**3GPP TSG-RAN2 Meeting #119-e *R2-220xxxx***

**Online, 17th Aug 2022 - 29th Aug 2022**

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| *CR-Form-v12.2* |
| **CHANGE REQUEST** |
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|  | **36.331** | **CR** | **4864** | **rev** | **2** | **Current version:** | **16.9.0** |  |
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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:***  | Clarification on SPS deactivation upon carrier reconfiguration |
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| ***Source to WG:*** | ZTE Corporation, Sanechips |
| ***Source to TSG:*** | R2 |
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| ***Work item code:*** | NB\_IOTenh3-Core |  | ***Date:*** | 2022-09-xx |
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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 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-16 (Release 16)Rel-17 (Release 17)Rel-18 (Release 18)Rel-19 (Release 19)* |
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| ***Reason for change:*** | 1. In R15, *sr-SPS-BSR-Config* is introduced in NB-IoT. If *carrierConfigDedicated* is provided in *RRCConnectionReconfiguration* message (e.g., to change carrier), existing SPS UL grants for SPS (if any) should be cleared. But in current specification, this is not specified.
2. If a new *sr-SPS-BSR-Config* is included in *RRCConnectionReconfiguration*, existing UL grants for SPS (if any) should be cleared before applying new configuration.
3. The field description of *sr-SPS-BSR-Config* states that this field activates SR with SPS BSR. However, this provides only the RRC configuration for configured uplink grants to be used for SR with SPS BSR. The activation is done by DCI. So the wording “Activation” in the field description of *sr-SPS-BSR-Config* is not suitable.
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| ***Summary of change:*** | 1. To describe that, upon reception of *carrierConfigDedicated* in *RRCConnectionReconfiguration* message, if *schedulingRequestConfig* is not received or does not include the *sr-SPS-BSR-Config*, UE configures lower layers to clear existing configured uplink grant for Semi-Persistent Scheduling (if any).
2. Calrify in 5.3.10.18 if *sr-SPS-BSR-Config* is includedin *RRCConnectionReconfiguration* message, existing UL grants for SPS (if any) is cleared before applying new configuration.
3. Clarify in field description of *sr-SPS-BSR-Config* that this field provides configuration for configured uplink grants to be used for SR with Semi-Persistent Scheduling for BSR. Moreover, to correct the typo “*sr-SPS-BSR*” to “*sr-SPS-BSR-Config*”.

**Impact Analysis**Impacted functionality:1. The first change impacts the UE behaviour upon reception of *carrierConfigDedicated* in *RRCConnectionReconfiguration* message, if *the* SPS for BSR is activated previously.
2. The second change impacts the UE behaviour upon reception of *sr-SPS-BSR-Config* in *RRCConnectionReconfiguration* message, if *the* SPS for BSR is activated previously.
3. The third change is just editorial change for clarification. No impacts on function.

Inter-operability:If the network is implemented the changes and the UE is not or vice versa, it may cause inconsistent understanding on SPS resources status between UE and eNB. |
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| ***Consequences if not approved:*** | The UE behaviour is not completely specified upon reception of *carrierConfigDedicated* in *RRCConnectionReconfiguration* message or upon reception *sr-SPS-BSR-Config* in *RRCConnectionReconfiguration* message, if *the* *sr-SPS-BSR-Config* is activated previousy. This may cause inconsistent understanding on SPS resources status between UE and eNB. The UE may keep using the old SPS resources activated previously. |
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| ***Clauses affected:*** | 5.3.10.6, 5.3.10.18, 6.7.3.2 |
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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 ...  |
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| ***Other comments:*** |  |
|  |  |
| ***This CR's revision history:*** |  |

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| First change |

#### 5.3.10.6 Physical channel reconfiguration

Except for NB-IoT, the UE shall:

1> if the *antennaInfo-r10* is included in the received *physicalConfigDedicated* and the previous version of this field that was received by the UE was *antennaInfo* (without suffix i.e. the version defined in REL-8):

2> apply the default antenna configuration as specified in 9.2.4;

1> if the *cqi-ReportConfig-r10* is included in the received *physicalConfigDedicated* and the previous version of this field that was received by the UE was *cqi-ReportConfig* (without suffix i.e. the version defined in REL-8):

2> apply the default CQI reporting configuration as specified in 9.2.4;

NOTE 1: Application of the default configuration involves release of all extensions introduced in REL-9 and later.

1> reconfigure the physical channel configuration in accordance with the received *physicalConfigDedicated*;

1> if the *antennaInfo* is included and set to *explicitValue*:

2> if the configured *transmissionMode* is *tm1*, *tm2*, *tm5*, *tm6* or *tm7*; or

2> if the configured *transmissionMode* is *tm8* and *pmi-RI-Report* is not present; or

2> if the configured *transmissionMode* is *tm9* and *pmi-RI-Report* is not present; or

2> if the configured *transmissionMode* is *tm9* and *pmi-RI-Report* is present and *antennaPortsCount* within *csi-RS* is set to *an1*:

3> release *ri-ConfigIndex* in *cqi-ReportPeriodic*, if previously configured;

1> else if the *antennaInfo* is included and set to *defaultValue*:

2> release *ri-ConfigIndex* in *cqi-ReportPeriodic*, if previously configured;

1> if the *pusch-EnhancementsConfig* is included in the received *physicalConfigDedicated*, for the associated serving cell:

2> if PUSCH enhancement mode is previously released or not configured and *pusch-EnhancementsConfig* is set to *setup*, or

2> if PUSCH enhancement mode is previously configured and *pusch-EnhancementConfig* is set to *release*:

3> instruct the associated MAC entity to perform partial reset;

1> if the procedure was not triggered due to handover and *ce-Mode* is included in the received *physicalConfigDedicated*, for the associated serving cell:

2> if *ce-Mode* is not currently configured and *ce-Mode* is set to *setup*, or

2> if *ce-Mode* is currently configured and *ce-Mode* is set to *release*:

3> instruct the associated MAC entity to perform partial reset;

For NB-IoT, the UE shall:

1> if the *carrierConfigDedicated* is not included in the received *physicalConfigDedicated*:

2> if the UE is configured with a carrier configuration previously received in *carrierConfigDedicated*:

3> use the carrier configuration received in *carrierConfigDedicated*;

2> else:

3> use the carrier configuration received in system information for the uplink and downlink carrier used during the random access procedure;

1> else:

2> if *schedulingRequestConfig* is not received or does not include the *sr-SPS-BSR-Config*:

3> configure lower layers to clear existing configured uplink grants for BSR (if any);

2> use the carrier configuration received in *carrierConfigDedicated*;

2> start to use the new carrier immediately after the last transport block carrying the RRC message has been acknowledged by the MAC layer, and any subsequent RRC response message sent for the current RRC procedure is therefore sent on the new carrier;

1> reconfigure the physical channel configuration in accordance with the received *physicalConfigDedicated*.

NOTE 2: In case of physical channel reconfiguration at a DAPS HO, the reconfiguration is applied for the target PCell.

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| Second change |

#### 5.3.10.18 Scheduling Request Configuration for NB-IoT

The UE shall:

1> apply *sr-WithHARQ-ACK-Config*, if included;

1> apply *sr-WithoutHARQ-ACK-Config*, if included;

1> if *sr-SPS-BSR-Config* is included:

2> configure lower layers to clear existing configured uplink grants for BSR (if any);

2> apply *sr-SPS-BSR-Config*.

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| Third change |

#### 6.7.3.2 NB-IoT Radio resource control information elements

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#### – *SchedulingRequestConfig-NB*

The IE *SchedulingRequestConfig-NB* is used to specify the Scheduling Request related parameters.

*SchedulingRequestConfig-NB* information element

-- ASN1START

SchedulingRequestConfig-NB-r15 ::= SEQUENCE {

 sr-WithHARQ-ACK-Config-r15 ENUMERATED {true} OPTIONAL,

 sr-WithoutHARQ-ACK-Config-r15 SR-WithoutHARQ-ACK-Config-NB-r15 OPTIONAL, -- Need ON

 sr-SPS-BSR-Config-r15 SR-SPS-BSR-Config-NB-r15 OPTIONAL, -- Need ON

 ...

}

SR-WithoutHARQ-ACK-Config-NB-r15 ::= CHOICE {

 release NULL,

 setup SEQUENCE {

 sr-ProhibitTimer-r15 INTEGER (0..7) OPTIONAL, -- Need ON

 sr-NPRACH-Resource-r15 SR-NPRACH-Resource-NB-r15 OPTIONAL -- Need ON

 }

}

SR-NPRACH-Resource-NB-r15 ::= SEQUENCE {

 nprach-CarrierIndex-r15 INTEGER (0..maxNonAnchorCarriers-NB-r14),

 nprach-ResourceIndex-r15 INTEGER (1..maxNPRACH-Resources-NB-r13),

 nprach-SubCarrierIndex-r15 CHOICE {

 nprach-Fmt0Fmt1-r15 INTEGER (0..47),

 nprach-Fmt2-r15 INTEGER (0..143)

 },

 p0-SR-r15 INTEGER (-126..24),

 alpha-r15 ENUMERATED {al0, al04, al05, al06, al07, al08, al09, al1}}

SR-SPS-BSR-Config-NB-r15 ::= CHOICE {

 release NULL,

 setup SEQUENCE {

 semiPersistSchedC-RNTI-r15 C-RNTI,

 semiPersistSchedIntervalUL-r15 ENUMERATED {sf128, sf256, sf512, sf1024,

 sf1280, sf2048, sf2560, sf5120}

 }

}

-- ASN1STOP

| ***SchedulingRequestConfig-NB* field descriptions** |
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| ***alpha***Parameter: *αc*. Fractional power control parameter for SR without HARQ-ACK. See TS 36.213 [23], clause 16.2.1.2.1, where value *al0* corresponds to 0, value *al04* corresponds to 0.4, value *al05* to 0.5, value *al06* to 0.6, value *al07* to 0.7, value *al08* to 0.8, value *al09* to 0.9 and value *al1* corresponds to 1.  |
| ***nprach-CarrierIndex***Index of the carrier in the list of UL non anchor carriers in *SystemInformationBlockType22-NB*. The first entry in the list has index '1', the second entry has index '2' and so on. Value '0' indicates the anchor carrier.  |
| ***nprach-ResourceIndex***Index of the NPRACH resource in the list of NPRACH resources in *NPRACH-ParametersList* or *NPRACH-ParametersList-Fmt2* for the UL carrier indicated by *nprach-CarrierIndex*. The first entry in the list has index '1', the second entry has index '2' and so on.E-UTRAN configures a NPRACH resource in *NPRACH-ParametersList-Fmt2* only to UEs that have reported support of NPRACH resource Format2. |
| ***nprach-SubCarrierIndex***Index of the subcarrier in the NPRACH resource in *NPRACH-ParametersList* or or *NPRACH-ParametersList-Fmt2* for the indicated UL carrier.E-UTRAN does not configure *nprach-SubcarrierIndex* to a smaller value than *nprach-SubcarrierOffset* + *nprach-NumCBRA-StartSubcarriers* for the indicated NPRACH resource. |
| ***p0-SR***Parameter:. Target power for SR without HARQ-ACK. See TS 36.213 [23], clause 16.2.1.2.1, unit dBm.  |
| ***semiPersistSchedC-RNTI***Semi-persistent Scheduling C-RNTI, see TS 36.321 [6]. |
| ***semiPersistSchedIntervalUL***Semi-persistent scheduling interval in uplink, see TS 36.321 [6]. Value in number of sub-frames. Value *sf128* corresponds to 128 sub-frames, value *sf256* corresponds to 256 sub-frames and so on. |
| ***sr-SPS-BSR-Config***Configuration of SR with Semi-Persistent Scheduling for BSR, see TS 36.321 [6].E-UTRAN cannot configure *sr-SPS-BSR-Config* together with *sr-WithoutHARQ-ACK-Config*. |
| ***sr-NPRACH-Resource***NPRACH resource for physical layer SR without HARQ-ACK, see TS 36.211 [21] and TS 36.213 [23]. |
| ***sr-ProhibitTimer***Timer for SR transmission on the NPRACH resource for SR in TS 36.321 [6]. Value in number of SR period, where the SR period is equal to the field *nprach-Periodicity* of the NPRACH resource. Value 0 means that behaviour as specified in 7.3.2 applies. Value 1 corresponds to one SR period, Value 2 corresponds to 2\*SR period and so on.  |
| ***sr-WithHARQ-ACK-Config***Activation of physical layer SR with HARQ ACK, see TS 36.213 [23]. |
| ***sr-WithoutHARQ-ACK-Config***Activation of physical layer SR without HARQ ACK, see TS 36.211 [21] and TS 36.213 [23].E-UTRAN cannot configure *sr-WithoutHARQ-ACK-Config* together with *sr-SPS-BSR-Config*. |