For r17 it seems clear. For inter-frequency idle/inactive also it would seem obvious - sib of serving cell.

For Scell requirements - Our understanding is that the idea in RAN4 is that HST FR2 is dedicated deployment, i.e., HST is true on all intra-band carriers.

Therefore, if PCell is already signalling HST configuration to PC6 UE, then it automatically should assume that all other carriers that are configured for CA (in one of SIBs, SIB4?) then they all should be considered as HST as well. For FR1 HST UE potentially may connect to a cell that is from outside of HST deployment, but in HST FR2 it should not be possible.

So in all cases UE follows Pcell/serving cell SIB

**3GPP TSG-RAN WG2 Meeting #125 R2-2401565**

**Athens, Greece, February 26th – March 1st, 2024**

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| *CR-Form-v12.2* |
| **CHANGE REQUEST** |
|  |
|  | **38.331** | **CR** | **4428** | **Rev** | **2** | **Current version:** | **18.0.0** |  |
|  |
| *For* [***HELP***](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:***  | Introduction of Rel-18 HST FR2 RRM enhancements |
|  |  |
| ***Source to WG:*** | Samsung, Qualcomm, Ericsson |
| ***Source to TSG:*** | RAN2 |
|  |  |
| ***Work item code:*** | NR\_HST\_FR2\_Enh |  | ***Date:*** | 2024-02-18 |
|  |  |  |  |  |
| ***Category:*** | **B** |  | ***Release:*** | Rel-18 |
|  | *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)* |
|  |  |
| ***Reason for change:*** | Based on RAN4 LS (R4-2317342), RAN4 made the following agreements to support Rel-18 FR2 HST RRM enhancements.* For Rel-18 inter-frequency measurement enhancement for FR2 HST
* RAN4 made the agreement as below:

|  |
| --- |
| * + Reuse Rel-17 IE highSpeedMeasFlagFR2-r17 in SIB to inform UE whether to apply the enhanced RRM requirements for inter-frequency measurement for FR2 HST in idle/inactive mode.
	+ Reuse Rel-17 signalling highSpeedMeasFlagFR2 to inform UE whether to apply the enhanced RRM requirements for inter-frequency measurement for FR2 HST in Connected mode.
 |

* For CA enhancement
	+ For Rel-18 intra-frequency measurement on SCC for FR2 HST

|  |
| --- |
| * + Reuse Rel-17 signalling highSpeedMeasFlagFR2 to inform UE whether to apply the enhanced RRM requirements for intra-frequency measurement on SCC for FR2 HST in Connected mode.
 |

In Rel-17, FR2 HST RRM requirement is applied to only intra-frequency in PSCell. |
|  |  |
| ***Summary of change:*** | The following changes are introduced for highSpeedMeasFlagFR2. * Enable inter-frequency RRM requirements for idle and inactive mode UE.
* Enable inter-frequency RRM requirements and intra-frequency measurement on SCC in connected mode.

 Some minor clarifications are included for Rel-17.* Change from intra-NR to intra-frequency
* Add “to the serving frequency of SpCell”
* Add UE capability (ue-PowerClass-v1700 set to '*pc6)* for Rel17 FR2 HST RRM requirement
 |
|  |  |
| ***Consequences if not approved:*** | Rel-18 HST FR2 RRM enhancement is not supported. |
|  |  |
| ***Clauses affected:*** | 6.3.2 |
|  |  |
|  | **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:*** |  |
|  |  |

### 6.3.2 Radio resource control information elements

……….omitted……………..

#### – *HighSpeedConfig*

The IE *HighSpeedConfig* is used to configure parameters for high speed scenarios.

*HighSpeedConfig* information element

-- ASN1START

-- TAG-HIGHSPEEDCONFIG-START

HighSpeedConfig-r16 ::= SEQUENCE {

 highSpeedMeasFlag-r16 ENUMERATED {true} OPTIONAL, -- Cond SpCellOnly

 highSpeedDemodFlag-r16 ENUMERATED {true} OPTIONAL, -- Need R

 ...

}

HighSpeedConfig-v1700 ::= SEQUENCE {

 highSpeedMeasCA-Scell-r17 ENUMERATED {true} OPTIONAL, -- Cond SCellOnly

 highSpeedMeasInterFreq-r17 ENUMERATED {true} OPTIONAL, -- Cond SpCellOnly2

 highSpeedDemodCA-Scell-r17 ENUMERATED {true} OPTIONAL, -- Need R

 ...

}

HighSpeedConfigFR2-r17 ::= SEQUENCE {

 highSpeedMeasFlagFR2-r17 ENUMERATED {set1, set2} OPTIONAL, -- Need R

 highSpeedDeploymentTypeFR2-r17 ENUMERATED {unidirectional, bidirectional} OPTIONAL, -- Need R

 highSpeedLargeOneStepUL-TimingFR2-r17 ENUMERATED {true} OPTIONAL, -- Need R

 ...

}

-- TAG-HIGHSPEEDCONFIG-STOP

-- ASN1STOP

| *HighSpeedConfig* field descriptions |
| --- |
| ***HighSpeedDemodCA-Scell***If the field is present and UE supports *demodulationEnhancementCA-r17*, the UE shall apply the enhanced demodulation processing for HST-SFN joint transmission scheme with velocity up to 500km/h as specified in TS 38.101-4 [59]. This parameter only applies to SCell. |
| ***highSpeedDemodFlag***If the field is present and UE supports *demodulationEnhancement-r16*, the UE shall apply the enhanced demodulation processing for HST-SFN joint transmission scheme with velocity up to 500km/h as specified in TS 38.101-4 [59]. This parameter only applies to SpCell. |
| ***highSpeedDeploymentTypeFR2***If the field is present, and field value is *unidirectional*, the UE shall assume uni-directional deployment or if field value is *birectional* the UE shall assume bidirectional deployment for FR2 up to 350km/h as specified in TS 38.133 [14]. |
| ***highSpeedLargeOneStepUL-TimingFR2***If the field is present, large one step UE autonomous uplink transmit timing adjustment for FR2 up to 350km/h as specified in TS 38.133 [14] is enabled. |
| ***highSpeedMeasCA-Scell***If the field is present and UE supports *measurementEnhancementCA-r17*, the UE shall apply the enhanced RRM requirements to the serving frequency of SCell for carrier aggregation to support high speed up to 500 km/h as specified in TS 38.133 [14]. |
| ***highSpeedMeasFlag***If the field is present and UE supports *measurementEnhancement-r16*, the UE shall apply the enhanced intra-NR and inter-RAT EUTRAN RRM requirements to support high speed up to 500 km/h as specified in TS 38.133 [14].If the field is present and UE supports *intraNR-MeasurementEnhancement-r16*, the UE shall apply enhanced intra-NR RRM requirement to support high speed up to 500 km/h as specified in TS 38.133 [14].If the field is present and UE supports *interRAT-MeasurementEnhancement-r16*, the UE shall apply enhanced inter-RAT EUTRAN RRM requirement to support high speed up to 500 km/h as specified in TS 38.133 [14].This parameter only applies to the serving frequency of SpCell. |
| ***highSpeedMeasFlagFR2***If the field is present and UE supports *ue-PowerClass-v1700* set to *pc6*, the UE shall apply enhanced intra-frequency RRM requirement to the serving frequency of SpCell to support high speed up to 350 km/h for FR2 as specified in TS 38.133 [14].If the field is present and the UE supports enhanced inter-frequency RRM requirements for FR2 HST in RRC\_IDLE and RRC\_INACTIVE, the UE shall apply enhanced inter-frequency RRM requirement to support high speed up to 350 km/h for FR2 as specified in TS 38.133 [14] in RRC\_IDLE and RRC\_INACTIVE.If the field is present for SpCell and the UE supports *measEnhCAInterFreqFR2-r18*, the UE shall apply enhanced inter-frequency RRM requirement to support high speed up to 350 km/h for FR2 as specified in TS 38.133 [14] in RRC\_CONNECTED.If the field is present for SCell(s) and and the UE supports *measEnhCAInterFreqFR2-r18,* the UE shall apply enhanced intra-frequency RRM requirements to the serving frequency of the corresponding SCell to support high speed up to 350 km/h for FR2 as specified in TS 38.133 [14] in RRC\_CONNECTED.The field value, *set1* or *set2*, is applied as specified in TS38.133 [14]. |
| ***highSpeedMeasInterFreq***If the field is present and UE supports *measurementEnhancementInterFreq-r17*, the UE shall apply the enhanced RRM requirements for inter-frequency measurement in RRC\_CONNECTED to support high speed up to 500 km/h as specified in TS 38.133 [14]. |

|  |  |
| --- | --- |
| Conditional Presence | Explanation |
| *SCellOnly* | The field is optionally present, Need R, in *ServingCellConfigCommon* of an SCell. It is absent otherwise. |
| *SpCellOnly* | The field is optionally present, Need R, in *ServingCellConfigCommonSIB* or in the *ServingCellConfigCommon* of an SpCell. It is absent otherwise. |
| *SpCellOnly2* | The field is optionally present, Need R, in *ServingCellConfigCommon* of an SpCell. It is absent otherwise. |