**3GPP TSG-CT WG1 Meeting #133e-bisC1-22aabb**

**E-meeting, 17-21 January 2022 was C1-220397**

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| *CR-Form-v12.1* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
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|  | **24.301** | **CR** | **3673** | **rev** | **1** | **Current version:** | **17.5.0** |  |
|  | | | | | | | | |
| *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 |  |

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| ***Title:*** | Constructing TAI for Attach in NTN | | | | | | | | | |
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| ***Source to WG:*** | MediaTek Inc. | | | | | | | | | |
| ***Source to TSG:*** | C1 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | IoT\_SAT\_ARCH\_EPS | | | | |  | ***Date:*** | | | 2022-01-19 |
|  |  | | | |  | |  | | |  |
| ***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-15 (Release 15) Rel-16 (Release 16) Rel-17 (Release 17) Rel-18 (Release 18)* | |
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| ***Reason for change:*** | | In terrestrial networks a cell broadcast a TAC for a PLMN.  When initiating an ATTACH procedure against the PLMN the UE shall memorize a TAI, i.e. TAC + PLMN ID, for what the ATTACH procedure is initiated. This is called in 24.301 as a current TAI.  When a cell offers satellite access, the cell may broadcast / indicate support for multiple TACs per a PLMN.  When the UE initiates a ATTACH procedure in the cell for the PLMN the UE should memorize all TACs for the PLMN (current TAIs). | | | | | | | | |
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| ***Summary of change:*** | | If a cell offering satellite access is broadcasting multiple TACs per PLMN, the UE shall memorize each TAC of the PLMN when initiating an ATTACH procedure. | | | | | | | | |
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| ***Consequences if not approved:*** | | IoT NTN cell broadcasting multiple TACs for a PLMN is not taken into account when the UE initiates an ATTACH procedure for the PLMN. | | | | | | | | |
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| ***Clauses affected:*** | | 5.5.1.1 | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **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:*** | |  | | | | | | | | |

#### 5.5.1.1 General

The attach procedure is used to attach to an EPC for packet services in EPS.

The attach procedure is used for the following purposes:

- by a UE in PS mode of operation to attach for EPS services only;

- by a UE in CS/PS mode 1 or CS/PS mode 2 of operation to attach for both EPS and non-EPS services;

- by a UE supporting NB-S1 mode only in PS mode of operation to attach for EPS services and "SMS only";

- to attach for emergency bearer services; or

- an attach for access to RLOS.

The lower layers indicate to NAS that the network does not support emergency bearer services for the UE in limited service state (3GPP TS 36.331 [22]). This information is taken into account when deciding whether to initiate attach for emergency bearer services in WB-S1 mode.

If the MME does not support an attach for emergency bearer services, the MME shall reject any request to attach with an attach type set to "EPS emergency attach".

The lower layers may indicate to NAS whether the network supports access to RLOS (3GPP TS 36.331 [22]). This information is taken into account when deciding whether to initiate attach for access to RLOS in WB-S1 mode.

With a successful attach procedure, a context is established for the UE in the MME. Furthermore, if the UE requested PDN connectivity, a default bearer is established between the UE and the PDN GW, thus enabling always-on IP connectivity to the UE. In WB-S1 mode, the network may also initiate the activation of dedicated bearers as part of the attach procedure. In NB-S1 mode the network shall not initiate the activation of dedicated bearers.

With a successful attach procedure in NB-S1 mode, a context is established for the UE in the MME. If the attach request included information to request PDN connectivity, a default bearer is also established between the UE and the PDN.

If EMM-REGISTERED without PDN connection is supported by the UE and the MME, a default bearer need not be requested by the UE during the attach procedure. If EMM-REGISTERED without PDN connection is not supported by the UE or the MME, then the UE shall request establishment of a default bearer.

During the attach procedure with default bearer establishment, the UE may also obtain the home agent IPv4 or IPv6 address or both.

In a shared network, the UE shall choose one of the PLMN identities as specified in 3GPP TS 23.122 [6]. If the cell does not indicate support for more than one TAC for the chosen PLMN, the UE shall construct the TAI of the cell from this chosen PLMN identity and the TAC received for this PLMN identity as part of the broadcast system information. The chosen PLMN identity shall be indicated to the E-UTRAN (see 3GPP TS 36.331 [22]). Whenever an ATTACH REJECT message with the EMM cause #11 "PLMN not allowed" is received by the UE, the chosen PLMN identity shall be stored in the "forbidden PLMN list" and if the UE is configured to use timer T3245 (see 3GPP TS 24.368 [15A] or 3GPP TS 31.102 [17]) then the UE shall start timer T3245 and proceed as described in clause 5.3.7a. Whenever an ATTACH REJECT message with the EMM cause #14 "EPS services not allowed in this PLMN" is received by the UE, the chosen PLMN identity shall be stored in the "forbidden PLMNs for GPRS service" and if the UE is configured to use timer T3245 (see 3GPP TS 24.368 [15A] or 3GPP TS 31.102 [17]) then the UE shall start timer T3245 and proceed as described in clause 5.3.7a. Whenever an ATTACH REJECT message is received by the UE with the EMM cause #12 "tracking area not allowed", #13 "roaming not allowed in this tracking area", or #15 "no suitable cells in tracking area", the constructed TAI shall be stored in the suitable forbidden list.

In a satellite access, if the cell indicates support for more than one TACs for the chosen PLMN identity, the UE shall construct the TAI list of the cell from the chosen PLMN identity and TACs received for this PLMN identity on the broadcast system information. Whenever an ATTACH REJECT message is received by the UE with the EMM cause #12 "tracking area not allowed", #13 "roaming not allowed in this tracking area", or #15 "no suitable cells in tracking area", all TAIs in the constructed TAI list of the current cell shall be stored in the suitable forbidden list.

An attach attempt counter is used to limit the number of subsequently rejected attach attempts. The attach attempt counter shall be incremented as specified in clause 5.5.1.2.6. Depending on the value of the attach attempt counter, specific actions shall be performed. The attach attempt counter shall be reset when:

- the UE is powered on;

- a USIM is inserted;

- an attach or combined attach procedure is successfully completed;

NOTE: The attach procedure can be initiated in S1 or S101 mode as described in clause 5.5.1.

- a GPRS attach or combined GPRS attach procedure is successfully completed in A/Gb or Iu mode;

- a registration procedure for initial registration performed over 3GPP access is successfully completed in N1 mode and the UE is operating in single-registration mode;

- a combined attach procedure is completed for EPS services only with cause #2, #16, #17, #18 or #22;

- an attach or combined attach procedure is rejected with cause #11, #12, #13, #14, #15, #25 or #35:

- a network initiated detach procedure is completed with cause #11, #12, #13, #14, #15 or #25; or

- a new PLMN is selected.

Additionally the attach attempt counter shall be reset when the UE is in substate EMM-DEREGISTERED.ATTEMPTING-TO-ATTACH and:

- a new tracking area is entered;

- timer T3402 expires; or

- timer T3346 is started.