**3GPP TSG-RAN3 #115-e R3-222603**

**21 Feb – 3 Mar 2022**

**Online**

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| *CR-Form-v12.1* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
|  | | | | | | | | |
|  | **38.470** | **CR** | **0085** | **rev** | **1** | **Current version:** | **16.5.0** |  |
|  | | | | | | | | |
| *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:*** | (Stage-2 F1AP CR) support for NR Sidelink Relay | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Source to WG:*** | Nokia, Nokia Shanghai Bell | | | | | | | | | |
| ***Source to TSG:*** | R3 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | NR\_SL\_Relay | | | | |  | ***Date:*** | | | 2022-02-07 |
|  |  | | | |  | |  | | |  |
| ***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 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-15 (Release 15) Rel-16 (Release 16) Rel-17 (Release 17) Rel-18 (Release 18)* | |
|  |  | | | | | | | | | |
| ***Reason for change:*** | | Support for Rel-17 SL Relay. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Summary of change:*** | | Add the support for SL Relay. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Consequences if not approved:*** | | Not be able to support Rel-17 SL Relay | | | | | | | | |
|  | |  | | | | | | | | |
| ***Clauses affected:*** | | 3.1, 3.3, 4.3, 5.2.3 | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **Y** | **N** |  | | | |  | | |
| ***Other specs*** | | **X** |  | Other core specifications | | | | TS 38.473 CR 0842 | | |
| ***affected:*** | |  | **X** | Test specifications | | | | TS/TR ... CR ... | | |
| ***(show related CRs)*** | |  | **X** | O&M Specifications | | | | TS/TR ... CR ... | | |
|  | |  | | | | | | | | |
| ***Other comments:*** | |  | | | | | | | | |
|  | |  | | | | | | | | |
| ***This CR's revision history:*** | | Rev 1: Updated during RAN3#115eᅞ | | | | | | | | |

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3 Definitions and abbreviations

3.1 Definitions

For the purposes of the present document, the terms and definitions given in 3GPP TR 21.905 [1] and the following apply. A term defined in the present document takes precedence over the definition of the same term, if any, in 3GPP TR 21.905 [1].

**BH RLC channel:** as defined in TS 38.300 [8].

**en-gNB**: as defined in TS 37.340 [9].

**gNB-CU**: as defined in TS 38.401 [2].

**gNB-DU**: as defined in TS 38.401 [2].

**gNB**: as defined in TS 38.300 [8].

**IAB-MT**: as defined in TS 38.300 [8].

**IAB-DU**: as defined in TS 38.300 [8].

**IAB-node**: as defined in TS 38.300 [8].

**IAB-donor**:as defined in TS 38.300 [8].

**IAB-donor-CU**: as defined in TS 38.401 [2].

**IAB-donor-DU**: as defined in TS 38.401 [2].

**U2N Relay UE:** as defined in TS 38.300 [2].

**U2N Remote UE:** as defined in TS 38.300 [2].

**Uu RLC channel**: as defined in TS 38.300 [8].

**PC5 RLC channel**: as defined in TS 38.300 [8].

## 3.3 Abbreviations

For the purposes of the present document, the abbreviations given in 3GPP TR 21.905 [1] and the following apply. An abbreviation defined in the present document takes precedence over the definition of the same abbreviation, if any, in 3GPP TR 21.905 [1].

BH Backhaul

DRB Data Radio Bearers

F1-U F1 User plane interface

F1-C F1 Control plane interface

F1AP F1 Application Protocol

GTP-U GPRS Tunnelling Protocol

IAB Integrated Access and Backhaul

IP Internet Protocol

L2 Layer-2NR-MIB NR-Master Information Block

O&M Operation and Maintenance

PA Paging Area

PF Paging Frame

PO Paging Occasion

QoS Quality of Service

RIM Remote Interference Management

RLC Radio Link Control

RRC Radio Resource Control

SCTP Stream Control Transmission Protocol

SRB Signalling Radio Bearers

SIB1 System Information Block 1

SIB10 System Information Block 10

SIB12 System Information Block 12

SIB13 System Information Block 13

SIB14 System Information Block 14

SL Sidelink

TNL Transport Network Layer

U2N UE-to-Network

V2X Vehicle-to-Everything

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## 4.3 F1 interface capabilities

The F1 interface supports:

- procedures to establish, maintain and release radio bearers for the NG-RAN part of PDU sessions and for E-UTRAN Radio Access Bearers;

- procedures to establish, maintain and release BH RLC channels;

- the separation of each UE on the protocol level for user specific signalling management;

- the separation of each IAB-MT on the protocol level for IAB-MT specific signalling management;

- the transfer of RRC signalling messages between the UE and the gNB-CU;

- procedures to establish, maintain and release Uu RLC channels and PC5 RLC channels.

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### 5.2.3 F1 UE context management function

The F1 UE context management function supports the establishment and modification of the necessary overall UE context.

The establishment of the F1 UE context is initiated by the gNB-CU and accepted or rejected by the gNB-DU based on admission control criteria (e.g., resource not available).

The modification of the F1 UE context can be initiated by either gNB-CU or gNB-DU. The receiving node can accept or reject the modification. The F1 UE context management function also supports the release of the context previously established in the gNB-DU. The release of the context is triggered by the gNB-CU either directly or following a request received from the gNB-DU. The gNB-CU request the gNB-DU to release the UE Context when the UE enters RRC\_IDLE or RRC\_INACTIVE.

This function can be also used to manage DRBs, SRBs and SL DRBs, i.e., establishing, modifying and releasing DRB, SRB and SL DRB resources. The establishment and modification of DRB, or SL DRB resources are triggered by the gNB-CU and accepted/rejected by the gNB-DU based on resource reservation information and QoS information to be provided to the gNB-DU. For each DRB to be setup or modified, the S-NSSAI may be provided by gNB-CU to the gNB-DU in the UE Context Setup procedure and the UE Context Modification procedure. In case of NG-RAN sharing, the gNB-CU includes the serving PLMN ID (for SNPNs the serving SNPN ID) in the UE Context Setup procedure.

For Uu, the mapping between QoS flows and radio bearers is performed by gNB-CU and the granularity of bearer related management over F1 is radio bearer level. For NG-RAN, the gNB-CU decides an aggregated DRB QoS profile for each radio bearer based on received QoS flow profile, and provides both aggregated DRB QoS profile and QoS flow profile to the gNB-DU, and the gNB-DU either accepts the request or rejects it with appropriate cause value. With this function, gNB-DU could also notify gNB-CU whether the QoS for already established DRBs is not fulfilled any longer or it is fulfilled again. The function can be also used to inform the gNB-DU the alternative QoS Parameters Sets when available for a QoS flow. To support packet duplication for intra-gNB-DU CA as described in TS 38.300 [8], one data radio bearer should be configured with at least two GTP-U tunnels between gNB-CU and a gNB-DU.

For SL, the mapping between QoS flows and radio bearers is performed by gNB-CU and the granularity of bearer related management over F1 is radio bearer level. For NG-RAN, the gNB-CU decides an aggregated SL DRB QoS profile for each radio bearer based on received QoS flow profile, and provides both aggregated SL DRB QoS profile and QoS flow profile to the gNB-DU, and the gNB-DU either accepts the request or rejects it with appropriate cause value.

With this function, gNB-CU requests the gNB-DU to setup or change of the SpCell (as defined in TS 38.321 [10]) for the UE, and the gNB-DU either accepts or rejects the request with appropriate cause value. This function also enables the gNB-DU to inform the gNB-CU of which cell the UE has successfully accessed during conditional mobility.

With this function, the gNB-CU requests the setup of the SCell(s) at the gNB-DU side, and the gNB-DU accepts all, some or none of the SCell(s) and replies to the gNB-CU. The gNB-CU requests the removal of the SCell(s) for the UE.

With this function, the gNB-CU indicates the UL UE AMBR limit to the gNB-DU, and the gNB-DU enforces the indicated limit.

With this function, the gNB-DU indicates that a bearer, or a UE is inactive or active. The gNB-CU consolidates all the serving gNB-DUs for the UE and takes further action.

With this function, the gNB-CU indicates the gNB-DU that the UE context concerns mobility enhancement operation, and the gNB-DU takes corresponding actions.

In addition, for IAB-nodes and IAB-donors:

- The F1 UE context management function is used for managing BH RLC channels, i.e. establishing, modifying and releasing BH RLC channel resources. The establishment of BH RLC channels is triggered by the IAB-donor-CU. The establishment and modification is accepted/rejected by the IAB-node’s parent, based on e.g. resource reservation information and QoS information provided to the IAB-node’s parent.

- The DRB QoS profile framework is reused for BH RLC channels carrying DRBs. Prioritization of traffic on the F1-C interface is based on traffic type (e.g. UE-associated F1AP signalling, non-UE-associated F1AP signalling) and is enforced in the IAB-donor-DU and in IAB-nodes, considering that the traffic on the F1-C interface has higher priority than other traffic; in-sequence delivery over the signaling connection is always ensured.

- The IAB-donor-CU associates each BH RLC channel carrying control plane traffic with one of the signaled control plane traffic type values.

For L2 U2N Relay:

- The F1 UE context management function is used for managing Uu RLC channels and PC5 RLC channels for L2 U2N relay, i.e. establishing, modifying and releasing Uu RLC channel and PC5 RLC channel resources. The establishment of Uu RLC channels and PC5 RLC channel are triggered by the gNB-CU. The establishment and modification is accepted/rejected by the gNB-DU based on resource reservation information and QoS information provided to the gNB-DU. The modification of Uu/PC5 RLC channels can be triggered by the gNB-CU or the gNB-DU.

- The gNB-CU determines the QoS for the PC5 RLC Channel and the QoS for the Uu RLC channel based on the received QoS profile for the Remote UE, and provides the QoS information to the gNB-DU.

* The gNB-CU configures the gNB-DU about the SRB(s)/DRB(s) to Uu RLC channel(s) mapping, which is use by the gNB-DU to perform data transfer of U2N Remote UE. The mapping between DRB and Uu RLC Channel is configured at the granularity of GTP-U tunnel.
* The gNB-CU is responsible for the local ID allocation and update for Remote UE.

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