**3GPP TSG-RAN2 Meeting #113-e *R2-210xxxx***

**E-Meeting, 25 January – 5 February 2021**

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| *CR-Form-v12.0* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
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|  | **38.331** | **CR** | 2448 | **rev** | **1** | **Current version:** | **16.3.0** |  |
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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 |  | Radio Access Network | **X** | Core Network |  |

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| ***Title:*** | UTRA capabilities forwarding in handover preparation | | | | | | | | | |
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| ***Source to WG:*** | Google Inc. | | | | | | | | | |
| ***Source to TSG:*** | R2 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | SRVCC\_NR\_to\_UMTS-Core | | | | |  | ***Date:*** | | | 2021-02-05 |
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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:*** | | As described in 36.300 and 38.30, the UTRAN capabilities, i.e. the INTER RAT HANDOVER INFO, include START-CS, START-PS and "predefined configurations", which are "dynamic" IEs. If the target gNB receives UTRA capabilities from the source eNB or gNB, the target gNB should ignore the UTRA capabilities to avoid the potential START value desynchronisation and key replaying issues. Thus, the target gNB would obtain UTRA capabilities from the UE for SRVCC. | | | | | | | | |
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| ***Summary of change:*** | | The target gNB ignores the UTRA capabilities if the target gNB receives the UTRA capabilities in the *HandoverPreparationInformation* message.  **Impact analysis**  Impacted functionality:  SRVCC from NR to UTRAN  Inter-operability:  If the target gNB does not implement the CR and receives UTRA capabilities from the source eNB or gNB, the target gNB may use the UTRA capabilities in the SRVCC handover from the NR to UTRAN. In such case, if the target gNB ensures that the UTRA capabilities (i.e., the START value) are the lastest, there is no inter-operability issue. Otherwise, the START value desynchronization and the key replaying issues might occur.  No interoperability issue between the UE and network is foreseen. | | | | | | | | |
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| ***Consequences if not approved:*** | | It is missing to specify the handling of the UTRA capabilities for the target gNB. | | | | | | | | |
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| ***Clauses affected:*** | | 10.2.2 | | | | | | | | |
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|  | | **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:*** | |  | | | | | | | | |
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| ***This CR's revision history:*** | |  | | | | | | | | |

#### *– HandoverPreparationInformation*

This message is used to transfer the NR RRC information used by the target gNB during handover preparation or UE context retrieval, e.g. in case of resume or re-establishment, including UE capability information. This message is also used for transferring the information between the CU and DU.

Direction: source gNB/source RAN to target gNB or CU to DU.

*HandoverPreparationInformation* message

-- ASN1START

-- TAG-HANDOVER-PREPARATION-INFORMATION-START

HandoverPreparationInformation ::= SEQUENCE {

criticalExtensions CHOICE {

c1 CHOICE{

handoverPreparationInformation HandoverPreparationInformation-IEs,

spare3 NULL, spare2 NULL, spare1 NULL

},

criticalExtensionsFuture SEQUENCE {}

}

}

HandoverPreparationInformation-IEs ::= SEQUENCE {

ue-CapabilityRAT-List UE-CapabilityRAT-ContainerList,

sourceConfig AS-Config OPTIONAL, -- Cond HO

rrm-Config RRM-Config OPTIONAL,

as-Context AS-Context OPTIONAL,

nonCriticalExtension SEQUENCE {} OPTIONAL

}

AS-Config ::= SEQUENCE {

rrcReconfiguration OCTET STRING (CONTAINING RRCReconfiguration),

...,

[[

sourceRB-SN-Config OCTET STRING (CONTAINING RadioBearerConfig) OPTIONAL,

sourceSCG-NR-Config OCTET STRING (CONTAINING RRCReconfiguration) OPTIONAL,

sourceSCG-EUTRA-Config OCTET STRING OPTIONAL

]],

[[

sourceSCG-Configured ENUMERATED {true} OPTIONAL

]]

}

AS-Context ::= SEQUENCE {

reestablishmentInfo ReestablishmentInfo OPTIONAL,

configRestrictInfo ConfigRestrictInfoSCG OPTIONAL,

...,

[[ ran-NotificationAreaInfo RAN-NotificationAreaInfo OPTIONAL

]],

[[ ueAssistanceInformation OCTET STRING (CONTAINING UEAssistanceInformation) OPTIONAL -- Cond HO2

]],

[[

selectedBandCombinationSN BandCombinationInfoSN OPTIONAL

]],

[[

configRestrictInfoDAPS-r16 ConfigRestrictInfoDAPS-r16 OPTIONAL,

sidelinkUEInformationNR-r16 OCTET STRING OPTIONAL,

sidelinkUEInformationEUTRA-r16 OCTET STRING OPTIONAL,

ueAssistanceInformationEUTRA-r16 OCTET STRING OPTIONAL,

ueAssistanceInformationSCG-r16 OCTET STRING (CONTAINING UEAssistanceInformation) OPTIONAL, -- Cond HO2

needForGapsInfoNR-r16 NeedForGapsInfoNR-r16 OPTIONAL

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}

ConfigRestrictInfoDAPS-r16 ::= SEQUENCE {

powerCoordination-r16 SEQUENCE {

p-DAPS-Source-r16 P-Max,

p-DAPS-Target-r16 P-Max,

uplinkPowerSharingDAPS-Mode-r16 ENUMERATED {semi-static-mode1, semi-static-mode2, dynamic }

} OPTIONAL

}

ReestablishmentInfo ::= SEQUENCE {

sourcePhysCellId PhysCellId,

targetCellShortMAC-I ShortMAC-I,

additionalReestabInfoList ReestabNCellInfoList OPTIONAL

}

ReestabNCellInfoList ::= SEQUENCE ( SIZE (1..maxCellPrep) ) OF ReestabNCellInfo

ReestabNCellInfo::= SEQUENCE{

cellIdentity CellIdentity,

key-gNodeB-Star BIT STRING (SIZE (256)),

shortMAC-I ShortMAC-I

}

RRM-Config ::= SEQUENCE {

ue-InactiveTime ENUMERATED {

s1, s2, s3, s5, s7, s10, s15, s20,

s25, s30, s40, s50, min1, min1s20, min1s40,

min2, min2s30, min3, min3s30, min4, min5, min6,

min7, min8, min9, min10, min12, min14, min17, min20,

min24, min28, min33, min38, min44, min50, hr1,

hr1min30, hr2, hr2min30, hr3, hr3min30, hr4, hr5, hr6,

hr8, hr10, hr13, hr16, hr20, day1, day1hr12, day2,

day2hr12, day3, day4, day5, day7, day10, day14, day19,

day24, day30, dayMoreThan30} OPTIONAL,

candidateCellInfoList MeasResultList2NR OPTIONAL,

...,

[[

candidateCellInfoListSN-EUTRA MeasResultServFreqListEUTRA-SCG OPTIONAL

]]

}

-- TAG-HANDOVER-PREPARATION-INFORMATION-STOP

-- ASN1STOP

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| *HandoverPreparationInformation* field descriptions |
| ***as-Context***  Local RAN context required by the target gNB or DU. |
| ***rrm-Config***  Local RAN context used mainly for RRM purposes. |
| ***sourceConfig***  The radio resource configuration as used in the source cell. |
| ***ue-CapabilityRAT-List***  The UE radio access related capabilities concerning RATs supported by the UE. A gNB that retrieves MRDC related capability containers ensures that the set of included MRDC containers is consistent w.r.t. the feature set related information. |
| ***ue-InactiveTime***  Duration while UE has not received or transmitted any user data. Thus the timer is still running in case e.g., UE measures the neighbour cells for the HO purpose. Value *s1* corresponds to 1 second, *s2* corresponds to 2 seconds and so on. Value *min1* corresponds to 1 minute, value *min1s20* corresponds to 1 minute and 20 seconds, value *min1s40* corresponds to 1 minute and 40 seconds and so on. Value *hr1* corresponds to 1 hour, *hr1min30* corresponds to 1 hour and 30 minutes and so on. |

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| *AS-Config* field descriptions |
| ***rrcReconfiguration***  Contains the *RRCReconfiguration* configuration as generated entirely by the MN. |
| ***sourceRB-SN-Config***  Contains the IE *RadioBearerConfig* as generated entirely by the SN. This field is only used when the UE is configured with SN terminated RB(s). |
| ***sourceSCG-Configured***  Value *true* indicates that the UE is configured with NR or EUTRA SCG in source configuration. The field is only used in NR-DC and NE-DC and is included only if the fields *sourceSCG-NR-Config* and *sourceSCG-EUTRA-Config* are absent. |
| ***sourceSCG-EUTRA-Config***  Contains the current dedicated SCG configuration in *RRCConnectionReconfiguration* message as specified in TS 36.331 [10] and generated entirely by the SN. In this version of the specification, the E-UTRA *RRCConnectionReconfiguration* message can only include the field *scg-Configuration* . This field is only used in NE-DC. |
| ***sourceSCG-NR-Config***  Contains the current dedicated SCG configuration in *RRCReconfiguration* message as generated entirely by the SN. In this version of the specification, the *RRCReconfiguration* message can only include fields *secondaryCellGroup* and *measConfig*. This field is only used in NR-DC. |

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| *AS-Context* field descriptions |
| ***configRestrictInfoDAPS***  Includes fields for which souce cell explictly indicates the restriction to be observed by target cell during DAPS handover. |
| ***needForGapsInfoNR***  Includes measurement gap requirement information of the UE for NR target bands. |
| ***selectedBandCombinationSN***  Indicates the band combination selected by SN in (NG)EN-DC, NE-DC, and NR-DC. |
| ***sidelinkUEInformationEUTRA***  This field includes *SidelinkUEInformation* IE as specified in TS 36.331 [10]. |
| ***sidelinkUEInformationNR***  This field includes *SidelinkUEInformationNR* IE. |
| ***ueAssistanceInformation***  Includes for each UE assistance feature the information last reported by the UE, if any. |
| ***ueAssistanceInformationSCG***  Includes for each UE assistance feature associated with the SCG, the information last reported by the UE in the NR *UEAssistanceInformation* message for the SCG, if any. |

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| *RRM-Config* field descriptions |
| ***candidateCellInfoList***  A list of the best cells on each frequency for which measurement information was available |
| ***candidateCellInfoListSN-EUTRA***  A list of EUTRA cells including serving cells and best neighbour cells on each serving frequency, for which measurement results were available. This field is only used in NE-DC. |

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| Conditional Presence | Explanation |
| *HO* | The field is mandatory present in case of handover within NR or UE context retrieval, e.g. in case of resume or re-establishment. The field is optionally present in case of handover from E-UTRA/5GC. Otherwise the field is absent. |
| *HO2* | The field is optionally present in case of handover within NR; otherwise the field is absent. |

NOTE 1: The following table indicates per source RAT whether RAT capabilities are included or not.



|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Source RAT | NR capabilites | E-UTRA capabilities | MR-DC capabilities | UTRA capabilities |
| NR | May be included if UE Radio Capability ID as specified in 23.502 [43] is used for the UE. Included otherwise. | May be included | May be included | May be included, ignored by gNB if received |
| E-UTRAN | May be included if UE Radio Capability ID as specified in 23.502 [43] is used for the UE. Included otherwise. | May be included | May be included | May be included, ignored by gNB if received |

NOTE 2: The following table indicates, in case of inter-RAT handover from E-UTRA, which additional IEs are included or not:

|  |  |  |  |
| --- | --- | --- | --- |
| Source system | sourceConfig | rrm-Config | as-Context |
| E-UTRA/EPC | Not included | May be included | Not included |
| E-UTRA/5GC | May be included, but only *radioBearerConfig* is included in the *RRCReconfiguration*. | May be included | Not included |