**3GPP TSG-CT WG1 Meeting #126-eC1-20xxxx was6030**

**Electronic meeting, 15-23 October 2020**

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| *CR-Form-v12.0* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
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|  | **24.301** | **CR** | **3439** | **rev** | **1** | **Current version:** | **16.6.0** |  |
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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:*** | Correction on UE behaviour for RACS | | | | | | | | | |
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| ***Source to WG:*** | MediaTek Inc. | | | | | | | | | |
| ***Source to TSG:*** | C1 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | RACS | | | | |  | ***Date:*** | | | 2020-10-06 |
|  |  | | | |  | |  | | |  |
| ***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-12 (Release 12)* *Rel-13 (Release 13) Rel-14 (Release 14) Rel-15 (Release 15) Rel-16 (Release 16) Rel-17 (Release 17)* | |
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| ***Reason for change:*** | | As discussed in **C1-206029**, it is proposed that the UTRAN capability is excluded from the scope of RACS because  - For a UE with valid RACS ID for its current radio configuration, the ID will be invalidated each time the UE returns from UTRAN to E-UTRAN even if the UE does not change any configuration.  - One occurance of UTRAN system change will consume a RACS ID, which may drain out the RACS ID quickly.  - The RAN will not leverage the UTRAN radio capability acquired from core network (e.g., from UCMF, AMF, MME), instead the RAN will query the the **INTER RAT HANDOVER INFO** by itself when needed. It is meaningless to include UTRAN capability in the scope of RACS because the RAN will not use it. | | | | | | | | |
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| ***Summary of change:*** | | Excluded from the scope of RACS | | | | | | | | |
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| ***Consequences if not approved:*** | | 1. ID will be invalidated each time the UE returns from UTRAN to E-UTRAN even if the UE does not change any configuration 2. RACS ID drain out quickly 3. Waste resource to store UTRAN radio capability in the core network but RAN will never use it | | | | | | | | |
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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:*** | |  | | | | | | | | |

\*\*\* 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 excluding the radio capability of the radio access technology for UTRAN 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 excluding the radio capability of the radio access technology for UTRAN 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 its UE radio capability ID by the network during a security mode control procedure, the UE shall include its UE radio capability ID in the UE radio capability ID IE of the SECURITY MODE COMPLETE 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 SECURITY MODE COMPLETE message;

- 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 excluding the radio capability of the radio access technology for UTRAN, 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 include a UE radio capability ID availability IE set to "UE radio capability ID available" in the TRACKING AREA UPDATE 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 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 excluding the radio capability of the radio access technology for UTRAN, 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 or the TRACKING AREA UPDATE ACCEPT 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 excluding the radio capability of the radio access technology for UTRAN 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 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 or the TRACKING AREA UPDATE ACCEPT 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; and

- 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.

\*\*\* end of change \*\*\*