**3GPP TSG-RAN WG3 #114bis-e R3-220943**

**17-26 Jan 2022**

**Online**

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| *CR-Form-v12.1* |
| **CHANGE REQUEST** |
|  |
|  | **37.340** | **CR** | **Draft** | **rev** | **-** | **Current version:** | **16.8.0** |  |
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| *For* ***[HE](http://www.3gpp.org/3G_Specs/CRs.htm%22%20%5Cl%20%22_blank)******[LP](http://www.3gpp.org/3G_Specs/CRs.htm%22%20%5Cl%20%22_blank)*** *on using this form: comprehensive instructions can be found at <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:***  | Introduction of Enhancement of RAN Slicing to TS 37.340 |
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| ***Source to WG:*** | CATT,ZTE |
| ***Source to TSG:*** | R3 |
|  |  |
| ***Work item code:*** | NR\_slice-Core |  | ***Date:*** | 2022-1-6 |
|  |  |  |  |  |
| ***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 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:*** | In order to enable Enhancement of RAN Slicing support for NR in Rel-17, changes are needed. This is the baseline CR covering all the agreed modification. |
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| ***Summary of change:*** | Introduction of Enhancement of RAN Slicing * Add slice MBR supporting in MR-DC with 5GC
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| ***Consequences if not approved:*** | Introduction of Enhancement of RAN Slicing cannot be supported |
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| ***Clauses affected:*** | 8.1 |
|  |  |
|  | **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 ...  |
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| ***Other comments:*** |  |
|  |  |
| ***This CR's revision history:*** |  |

8.1 QoS aspects

In EN-DC, the E-UTRAN QoS framework defined in TS 36.300 [2] applies:

- An S1-U bearer is established between the EPC and the SN for SN terminated bearers;

- An X2-U bearer is established between the MN and the SN for split bearers, MN terminated SCG bearers and SN terminated MCG bearers;

- MN terminated and SN terminated bearers may have either MCG or SCG radio resources or both, MCG and SCG radio resources, established;

In MR-DC with 5GC:

- The NG-RAN QoS framework defined in TS 38.300 [3] applies;

- QoS flows belonging to the same PDU session may be mapped to different bearer types (see clause 4.2.2) and as a result there may be two different SDAP entities for the same PDU session: one at the MN and another one at the SN, in which case the MN decides which QoS flows are assigned to the SDAP entity in the SN. If the SN decides that its SDAP entity cannot host a given QoS flow any longer, the SN informs the MN and the MN cannot reject the request. If the MN decides that its SDAP entity can host a given QoS flow which has already been relocated to SN, the MN informs the SN;

- The MN or SN node that hosts the SDAP entity for a given QoS flow decides how to map the QoS flow to DRBs;

- If the SDAP entity for a given QoS flow is hosted by the MN and the MN decides that SCG resources are to be configured it provides to the SN

- DRB QoS flow level QoS parameters, which the SN may reject, and

- QoS flow to DRB mapping information and the respective per QoS flow information;

- If the SDAP entity for a given QoS flow is hosted by the SN and the SN configures MCG resources, based on offered MCG resource information from the MN, the SN provides to the MN

- DRB QoS flow level QoS parameters, which the MN may reject, and

- QoS flow to DRB mapping information and the respective per QoS flow information.

- If the SDAP entity for a given QoS flow is hosted by the SN, the MN provides sufficient QoS related information to enable the SN to configure appropriate SCG resources and to request the configuration of appropriate MCG resources. The MN may offer MCG resources to the SN and may indicate for GBR QoS flows the amount offered to the SN on a per QoS flow level. Otherwise, the SN can only use SCG resources for the concerned QoS flow. The SN may request the MN to release QoS flows from the SDAP entity hosted by the SN that the MN cannot reject. The MN may also offer MCG resources per PDU Session for all DRBs to which non-GBR QoS flows contained in the PDU Session are mapped.

- MN decides the DL PDU session AMBR and UL PDU session AMBR limits to be assigned to the SN, and indicates these to the SN:

- The PDCP entity at the SN applies the received DL PDU session AMBR limi t to the set of all bearers for which the SN hosts PDCP for the UE;

- The MAC entity at the SN applies the received UL PDU session AMBR limit to the scheduled uplink radio traffic at the SN for the UE.

- The MN can decide to reallocate one or more QoS flows from the MN to the SN. In such case, the SN decides which DRBs the offloaded QoS flows are mapped to. It is possible to avoid/ minimise loss and ensure in-order delivery when reallocating all QoS flows mapped to a given DRB in the MN by keeping the QoS flows mapped to the same DRB in the SN. To achieve this, the SN should behave similar to what is specified for the target NG-RAN node upon handover, see TS 38.300 clause 9.2.3.2.2 [3]. The corresponding behaviour applies when QoS flows are re-allocated from the SN to the MN.

- The MN decides the DL UE Slice MBR and UL UE Slice MBR limits to be assigned to the SN, and indicates these to the SN:

- The PDCP entity at the SN applies the received DL UE Slice MBR limit to the set of all bearers for which the SN hosts PDCP for the UE Slice;

- The MAC entity at the SN applies the received UL UE Slice MBR limit to the scheduled uplink radio traffic at the SN for the UE Slice.

In all MR-DC cases:

- The MN decides the DL UE AMBR and UL UE AMBR limits to be assigned to the SN, and indicates these to the SN:

- The PDCP entity at the SN applies the received DL UE AMBR limit to the set of all bearers for which the SN hosts PDCP for the UE;

- The MAC entity at the SN applies the received UL UE AMBR limit to the scheduled uplink radio traffic at the SN for the UE.

To support PDU sessions mapped to different bearer types, MR-DC with 5GC provides the possibility for the MN to request the 5GC:

- For some PDU sessions of a UE: Direct the User Plane traffic of the whole PDU session either to the MN or to the SN. In that case, there is a single NG-U tunnel termination at the NG-RAN for such PDU session.

- The MN may request to change this assignment during the life time of the PDU session.

- For some other PDU sessions of a UE: Direct the User Plane traffic of a subset of the QoS flows of the PDU session to the SN (respectively MN) while the rest of the QoS flows of the PDU session is directed to the MN (respectively SN). In that case, there are two NG-U tunnel terminations at the NG-RAN for such PDU session.

- The MN may request to change this assignment during the life time of the PDU session.

To support notification control indication for GBR QoS flows along the QoS framework specified in 38.300 [3] for MR-DC with 5GC, SN and MN may mutually indicate whenever QoS requirements for GBR QoS flows cannot be fulfilled anymore or can be fulfilled again. When indicating that GBR QoS flows cannot be fulfilled anymore, SN or MN may additionally indicate the reference to the QoS Parameter Set which it can currently fulfil.