**3GPP TSG-RAN5 Meeting #94-e *R5-22XXXX***

**Electronic Meeting, 21st Feb– 04th March 2022**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| *CR-Form-v12.2* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
|  | | | | | | | | |
|  | **38.523-1** | **CR** |  | **rev** | **-** | **Current version:** | **16.10.0** |  |
|  | | | | | | | | |
| *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 |  | Radio Access Network |  | Core Network |  |

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| ***Title:*** | Correction to NR TC 11.1.2-EPS Fallback with redirection without N26 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Source to WG:*** | Huawei, HiSilicon | | | | | | | | | |
| ***Source to TSG:*** | R5 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | 5GS\_NR\_LTE-UEConTest | | | | |  | ***Date:*** | | | 2022-02-10 |
|  |  | | | |  | |  | | |  |
| ***Category:*** | F |  | | | | | ***Release:*** | | | Rel-16 |
|  | *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-16 (Release 16) Rel-17 (Release 17) Rel-18 (Release 18) Rel-19 (Release 19)* | |
|  |  | | | | | | | | | |
| ***Reason for change:*** | | During this test case, the network SS simulated is supporting without N26, however 5GC indicate that it support without N26 in Registration Accept, and EPC indicate that it support N26 in Attach Accept. As we know, N26 is the interface between AMF he MME, so it is not properated to set EPC not support without N26 (i.e support N26). | | | | | | | | |
|  | |  | | | | | | | | |
| ***Summary of change:*** | | Change the EPC indicate IWKN26 of in Attach Accept from ”not support without N26” to ”support without N26” | | | | | | | | |
|  | |  | | | | | | | | |
| ***Consequences if not approved:*** | | A Conformant UE may fail the TC. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Clauses affected:*** | | 11.1.2 | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **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:*** | |  | | | | | | | | |

**<Start of modified section 1>**

### 11.1.2 MO MMTEL voice call setup from NR RRC\_IDLE / EPS Fallback with redirection / Single registration mode without N26 interface / Success

11.1.2.1 Test Purpose (TP)

(1)

**with** {UE supporting both S1 mode and N1 mode and operating in single-registration mode, and, the Network has indicated "interworking without N26 interface supported", and, the UE is in NR RRC\_IDLE state}

**ensure that** {

**when** {User initiates a MMTEL call and the UE completes Access control and checking in 5GMM-IDLE mode}

**then** {UE requests the establishment of a MMTEL call by transmitting an RRCSetupRequest message with establishmentCause set to 'mo-VoiceCall', and, a SERVICE REQUEST message with Service type set to 'data'}

}

(2)

**with** {the UE is NR RRC\_CONNECTED state after having requested a MMTEL call establishment and the MO IMS voice session establishment has been initiated}

**ensure that** {

**when** {the UE receives a RRCRelease message which includes redirectedCarrierInfo indicating redirection to eutra}

**then** {the UE selects the E-UTRA cell, performs an ATTACH or a TAU procedure, and, successfully completes the MO MMTEL call setup in EPS}

}

11.1.2.2 Conformance requirements

References: The conformance requirements covered in the current TC are specified in: TS23.502, clauses 4.11.2.2, 4.13.6.1; TS 24.501, clauses 4.5.4.1, 4.8.2.3; TS 38.331, clause5.3.11. Unless otherwise stated these are Rel-15 requirements.

[TS 23.502, clause 4.11.2.2]

The following procedure is used by UEs in single-registration or dual registration mode on mobility from 5GS to EPS.

In the case of network sharing the UE selects the target PLMN ID according to clause 5.18.3 of TS 23.501 [2].



Figure 4.11.2.2-1: Mobility procedure from 5GS to EPS without N26 interface

The UE operating in single-registration mode can start the procedure from Step 1 or Step 5. The UE operating in dual-registration mode starts the procedure from Step 5.

NOTE 1: The network has indicated the "Interworking without N26" to the UE. To support IP address preservation, the UE in single-registration mode starts the procedure from Step 5. If the UE in single-registration mode starts the procedure from Step 1, the IP address preservation is not provided.

0. UE is registered in 5GS and established PDU sessions. The FQDN for the S5/S8 interface of the PGW-C+SMF is also stored in the UDM by the PGW-C+SMF during PDU Session setup in addition to what is specified in clause 4.3.2.2.1 and clause 4.3.2.2.2.

NOTE 2: At 5GS to EPS mobility, the MME use the FQDN for the S5/S8 interface of the PGW-C+SMF to find the PGW-C+SMF, and when UE moves back from EPS to 5GS, the AMF uses FQDN for the S5/S8 interface of the PGW-C+SMF to find the PGW-C+SMF.

1. Step 1 as in clause 5.3.3.1 (Tracking Area Update) in TS 23.401 [13].

2. Step 2 as in clause 5.3.3.1 (Tracking Area Update) in TS 23.401 [13] with the following modifications:

The UE shall provide a EPS-GUTI that is mapped from the 5G-GUTI following the mapping rules specified in TS 23.501 [2]. The UE indicates that it is moving from 5GC.

3. Step 3 as in clause 5.3.3.1 (Tracking Area Update) in TS 23.401 [13].

4. If the MME determined that the old node is an AMF based on UE's GUTI mapped from 5G-GUTI and the MME is configured to support 5GS-EPS interworking without N26 procedure, the MME sends a TAU Reject to the UE.

5. Step 1 as in clause 5.3.2.1 (E-UTRAN Initial Attach) in TS 23.401 [13] with the modifications captured in clause 4.11.2.4.1.

6. Step 2 as in clause 5.3.2.1 (E-UTRAN Initial Attach) in TS 23.401 [13].

7. Steps 4-7 as in clause 5.3.2.1 (E-UTRAN Initial Attach) in TS 23.401 [13], with the modifications captured in clause 4.11.2.4.1.

8. Step 8 as in clause 5.3.2.1 (E-UTRAN Initial Attach) in TS 23.401 [13], with the modifications captured in clause 4.11.2.4.1.

9. Step 11 as in clause 5.3.2.1 (E-UTRAN Initial Attach) in TS 23.401 [13], with the following modifications:

The subscription profile the MME receives from HSS+UDM includes per DNN/APN at most one PGW-C+SMF FQDN as described in in clause 5.17.2.1 in TS 23.501 [2].

10. Steps 12-24 as in clause 5.3.2.1 (E-UTRAN Initial Attach) in TS 23.401 [13], with the modifications as described in clause 4.11.2.4.1.

11. Step 25 as in clause 5.3.2.1 (E-UTRAN Initial Attach) in TS 23.401 [13].

12. Step 26 as in clause 5.3.2.1 (E-UTRAN Initial Attach) in TS 23.401 [13].

13. If the UE has remaining PDU Sessions in 5GS which it wants to transfer to EPS and maintain the same IP address/prefix, the UE performs the UE requested PDN Connectivity Procedure as specified in TS 23.401 [13] clause 5.10.2 and sets the Request Type to "handover" in Step 1 of the procedure with modification captured in clause 4.11.2.4.2. UE provides an APN and the PDU Session ID corresponding to the PDU Session it wants to transfer to EPS. The UE provides the PDU Session ID in PCO as described in clause 4.11.1.1.

UEs in single-registration mode performs this step for each PDU Session immediately after completing the E-UTRAN Initial Attach procedure. UEs in dual-registration mode may perform this step any time after the completing of E-UTRAN Initial Attach procedure. Also, UEs in dual-registration mode may perform this step only for a subset of PDU Sessions.

The MME determines the PGW-C+SMF address for the Create Session Request based on the APN received from the UE and the subscription profile received from the HSS+UDM in Step 9 or when the HSS+UDM notifies the MME for the new PGW-C+SMF ID in the updated subscription profile.

The PGW-C+SMF uses the PDU Session ID to correlate the transferred PDN connection with the PDU Session in 5GC.

As a result of the procedure the PGW-U+UPF starts routing DL data packets to the Serving GW for the default and any dedicated EPS bearers established for this PDN connection.

14. The PGW-C+SMF initiates release of the PDU Session(s) in 5GS transferred to EPS as specified in clause 4.3.4.2 with the following clarification:

In step 2, the PGW-C+SMF shall not release IP address/prefix(es) allocated for the PDU Session.

If UP connection of the PDU Session is not active, step 3b is not executed, thus the steps triggered by step 3b are not executed;

If UP connection of the PDU Session is active, the SMF invokes the Namf\_Communication\_N1N2MessageTransfer service operation without including N1 SM container (PDU Session Release Command).

[TS 23.502, clause 4.13.6.1]

Figure 4.13.6.1-1 describes the EPS fallback procedure for IMS voice.

When the UE is served by the 5G System, the UE has one or more ongoing PDU Sessions each including one or more QoS Flows. The serving PLMN AMF has sent an indication towards the UE during the Registration procedure that IMS voice over PS session is supported, see clause 5.16.3.10 in TS 23.501 [2] and the UE has registered in the IMS. If N26 is not supported, the serving PLMN AMF sends an indication towards the UE during the Registration procedure that interworking without N26 is supported, see clause 5.17.2.3.1 in TS 23.501 [2].



Figure 4.13.6.1-1: EPS Fallback for IMS voice

1. UE camps on NG-RAN in the 5GS and an MO or MT IMS voice session establishment has been initiated.

2. Network initiated PDU Session modification to setup QoS flow for voice reaches the NG-RAN (see N2 PDU Session Request in clause 4.3.3).

3. NG-RAN is configured to support EPS fallback for IMS voice and decides to trigger fallback to EPS, taking into account UE capabilities, indication from AMF that "Redirection for EPS fallback for voice is possible" (received as part of initial context setup as defined in TS 38.413 [10]), network configuration (e.g. N26 availability configuration) and radio conditions. If NG-RAN decides not to trigger fallback to EPS, then the procedure stops here and following steps are not executed.

NG-RAN may initiate measurement report solicitation from the UE including E-UTRAN as target.

NOTE 1: If AMF has indicated that "Redirection for EPS fallback for voice is not possible", then AN Release via inter-system redirection to EPS is not performed in step 5.

4. NG-RAN responds indicating rejection of the PDU Session modification to setup QoS flow for IMS voice received in step 2 by PDU Session Response message towards the PGW-C+SMF (or H-SMF+P-GW-C via V-SMF, in case of roaming scenario) via AMF with an indication that mobility due to fallback for IMS voice is ongoing. The PGW-C+SMF maintains the PCC rule(s) associated with the QoS Flow(s).

5. NG-RAN initiates either handover (see clause 4.11.1.2.1), or AN Release via inter-system redirection to EPS (see clause 4.2.6 and clause 4.11.1.3.2), taking into account UE capabilities. The PGW-C+SMF reports change of the RAT type if subscribed by PCF as specified in clause 4.11.1.2.1, or clause 4.11.1.3.2.6. When the UE is connected to EPS, either 6a or 6b is executed

6a. In the case of 5GS to EPS handover, see clause 4.11.1.2.1, and in the case of inter-system redirection to EPS with N26 interface, see clause 4.11.1.3.2. In either case the UE initiates TAU procedure; or

6b. In the case of inter-system redirection to EPS without N26 interface, see clause 4.11.2.2. If the UE supports Request Type flag "handover" for PDN connectivity request during the attach procedure as described in clause 5.3.2.1 of TS 23.401 [13] and has received the indication that interworking without N26 is supported, then the UE initiates Attach with PDN connectivity request with request type "handover".

In inter-system redirection, the UE uses the emergency indication in the RRC message as specified in clause 6.2.2 of TS 36.331 [16] and E-UTRAN provides the emergency indication to MME during Tracking Area Update or Attach procedure. For the handover procedure see clause 4.11.1.2.1, step 1.

7. After completion of the mobility procedure to EPS or as part of the 5GS to EPS handover procedure (see clause 4.11.1.2.1), the SMF/PGW re-initiates the setup of the dedicated bearer for IMS voice, mapping the 5G QoS to EPC QoS parameters. The PGW-C+SMF behaves as specified in clause 4.9.1.3.1. The PGW-C+SMF reports about Successful Resource Allocation and Access Network Information if subscribed by PCF.

8. The IMS voice session establishment is continued.

At least for the duration of the voice call in EPS the E-UTRAN is configured to not trigger any handover to 5GS.

[TS 24.501, clause 4.5.4.1]

When the UE is in 5GMM-IDLE mode, upon receiving a request from the upper layers for an access attempt, the NAS shall categorize the access attempt into access identities and an access category following subclause 4.5.2, table 4.5.2.1 and table 4.5.2.2, and subclause 4.5.3, and provide the applicable access identities and the access category to the lower layers for the purpose of access control checking. In this request to the lower layer the NAS can also provide to the lower layer the RRC establishment cause determined as specified in subclause 4.5.6 of this specification.

NOTE 1: The access barring check is performed by the lower layers.

NOTE 2: As an implementation option, the NAS can provide the RRC establishment cause to the lower layers after being informed by the lower layers that the access attempt is allowed.

If the UE has uplink user data pending for one or more PDU sessions when it builds a REGISTRATION REQUEST or SERVICE REQUEST message as initial NAS message, the UE shall indicate the respective PDU sessions in the Uplink data status IE as specified in subclause 5.5.1.3.2 and 5.6.1.2, regardless of the access category for which the access barring check is performed.

NOTE 3: The UE indicates pending user data for all the respective PDU sessions, even if barring timers are running for some of the corresponding access categories.

If the lower layers indicate that the access attempt is allowed, the NAS shall initiate the procedure to send the initial NAS message for the access attempt.

If the lower layers indicate that the access attempt is barred, the NAS shall not initiate the procedure to send the initial NAS message for the access attempt. Additionally:

a) if the event which triggered the access attempt was an MO-MMTEL-voice-call-started indication or an MO-MMTEL-video-call-started indication:

1) if the UE is operating in the single-registration mode and the UE's usage setting is "voice centric", the UE may attempt to select an E-UTRA cell connected to EPC. If the UE finds a suitable E-UTRA cell connected to EPC, it then proceeds with the appropriate EMM specific procedures and, if necessary, ESM procedures to make a PDN connection providing access to IMS available; see subclause 4.8.2 and 3GPP TS 24.301 [15];

2) if the UE is operating in the dual-registration mode, the UE may proceed in S1 mode with the appropriate EMM specific procedures and ESM procedures to make a PDN connection providing access to IMS available; see subclause 4.8.3 and 3GPP TS 24.301 [15];

3) otherwise, the NAS shall notify the upper layers that the access attempt is barred. In this case, upon receiving an indication from the lower layers that the barring is alleviated for the access category with which the access attempt was associated, the NAS shall notify the upper layers that the barring is alleviated for the access category and may initiate the procedure to send the initial NAS message, if still needed; and

b) if the event which triggered the access attempt was an MO-SMSoIP-attempt-started indication:

1) if the UE is operating in the single-registration mode, the UE may attempt to select an E-UTRA cell connected to EPC. If the UE finds a suitable E-UTRA cell connected to EPC, it then proceeds with the appropriate EMM specific procedures and, if necessary, ESM procedures to make a PDN connection providing access to IMS available; see subclause 4.8.2 and 3GPP TS 24.301 [15];

2) if the UE is operating in the dual-registration mode, the UE may proceed in S1 mode with the appropriate EMM specific procedures and ESM procedures to make a PDN connection providing access to IMS available; see subclause 4.8.3 and 3GPP TS 24.301 [15];

3) otherwise, the NAS layer shall notify the upper layers that the access attempt is barred. In this case, upon receiving an indication from the lower layers that the barring is alleviated for the access category with which the access attempt was associated, the NAS shall notify the upper layers that the barring is alleviated for the access category and may initiate the procedure to send the initial NAS message, if still needed.

NOTE 4: Barring timers, on a per access category basis, are run by the lower layers. At expiry of barring timers, the indication of alleviation of access barring is indicated to the NAS on a per access category basis.

[TS 24.501, clause 4.8.2.3]

At inter-system change from N1 mode to S1 mode in EMM-IDLE mode when:（ PDU SEESION ACTIVE）

a) the UE supports non-IP PDN type and at least one PDU session is active; or

b) the UE does not support non-IP PDN type and at least one PDU session of IPv4, IPv6 or IPv4v6 PDU session type is active,

the UE shall proceed as follows:

a) 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 and the UE has received an "interworking without N26 interface supported" indication from the network, the UE shall:

1) enter substates EMM-DEREGISTERED.NORMAL-SERVICE and 5GMM-REGISTERED.NO-CELL-AVAILABLE;

2) map the PDU session(s) which the UE intends to transfer to EPS to the default EPS bearer context of the corresponding PDN connection(s) as specified in subclause 6.1.4.2; and

3) initiate an EPS attach procedure and include a PDN CONNECTIVITY REQUEST message with request type set to "handover" in the ATTACH REQUEST message to activate a default EPS bearer context for one of the active PDU sessions which the UE intends to transfer to EPS.

After successful completion of the EPS attach procedure, the UE shall reset the registration attempt counter and the attach attempt counter (see 3GPP TS 24.301 [15]) and attempt to activate each of the other default EPS bearer contexts, if any, by initiating a stand-alone PDN connectivity procedure with request type set to "handover" in the PDN CONNECTIVITY REQUEST message; and

b) otherwise, enter substates EMM-REGISTERED.NORMAL-SERVICE and 5GMM-REGISTERED.NO-CELL-AVAILABLE and initiate a tracking area update procedure (see 3GPP TS 24.301 [15]).

At inter-system change from N1 mode to S1 mode in EMM-IDLE mode when:（NO PDU SESSION）

a) the UE supports non-IP PDN type and no PDU session is active; or

b) the UE does not support non-IP PDN type and no PDU session of IPv4, IPv6 or IPv4v6 PDU session type is active,

the UE shall enter substates EMM-DEREGISTERED.NORMAL-SERVICE and 5GMM-DEREGISTERED.NO-CELL-AVAILABLE, and initiate an attach procedure.

At inter-system change from S1 mode to N1 mode in 5GMM-IDLE mode, the UE shall:

a) enter substate 5GMM-REGISTERED.NORMAL-SERVICE and substate EMM-REGISTERED.NO-CELL-AVAILABLE;

b) map the default EPS bearer context(s) of the PDN connection(s) which the UE intends to transfer to 5GS, if any, to the corresponding PDU session(s) as specified in subclause 6.1.4.2; and

c) initiate the registration procedure for mobility and periodic registration update indicating "mobility registration updating" in the 5GS registration type IE of the REGISTRATION REQUEST message (see subclause 5.5.1.3).

After having successfully registered in N1 mode the UE shall reset the registration attempt counter and the attach attempt counter (see 3GPP TS 24.301 [15]) and:

a) if the UE supports the PDU session establishment procedure with request type set to "existing PDU session" to transfer a PDN connection from S1 mode to N1 mode and the UE has received an "interworking without N26 interface supported" indication from the network, attempt to transfer the PDN connection(s) which the UE intends to transfer to 5GS, if any, from S1 mode to N1 mode by initiating the PDU session establishment procedure with request type set to "existing PDU session"; and

b) otherwise, establish PDU session(s) corresponding to the PDN connection(s) which the UE intends to transfer to 5GS, if any, by initiating the PDU session establishment procedure with request type set to "initial request".

See subclause 5.1.4.3 for coordination between 5GMM and EMM and subclause 6.1.4.2 for coordination between 5GSM and ESM.

[TS 38.331, clause 5.3.11]

UE shall:

1> reset MAC;

1> if T302 is running:

2> stop timer T302;

2> perform the actions as specified in 5.3.14.4;

1> stop all timers that are running except T320 and T325;

1> discard the UE Inactive AS context;

1> set the variable *pendingRnaUpdate* to *false*, if that is set to *true*;

1> discard the KgNB, the KRRCenc key, the KRRCint, the KUPint key and the KUPenc key, if any;

1> release all radio resources, including release of the RLC entity, the MAC configuration and the associated PDCP entity and SDAP for all established RBs;

1> indicate the release of the RRC connection to upper layers together with the release cause;

1> enter RRC\_IDLE and perform cell selection as specified in TS 38.304 [20], except if going to RRC\_IDLE was triggered by selecting an inter-RAT cell while T311 was running;

1> if going to RRC\_IDLE was triggered by reception of the *RRCRelease* message including a *waitTime*:

2> start timer T302 with the value set to the *waitTime*;

2> inform the upper layer that access barring is applicable for all access categories except categories '0' and '2'.

11.1.2.3 Test description

11.1.2.3.1 Pre-test conditions

System Simulator:

- 2 cells

- NR Cell 1 as defined in TS 38.508-1 [4] Table 4.4.2-3. System information combination NR-6 as defined in TS 38.508-1 [4], sub-clause 4.4.3.1.2.

- E-UTRA Cell 1 as defined in TS 36.508 [7] Table 4.4.2-2. System information combination 31 as defined in TS 36.508 [7], sub-clause 4.4.3.1.1.

- Power levels are constant and as defined in Tables 11.1.2.3.1-1/2.

Table 11.1.2.3.1-1: Time instances of cell power level and parameter changes for FR1

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Parameter name** | **Unit** | **NR Cell 1** | **E-UTRA Cell 1** | **Remark** |
| T0 | SS/PBCH SSS EPRE | dBm/SCS | -88 | - |  |
| RS EPRE | dBm/15kHz | - | -91 |

Table 11.1.2.3.1-2: Time instances of cell power level and parameter changes for FR2

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Parameter name** | **Unit** | **NR Cell 1** | **E-UTRA Cell 1** | **Remark** |
| T0 | SS/PBCH SSS EPRE | dBm/SCS | -82 | - |  |
| RS EPRE | dBm/15kHz | - | -91 |

UE:

- None

Preamble:

- With E-UTRA Cell 1 "Serving cell" and NR Cell 1 "Non-suitable "Off" cell" in accordance with TS 38.508-1 [4], Table 6.2.2.1-3, the UE is brought to state RRC\_IDLE using generic procedure parameters Connectivity (*E-UTRA/EPC*) and Unrestricted nr PDN (*On*) in accordance with the procedure described in TS 38.508-1 [4], clause 4.5.2. 4G GUTI and eKSI are assigned and security context established

- The UE is switched-off

- With E-UTRA Cell 1 "Non-suitable "Off" cell" and NR Cell 1 "Serving cell" in accordance with TS 38.508-1 [4], Table 6.2.2.1-3, the UE is brought to state 1N-A, RRC\_IDLE Connectivity (NR), in accordance with the procedure described in TS 38.508-1 [4], with one IMS PDU session on NR Cell 1, Table 4.5.2.2-2. 5G-GUTI and ngKSI are assigned and security context established.

11.1.2.3.2 Test procedure sequence

Table 11.1.2.3.2-1: Main behaviour

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| St | Procedure | Message Sequence | | TP | Verdict |
|  |  | U – S | Message |  |  |
| 1 | Void | - | - | - | - |
| - | EXCEPTION: Uless otherwise stated the following messages are exchange on NR Cell 1. | - | - | - | - |
| 2 | User initiates a MMTEL call. | - | - | - | - |
| 3 | Check: Does the UE transmits an *RRCSetupRequest* message? | --> | NR RRC: *RRCSetupRequest* | 1 | P |
| 4 | The SS transmits an *RRCSetup* message. | <-- | NR RRC: *RRCSetup* | - | - |
| 5 | Check: Does the UE transmits an *RRCSetupComplete* message and a SERVICE REQUEST message? | --> | NR RRC: *RRCSetupComplete*  5GMM: SERVICE REQUEST | 1 | P |
| 5AA | Set the power levels according to “T0” as per Table 11.1.2.3.1-1/2. | - | - | - | - |
| 5A | The SS transmits a *SecurityModeCommand* message. | <-- | NR RRC: SecurityModeCommand | - | - |
| 5B | The UE transmits a *SecurityModeComplete* message. | --> | NR RRC: SecurityModeComplete | - | - |
| 6 | The SS transmits an *RRCRelease* message. | <-- | NR RRC: *RRCRelease* | - | - |
| - | EXCEPTION: Unless otherwise stated the following messages are exchange on E-UTRA Cell 1. | - | - | - | - |
| 7 | The UE transmits an *RRCConnectionRequest* message on the cell specified in the test case. | --> | RRC: *RRCConnectionRequest* | - | - |
| 8 | SS transmits an *RRCConnectionSetup* message. | <-- | RRC: *RRCConnectionSetup* | - |  |
| - | EXCEPTION: Steps 8a1 to 8b18 describe behaviour that depends on the UE implementation; the "lower case letter" identifies a step sequence that take place depending on the UE implementation. | - | - | - | - |
| 8a1 | If the UE tries to preserve the IP address of the PDN connection then check does the UE transmits an ATTACH REQUEST message? | --> | RRC: *RRCConnectionSetupComplete* NAS: ATTACH REQUEST | 2 | P |
| 8b1 | Else check: does the UE transmit a TRACKING AREA UPDATE REQUEST message? | --> | RRC: *RRCConnectionSetupComplete* NAS: TRACKING AREA UPDATE REQUEST | 2 | P |
| 8b2 | The SS transmites a TRACKING AREA UPDATE REJECT message to UE. | <-- | RRC: *DLInformationTransfer*  NAS: TRACKING AREA UPDATE REQUEST REJECT | - | - |
| 8b3 | The UE transmits an ATTACH REQUEST message. | --> | RRC: *ULInformationTransfer*  NAS: ATTACH REQUEST | - | - |
| 9-20 | Steps 5 to 16 of the generic test procedure for UE registration (TS 36.508 [2] Table 4.5.2.3-1) | - | - | - | - |
| - | EXCEPTION: In parallel to the events described in steps 21 to 29 the steps specified in Table 11.1.2.3.2-2 may take place to transfer other PDU sessions to EPS. | - | - | - | - |
| - | EXCEPTION: In parallel to the events described in steps 10 to 16 the UE may perform IMS re-registration on EUTRAN assteps as defined in TS 34.229-1 [35] subclause C.46 | - | - | - | - |
| - | EXCEPTION: Steps 21a1 to 21b1 describe behaviour that depends on the UE category. | - | - | - | - |
| 21a1 – 21a3 | IF not pc\_ue\_CategoryDL\_M1 THEN steps 2-4 of the expected sequence defined in annex C.21 of TS 34.229-1 [35]. MTSI MO speech call for EPS take place. | - | - | - | - |
| 21b1 – 21b3 | IF pc\_ue\_CategoryDL\_M1 THEN steps 2-4 of the expected sequence defined in annex C.21d of TS 34.229-1 [35]. MTSI MO speech call for EPS / UE category M1 take place. | - | - | - | - |
| 22-24 | Steps 12-14 from the Generic Test Procedure for MTSI MO speech call establishment (TS 36.508 [2] table 4.5A.6.3-1) are performed. | - | - | - | - |
| 25-28 | Void | - | - | - | - |
| 29 | The SS waits 1 second. | - | - | - | - |
| 30 | Release IMS Call as specified in the generic procedure in TS 34.229-1 [35] subclause C.32. | - | - | - | - |

Table 11.1.2.3.2-2: Parallel behaviour

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| St | Procedure | Message Sequence | | TP | Verdict |
|  |  | U - S | Message |  |  |
| 1 | Check: Does the UE transmit a PDN CONNECTIVITY REQUEST message to request an additional PDN. | --> | RRC: *ULInformationTransfer*  NAS: PDN CONNECTIVITY REQUEST | 1 | P |
| 2 | The SS configures a new data radio bearer, associated with the additional default EPS bearer context. *RRCConnectionReconfiguration* message contains the ACTIVATE DEFAULT EPS BEARER CONTEXT REQUEST message. | <-- | RRC: *RRCConnectionReconfiguration*  NAS:  ACTIVATE DEFAULT EPS BEARER CONTEXT REQUEST |  |  |
| 3 | The UE transmits an *RRCConnectionReconfigurationComplete* message to confirm the establishment of additional default bearer. | --> | RRC: *RRCConnectionReconfigurationComplete* |  |  |
| - | EXCEPTION: In parallel to the event described in step 4 below, if initiated by the UE the generic procedure for IP address allocation in the U-plane specified in TS 36.508 subclause 4.5A.1 takes place performing IP address allocation in the U-plane. | - | - |  |  |
| 4 | The UE transmits an ACTIVATE DEFAULT EPS BEARER CONTEXT ACCEPT message. | --> | RRC: *ULInformationTransfer*  NAS: ACTIVATE DEFAULT EPS BEARER CONTEXT ACCEPT |  |  |

11.1.2.3.3 Specific message contents

Table 11.1.2.3.3-0: REGISTRATION ACCEPT (preamble; step 14, TS 38.508-1 [4], Table 4.5.2.2-2)

|  |  |  |  |
| --- | --- | --- | --- |
| Derivation path: TS 38.508-1 [4] Table 4.7.1-7 | | | |
| Information Element | | Value/remark | Comment | Condition |
| Extended protocol discriminator | | ‘0111 1110’B | 5GS mobility management messages |  |
| Security header type | | ’0000’B | Plain 5GS NAS message, not security protected |  |
| Spare half octet | | '0000'B |  |  |
| 5GS network feature support | | ‘0100 0001 0000 0000’B | Interworking without N26 interface supported |  |

Table 11.1.2.3.3-1: RRCSetupRequest (step 3, table 11.1.2.3.2-1)

|  |  |  |  |
| --- | --- | --- | --- |
| Derivation Path: TS 38.508-1 [4] Table 4.6.1-23 | | | |
| Information Element | | Value/remark | Comment | Condition |
| RRCSetupRequest ::= SEQUENCE { | |  |  |  |
| rrcSetupRequest SEQUENCE { | |  |  |  |
| establishmentCause | | Mo-Voicecall |  |  |
| } | |  |  |  |
| } | |  |  |  |

Table 11.1.2.3.3-2: SERVICE REQUEST (step 5, table 11.1.2.3.2-1)

|  |  |  |  |
| --- | --- | --- | --- |
| Derivation path: TS 38.508-1 [4] Table 4.7.1-16 | | | |
| Information Element | Value/Remark | Comment | Condition |
| Service type | ‘0001’B | data |  |
| Uplink data status | Present | PSI bit corresponding to IMS PDN needs to be set |  |

Table 11.1.2.3.3-3: RRCRelease (step 6, table 11.1.2.3.2-1)

|  |  |  |  |
| --- | --- | --- | --- |
| Derivation path: TS 38.508-1 [4] Table 4.6.1-16 | | | |
| Information Element | Value/Remark | Comment | Condition |
| RRCRelease ::= SEQUENCE { |  |  |  |
| criticalExtensions CHOICE { |  |  |  |
| rrcRelease SEQUENCE { |  |  |  |
| redirectedCarrierInfo CHOICE { |  |  |  |
| eutra.SEQUENCE{ |  |  |  |
| eutraFrequency | Downlink EARFCN of E-UTRA cell 1 |  |  |
| cnType | epc |  |  |
| } |  |  |  |
| } |  |  |  |
| } |  |  |  |
| } |  |  |  |
| } |  |  |  |

Table 11.1.2.3.3-3A: ATTACH REQUEST (step 8a1, table 11.1.2.3.2-1)

|  |  |  |  |
| --- | --- | --- | --- |
| Derivation Path: TS 36.508 [7], Table 4.7.2-4. | | | |
| Information Element | Value/Remark | Comment | Condition |
| NAS key set identifier | KSIASME that was created when the UE last registered to EPC E-UTRA |  |  |
| Old GUTI | GUTI, mapped from the 5G-GUTI assigned at the initial registration when the UE entered N1 |  |  |
| Last visited registered TAI | The TAI the last visited E-UTRA Cell belonged to, if any. Not included if the UE does not have last stored EPC TAI. |  |  |
| Old GUTI type | "Native GUTI" |  |  |
| ESM message container | PDN CONNECTIVITY REQUEST message to active PDU sessions which the UE intends to transfer to EPS. |  |  |

Table 11.1.2.3.3-3B: PDN CONNECTIVITY REQUEST (Table 11.1.2.3.3-3A)

|  |  |  |  |
| --- | --- | --- | --- |
| Derivation Path: TS 36.508 [7], Table 4.7.3-20 | | | |
| Information Element | | Value/remark | Comment | Condition |
| EPS bearer identity | | 0 | No EPS bearer identity assigned, for coding see Table 9.11.4.8.1 in TS 24.501 [22] |  |
| Procedure transaction identity | | Any value from 1 to 254 |  |  |
| PDN connectivity request message identity | | '1101 0000'B | PDN connectivity request |  |
| Request type | | '010'B | Handover |  |
| PDN type | | Any value between '001'B, '010'B, '011'B and '100'B | The allowed values are respectively IPv4, IPv6, IPv4v6 and "unused but interpreted as IPv6 by the network" |  |
| Protocol configuration options | | PDU session ID of 5GS PDU session |  |  |

Table 11.1.2.3.3-4: TRACKING AREA UPDATE REQUEST (step 8b1, table 11.1.2.3.2-1)

|  |  |  |  |
| --- | --- | --- | --- |
| Derivation Path: TS 36.508 [7], Table 4.7.2-27, condition NR. | | | |
| Information Element | Value/Remark | Comment | Condition |
| "Active" flag | 0001 | Bearer Establishment requested |  |
| EPS bearer context status | Present | EBI corresponding to active PDU Sessions need to be set to 1 |  |
| NAS key set identifier | KSIASME that was created when the UE last registered to EPC E-UTRA |  |  |
| Old GUTI | GUTI, mapped from the 5G-GUTI assigned at the initial registration when the UE entered N1 |  |  |
| Last visited registered TAI | The TAI the last visited E-UTRA Cell belonged to, if any. Not included if the UE does not have last stored EPC TAI. |  |  |
| Old GUTI type | "Native GUTI" |  |  |
| UE status | "UE is in 5GMM-REGISTERED state" |  |  |

Table 11.1.2.3.3-5: TRACKING AREA UPDATE REJECT (step 8b2, table 11.1.2.3.2-1)

|  |  |  |  |
| --- | --- | --- | --- |
| Derivation Path: TS 36.508 [7], Table 4.7.2-26. | | | |
| Information Element | Value/Remark | Comment | Condition |
| EMM cause | ‘0000 1001’B | #9 "UE identity cannot be derived by the network" |  |

Table 11.1.2.3.3-6: ATTACH REQUEST (step 8b3, table 11.1.2.3.2-1)

|  |  |  |  |
| --- | --- | --- | --- |
| Derivation Path: TS 36.508 [7], Table 4.7.2-4. | | | |
| Information Element | Value/Remark | Comment | Condition |
| IMSI | IMSI of the UE |  |  |

Table 11.1.2.3.3-7: PDN CONNECTIVITY REQUEST (step 1, table 11.1.2.3.2-2)

|  |  |  |  |
| --- | --- | --- | --- |
| Derivation Path: TS 36.508 [7], Table 4.7.3-20 | | | |
| Information Element | | Value/remark | Comment | Condition |
| EPS bearer identity | | 0 | No EPS bearer identity assigned, for coding see Table 9.11.4.8.1 in TS 24.501 [22] |  |
| Procedure transaction identity | | Any value from 1 to 254 |  |  |
| PDN connectivity request message identity | | '1101 0000'B | PDN connectivity request |  |
| Request type | | '010'B | Handover |  |
| PDN type | | Any value between '001'B, '010'B, '011'B and '100'B | The allowed values are respectively IPv4, IPv6, IPv4v6 and "unused but interpreted as IPv6 by the network" |  |
| Protocol configuration options | | PDU session ID of internet PDU session |  |  |

Table 11.1.2.3.3-8: ATTACH ACCEPT (preamble, step 18; step 14, TS 36.508-1 [7], Table 4.5.2.3-1)

|  |  |  |  |
| --- | --- | --- | --- |
| Derivation path: TS 36.508-1 [7] Table 4.7.2-1 | | | |
| Information Element | | Value/remark | Comment | Condition |
| EPS network feature support | | '0000 0011 0100 1000'B | - IMS voice over PS session in S1 mode supported  - emergency bearer services in S1 mode supported  - ePCO supported  - Interworking without N26 interface supported |  |

**<End of modified section 1>**