**3GPP TSG-CT WG1 Meeting #124-eC1-203785**

**Electronic meeting, 2-10 June 2020**

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| *CR-Form-v12.0* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
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|  | **24.301** | **CR** | **3403** | **rev** | **1** | **Current version:** | **16.4.0** |  |
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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:*** | IP header compression after inter-system change from N1 mode to S1 mode | | | | | | | | | |
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| ***Source to WG:*** | Samsung | | | | | | | | | |
| ***Source to TSG:*** | C1 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | 5G\_CIoT | | | | |  | ***Date:*** | | | 2020-05-26 |
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| ***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)* | |
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| ***Reason for change:*** | | The UE includes the Header compression configuration IE in the PDN CONNECTIVITY REQUEST message as specified in 8.3.20.7 of TS 24.301 if:  a) the PDN type value of the PDN type IE is set to IPv4 or IPv6 or IPv4v6;  b) the UE indicates "Control Plane CIoT EPS optimization supported" in the UE network capability IE of the ATTACH REQUEST message; and  c) the UE supports header compression.  While this works for PDN connections that are established in EPS, there is currently no description of how the IP header compression parameters are negotiated for a PDN connection of type IP that gets transferred from N1 mode to S1 mode.  It is therefore required to handle IWK for header compression to apply when control plane CIoT 5GS optimization is being used. | | | | | | | | |
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| ***Summary of change:*** | | After an inter-system change from N1 mode to S1 mode, if:  a) the PDN type value of the PDN type IE is set to "IPv4", "IPv6" or "IPv4v6";  b) the UE indicates "Control plane CIoT EPS optimization supported" and "Header compression for control plane CIoT EPS optimization supported" in the in the UE network capability IE of the TRACKING AREA UPDATE REQUEST message; and  c) the network indicates "Control plane CIoT 5GS optimization supported" and "Header compression for control plane CIoT EPS optimization supported" in the EPS network feature support IE of the TRACKING AREA UPDATE ACCEPT message;  the UE shall send a BEARER RESOURCE MODIFICATION REQUEST message to the MME and include the Header compression configuration IE to negotiate the IP header compression configuration. | | | | | | | | |
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| ***Consequences if not approved:*** | | Header compression cannot be used for sessions that are transferred from 5GS thereby IWK for CIoT with header compression is not enabled.  UE behavior will be inconsistent since as part of the TAU procedure, the UE and network will negotiate support for IP header compression (i.e. at EMM layer) which does not lead to negotiation of the compression parameters as the ESM layer unlike attach procedure including/followed by a PDN connection establishment procedure. | | | | | | | | |
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| ***Clauses affected:*** | | 6.5.4.2, 8.3.10.7 | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **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 CHANGE \*\*\*

#### 6.5.4.2 UE requested bearer resource modification procedure initiation

In order to request the modification of bearer resources for one traffic flow aggregate, the UE shall send a BEARER RESOURCE MODIFICATION REQUEST message to the MME, start timer T3481 and enter the state PROCEDURE TRANSACTION PENDING (see example in figure 6.5.4.2.1).

The UE shall include the EPS bearer identity of the EPS bearer associated with the traffic flow aggregate in the EPS bearer identity for packet filter IE.

To request a change of the GBR without changing the packet filter(s), the UE shall set the TFT operation code in the Traffic flow aggregate IE to "no TFT operation" and include the packet filter identifier(s) to which the change of the GBR applies in the Packet filter identifier parameter in the parameters list. The UE shall indicate the new GBR requested for the EPS bearer context in the Required traffic flow QoS IE.

To request a modification of a traffic flow aggregate, the UE shall set the TFT operation code in the Traffic flow aggregate IE to "Replace packet filters in existing TFT" or "Add packet filters to existing TFT". If the TFT operation code is set to "Add packet filters to existing TFT", the UE shall include in the parameter list one existing packet filter identifier to which the newly added packet filter(s) is linked. If the EPS bearer is a GBR bearer and the UE also wishes to request a change of GBR, the UE shall indicate the new GBR requested for the EPS bearer context in the Required traffic flow QoS IE.

To request a release of bearer resources, the UE shall set the TFT operation code in the Traffic flow aggregate IE to "Delete packet filters from existing TFT". If the EPS bearer is a GBR bearer and the UE does not request the release of all bearer resources, the UE shall indicate the new GBR requested for the EPS bearer context in the Required traffic flow QoS IE.

To request re-negotiation of header compression configuration associated to an EPS bearer context, the UE shall include the Header compression configuration IE in the BEARER RESOURCE MODIFICATION REQUEST message if the network indicated "Control plane CIoT EPS optimization supported" and "Header compression for control plane CIoT EPS optimization supported" in the EPS network feature support IE.

After an inter-system change from N1 mode to S1 mode, if:

a) the UE is operating in single-registration mode and has received the interworking without N26 interface indicator set to "interworking without N26 interface not supported" from the network;

b) the PDN type value of the PDN type IE is set to "IPv4", "IPv6" or "IPv4v6";

c) the UE indicates "Control plane CIoT EPS optimization supported" and "Header compression for control plane CIoT EPS optimization supported" in the in the UE network capability IE of the TRACKING AREA UPDATE REQUEST message; and

d) the network indicates "Control plane CIoT 5GS optimization supported" and "Header compression for control plane CIoT EPS optimization supported" in the EPS network feature support IE of the TRACKING AREA UPDATE ACCEPT message;

the UE shall send a BEARER RESOURCE MODIFICATION REQUEST message to the MME and include the Header compression configuration IE to negotiate the header compression configuration.

To indicate a change of 3GPP PS data off UE status associated to a PDN connection, the UE shall include the protocol configuration options IE in the BEARER RESOURCE MODIFICATION REQUEST message and set the 3GPP PS data off UE status only if:

- the network included the 3GPP PS data off support indication in the protocol configuration options IE in the ACTIVATE DEFAULT EPS BEARER CONTEXT REQUEST message when the PDN connection was established; or

- the PDU session was established when in N1 mode.

The UE behaves as described in subclause 6.3.10.

If the UE requests the modification of a traffic flow aggregate, which is assigned to a dedicated EPS bearer context, it shall ensure that at least one packet filter applicable for the uplink direction remains among the packet filters created on request from the UE in that TFT, or no own packet filters.

NOTE: If the UE requests the release of all bearer resources of a GBR bearer and includes a Required traffic flow QoS IE in the BEARER RESOURCE MODIFICATION REQUEST message, the network ignores the Required traffic flow QoS IE.

If the UE includes the Required traffic flow QoS IE, the UE shall set the QCI to the current QCI value of the EPS bearer context.

If the UE requests the release of bearer resources, the ESM cause value typically indicates one of the following:

#36: regular deactivation.



Figure 6.5.4.2.1: UE requested bearer resource modification procedure

For the NBIFOM procedures as defined in 3GPP TS 24.161 [36], the UE may send a BEARER RESOURCE MODIFICATION REQUEST message to the MME.

It is possible that the traffic flow aggregate IE is not needed in the following procedures:

- re-negotiation of header compression configuration associated to an EPS bearer context;

- indicating a change of 3GPP PS data off UE status associated to a PDN connection; or

- NBIFOM procedures.

If the traffic flow aggregate IE is not needed, the UE shall set:

- the length indicator of the Traffic flow aggregate IE to the value 1;

- the TFT operation code to "000";

- the E bit to zero; and

- the number of packet filters to zero.

\*\*\* START CHANGE \*\*\*

#### 8.3.10.7 Header compression configuration

This IE is included in the message if:

a) the UE wishes to re-negotiate header compression configuration associated to an EPS bearer context and both the UE and the network support Control plane CIoT EPS optimization and header compression; or

b) to negotiate header compression configuration associated to an EPS bearer context after an inter-system change from N1 mode to S1 mode when both the UE and the network support control plane CIoT EPS optimization and header compression, and the UE is operating in single-registration mode and has received the interworking without N26 interface indicator set to "interworking without N26 interface not supported" from the network.