**3GPP TSG- Meeting #14-bis-e *220879***

**E-meeting, Jan 17th – Jan 26th, 2022**

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| *CR-Form-v11.4* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
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|  |  | **CR** | **0744** | **rev** | **0** | **Current version:** |  |  |
|  | | | | | | | | |
| *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 |  | Radio Access Network | **X** | Core Network |  |

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| ***Title:*** | CR on data forwarding from MR-DC to SA handover | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Source to WG:*** | CMCC, CATT, Qualcomm | | | | | | | | | |
| ***Source to TSG:*** |  | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | Direct\_data\_fw\_NR-Core,TEI16 | | | | |  | ***Date:*** | | | 06 |
|  |  | | | |  | |  | | |  |
| ***Category:*** | **F** |  | | | | | ***Release:*** | | | 6 |
|  | *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)* | |
|  |  | | | | | | | | | |
| ***Reason for change:*** | | Introduces changes to support DL direct data forwarding from source secondary NG-RAN node to target NG-RAN node in MR-DC to NR SA inter-system handover. | | | | | | | | |
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| ***Summary of change:*** | | * Text changes in the description of the Handover Preparation procedure indicating how the *Direct Forwarding Path Availability* IE in the HANDOVER REQUIRED message is set in the case of MR-DC to NR SA handover   Impact assessment towards the previous version (same release) of the specification:  This CR has no backward compatibility issue.  Source NG-RAN implementing a previous version does not support this feature, i.e., MR-DC to NR SA HO, and the changes will not be triggered. | | | | | | | | |
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| ***Consequences if not approved:*** | | DL direct data forwarding from source secondary NG-RAN node to target NG-RAN node in MR-DC to NR SA cannot be supported. | | | | | | | | |
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| ***Clauses affected:*** | | 8.4.1.2 | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **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:*** | |  | | | | | | | | |

=======================Start of changes==========================

### 8.4.1 Handover Preparation

#### 8.4.1.1 General

The purpose of the Handover Preparation procedure is to request the preparation of resources at the target side via the 5GC. There is only one Handover Preparation procedure ongoing at the same time for a certain UE.

#### 8.4.1.2 Successful Operation



Figure 8.4.1.2-1: Handover preparation: successful operation

The source NG-RAN node initiates the handover preparation by sending the HANDOVER REQUIRED message to the serving AMF. When the source NG-RAN node sends the HANDOVER REQUIRED message, it shall start the timer TNGRELOCprep. The source NG-RAN node shall indicate the appropriate cause value for the handover in the *Cause* IE.

Upon reception of the HANDOVER REQUIRED message the AMF shall, for each PDU session indicated in the *PDU Session ID* IE, transparently transfer the *Handover Required Transfer* IE to the SMF associated with the concerned PDU session.

In case of intra-system handover, the information in the *Source to Target Transparent Container* IE shall be encoded according to the definition of the *Source NG-RAN node to Target NG-RAN node Transparent Container* IE.

If the *DL Forwarding* IE is included for a given QoS flow in the *PDU Session Resource Information Item* IE within the *Source NG-RAN node to Target NG-RAN node Transparent Container* IE of the HANDOVER REQUIRED message and it is set to "DL forwarding proposed", it indicates that the source NG-RAN node proposes forwarding of downlink data for that QoS flow.

If the *UL Forwarding* IE is included for a given QoS flow in the *PDU Session Resource Information Item* IE within the *Source NG-RAN Node to Target NG-RAN Node Transparent Container* IE of the HANDOVER REQUIRED message and it is set to "UL forwarding proposed", it indicates that the source NG-RAN node proposes forwarding of uplink data for that QoS flow.

If the *DRBs to QoS Flows Mapping List* IE is included in the *PDU Session Resource Information Item* IE within the *Source NG-RAN node to Target NG-RAN node Transparent Container* IE of the HANDOVER REQUIRED message, it implicitly indicates that the source NG-RAN node proposes forwarding of downlink data for those DRBs.

If the *QoS Flow Mapping Indication* IE for a QoS flow is included in the *Associated QoS Flow List* IE within the *DRBs to QoS Flows Mapping List* IE within the *Source NG-RAN node to Target NG-RAN node Transparent Container* IE of the HANDOVER REQUIRED message, it indicates that the source NG-RAN node has mapped only the uplink or downlink of the QoS flow to the DRB.

In case of intra-system handover, if the HANDOVER COMMAND message contains the *DL Forwarding UP TNL Information* IE for a given DRB within the *Data Forwarding Response DRB List* IE in the *Handover Command Transfer* IE, the source NG-RAN node shall consider that the forwarding of downlink data for this DRB is accepted by the target NG-RAN node. If the HANDOVER COMMAND message contains the *UL Forwarding UP TNL Information* IE for a given DRB in the *Data Forwarding Response DRB List* IE within the *Handover Command Transfer* IE, it means the target NG-RAN node has requested the forwarding of uplink data for this DRB.

In case direct data forwarding is applied for inter-system handover, if the *Data Forwarding Response E-RAB List* IE in the *Handover Command Transfer* IE is included in the HANDOVER COMMAND message, the source NG-RAN node shall consider that forwarding of downlink data for this E-RAB is accepted by the target eNB.

If the HANDOVER COMMAND message contains the *UL Forwarding UP TNL Information* IE for a given PDU session within the *Handover Command Transfer* IE, the source NG-RAN node shall consider that the forwarding of uplink data of the QoS flows is accepted by the target NG-RAN node.

In case of inter-system handover to LTE, the information in the *Source to Target Transparent Container* IE shall be encoded according to the *Source eNB to Target eNB Transparent Container* IE definition as specified in TS 36.413 [16].

If the *Direct Forwarding Path Availability* IE is included in the HANDOVER REQUIRED message the AMF shall handle it as specified in TS 23.502 [10].

In case of handover from MR-DC to NR, if the *Direct Forwarding Path Availability* IE is included in the HANDOVER REQUIRED message, it indicates that the source Master NG-RAN node or the source secondary NG-RAN node has a direct path available to the target NG-RAN node.

If the *Direct Forwarding Path Availability* IE is included within the *Handover Required Transfer* IE of the HANDOVER REQUIRED message the SMF shall handle it as specified in TS 23.502 [10].

When the preparation, including the reservation of resources at the target side is ready, the AMF responds with the HANDOVER COMMAND message to the source NG-RAN node. In case of intra-system handover, the AMF shall include the *PDU Session Resource Handover List* IE in the HANDOVER COMMAND message.

Upon reception of the HANDOVER COMMAND message the source NG-RAN node shall stop the timer TNGRELOCprep and start the timer TNGRELOCoverall.

If there are any PDU Sessions that could not be admitted in the target, they shall be indicated in the *PDU Session Resources to Release List* IE.

NOTE: As an exception in case of inter-system handover to LTE, the AMF generates the *Handover Preparation Unsuccessful Transfer* IE in the *PDU Session Resources to Release List* IE.

If the HANDOVER COMMAND message contains the *QoS Flow to be Forwarded List* IE within the *Handover Command Transfer* IE for a given PDU session, then the source NG-RAN node should initiate data forwarding for the listed QoS flows over the forwarding tunnel specified in the *DL Forwarding UP TNL Information* IE as specified in TS 38.300 [8].

If the HANDOVER COMMAND message contains the *Additional DL Forwarding UP TNL Information* IE within the *Handover Command Transfer* IE, the source NG-RAN node should initiate data forwarding of the PDU session split in different tunnel and shall use the received UP transport layer information for the forwarding QoS flows associated to it.

If the HANDOVER COMMAND message contains the *Additional UL Forwarding UP TNL Information* IE within the *Handover Command Transfer* IE, the source NG-RAN node should initiate data forwarding of the PDU session split in different tunnels using the received UP transport layer information.

If the *NAS Security Parameters from NG-RAN* IE is included in the HANDOVER COMMAND message the NG-RAN node shall use it as specified in TS 33.501 [13].

If the *Target to Source Transparent Container* IE has been received by the AMF from the handover target then the transparent container shall be included in the HANDOVER COMMAND message.

In case of inter-system handover to LTE, the information in the *Target to Source Transparent Container* IE shall be encoded according to the definition of the *Target eNB to Source eNB Transparent Container* IE as specified in TS 36.413 [16].

If the *Index to RAT/Frequency Selection Priority* IE is contained in the *Source NG-RAN Node to Target NG-RAN Node Transparent Container* IE, the target NG-RAN node shall store the content of the received *Index to RAT/Frequency Selection Priority* IE in the UE context and use it as defined in TS 23.501 [9].

=======================End of changes==========================