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

**Electronic meeting, 19 – 27 Aug 2021 *was C1-214628***

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| *CR-Form-v12.0* |
| **CHANGE REQUEST** |
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|  | **24.301** | **CR** | **3582** | **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 | **x** |

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| ***Title:***  | TF of received UE radio capability ID is not expected value(s) |
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| ***Source to WG:*** | Huawei, HiSilicon |
| ***Source to TSG:*** | C1 |
|  |  |
| ***Work item code:*** | TEI17, RACS |  | ***Date:*** | 2021-08-12 |
|  |  |  |  |  |
| ***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:*** | * Following is the format of UE radio capability ID specified in TS 23.003

*1) Type Field (TF): identifies the type of UE radio capability ID. The following values are defined:**- 0: manufacturer-assigned UE radio capability ID;**- 1: network-assigned UE radio capability ID; and**- 2 to F: spare values for future use.** As the following text quoted from clause 4.16 of TS24.501 specified, the UE radio capability ID that the UE received can only be the network-assigned UE radio capability ID. That is the TF of the received UE radio capability ID by UE can only be “1”

*d) upon receiving a network-assigned UE radio capability ID in the REGISTRATION ACCEPT message or the CONFIGURATION UPDATE COMMAND message, the UE shall store the network-assigned UE radio capability ID and the PLMN ID or SNPN identity of the serving network along with a mapping to the current UE radio configuration in its non-volatile memory as specified in annex C. The UE shall be able to store at least the last 16 received network-assigned UE radio capability IDs with the associated PLMN ID or SNPN identity and the mapping to the corresponding UE radio configuration;** As the following text quoted from clause 4.16 and clause 3.1 of TS24.501 specified, the UE radio capability ID that the NW received can be a network-assigned UE radio capability ID or a manufacturer-assigned UE radio capability ID. That is the TF of the received UE radio capability ID by NW can be “0” or “1”

*b) if the UE performs a registration procedure for initial registration and the UE has an applicable UE radio capability ID for the current UE radio configuration in the selected network, the UE shall include the UE radio capability ID in the UE radio capability ID IE as a non-cleartext IE in the REGISTRATION REQUEST message. If both a network-assigned UE radio capability ID and a manufacturer-assigned UE Radio Capability ID are applicable, the UE shall include the network-assigned UE radio capability ID in the REGISTRATION REQUEST message;****Applicable UE radio capability ID for the current UE radio configuration in the selected network:*** *The UE has an applicable UE radio capability ID for the current UE radio configuration in the selected network if:**a) the UE supports RACS; and**b) the UE has:**1) a stored network-assigned UE radio capability ID which is associated with the PLMN ID or SNPN identity of the serving network and which maps to the set of radio capabilities currently enabled at the UE; or**2) a manufacturer-assigned UE radio capability ID which maps to the set of radio capabilities currently enabled at the UE.*There is no description about how to do if an unexpected TF value received by UE/NW. |
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| ***Summary of change:*** | If the TF of UE radio capability ID received by UE is not “1”, UE shall discard it; If the TF of UE radio capability ID received by NW is not “0” or “1”, NW shall discard it. |
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| ***Consequences if not approved:*** | UE/NW does not know how to do if the TF of the received UE radio capability ID is not the expected value(s) |
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| ***Clauses affected:*** | 5.3.20 |
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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 ...  |
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| ***Other comments:*** |  |
|  |  |
| ***This CR's revision history:*** |  |

\*\*\*\*\* start of 1st change \*\*\*\*\*

### 5.3.20 UE radio capability signalling optimisation

UE radio capability signalling optimisation (RACS) is a feature that is optional at both the UE and the network and which aims to optimise the transmission of UE radio capability over the radio interface (see 3GPP TS 23.401 [10]). RACS works by assigning an identifier to represent a set of UE radio capabilities. This identifier is called the UE radio capability ID. A UE radio capability ID can be either manufacturer-assigned or network-assigned. The UE radio capability ID is an alternative to the signalling of the radio capabilities container over the radio interface.

In this release of the specification, RACS is not applicable to NB-S1 mode.

If the UE supports RACS:

- the UE shall indicate support for RACS by setting the RACS bit to "RACS supported" in the UE network capability IE of the ATTACH REQUEST and TRACKING AREA UPDATE REQUEST messages;

- if the UE performs an attach procedure and the UE has an applicable UE radio capability ID for the current UE radio configuration in the selected network, the UE shall include the UE radio capability ID availability IE in the ATTACH REQUEST message and set the IE to "UE radio capability ID available";

- if the UE performs a tracking area updating procedure and the UE has an applicable UE radio capability ID for the current UE radio configuration in the selected network, the UE shall include the UE radio capability ID availability IE in the TRACKING AREA UPDATE REQUEST message and set the IE to "UE radio capability ID available";

- If the UE is requested to provide the UE radio capability ID by the network during a security mode control procedure, the UE shall include the UE radio capability ID in the UE radio capability ID IE of the SECURITY MODE COMPLETE message according to the rules in clause 5.4.3.3.;

- if the radio configuration at the UE changes (for instance because the UE has disabled a specific radio capability) then:

a) if the UE has an applicable UE radio capability ID for the new UE radio configuration, the UE shall initiate a tracking area updating procedure, include a UE radio capability information update needed IE in the TRACKING AREA UPDATE REQUEST message and set the URCIDA bit to "UE radio capability ID available" in the UE radio capability ID availability IE in the TRACKING AREA UPDATE REQUEST message; and

b) if the UE does not have an applicable UE radio capability ID for the new UE radio configuration, the UE shall initiate a tracking area updating procedure and shall include a UE radio capability information update needed IE in the TRACKING AREA UPDATE REQUEST message;

NOTE: Performing the tracking area updating procedure with the UE radio capability information update needed IE included in the TRACKING AREA UPDATE REQUEST message and without the UE radio capability ID availability IE set to "UE radio capability ID available" in the TRACKING AREA UPDATE REQUEST message as specified in b) above can trigger the network to assign a new UE radio capability ID to the UE.

- upon receiving a network-assigned UE radio capability ID in the ATTACH ACCEPT message,in the TRACKING AREA UPDATE ACCEPT message or in the GUTI REALLOCATION COMMAND message, the UE shall store the network-assigned UE radio capability ID and the PLMN ID of the serving network along with a mapping to the current UE radio configuration in its non-volatile memory as specified in annex C. The TF of the UE radio capability ID shall be "1", all other values shall be discarded as "1" if received by the UE. The UE shall be able to store at least the last 16 received network-assigned UE radio capability IDs with the associated PLMN ID and the mapping to the corresponding UE radio configuration;

- the UE shall not use a network-assigned UE radio capability ID in PLMNs equivalent to the PLMN which assigned it; and

- upon receiving a UE radio capability ID deletion indication IE set to "delete network-assigned UE radio capability IDs" in the ATTACH ACCEPT message,in the TRACKING AREA UPDATE ACCEPT message or in the GUTI REALLOCATION COMMAND message, the UE shall delete all network-assigned UE radio capability IDs stored at the UE for the serving network and initiate a tracking area updating procedure. If the UE has an applicable manufacturer-assigned UE radio capability ID for the current UE radio configuration in the selected network, the UE shall include a UE radio capability ID availability IE set to "UE radio capability ID available" in the TRACKING AREA UPDATE REQUEST message.

If the network supports RACS:

- if the UE has included the UE radio capability ID availability IE in the ATTACH REQUEST message and set the IE to "UE radio capability ID available", the network shall initiate a security mode control procedure to retrieve the UE radio capability ID from the UE;

- if the UE has included the UE radio capability ID availability IE in the TRACKING AREA UPDATE REQUEST message and set the IE to "UE radio capability ID available", the network may initiate a security mode control procedure to retrieve the UE radio capability ID from the UE;

- if the UE has included the UE radio capability ID availability IE in the TRACKING AREA UPDATE REQUEST message, set the URCIDA bit to "UE radio capability ID available" in the UE radio capability ID availability IE and no UE radio capability ID is available in the UE context in the MME, the network shall initiate a security mode control procedure to retrieve the UE radio capability ID from the UE;

- the network may assign a network-assigned UE radio capability ID to a UE which supports RACS by including a UE radio capability ID IE in the ATTACH ACCEPT message, in the TRACKING AREA UPDATE ACCEPT message or in the GUTI REALLOCATION COMMAND message;

- the network may trigger the UE to delete all network-assigned UE radio capability IDs stored at the UE for the serving network by including a UE radio capability ID deletion indication IE set to "delete network-assigned UE radio capability IDs" in the ATTACH ACCEPT message, in the TRACKING AREA UPDATE ACCEPT message or in the GUTI REALLOCATION COMMAND message; and

- the network may receive a UE radio capability ID IE in the ATTACH REQUEST message, the TRACKING AREA UPDATE REQUEST message or the SECURITY MODE COMPLETE message, the TF of the UE radio capability ID shall be "0" or "1", all other values shall be discarded if received by the network.

\*\*\*\*\* end of 1st change \*\*\*\*\*