**3GPP TSG- Meeting #**

**1 June - 12 June 2020**

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| *CR-Form-v12.0* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
|  | | | | | | | | |
|  | **38.331** | **CR** | **Draft-CR** | **rev** | **-** | **Current version:** | **16.0.0** |  |
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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 | **X** | Radio Access Network | **X** | Core Network |  |

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| ***Title:*** | CR on PC5 capability on PC5-RRC and Uu-RRC (focusing on RAN1/RAN4 capability) | | | | | | | | | |
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| ***Source to WG:*** | OPPO | | | | | | | | | |
| ***Source to TSG:*** | RAN2 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | 5G\_V2X\_NRSL-Core | | | | |  | ***Date:*** | | | 2020-6-2 |
|  |  | | | |  | |  | | |  |
| ***Category:*** | **B** |  | | | | | ***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:*** | | In RAN2#109-E, the following agreements were reached  Agreements on UE capabilities:  1: In Uu-RRC, capture SL per-band capability as a sidelink band list within RF-parameters in UE-NR-Capability (pending final RAN1 conclusion on L1 feature list).  2: In Uu-RRC, introduce supported LTE / NR PC5 band combination(s) for each NR Uu band combination by referring to a list of PC6 band combinations.  3: In Uu-RRC, when rat-Type=nr, UE reports NR-PC5 capability for NR standalone / NR-DC controlled NR-PC5 via UE-NR-Capability.  4: In Uu-RRC, introduce supported NR PC5 band combination(s) for each LTE Uu band combination.  5: For PC5-RRC, include frequencyBandListFilter in UECapabilityEnquirySidelink to indicate the requested frequency band of sidelink capability report on PC5-RRC. RAN2 to confirm that rat-Type in not included in UECapabilityEnquirySidelink.  In RAN2#109bis-E, the following agreements were reached  Agreements on capabilities:  1: For LTE-Uu controlling NR-PC5, define the NR PC5 band combination in UE-EUTRA-Capability.  2: For NR-Uu controlling LTE-PC5, define the NR PC5 band combination in UE-NR-Capability.  3: Working assumption: The band combination of mixed LTE-PC5 and NR-PC5 will be reported, in addition to pure LTE-PC5 band combination and NR-PC5 band combination.  4: RRC\_CONNECTED UE reports the received SL capability via PC5-RRC to network.  5: RAN2 not pursue UE reporting the SL capability to network for network to transfer the SL capability to the counterpart UE.  6: For layer-2 buffer size, leave the decision of maximum data rate discussion to RAN1, and only focus on RTT in RAN2.  7: Disallow autonomous update of UE capability on PC5.  8: For SL capability report on Uu-RRC, introduce MAC parameters: a) LCP restriction, b) Logical channel SR-delay timer, c) Multiple CGs.  9: For SL capability report on PC5-RRC, introduce PDCP parameter: a) Out of order delivery.  In RAN2#110-E, the following agreements are reached:  Agreements on UE capabilities:  1a: For SL capability report on Uu-RRC, introduce RLC parameters: a) 12-bit SN length for UM, b) 18-bit SN for AM, and MAC parameter: multiple SR configuration.  1b: RRC specification will update SRB0, i.e. to 6bits.  2: RAN2 will wait for RAN1 decision on the capability of range-based HARQ feedback.  3: For SL capability report on Uu-RRC agreed in RAN2, they are per-UE capability.  4: For SL capability report on Uu-RRC agreed in RAN2, allow FDD/TDD differentiation only for a) Logical channel SR-delay timer, and c) multiple SR configuration.  5: For SL capability report on Uu-RRC agreed in RAN2, no need for FR1/FR2 differentiation.  6: For SL capability report on Uu-RRC agreed in RAN2, conditionally (i.e., if UE supports NR sidelink) mandatory feature without capability signalling includes PDCP parameters: 1) 12-bit SN, 2) 18-bit SN, and RLC parameter: 1) 6-bit SN for UM, 2) 12-bit SN for AM. 18-bit PDCP SN can be revisited after PDCP discussion (if required).  7: For SL capability report on Uu-RRC agreed in RAN2, optional feature with capability signaling includes RLC parameter: 1) 12-bit SN for UM, 2) 18-bit SN for AM; and MAC parameter: 1) LCP restriction, 2) Logical channel SR-delay timer, 3) Multiple CGs, 4) multiple SR configuration.  8: For SL capability report on PC5-RRC, introduce RLC parameters: a) 12-bit SN length for UM, b) 18-bit SN for AM.  9: For SL capability report on PC5-RRC agreed in RAN2, they are per-UE capability.  10: For SL capability report on PC5-RRC agreed in RAN2, no need for either FDD/TDD or FR1/FR2 differentiation.  11: For SL capability report on PC5-RRC agreed in RAN2, conditionally (i.e., if UE supports NR sidelink) mandatory feature without capability signalling includes PDCP parameters: 1) 12-bit SN, 2) 18-bit SN, and RLC parameter: 1) 6-bit SN for UM, 2) 12-bit SN for AM. 18-bit PDCP SN can be revisited after PDCP discussion (if required).  12: For SL capability report on PC5-RRC agreed in RAN2, optional feature with capability signaling includes PDCP parameter: out-of-order delivery, RLC parameter: 1) 12-bit SN for UM, 2) 18-bit SN for AM.  13: Maximum number of destinations is not considered in the definition of layer-2 buffer size.  14: RRC\_CONNECTED UE reports the received SL capability (carrying RX UE capability received via UECapabilityInformationSidelink) via PC5-RRC to network using a container within SidelinkUEInformationNR message.  15: RAN2 not pursue the timer to handle the failure case of UE capability transfer via sidelink.  16: RAN2 not purse signaling overhead optimization for capability transfer procedure for TX-UE forwarding peer-UE SL capability to network via Uu-RRC.  17: RAN2 not pursue signalling overhead optimization for capability transfer procedure via PC5-RRC. | | | | | | | | |
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| ***Summary of change:*** | | Capture the L1/RAN4 capability for Sidelink of Uu-RRC in 6.3.3; | | | | | | | | |
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| ***Consequences if not approved:*** | | UE capability transfer via Uu-RRC and PC5-RRC is missing for Rel-16 NR V2X WI. | | | | | | | | |
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| ***Clauses affected:*** | | 6.3.3 | | | | | | | | |
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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:*** | |  | | | | | | | | |
|  | |  | | | | | | | | |
| ***This CR's revision history:*** | |  | | | | | | | | |

*Start Change*

– *SidelinkParametersEUTRA*

The IE *SidelinkParametersEUTRA* is used to convey capabilities related to V2X sidelink communication.

***SidelinkParametersEUTRA information element***

-- ASN1START

-- TAG-SIDELINKPARAMETERSEUTRA-START

SidelinkParametersEUTRA-r16 ::= SEQUENCE {

sl-ParametersEUTRA1-r16 OCTET STRING OPTIONAL,

sl-ParametersEUTRA2-r16 OCTET STRING OPTIONAL,

sl-ParametersEUTRA3-r16 OCTET STRING OPTIONAL,

supportedBandListSidelinkEUTRA-r16 SEQUENCE (SIZE (1..maxBands)) OF BandSidelinkEUTRA-r16 OPTIONAL,

...

}

BandSidelinkEUTRA-r16 ::= SEQUENCE {

freqBandSidelinkEUTRA-r16 FreqBandIndicatorEUTRA,

--15-7: 1/2

gnb-ScheduledMode3SidelinkEUTRA-r16 SEQUENCE {

gnb-ScheduledMode3DelaySidelinkEUTRA-r16 ENUMERATED {ms0, ms0dot25, ms0dot5, ms0dot625,

ms0dot75, ms1, ms1dot25, ms1dot5, ms1dot75,

ms2, ms2dot5, ms3, ms4, ms5, ms6, ms8,

ms10, ms20}

} OPTIONAL,

--15-9

gnb-ScheduledMode4SidelinkEUTRA-r16 ENUMERATED {supported} OPTIONAL

}

-- TAG-SIDELINKPARAMETERSEUTRA-STOP

-- ASN1STOP

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| ***SidelinkParametersEUTRA* field descriptions** |
| ***sl-ParametersEUTRA1, sl-ParametersEUTRA2, sl-ParametersEUTRA3***  This field includes IE of *SL-Parameters-v1430* (where *v2x-eNB-Scheduled*-r14 and *V2X-SupportedBandCombination-r14* shall not be included), *SL-Parameters-v1530* (where *V2X-SupportedBandCombination-r1530* shall not be included) and *SL-Parameters-v1540* respectively defined in 36.331 [10]. It is used for reporting the per-UE capability for V2X sidelink communication. |

*Next Change*

– *UE-NR-Capability*

The IE *UE-NR-Capability* is used to convey the NR UE Radio Access Capability Parameters, see TS 38.306 [26].

***UE-NR-Capability* information element**

-- ASN1START

-- TAG-UE-NR-CAPABILITY-START

UE-NR-Capability ::= SEQUENCE {

accessStratumRelease AccessStratumRelease,

pdcp-Parameters PDCP-Parameters,

rlc-Parameters RLC-Parameters OPTIONAL,

mac-Parameters MAC-Parameters OPTIONAL,

phy-Parameters Phy-Parameters,

rf-Parameters RF-Parameters,

measAndMobParameters MeasAndMobParameters OPTIONAL,

fdd-Add-UE-NR-Capabilities UE-NR-CapabilityAddXDD-Mode OPTIONAL,

tdd-Add-UE-NR-Capabilities UE-NR-CapabilityAddXDD-Mode OPTIONAL,

fr1-Add-UE-NR-Capabilities UE-NR-CapabilityAddFRX-Mode OPTIONAL,

fr2-Add-UE-NR-Capabilities UE-NR-CapabilityAddFRX-Mode OPTIONAL,

featureSets FeatureSets OPTIONAL,

featureSetCombinations SEQUENCE (SIZE (1..maxFeatureSetCombinations)) OF FeatureSetCombination OPTIONAL,

lateNonCriticalExtension OCTET STRING OPTIONAL,

nonCriticalExtension UE-NR-Capability-v1530 OPTIONAL

}

UE-NR-Capability-v1530 ::= SEQUENCE {

fdd-Add-UE-NR-Capabilities-v1530 UE-NR-CapabilityAddXDD-Mode-v1530 OPTIONAL,

tdd-Add-UE-NR-Capabilities-v1530 UE-NR-CapabilityAddXDD-Mode-v1530 OPTIONAL,

dummy ENUMERATED {supported} OPTIONAL,

interRAT-Parameters InterRAT-Parameters OPTIONAL,

inactiveState ENUMERATED {supported} OPTIONAL,

delayBudgetReporting ENUMERATED {supported} OPTIONAL,

nonCriticalExtension UE-NR-Capability-v1540 OPTIONAL

}

UE-NR-Capability-v1540 ::= SEQUENCE {

sdap-Parameters SDAP-Parameters OPTIONAL,

overheatingInd ENUMERATED {supported} OPTIONAL,

ims-Parameters IMS-Parameters OPTIONAL,

fr1-Add-UE-NR-Capabilities-v1540 UE-NR-CapabilityAddFRX-Mode-v1540 OPTIONAL,

fr2-Add-UE-NR-Capabilities-v1540 UE-NR-CapabilityAddFRX-Mode-v1540 OPTIONAL,

fr1-fr2-Add-UE-NR-Capabilities UE-NR-CapabilityAddFRX-Mode OPTIONAL,

nonCriticalExtension UE-NR-Capability-v1550 OPTIONAL

}

UE-NR-Capability-v1550 ::= SEQUENCE {

reducedCP-Latency ENUMERATED {supported} OPTIONAL,

nonCriticalExtension UE-NR-Capability-v1560 OPTIONAL

}

UE-NR-Capability-v1560 ::= SEQUENCE {

nrdc-Parameters NRDC-Parameters OPTIONAL,

receivedFilters OCTET STRING (CONTAINING UECapabilityEnquiry-v1560-IEs) OPTIONAL,

nonCriticalExtension UE-NR-Capability-v1570 OPTIONAL

}

UE-NR-Capability-v1570 ::= SEQUENCE {

nrdc-Parameters-v1570 NRDC-Parameters-v1570 OPTIONAL,

nonCriticalExtension UE-NR-Capability-v16xy OPTIONAL

}

UE-NR-Capability-v16xy ::= SEQUENCE {

inDeviceCoexInd-r16 ENUMERATED {supported} OPTIONAL,

dl-DedicatedMessageSegmentation-r16 ENUMERATED {supported} OPTIONAL,

nru-Parameters-r16 NRU-Parameters-r16 OPTIONAL,

sidelinkParametersEUTRA-r16 SidelinkParametersEUTRA-r16 OPTIONAL,

nonCriticalExtension SEQUENCE {} OPTIONAL

}

UE-NR-CapabilityAddXDD-Mode ::= SEQUENCE {

phy-ParametersXDD-Diff Phy-ParametersXDD-Diff OPTIONAL,

mac-ParametersXDD-Diff MAC-ParametersXDD-Diff OPTIONAL,

measAndMobParametersXDD-Diff MeasAndMobParametersXDD-Diff OPTIONAL

}

UE-NR-CapabilityAddXDD-Mode-v1530 ::= SEQUENCE {

eutra-ParametersXDD-Diff EUTRA-ParametersXDD-Diff

}

UE-NR-CapabilityAddFRX-Mode ::= SEQUENCE {

phy-ParametersFRX-Diff Phy-ParametersFRX-Diff OPTIONAL,

measAndMobParametersFRX-Diff MeasAndMobParametersFRX-Diff OPTIONAL

}

UE-NR-CapabilityAddFRX-Mode-v1540 ::= SEQUENCE {

ims-ParametersFRX-Diff IMS-ParametersFRX-Diff OPTIONAL

}

NRU-Parameters-r16 ::= SEQUENCE {

rssi-CO-Measurements-r16 ENUMERATED {supported} OPTIONAL

}

-- TAG-UE-NR-CAPABILITY-STOP

-- ASN1STOP

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| ***UE-NR-Capability* field descriptions** |
| ***featureSetCombinations***  A list of *FeatureSetCombination:s* for *supportedBandCombinationList* in *UE-NR-Capability*. The *FeatureSetDownlink:s* and *FeatureSetUplink:s* referred to from these *FeatureSetCombination:s* are defined in the *featureSets* list in *UE-NR-Capability*. |
| ***rssi-CO-Measurements***  Indicates whether the UE supports performing RSSI and Channel Occupancy (CO) measurements for operation with shared spectrum channel access. |

*Next Change*