**3GPP TSG RAN WG1 #104bis-e R1-21xxxxx**

e-Meeting, April 12th – 20th, 2021

Source: NTT DOCOMO, INC.

Title: Session Notes for NR UE Features

Agenda Item: 7.2.11

**Document for:** **Discussion and Decision**

**7.2.11 NR Rel-16 UE Features (4)**

R1-2103603 Summary on Rel-16 UE features related discussion Moderator (NTT DOCOMO INC.)

[104b-e-NR-UEFeatures-eMIMO-01] Email discussion/approval on how to capture the following conclusion from RAN1 #104-e in FGs 16-1a-1, 16-1g, and FG16-1g-1, till 4/15 (Ralf, AT&T)

* If one resource is used for one or multiple of BFD/RLM, it is counted as one (basic usage1)
* If one resource is used for one or multiple of NBI/PL-RS/RSRP, add 1 (basic usage 2)
* If one resource is used for L1-SINR in addition to basic usage 1 & 2, add N if referred N times by one or more CSI Reporting Settings

[104b-e-NR-UEFeature-URLLCIIoT-01] Email discussion/approval on UE features for URLLC/IIoT, till 4/16 (Hiroki, DCM)

* For FG 11-3c, FG 11-3d, FG 11-4d and FG 11-4e, add “in the same subslot” to restrict the time granularity where the two PUCCH should be supported
* For FG 11-3d and FG 11-4e, add the restriction of “consecutive symbols” for supporting the two PUCCH
* For FG 11-3e and FG 11-3f, change the plural to singular
* For FG 11-4c, FG11-4d, FG 11-4f and FG 11-4h, add the restriction that they are for two codebooks where one of the two is sub-slot based codebook, and the other is slot-based codebook
* For 11-4f, clarify it is for “two” codebooks
* Correct that FG 11-4h is to cover the missing case in 11-4d and 11-4f
* Correct that FG 11-4i is to cover the missing case in 11-4e and 11-4g

**R1-2103811** Summary on [104b-e-NR-UEFeature-URLLCIIoT-01] Moderator (NTT DOCOMO INC.)

Agreement:

* For FG 11-3c, FG 11-3d, FG 11-4d and FG 11-4e, add “in the same subslot” to restrict the time granularity where the two PUCCH should be supported

Updated FL proposal #2

* For FG 11-4e, add the restriction of “in consecutive symbols” for supporting the two PUCCH
* For FG 11-3d, add the restriction of “in consecutive symbols” for supporting the two PUCCH

Agreement:

* For FG 11-3e and FG 11-3f, change the plural to singular

Updated FL proposal #4

* For FG 11-4c, FG11-4d, FG 11-4f and FG 11-4h, add the restriction that they are for two codebooks where one of the two is sub-slot based codebook, and the other is slot-based codebook
* Alt.1: Inform RAN2 that even with above restriction on FG 11-4c/4d/4f/4h following sentences in TS38.306 should be kept.
* Alt.2: Ask RAN2 to handle where to capture following sentences in TS38.306 considering above restriction on FG 11-4c/4d/4f/4h.

|  |
| --- |
| ***twoPUCCH-Type5-r16***  Indicates whether the UE supports two PUCCH of format 0 or 2 for two HARQ-ACK codebooks with one 7\*2-symbol subslot based HARQ-ACK codebook. When simultaneously configured with two slot-based HARQ-ACK codebooks, the capability for each HARQ-ACK codebook is subjected to the capability reported by *twoPUCCH-F0-2-ConsecSymbols.*  ***twoPUCCH-Type6-r16***  Indicates whether the UE supports two PUCCH of format 0 or 2 in consecutive symbols for two HARQ-ACK codebooks with one 2\*7-symbol subslot based HARQ-ACK codebook. When simultaneously configured with two slot-based HARQ-ACK codebooks, the capability for each HARQ-ACK codebook is subjected to the capability reported by twoPUCCH-F0-2-ConsecSymbols.  ***twoPUCCH-Type8-r16***  Indicates whether the UE supports one PUCCH format 0 or 2 and one PUCCH format 1, 3 or 4 in the same subslot for HARQ-ACK codebooks with one 2\*7-symbol subslot based HARQ-ACK codebook. When simultaneously configured with two slot-based HARQ-ACK codebooks, the capability for each HARQ-ACK codebook is subjected to the capability reported by onePUCCH-LongAndShortFormat.  ***twoPUCCH-Type10-r16***  Indicates whether the UE supports two PUCCH transmissions in the same subslot for two HARQ-ACK codebooks with one 2\*7-symbol subslot which are not covered by *twoPUCCH-Type5-r16* and *twoPUCCH-Type7-r16*. When simultaneously configured with two slot-based HARQ-ACK codebooks, the capability for each HARQ-ACK codebook is subjected to the capability reported by *twoPUCCH-AnyOthersInSlot.* |

Agreement:

* For 11-4f, clarify it is for “two” codebooks

FL proposal #6

* Correct that FG 11-4h is to cover the missing case in 11-4d and 11-4f

FL proposal #7

* Correct that FG 11-4i is to cover the missing case in 11-4e and 11-4g

[104b-e-NR-UEFeature-MRDCCA-01] Email discussion/approval on UE features for MR-DC/CA enhancement, till 4/15 (Hiroki, DCM)

* Delete “X applies per span in a slot of scheduling CC” in FG 18-5c/d

**R1-2103812** Summary on [104b-e-NR-UEFeature-MRDCCA-01] Moderator (NTT DOCOMO INC.)

Agreement:

* Modify “X applies per span in a slot of scheduling CC” to “X applies per ~~span in a~~ slot in scheduling CC” in FG 18-5c/d

[104b-e-NR-UEFeature-Others-01] Email discussion/approval on UE features that are not dedicated to specific Rel-16 WI/TEI, till 4/16 (Hiroki, DCM)

* Clarify FG3-1 as below.
  + 5) Processing one unicast DCI scheduling DL and one unicast DCI scheduling UL per scheduling slot per scheduled CC for FDD scheduling cell
  + 6) Processing one unicast DCI scheduling DL and 2 unicast DCI scheduling UL per scheduling slot per scheduled CC for TDD scheduling cell
* Send an LS to RAN2 to add in the description of FG 22-5c and 22-5d the following note
  + For simultaneously Ant.Sw . + Ant.Sw SRS in intra-band CA, or in inter-band CAs with bands whose UL are switched together according to the reported UE capability, the UE expects the same configuration of xTyR across the different CCs and the SRS resources overlapped in time domain from UE perspective are from the same UE antenna ports.
* Introduce the following FGs
  + FG22-Xa/Xb to address the missing 'cri-RI-CQI' report related UE capability
  + Replicate FG 2-38, i.e., csi-ReportWithoutPMI, to address the NBC issue

**R1-2103813** Summary on [104b-e-NR-UEFeature-Others-01] Moderator (NTT DOCOMO INC.)

Updated FL proposal #1

* For the case of lower SCS scheduling higher SCS,
  + Alt.1-1: if UE supports cross-carrier scheduling from low to high, then FG18-5c/5d has to be supported and X=1 is added to the candidate value set in FG18-5c/5d
  + Alt.1-2: even if UE supports cross-carrier scheduling from low to high, FG18-5c/5d can be optional and some clarification/component in FG 3-1 or FG 18-5/5b is added for the case where UE does not report FG18-5c/5d
* For the case of higher SCS scheduling lower SCS,
  + Alt.2-1: if UE supports cross-carrier scheduling from high to low, then new FG similar to FG18-5c/5d has to be supported
    - Alt.2-1-1: X applies per slot of scheduled CC
    - Alt.2-1-2: X applies per slot of scheduling CC
  + Alt.2-2: even for the case where UE supports cross-carrier scheduling from high to low, no new FG is introduced and some clarification/component in FG 3-1 or FG 18-5/5b is added.
* Note: for the case where two scheduling cells can be configured to schedule one scheduled cell such as discussed in Rel-17 DSS, whether existing FGs can be applied or not will be discussed in Rel-17 UE features discussion

Agreement:

* Ask RAN2 to add in the description of FG 22-5c and 22-5d the following note (by using regular LS on updated UE features list)
  + For simultaneously Ant.Sw . + Ant.Sw SRS in intra-band CA, or in inter-band CAs with bands whose UL are switched together according to the reported UE capability, the UE expects the same configuration of xTyR across the different CCs and the SRS resources overlapped in time domain from UE perspective are from the same UE antenna ports.

Updated FL proposal #3

* Introduce the following FG to address the issues on RRC signaling overhead and UE memory related to ‘port-to-layer mapping’

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 22. NR Others | 22-X | Support of ‘cri-RI-CQI’ report without non-PMI-PortIndication | UE supports CSI-ReportConfig with the higher layer parameter reportQuantity set to ‘cri-RI-CQI’ and the higher layer parameter non-PMI-PortIndication is not configured |  | Yes | N/A |  | Per UE | N/A | Yes | N/A |  | Optional with capability signalling |

[R1-2102490](file:///C:\Users\wanshic\OneDrive%20-%20Qualcomm\Documents\Standards\3GPP%20Standards\Meeting%20Documents\TSGR1_104b\Docs\R1-2102490.zip) Discussion on NR Rel-16 UE Features ZTE

[R1-2102557](file:///C:\Users\wanshic\OneDrive%20-%20Qualcomm\Documents\Standards\3GPP%20Standards\Meeting%20Documents\TSGR1_104b\Docs\R1-2102557.zip) Discussion on NR Rel-16 UE Features OPPO

[R1-2102950](file:///C:\Users\wanshic\OneDrive%20-%20Qualcomm\Documents\Standards\3GPP%20Standards\Meeting%20Documents\TSGR1_104b\Docs\R1-2102950.zip) Remaining issues on Rel-16 eMIMO UE features. vivo

[R1-2103087](file:///C:\Users\wanshic\OneDrive%20-%20Qualcomm\Documents\Standards\3GPP%20Standards\Meeting%20Documents\TSGR1_104b\Docs\R1-2103087.zip) Discussions on NR Rel-16 UE features Apple

[R1-2103148](file:///C:\Users\wanshic\OneDrive%20-%20Qualcomm\Documents\Standards\3GPP%20Standards\Meeting%20Documents\TSGR1_104b\Docs\R1-2103148.zip) Discussion on NR Rel-16 UE features Qualcomm Incorporated

[R1-2103197](file:///C:\Users\wanshic\OneDrive%20-%20Qualcomm\Documents\Standards\3GPP%20Standards\Meeting%20Documents\TSGR1_104b\Docs\R1-2103197.zip) Remaining issues on NR Rel-16 UE features Nokia, Nokia Shanghai Bell

[R1-2103399](file:///C:\Users\wanshic\OneDrive%20-%20Qualcomm\Documents\Standards\3GPP%20Standards\Meeting%20Documents\TSGR1_104b\Docs\R1-2103399.zip) Remaining details of Rel-16 NR UE features Huawei, HiSilicon

[R1-2103662](file:///C:\Users\wanshic\OneDrive%20-%20Qualcomm\Documents\Standards\3GPP%20Standards\Meeting%20Documents\TSGR1_104b\Docs\R1-2103662.zip) Remaining details of Rel-16 NR UE features Ericsson