**3GPP TSG-CT WG1 Meeting #131-eC1-21xxxx**

**E-meeting, 19-27 August 2021**

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| *CR-Form-v12.1* |
| **CHANGE REQUEST** |
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|  | **24.301** | **CR** | **3586** | **rev** | **1** | **Current version:** | **17.3.0** |  |
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| *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 |  |

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| ***Title:***  | Obtaining voice services for EMM cause #2 (IMSI unknown in HSS) |
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| ***Source to WG:*** | Huawei, HiSilicon |
| ***Source to TSG:*** | C1 |
|  |  |
| ***Work item code:*** | TEI17 |  | ***Date:*** | 2021-08-09 |
|  |  |  |  |  |
| ***Category:*** | **F** |  | ***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 canbe 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-15 (Release 15)Rel-16 (Release 16)Rel-17 (Release 17)Rel-18 (Release 18)* |
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| ***Reason for change:*** | For combined attach/TAU successful for EPS services only with EMM #2 (IMSI unknown in HSS), it has specified that the UE is considered as invalid for CS services until switched off/on or USIM change but the UE is still registered for PS services and hence can stay in 4G.However, it is unclear what the voice centric UE should do in case of the current registered network cannot provide IMS voice services in 4G, i.e. the network indicates in the ATTACH ACCEPT message or the TRACKING AREA UPDATE ACCEPT message that IMS voice over PS sessions are not supported.In this case, the voice centric UE cannot move to 2G/3G as the CS services are invalid for it.If the voice centric UE supports N1 mode, then the UE can move to 5G to obtain the voice services in 5G. |
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| ***Summary of change:*** | It proposes in case of combined attach/TAU successful for EPS services only with EMM #2 (IMSI unknown in HSS), the voice centric UE shall disable the E-UTRA capability. |
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| ***Consequences if not approved:*** | The voice centric UE cannot obtain voice services. |
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| ***Clauses affected:*** | 5.5.1.3.4.3, 5.5.3.3.4.3 |
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|  | **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:*** |  |

\* \* \* First Change \* \* \* \*

###### 5.5.1.3.4.3 Combined attach successful for EPS services only

Apart from the actions on the tracking area updating attempt counter, the description for attach for EPS services as specified in clause 5.5.1.2.4 shall be followed. In addition, the following description for attach for non-EPS services applies.

If, due to emergency services fallback (see 3GPP TS 23.502 [59], clause 4.13.4), there is

a request for emergency services pending and the emergency bearer services indicator in the EPS network feature support IE indicates "emergency bearer services in S1 mode not supported",

then the UE shall skip the requirements defined below in the present clause for the receipt of an ATTACH ACCEPT message including an EMM cause value, attempt to select GERAN or UTRAN radio access technology, select a setup message as defined in clause 5.3.7, proceed with appropriate MM specific procedures, and send the setup message.

The UE receiving the ATTACH ACCEPT message takes one of the following actions depending on the EMM cause value:

#2 (IMSI unknown in HSS)

 The UE shall stop T3410 if still running and shall reset the tracking area updating attempt counter. The UE shall set the update status to U3 ROAMING NOT ALLOWED and shall delete any TMSI, LAI and ciphering key sequence number. The UE shall enter state EMM-REGISTERED.NORMAL-SERVICE. The new MM state is MM IDLE. The USIM shall be considered as invalid for non-EPS services until the UE is switched off, the UICC containing the USIM is removed or the timer T3245 expires as described in clause 5.3.7a. If the UE maintains a counter for "SIM/USIM considered invalid for non-GPRS services", then the UE shall set this counter to UE implementation-specific maximum value.

 If, due to emergency services fallback (see 3GPP TS 23.502 [59]), there is a request for CS fallback call pending (see clause 5.3.7), the UE shall attempt to select GERAN or UTRAN radio access technology and attempt emergency call setup.

 A UE operating in CS/PS mode 1 of operation with "IMS voice not available" shall disable the E-UTRA capability (see clause 4.5).

#16 (MSC temporarily not reachable); or

#17 (Network failure)

 The UE shall stop timer T3410 if still running, and shall enter state MM IDLE. The tracking area updating attempt counter shall be incremented, unless it was already set to 5.

 If the tracking area updating attempt counter is less than 5:

- the UE shall start timer T3411, shall set the EPS update status to EU1 UPDATED and shall enter state EMM-REGISTERED.ATTEMPTING-TO-UPDATE-MM. When timer T3411 expires the combined tracking area updating procedure indicating "combined TA/LA updating with IMSI attach" is triggered.

 If the tracking area updating attempt counter is equal to 5:

- a UE operating in CS/PS mode 2 of operation and a UE operating in CS/PS mode 1 of operation with "IMS voice available" shall start timer T3402, shall set the EPS update status to EU1 UPDATED and shall enter state EMM-REGISTERED.ATTEMPTING-TO-UPDATE-MM. When timer T3402 expires the combined tracking area updating procedure indicating "combined TA/LA updating with IMSI attach" is triggered;

- a UE operating in CS/PS mode 1 of operation with "IMS voice not available" shall attempt to select GERAN or UTRAN radio access technology and proceed with appropriate MM or GMM specific procedures and disable the E-UTRA capability (see clause 4.5).

#18 (CS domain not available)

 The UE shall stop timer T3410 if still running, shall reset the tracking area updating attempt counter, shall set the EPS update status to EU1 UPDATED and shall enter state EMM-REGISTERED.NORMAL-SERVICE.

 The UE shall enter state MM IDLE and shall set the update status to U2 NOT UPDATED.

 A UE in CS/PS mode 1 of operation with "IMS voice not available" shall attempt to select GERAN or UTRAN radio access technology and disable the E-UTRA capability (see clause 4.5).

 A UE in CS/PS mode 2 of operation and a UE operating in CS/PS mode 1 of operation with "IMS voice available" may provide a notification to the user or the upper layers that the CS domain is not available.

 The UE shall not attempt combined attach or combined tracking area updating procedures with current PLMN until switching off the UE or the UICC containing the USIM is removed.

#22 (Congestion)

 The UE shall stop the timer T3410 if still running. The tracking area updating attempt counter shall be set to 5. The UE shall start the timer T3402, shall set the EPS update status to EU1 UPDATED, shall enter state EMM-REGISTERED.ATTEMPTING-TO-UPDATE-MM, and shall enter state MM IDLE.

Other EMM cause values and the case that no EMM cause IE was received are considered as abnormal cases. The combined attach procedure shall be considered as failed for non-EPS services. The behaviour of the UE in those cases is specified in clause 5.5.1.3.6.

\* \* \* Next Change \* \* \* \*

###### 5.5.3.3.4.3 Combined tracking area updating successful for EPS services only

Apart from the actions on the tracking area updating attempt counter, the description for tracking area for EPS services as specified in clause 5.5.3.2.4 shall be followed. In addition, the following description for location updating for non-EPS services applies.

If, due to emergency services fallback (see 3GPP TS 23.502 [59], clause 4.13.4), there is a request for emergency services pending and the emergency bearer services indicator in the EPS network feature support IE indicates "emergency bearer services in S1 mode not supported", then the UE shall skip the requirements defined below in the present clause for the receipt of a TRACKING AREA UPDATE ACCEPT message including an EMM cause value, attempt to select GERAN or UTRAN radio access technology, select a setup message as defined in clause 5.3.7, proceed with appropriate MM specific procedures, and send the setup message.

The UE receiving the TRACKING AREA UPDATE ACCEPT message takes one of the following actions depending on the EMM cause value:

#2 (IMSI unknown in HSS)

 The UE shall stop T3430 if still running and shall reset the tracking area updating attempt counter. The UE shall set the update status to U3 ROAMING NOT ALLOWED and shall delete any TMSI, LAI and ciphering key sequence number. The UE shall enter state EMM-REGISTERED.NORMAL-SERVICE. The new MM state is MM IDLE. The USIM shall be considered as invalid for non-EPS services until switching off or the UICC containing the USIM is removed or the timer T3245 expires as described clause 5.3.7a. If the UE maintains a counter for "SIM/USIM considered invalid for non-GPRS services", then the UE shall set this counter to UE implementation-specific maximum value.

 If, due to emergency services fallback (see 3GPP TS 23.502 [59]), there is a request for CS fallback call pending (see clause 5.3.7), the UE shall attempt to select GERAN or UTRAN radio access technology and attempt emergency call setup.

 A UE operating in CS/PS mode 1 of operation with "IMS voice not available" and without a persistent EPS bearer context shall disable the E-UTRA capability (see clause 4.5).

 A UE operating in CS/PS mode 1 of operation with "IMS voice not available" and with a persistent EPS bearer context shall, after the radio bearer associated with the persistent EPS bearer context has been released, disable the E-UTRA capability (see clause 4.5).

#16 (MSC temporarily not reachable); or

#17 (Network failure)

 The UE shall stop timer T3430 if still running, and shall enter state MM IDLE. The tracking area updating attempt counter shall be incremented, unless it was already set to 5.

 If the tracking area updating attempt counter is less than 5:

- the UE shall start timer T3411, shall set the EPS update status to EU1 UPDATED and shall enter state EMM-REGISTERED.ATTEMPTING-TO-UPDATE-MM. When timer T3411 expires the combined tracking area updating procedure indicating "combined TA/LA updating with IMSI attach" is triggered again.

 If the tracking area updating attempt counter is equal to 5:

- a UE operating in CS/PS mode 2 of operation and a UE operating in CS/PS mode 1 of operation with "IMS voice available" shall start timer T3402, shall set the EPS update status to EU1 UPDATED and shall enter state EMM-REGISTERED.ATTEMPTING-TO-UPDATE-MM. When timer T3402 expires the combined tracking area updating procedure indicating "combined TA/LA updating with IMSI attach" is triggered again;

- a UE operating in CS/PS mode 1 of operation with "IMS voice not available" without a persistent EPS bearer context shall attempt to select GERAN or UTRAN radio access technology and proceed with appropriate MM or GMM specific procedures and disable the E-UTRA capability (see clause 4.5);

- a UE operating in CS/PS mode 1 of operation with "IMS voice not available" and with a persistent EPS bearer context shall start timer T3402, shall set the EPS update status to EU1 UPDATED and shall enter state EMM-REGISTERED.ATTEMPTING-TO-UPDATE-MM. When timer T3402 expires the combined tracking area updating procedure indicating "combined TA/LA updating with IMSI attach" is triggered again. When the radio bearer associated with the persistent EPS bearer context has been released and the UE is registered for EPS services only, operating in CS/PS mode 1 of operation with "IMS voice not available", then the UE shall stop timer T3402, if already running, attempt to select GERAN or UTRAN radio access technology and proceed with appropriate MM or GMM specific procedures and disable the E-UTRA capability (see clause 4.5).

#18 (CS domain not available)

 The UE shall stop timer T3430 if still running, shall reset the tracking area updating attempt counter, shall set the EPS update status to EU1 UPDATED and shall enter state EMM-REGISTERED.NORMAL-SERVICE.

 The UE shall enter state MM IDLE and shall set the update status to U2 NOT UPDATED.

 A UE in CS/PS mode 1 of operation with "IMS voice not available" without a persistent EPS bearer context shall attempt to select GERAN or UTRAN radio access technology rather than E-UTRAN for the registered PLMN or equivalent PLMN and disable the E-UTRA capability (see clause 4.5).

 A UE in CS/PS mode 1 of operation with "IMS voice not available" and with a persistent EPS bearer context shall, after the radio bearer associated with the persistent EPS bearer context has been released, attempt to select GERAN or UTRAN radio access technology rather than E-UTRAN for the registered PLMN or equivalent PLMN and disable the E-UTRA capability (see clause 4.5).

 A UE in CS/PS mode 2 of operation and a UE operating in CS/PS mode 1 of operation with "IMS voice available" may provide a notification to the user or the upper layers that the CS domain is not available.

 The UE shall not attempt combined attach or combined tracking area updating procedure with current PLMN until switching off the UE or the UICC containing the USIM is removed.

#22 (Congestion)

 The UE shall stop timer T3430 if still running. The tracking area updating attempt counter shall be set to 5. The UE shall start timer T3402, shall set the EPS update status to EU1 UPDATED, shall enter state EMM-REGISTERED.ATTEMPTING-TO-UPDATE-MM, shall enter state MM IDLE.

Other EMM cause values and the case that no EMM cause IE was received are considered as abnormal cases. The combined tracking area updating procedure shall be considered as failed for non-EPS services. The behaviour of the UE in those cases is specified in clause 5.5.3.3.6.

\* \* \* End of Change \* \* \* \*