any operator-defined access category definitions stored for the RPLMN and shall store the received operator-defined access category definitions for the RPLMN. If the UE receives the Operator-defined access category definitions IE in the REGISTRATION ACCEPT message and the Operator-defined access category definitions IE contains no operator-defined access category definitions, the UE shall delete any operator-defined access category definitions stored for the RPLMN. If the REGISTRATION ACCEPT message does not contain the Operator-defined access category definitions IE, the UE shall not delete the operator-defined access category definitions stored for the RPLMN.

If the UE has indicated support for service gap control in the REGISTRATION REQUEST message and:

- the REGISTRATION ACCEPT message contains the T3447 value IE, then the UE shall store the new T3447 value, erase any previous stored T3447 value if exists and use the new T3447 value with the timer T3447 next time it is started; or

- the REGISTRATION ACCEPT message does not contain the T3447 value IE, then the UE shall erase any previous stored T3447 value if exists and stop the timer T3447 if running.

If the REGISTRATION ACCEPT message contains the Truncated 5G-S-TMSI configuration IE, then the UE shall store the included truncated 5G-S-TMSI configuration and return a REGISTRATION COMPLETE message to the AMF to acknowledge reception of the truncated 5G-S-TMSI configuration.

NOTE 12: The UE provides the truncated 5G-S-TMSI configuration to the lower layers.

If the UE is not in NB-N1 mode, the UE has set the RACS bit to "RACS supported" in the 5GMM Capability IE of the REGISTRATION REQUEST message, and the REGISTRATION ACCEPT message includes:

a) a UE radio capability ID deletion indication IE set to "Network-assigned UE radio capability IDs deletion requested", the UE shall delete any network-assigned UE radio capability IDs associated with the RPLMN or RSNPN stored at the UE, then the UE shall initiate a registration procedure for mobility and periodic registration update as specified in subclause 5.5.1.3.2 over the existing N1 NAS signalling connection; and

b) a UE radio capability ID IE, the UE shall store the UE radio capability ID as specified in annex C.

If the registration procedure for mobility and periodic registration update was initiated and there is a request from the upper layers to perform "emergency services fallback" pending, the UE shall restart the service request procedure after the successful completion of the mobility and periodic registration update.

\*\*\*\*\* change \*\*\*\*\*

#### 9.11.3.1 5GMM capability

The purpose of the 5GMM capability information element is to provide the network with information concerning aspects of the UE related to the 5GCN or interworking with the EPS. The contents might affect the manner in which the network handles the operation of the UE.

The 5GMM capability information element is coded as shown in figure 9.11.3.1.1 and table 9.11.3.1.1.

The 5GMM capability is a type 4 information element with a minimum length of 3 octets and a maximum length of 15 octets.

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 8 | | 7 | | 6 | | 5 | | 4 | | 3 | | 2 | | 1 | |  | |
| 5GMM capability IEI | | | | | | | | | | | | | | | | octet 1 | |
| Length of 5GMM capability contents | | | | | | | | | | | | | | | | octet 2 | |
| SGC | | 5G-IPHC-CP CIoT | | N3 data | | 5G-CP CIoT | | RestrictEC | | LPP | | HO attach | | S1 mode | | octet 3 | |
| RACS | | NSSAA | | 5G-LCS | | V2XCNPC5 | | V2XCEPC5 | | V2X | | 5G-UP CIoT | | 5GSRVCC | | octet 4 | |
| ProSe-relay | | ProSe-dc | | ProSe-dd | | ER-NSSAI | | 5G-EHC-CP CIoT | | multipleUP | | WUSA | | CAG | | octet 5 | |
| 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | ProSePC5 | | octet 6 | |
| 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | octet 7\*-15\* | |
| Spare | | | | | | | | | | | | | | | |

Figure 9.11.3.1.1: 5GMM capability information element

Table 9.11.3.1.1: 5GMM capability information element

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| EPC NAS supported (S1 mode) (octet 3, bit 1) | | | | | | | | | | | | | | | | | | | | | |
| 0 | | |  | | | | |  | | | | |  | | | | | S1 mode not supported | | | |
| 1 | | |  | | | | |  | | | | |  | | | | | S1 mode supported | | | |
|  | | | | | | | | | | | | | | | | | | | | | |
| ATTACH REQUEST message containing PDN CONNECTIVITY REQUEST message for handover support (HO attach) (octet 3, bit 2) | | | | | | | | | | | | | | | | | | | | | |
| 0 | |  | | | |  | | | | |  | | | | | ATTACH REQUEST message containing PDN CONNECTIVITY REQUEST message with request type set to "handover" or "handover of emergency bearer services" to transfer PDU session from N1 mode to S1 mode not supported | | | | | |
| 1 | |  | | | |  | | | | |  | | | | | ATTACH REQUEST message containing PDN CONNECTIVITY REQUEST message with request type set to "handover" or "handover of emergency bearer services" to transfer PDU session from N1 mode to S1 mode supported | | | | | |
|  | | | | | | | | | | | | | | | | | | | | | |
| LTE Positioning Protocol (LPP) capability (octet 3, bit 3) | | | | | | | | | | | | | | | | | | | | | |
| 0 | | |  | | | | |  | | | | |  | | | | | LPP in N1 mode not supported | | | |
| 1 | | |  | | | | |  | | | | |  | | | | | LPP in N1 mode supported (see 3GPP TS 36.355 [26]) | | | |
|  | | | | | | | | | | | | | | | | | | | | | |
| Restriction on use of enhanced coverage support (RestrictEC) (octet 3, bit 4)  This bit indicates the capability to support restriction on use of enhanced coverage. | | | | | | | | | | | | | | | | | | | | | |
| 0 | | | |  | | | | |  | | | | |  | | | | | Restriction on use of enhanced coverage not supported | | |
| 1 | | | |  | | | | |  | | | | |  | | | | | Restriction on use of enhanced coverage supported | | |
| Control plane CIoT 5GS optimization (5G-CP CIoT) (octet 3, bit 5)  This bit indicates the capability for control plane CIoT 5GS optimization. | | | | | | | | | | | | | | | | | | | | | |
| 0 |  | | | | | |  | | | | |  | | | | | Control plane CIoT 5GS optimization not supported | | | | |
| 1 |  | | | | | |  | | | | |  | | | | | Control plane CIoT 5GS optimization supported | | | | |
| N3 data transfer (N3 data) (octet 3, bit 6)  This bit indicates the capability for N3 data transfer. | | | | | | | | | | | | | | | | | | | | | |
| 0 |  | | | | | |  | | | | |  | | | | | N3 data transfer supported | | | | |
| 1 |  | | | | | |  | | | | |  | | | | | N3 data transfer not supported | | | | |
| IP header compression for control plane CIoT 5GS optimization (5G-IPHC-CP CIoT) (octet 3, bit 7)  This bit indicates the capability for IP header compression for control plane CIoT 5GS optimization. | | | | | | | | | | | | | | | | | | | | | |
| 0 |  | | | | | |  | | | | |  | | | | | IP header compression for control plane CIoT 5GS optimization not supported | | | | |
| 1 |  | | | | | |  | | | | |  | | | | | IP header compression for control plane CIoT 5GS optimization supported | | | | |
|  | | | | | | | | | | | | | | | | | | | | | |
| Service gap control (SGC) (octet 3, bit 8) | | | | | | | | | | | | | | | | | | | | | |
| 0 | | |  | | | | |  | | | | |  | | | | | service gap control not supported | | | |
| 1 | | |  | | | | |  | | | | |  | | | | | service gap control supported | | | |
|  | | | | | | | | | | | | | | | | | | | | | |
| 5G-SRVCC from NG-RAN to UTRAN (5GSRVCC) capability (octet 4, bit 1) | | | | | | | | | | | | | | | | | | | | | |
| 0 | | |  | | | | |  | | | | |  | | | | | 5G-SRVCC from NG-RAN to UTRAN not supported | | | |
| 1 | | |  | | | | |  | | | | |  | | | | | 5G-SRVCC from NG-RAN to UTRAN supported (see 3GPP TS 23.216 [6A]) | | | |
| User plane CIoT 5GS optimization (5G-UP CIoT) (octet 4, bit 2)  This bit indicates the capability for user plane CIoT 5GS optimization. | | | | | | | | | | | | | | | | | | | | | |
| 0 |  | | | | | |  | | | | |  | | | | | User plane CIoT 5GS optimization not supported | | | | |
| 1 |  | | | | | |  | | | | |  | | | | | User plane CIoT 5GS optimization supported | | | | |
|  | | | | | | | | | | | | | | | | | | | | | |
| V2X capability (V2X) (octet 4, bit 3) | | | | | | | | | | | | | | | | | | | | | |
| This bit indicates the capability for V2X, as specified in 3GPP TS 24.587 [19B].  Bit | | | | | | | | | | | | | | | | | | | | | |
| 3 | |  | | | |  | | | | |  | | | | |  | | | | | |
| 0 | |  | | | |  | | | | |  | | | | | V2X not supported | | | | | |
| 1 | |  | | | |  | | | | |  | | | | | V2X supported | | | | | |
|  | | | | | | | | | | | | | | | | | | | | | |
| V2X communication over E-UTRA-PC5 capability (V2XCEPC5) (octet 4, bit 4) | | | | | | | | | | | | | | | | | | | | | |
| This bit indicates the capability for V2X communication over E-UTRA-PC5, as specified in 3GPP TS 24.587 [19B]. | | | | | | | | | | | | | | | | | | | | | |
| Bit | | | | | | | | | | | | | | | | | | | | | |
| 4 | |  | | | |  | | | | |  | | | | |  | | | | | |
| 0 | |  | | | |  | | | | |  | | | | | V2X communication over E-UTRA-PC5 not supported | | | | | |
| 1 | |  | | | |  | | | | |  | | | | | V2X communication over E-UTRA-PC5 supported | | | | | |
|  | | | | | | | | | | | | | | | | | | | | | |
| |  |  |  |  |  | | --- | --- | --- | --- | --- | | V2X communication over NR-PC5 capability (V2XCNPC5) (octet 4, bit 5) | | | | | | This bit indicates the capability for V2X communication over NR-PC5, as specified in 3GPP TS 24.587 [19B]. | | | | | | Bit | | | | | | 5 |  |  |  |  | | 0 |  |  |  | V2X communication over NR-PC5 not supported | | 1 |  |  |  | V2X communication over NR-PC5 supported | |  | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Location Services (5G-LCS) notification mechanisms capability (octet 4, bit 6) | | | | | | | | | | | | | | | | | | | | | |
| 0 | | | | |  | | | | |  | | | | |  | | | | | LCS notification mechanisms not supported | |
| 1 | | | | |  | | | | |  | | | | |  | | | | | LCS notification mechanisms supported (see 3GPP TS 23.273 [6B]) | |
| Network slice-specific authentication and authorization (NSSAA) (octet 4, bit 7)  This bit indicates the capability to support network slice-specific authentication and authorization. | | | | | | | | | | | | | | | | | | | | | |
| 0 | | | | |  | | | | |  | | | | |  | | | | | Network slice-specific authentication and authorization not supported | |
| 1 | | | | |  | | | | |  | | | | |  | | | | | Network slice-specific authentication and authorization supported | |
|  | | | | | | | | | | | | | | | | | | | | | |
| Radio capability signalling optimisation (RACS) capability (octet 4, bit 8) | | | | | | | | | | | | | | | | | | | | | |
| 0 | | | | |  | | | | |  | | | | |  | | | | | RACS not supported | |
| 1 | | | | |  | | | | |  | | | | |  | | | | | RACS supported | |
|  | | | | | | | | | | | | | | | | | | | | | |
| Closed Access Group (CAG) capability (octet 5, bit 1) | | | | | | | | | | | | | | | | | | | | | |
| 0 CAG not supported  1 CAG supported  WUS assistance (WUSA) information reception capability (octet 5, bit 2)  0 WUS assistance information reception not supported  1 WUS assistance information reception supported | | | | | | | | | | | | | | | | | | | | | |
|  | | | | | | | | | | | | | | | | | | | | | |
| Multiple user-plane resources support (multipleUP) (octet 5, bit 3) | | | | | | | | | | | | | | | | | | | | |
| This bit indicates the capability to support multiple user-plane resources in NB-N1 mode. | | | | | | | | | | | | | | | | | | | | |
| |  |  |  |  |  | | --- | --- | --- | --- | --- | | 0 |  |  |  | Multiple user-plane resources not supported | | 1 |  |  |  | Multiple user-plane resources supported | | | | | | | | | | | | | | | | | | | | | |
| Ethernet header compression for control plane CIoT 5GS optimization (5G-EHC-CP CIoT) (octet 5, bit 4)  0 Ethernet header compression for control plane CIoT 5GS optimization not supported  1 Ethernet header compression for control plane CIoT 5GS optimization supported | | | | | | | | | | | | | | | | | | | | |
| Extended rejected NSSAI support (ER-NSSAI) (octet 5, bit 5) | | | | | | | | | | | | | | | | | | | | |
| This bit indicates the capability to support extended rejected NSSAI. | | | | | | | | | | | | | | | | | | | | |
| |  |  |  |  |  | | --- | --- | --- | --- | --- | | 0 |  |  |  | Extended rejected NSSAI not supported | | 1 |  |  |  | Extended rejected NSSAI supported | | | | | | | | | | | | | | | | | | | | | |
| ProSe direct discovery (ProSe-dd) (octet 5, bit 6)  This bit indicates the capability for ProSe direct discovery.  Bit | | | | | | | | | | | | | | | | | | | | |
| 6 | |  | | | |  | | | | |  | | | | |  | | | | | |
| 0 | |  | | | |  | | | | |  | | | | | ProSe direct discovery not supported | | | | | |
| 1 | |  | | | |  | | | | |  | | | | | ProSe direct discovery supported | | | | | |
| ProSe direct communication (ProSe-dc) (octet 5, bit 7)  This bit indicates the capability for ProSe direct communication.   |  | | --- | | Bit | | |  |  |  |  |  | | --- | --- | --- | --- | --- | | 7 |  |  |  |  | | 0 |  |  |  | ProSe direct communication not supported | | 1 |  |  |  | ProSe direct communication supported | |   ProSe UE-to-network-relay (ProSe-relay) (octet 5, bit 8)  This bit indicates the capability to act as a ProSe UE-to-network relay | | | | | | | | | | | | | | | | | | | | |
| Bit | | | | | | | | | | | | | | | | | | | | |
| 8 | |  | | | |  | | | | |  | | | | |  | | | | | |
| 0 | |  | | | |  | | | | |  | | | | | Acting as a ProSe UE-to-network relay not supported | | | | | |
| 1 | |  | | | |  | | | | |  | | | | | Acting as a ProSe UE-to-network relay supported | | | | | |
| ProSe communications over NR-PC5 capability (ProSePC5) (octet 6, bit 1)  This bit indicates the capability for ProSe communications over NR-PC5, as specified in 3GPP TS 24.554 [19E].  Bit | | | | | | | | | | | | | | | | | | | | |
| 1 | |  | | | |  | | | | |  | | | | |  | | | | | |
| 0 | |  | | | |  | | | | |  | | | | | ProSe communications over NR-PC5 not supported | | | | | |
| 1 | |  | | | |  | | | | |  | | | | | ProSe communications over NR-PC5 supported | | | | | |
| bits 2-8 in octet 6 and bits in octets 7 to 15 are spare and shall be coded as zero, if the respective octet is included in the information element. | | | | | | | | | | | | | | | | | | | | |

\*\*\*\*\* change \*\*\*\*\*