**3GPP TSG-RAN WG2 Meeting # 113bis-e**  ***R2-2104635***

**E-Meeting, – 2021**

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| *CR-Form-v12.1* |
| **CHANGE REQUEST** |
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|  | **38.331** | **CR** | **2413** | **rev** | **3** | **Current version:** | **16.4.1** |  |
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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 | **X** | Core Network |  |

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| ***Title:***  | Redirection with MPS Indication |
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| ***Source to WG:*** | Perspecta Labs, CISA ECD, T-Mobile US, Ericsson, Qualcomm, NTT DoCoMo  |
| ***Source to TSG:*** | R2 |
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| ***Work item code:*** | NR\_newRAT-Core, TEI16 |  | ***Date:*** | 2021-03-31 |
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| ***Category:*** | **C** |  | ***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 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:*** | Multimedia Priority Service (MPS) provides priority treatment to increase the probability of an authorized Service User’s Voice, Video, and Data communication. It is important that a UE involved in an MPS session continues the MPS session with priority upon successfully reconnected in 5GS or EPS following an RRC release with redirect. A UE can be in an MPS session in one of the following three ways: 1. An authorized Service User using a UE with an MPS subscription can initiate MPS when it originates a session (See TS 22.153 clause 5.1). In the case of 5GS, the UE is assigned Access Identity 1 (AI1) and is entitled to the special Establishment Cause (mps-PriorityAccess) and priority treatment when it originates a session.
2. An authorized Service User using a UE that does not have an MPS subscription can initiate MPS for an originating session but priority treatment is only obtained after MPS is established for the session (See TS 22.153 clause 5.1). In this case the priority treatment is based on network control of the priority session as opposed to the UE subscription to MPS.
3. A terminating UE receives priority treatment for an incoming MPS session independent of whether the terminating UE has a subscription for MPS (See TS 22.153 clause 5.4). In this case the terminating UE receives priority treatment as for the above originating cases.

 This CR addresses the 2nd and 3rd cases: When the originating/terminating UE of an MPS session has to redirect (to another cell in NR or to E-UTRA), it is entitled to maintain MPS priority treatment on the ongoing MPS session. The redirection decision is performed by the gNB/eNB/ng-eNB. The UE that needs to redirect to another cell, another RAT or another core network to receive service, should be able to connect to the target network at the RRC layer with MPS priority following the release with redirection. Currently, the RRC layer at the UE without an MPS subscription is not aware of an MPS priority session in the network and does not connect to the network with MPS priority at the RRC layer following a release with redirection.This MPS redirection procedure is applicable to an ongoing MPS session for which the gNB/eNB/ng-eNB forces the UE to release with redirection. It is assumed that the gNB/eNB/ng-eNB is aware of the MPS session via the ARP and/or QoS characteristics of the MPS session.  |
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| ***Summary of change:*** | When the network performs a release with redirection, for UEs with MPS priority session(s), the network includes an MPS priority indicator in the RRCRelease message. When connecting to the target network and the connection establishment is the result of release with redirection with *mpsPriorityIndication*, the UE sets the RRC Establishment Cause to mps-PriorityAccess if the target RAN is NR and to highPriorityAccess if the target is E-UTRA. First change:If the UE has an indication of MPS priority for redirection, the UE sets the RRC Establishment Cause to mps-PriorityAccess to indicate to the network that the request is to be handled with MPS priority.Second change:The UE access attempt shall not be barred if the UE connection establishment is the result of release with redirection with *mpsPriorityIndication* and access barring for MPS priority is not in effect.Third change:Adds the MPS priority indication to the RRCRelease message.**Impact Analysis**:Impacted 5G architecture option:NR-SAImpacted functionality:Redirection from NR to: NR, LTE/EPC, LTE/5GC.Redirection from LTE/5GC to NR or LTE/5GC/EPC, and LTE/EPC to NR.Inter-operability:* If the network is implemented according to the CR and the UE is not; There is no inter-operability issue. The UE will ignore the *mpsPriorityIndication* and its redirection will occur without receiving MPS priority treatment in its new RRC connection.
* If the UE is implemented according to the CR and the network is not;

There is no inter-operability issue. The UE will not receive an indication from the network at the time of redirection; the UE will execute a normal redirection per standard. |
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| ***Consequences if not approved:*** | A user authorized to receive MPS priority service when using a UE that has no MPS subscription will not have MPS priority following a release with redirection.  |
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| ***Clauses affected:*** | 5.3.3.3, 5.3.14.5, 6.2.2 |
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|  | **Y** | **N** |  |  |
| ***Other specs*** | **X** |  |  Other core specifications  | TS 36.331 CR 4579TS 36.306 CR 1804 |
| ***affected:*** |  | **X** |  Test specifications | TS 38.306 CR 0526 |
| ***(show related CRs)*** |  | **X** |  O&M Specifications | TS/TR ... CR ...  |
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| ***Other comments:*** | Rev 3 adds cover page editorial fixes and normative text improvements; Rev 2 points to new TS 38.331 v16.4.1; Rev1 adds the dependence on the TS 38.306 CR |
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| ***This CR's revision history:*** | R2-2102233, R2-2101473, R3-2103043 |

#### \*\*\*\*\* First change \*\*\*\*\*

#### 5.3.3.3 Actions related to transmission of *RRCSetupRequest* message

The UE shall set the contents of *RRCSetupRequest* message as follows:

1> set the *ue-Identity* as follows:

2> if upper layers provide a 5G-S-TMSI:

3> set the *ue-Identity* to *ng-5G-S-TMSI-Part1*;

2> else:

3> draw a 39-bit random value in the range 0..239-1 and set the *ue-Identity* to this value;

NOTE 1: Upper layers provide the *5G-S-TMSI* if the UE is registered in the TA of the current cell.

1> if the establishment of the RRC connection is the result of release with redirect with *mpsPriorityIndication:*

2> set the *establishmentCause* to *mps-PriorityAccess*;

1> else:

 2> set the *establishmentCause* in accordance with the information received from upper layers;

The UE shall submit the *RRCSetupRequest* message to lower layers for transmission.

The UE shall continue cell re-selection related measurements as well as cell re-selection evaluation. If the conditions for cell re-selection are fulfilled, the UE shall perform cell re-selection as specified in 5.3.3.6.

#### \*\*\*\*\* Second change \*\*\*\*\*

#### 5.3.14.5 Access barring check

The UE shall:

1> if one or more Access Identities are indicated according to TS 24.501 [23], and

1> if for at least one of these Access Identities the corresponding bit in the *uac-BarringForAccessIdentity* contained in "UAC barring parameter" is set to *zero*:

2> consider the access attempt as allowed;

1> else:

2> if the establishment of the RRC connection is the result of release with redirect with *mpsPriorityIndication;* and

2> if the bit corresponding to Access Identity 1 in the *uac-BarringForAccessIdentity* contained in the "UAC barring parameter" is set to *zero:*

3> consider the access attempt as allowed;

2> else:

3> draw a random number '*rand*' uniformly distributed in the range: 0 ≤ *rand* < 1;

3> if '*rand*' is lower than the value indicated by *uac-BarringFactor* included in "UAC barring parameter":

4> consider the access attempt as allowed;

3> else:

4> consider the access attempt as barred;

1> if the access attempt is considered as barred:

2> draw a random number '*rand*' that is uniformly distributed in the range 0 ≤ *rand* < 1;

2> start timer T390 for the Access Category with the timer value calculated as follows, using the *uac-BarringTime* included in"AC barring parameter":

 T390 = (0.7+ 0.6 \* *rand*) \* *uac-BarringTime.*

#### \*\*\*\*\* Third change \*\*\*\*\*

– *RRCRelease*

The *RRCRelease* message is used to command the release of an RRC connection or the suspension of the RRC connection.

Signalling radio bearer: SRB1

RLC-SAP: AM

Logical channel: DCCH

Direction: Network to UE

***RRCRelease* message**

-- ASN1START

-- TAG-RRCRELEASE-START

RRCRelease ::= SEQUENCE {

 rrc-TransactionIdentifier RRC-TransactionIdentifier,

 criticalExtensions CHOICE {

 rrcRelease RRCRelease-IEs,

 criticalExtensionsFuture SEQUENCE {}

 }

}

RRCRelease-IEs ::= SEQUENCE {

 redirectedCarrierInfo RedirectedCarrierInfo OPTIONAL, -- Need N

 cellReselectionPriorities CellReselectionPriorities OPTIONAL, -- Need R

 suspendConfig SuspendConfig OPTIONAL, -- Need R

 deprioritisationReq SEQUENCE {

 deprioritisationType ENUMERATED {frequency, nr},

 deprioritisationTimer ENUMERATED {min5, min10, min15, min30}

 } OPTIONAL, -- Need N

 lateNonCriticalExtension OCTET STRING OPTIONAL,

 nonCriticalExtension RRCRelease-v1540-IEs OPTIONAL

}

RRCRelease-v1540-IEs ::= SEQUENCE {

 waitTime RejectWaitTime OPTIONAL, -- Need N

 nonCriticalExtension RRCRelease-v1610-IEs OPTIONAL

}

RRCRelease-v1610-IEs ::= SEQUENCE {

 voiceFallbackIndication-r16 ENUMERATED {true} OPTIONAL, -- Need N

 measIdleConfig-r16 SetupRelease {MeasIdleConfigDedicated-r16} OPTIONAL, -- Need M

 nonCriticalExtension RRCRelease-v16xy-IEs OPTIONAL

}

RRCRelease-v16xy-IEs ::= SEQUENCE {

 mpsPriorityIndication-r16 ENUMERATED {true} OPTIONAL, -- Cond RedirectedCarrierInfo

 nonCriticalExtension SEQUENCE {} OPTIONAL

}

RedirectedCarrierInfo ::= CHOICE {

 nr CarrierInfoNR,

 eutra RedirectedCarrierInfo-EUTRA,

 ...

}

RedirectedCarrierInfo-EUTRA ::= SEQUENCE {

 eutraFrequency ARFCN-ValueEUTRA,

 cnType ENUMERATED {epc,fiveGC} OPTIONAL -- Need N

}

CarrierInfoNR ::= SEQUENCE {

 carrierFreq ARFCN-ValueNR,

 ssbSubcarrierSpacing SubcarrierSpacing,

 smtc SSB-MTC OPTIONAL, -- Need S

 ...

}

SuspendConfig ::= SEQUENCE {

 fullI-RNTI I-RNTI-Value,

 shortI-RNTI ShortI-RNTI-Value,

 ran-PagingCycle PagingCycle,

 ran-NotificationAreaInfo RAN-NotificationAreaInfo OPTIONAL, -- Need M

 t380 PeriodicRNAU-TimerValue OPTIONAL, -- Need R

 nextHopChainingCount NextHopChainingCount,

 ...

}

PeriodicRNAU-TimerValue ::= ENUMERATED { min5, min10, min20, min30, min60, min120, min360, min720}

CellReselectionPriorities ::= SEQUENCE {

 freqPriorityListEUTRA FreqPriorityListEUTRA OPTIONAL, -- Need M

 freqPriorityListNR FreqPriorityListNR OPTIONAL, -- Need M

 t320 ENUMERATED {min5, min10, min20, min30, min60, min120, min180, spare1} OPTIONAL, -- Need R

 ...

}

PagingCycle ::= ENUMERATED {rf32, rf64, rf128, rf256}

FreqPriorityListEUTRA ::= SEQUENCE (SIZE (1..maxFreq)) OF FreqPriorityEUTRA

FreqPriorityListNR ::= SEQUENCE (SIZE (1..maxFreq)) OF FreqPriorityNR

FreqPriorityEUTRA ::= SEQUENCE {

 carrierFreq ARFCN-ValueEUTRA,

 cellReselectionPriority CellReselectionPriority,

 cellReselectionSubPriority CellReselectionSubPriority OPTIONAL -- Need R

}

FreqPriorityNR ::= SEQUENCE {

 carrierFreq ARFCN-ValueNR,

 cellReselectionPriority CellReselectionPriority,

 cellReselectionSubPriority CellReselectionSubPriority OPTIONAL -- Need R

}

RAN-NotificationAreaInfo ::= CHOICE {

 cellList PLMN-RAN-AreaCellList,

 ran-AreaConfigList PLMN-RAN-AreaConfigList,

 ...

}

PLMN-RAN-AreaCellList ::= SEQUENCE (SIZE (1.. maxPLMNIdentities)) OF PLMN-RAN-AreaCell

PLMN-RAN-AreaCell ::= SEQUENCE {

 plmn-Identity PLMN-Identity OPTIONAL, -- Need S

 ran-AreaCells SEQUENCE (SIZE (1..32)) OF CellIdentity

}

PLMN-RAN-AreaConfigList ::= SEQUENCE (SIZE (1..maxPLMNIdentities)) OF PLMN-RAN-AreaConfig

PLMN-RAN-AreaConfig ::= SEQUENCE {

 plmn-Identity PLMN-Identity OPTIONAL, -- Need S

 ran-Area SEQUENCE (SIZE (1..16)) OF RAN-AreaConfig

}

RAN-AreaConfig ::= SEQUENCE {

 trackingAreaCode TrackingAreaCode,

 ran-AreaCodeList SEQUENCE (SIZE (1..32)) OF RAN-AreaCode OPTIONAL -- Need R

}

-- TAG-RRCRELEASE-STOP

-- ASN1STOP

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| ***RRCRelease-IEs* field descriptions** |
| ***cnType***Indicate that the UE is redirected to EPC or 5GC. |
| ***deprioritisationReq***Indicates whether the current frequency or RAT is to be de-prioritised. |
| ***deprioritisationTimer***Indicates the period for which either the current carrier frequency or NR is deprioritised. Value *minN* corresponds to N minutes. |
| ***measIdleConfig***Indicates measurement configuration to be stored and used by the UE while in RRC\_IDLE or RRC\_INACTIVE. |
| ***mpsPriorityIndication***Indicates the UE can set the establishment cause to mps-PriorityAccess for a new connection to a new RAT following a redirect to NR. If the target RAT is E-UTRA, see TS 36.331 [10]. The gNB sets the indication only for UEs authorized to receive MPS treatment as indicated by ARP and/or QoS characteristics at the gNB, and it is applicable only for this instance of release with redirection to carrier/RAT included in the redirectedCarrierInfo field in the RRCRelease message. |
| ***suspendConfig***Indicates configuration for the RRC\_INACTIVE state. The network does not configure *suspendConfig* when the network redirect the UE to an inter-RAT carrier frequency or if the UE is configured with a DAPS bearer. |
| ***redirectedCarrierInfo***Indicates a carrier frequency (downlink for FDD) and is used to redirect the UE to an NR or an inter-RAT carrier frequency, by means of cell selection at transition to RRC\_IDLE or RRC\_INACTIVE as specified in TS 38.304 [20]. Based on UE capability, the network may include *redirectedCarrierInfo* in *RRCRelease* message with *suspendConfig* if this message is sent in response to an *RRCResumeRequest* or an *RRCResumeRequest1* which is triggered by the NAS layer (see 5.3.1.4 in TS 24.501 [23]). |
| ***voiceFallbackIndication***Indicates the RRC release is triggered by EPS fallback for IMS voice as specified in TS 23.502 [43]. |

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| ***CarrierInfoNR* field descriptions** |
| ***carrierFreq***Indicates the redirected NR frequency. |
| ***ssbSubcarrierSpacing***Subcarrier spacing of SSB in the redirected SSB frequency. Only the values 15 kHz or 30 kHz (FR1), and 120 kHz or 240 kHz (FR2) are applicable. |
| ***smtc***The SSB periodicity/offset/duration configuration for the redirected SSB frequency. It is based on timing reference of PCell. If the field is absent, the UE uses the SMTC configured in the measObjectNR having the same SSB frequency and subcarrier spacing. |

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| ***RAN-NotificationAreaInfo* field descriptions** |
| ***cellList***A list of cells configured as RAN area. |
| ***ran-AreaConfigList***A list of RAN area codes or RA code(s) as RAN area. |

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| ***PLMN-RAN-AreaConfig* field descriptions** |
| ***plmn-Identity***PLMN Identity to which the cells in *ran-Area* belong. If the field is absent the UE uses the ID of the registered PLMN. |
| ***ran-AreaCodeList***The total number of RAN-AreaCodes of all PLMNs does not exceed 32. |
| ***ran-Area***Indicates whether TA code(s) or RAN area code(s) are used for the RAN notification area. The network uses only TA code(s) or both TA code(s) and RAN area code(s) to configure a UE. The total number of TACs across all PLMNs does not exceed 16. |

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| ***PLMN-RAN-AreaCell* field descriptions** |
| ***plmn-Identity***PLMN Identity to which the cells in *ran-AreaCells* belong. If the field is absent the UE uses the ID of the registered PLMN. |
| ***ran-AreaCells***The total number of cells of all PLMNs does not exceed 32. |

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| ***SuspendConfig* field descriptions** |
| ***ran-NotificationAreaInfo***Network ensures that the UE in RRC\_INACTIVE always has a valid *ran-NotificationAreaInfo*. |
| ***ran-PagingCycle***Refers to the UE specific cycle for RAN-initiated paging. Value *rf32* corresponds to 32 radio frames, value *rf64* corresponds to 64 radio frames and so on. |
| ***t380***Refers to the timer that triggers the periodic RNAU procedure in UE. Value *min5* corresponds to 5 minutes, value *min10* corresponds to 10 minutes and so on. |

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| Conditional Presence | Explanation |
| *RedirectedCarrierInfo* | The field is optional present, Need R, if redirectedCarrierInfo is included, |

#### \*\*\*\*\* End of changes \*\*\*\*\*