**3GPP TSG-RAN Meeting #90e *RP-20xxxx***

**Electronic Meeting, December 7 – 11, 2020**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| *CR-Form-v12.0* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
|  | | | | | | | | |
|  | **38.306** | **CR** | **xxxx** | **rev** | **-** | **Current version:** | **16.2.0** |  |
|  | | | | | | | | |
| *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)*.* | | | | | | | | |
|  | | | | | | | | |

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| ***Proposed change affects:*** | UICC apps |  | ME | **X** | Radio Access Network |  | Core Network |  |

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | | | | | | | | | | |
| ***Title:*** | CR to 38.306 on handling of fallbacks for FR2 CA | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Source to WG:*** | - | | | | | | | | | |
| ***Source to TSG:*** | Apple Inc. | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | NR\_newRAT-Core | | | | |  | ***Date:*** | | | 2020-12-07 |
|  |  | | | |  | |  | | |  |
| ***Category:*** | **A** |  | | | | | ***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)* | |
|  |  | | | | | | | | | |
| ***Reason for change:*** | | RAN2 specificaitons (TS38.331 and TS38.306) are not aligned with RAN4 specifications (TS38.101-2, TS38.101-3) with regards to which fallback band combinations are supported for the class of band combinations which consist of mixed contiguous and non-contiguous intra-band CA within FR2. In an effort to reconcile this issue, it has been recognized that mandating additional in-gap requirements for all possible mixed contiguous and non-contiguous fallback band combinations results in a high number of requirements and is a burden on UE development. Together with per-UE capability signaling, this CR aligns the RAN4 specification with RAN2 specifications. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Summary of change:*** | | For FR2 intra-band CA combinations with multiple sub-blocks, where at least one of the sub-blocks consists of a contiguous CA combination, the following two changes are implemented:  1. Remove the requirement of direct fallback to single FR2 carrier  2. Based on UE signaling a capability bit, introduce an applicability rule for Rx requirements (impacting clauses 7.5A, 7.5D, 7.6A, 7.6D in TS38.101-2 and clauses 7.5A, 7.5B, 7.6A, 7.6B in TS38.101-3) for fallbacks with multiple sub-blocks, where at least one of the sub-blocks consists of a contiguous CA combination  Changes to RAN2 specifications on UE capabilities (38.306) and RRC (38.331) are needed to introduce per-UE capability.  **Impact analysis**  Impacted functionality:  Requirements for band combinations.  Inter-operability:  No inter-operability issues are foreseen. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Consequences if not approved:*** | | NW will not know whether the UE meets all the Rx requirements for all possible fallback band combinations for a band combination consisting of mixed contiguous and non-contiguous intra-band CA in FR2. But no functionality impact is foreseen. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Clauses affected:*** | | 4.2.7.11 | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **Y** | **N** |  | | | |  | | |
| ***Other specs*** | | **X** |  | Other core specifications | | | | TS38.331, TS38.101 | | |
| ***affected:*** | | **X** |  | Test specifications | | | | TS38.521-2 | | |
| ***(show related CRs)*** | |  | **X** | O&M Specifications | | | |  | | |
|  | |  | | | | | | | | |
| ***Other comments:*** | | This CR implements the principles for handling the FR2 fallback issue as described in RP-202556 | | | | | | | | |
|  | |  | | | | | | | | |
| ***This CR's revision history:*** | |  | | | | | | | | |

#### 4.2.7.11 Other PHY parameters

| Definitions for parameters | Per | M | FDD-TDD  DIFF | FR1-FR2  DIFF |
| --- | --- | --- | --- | --- |
| ***appliedFreqBandListFilter***  Mirrors the *FreqBandList* that the NW provided in the capability enquiry, if any. The UE filtered the band combinations in the *supportedBandCombinationList* in accordance with this *appliedFreqBandListFilter*. | UE | No | No | No |
| ***downlinkSetEUTRA***  Indicates the features that the UE supports on the DL carriers corresponding to one EUTRA band entry in a band combination by FeatureSetEUTRA-DownlinkId. The FeatureSetEUTRA-DownlinkId = 0 means that the UE does not support a EUTRA DL carrier in this band of a band combination. | Band | N/A | N/A | N/A |
| ***downlinkSetNR***  Indicates the features that the UE supports on the DL carriers corresponding to one NR band entry in a band combination by FeatureSetDownlinkId. The FeatureSetDownlinkId = 0 means that the UE does not support a DL carrier in this band of a band combination. A fallback per band feature set resulting from the reported DL feature set that has fallback per CC feature set is not signalled but the UE shall support it. | Band | N/A | N/A | N/A |
| ***featureSetCombinations***  Pools of feature sets that the UE supports on the NR or MR-DC band combinations. | UE | N/A | No | No |
| ***featureSets***  Pools of downlink and uplink features sets as well as a pool of FeatureSetCombination elements. A FeatureSetCombination refers to the IDs of the feature set(s) that the UE supports in that FeatureSetCombination. The BandCombination entries in the BandCombinationList then indicate the ID of the FeatureSetCombination that the UE supports for that band combination. | UE | N/A | No | No |
| ***naics-Capability-List***  Indicates that UE in MR-DC supports NAICS as defined in TS 36.331 [17]. | UE | No | No | No |
| ***partialVerifiedFR2-FallbackRX-Req***  Indicates whether the UE receiver performance is verified only for a partial set of minimum requirements for the eligible fallback band combinations in FR2 as described in Clause 4.2 of TS 38.101-2 [3] and Clause 4.2 of TS 38.101-3 [4]. If not indicated, the UE receiver performance is fully compliant for all fallback combinations. The UE shall support configuration of any of the fallback band combinations regardless of the presence or the absence of this field. | UE | No | No | No |
| ***receivedFilters***  Contains all filters requested with UE-CapabilityRequestFilterNR from version 15.6.0 onwards. | UE | No | No | No |
| ***supportedBandCombinationList***  Defines the supported NR and/or MR-DC band combinations by the UE. For each band combination the UE identifies the associated feature set combination by featureSetCombinations index referring to featureSetCombination. A fallback band combination resulting from the reported CA and MR-DC band combination is not signalled but the UE shall support it. For intra-band non-contiguous CA band combinations, the UE only includes one band combination, and exclude the others for which the presence of uplink CA bandwidth class in the band combination entry is different. One band combination entry can also indicate support of any other possible permutations in the presence of uplink CA bandwidth class where a paired downlink CA bandwidth class is the same or where the number of UL CCs is smaller than the one of paired DL CCs expressed by the CA bandwidth class, as specified in TS 36.306 [15]. For these band combinations not included in the capability, the supported feature set is the same as the ones for the band combination included in the UE capability. | UE | Yes | No | No |
| ***supportedBandCombinationListNEDC-Only***  Defines the supported NE-DC only type of band combinations by the UE. | UE | No | No | No |
| ***supportedBandCombinationList-UplinkTxSwitch-r16***  Defines the NR inter-band UL CA, SUL and/or EN-DC band combinations where UE supports dynamic UL Tx switching. UE only includes this field if requested by the network. All fallback band combinations resulting from the reported band combination, which include at least one band pair supporting dynamic UL Tx switching as indicated in *ULTxSwitchingBandPair*, shall be supported by the UE. | UE | No | No | No |
| ***supportedBandListNR***  Includes the supported NR bands as defined in TS 38.101-1 [2] and TS 38.101-2 [3]. | UE | Yes | No | No |
| ***uplinkSetEUTRA***  Indicates the features that the UE supports on the UL carriers corresponding to one EUTRA band entry in a band combination by FeatureSetEUTRA-UplinkId. The FeatureSetUplinkId = 0 means that the UE does not support a UL carrier in this band of a band combination. | Band | N/A | N/A | N/A |
| ***uplinkSetNR***  Indicates the features that the UE supports on the UL carriers corresponding to one NR band entry in a band combination by FeatureSetUplinkId. The FeatureSetUplinkId = 0 means that the UE does not support a UL carrier in this band of a band combination. A fallback per band feature set resulting from the reported UL feature set that has fallback per CC feature set is not signalled but the UE shall support it. | Band | N/A | N/A | N/A |