**3GPP TSG RAN WG1 #100bis-e R1-20xxxxx**

e-Meeting, April 20th – 30th, 2020

Source: NTT DOCOMO, INC.

Title: Session Notes for LTE UE Features (1)

Agenda Item: 6.2.5

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

**7.2.11 NR Rel-16 UE Features (1+2+6+5+4+10+6+5+5+4+5+1+2+2=58)**

[100e-b-NR-UEFeatures-Remaining] Email discussion/approval of remaining issues (especially the one identified as low priority items in FL’s summaries) starting no earlier than 4/30 till next meeting – Hiroki (DCM)/Ralf (ATT)

***7.2.11.1 UE features for two-step RACH (2)***

[R1-2002453](file:///C:\Users\Hiroki%20Harada\wanshic\OneDrive%20-%20Qualcomm\Documents\Standards\3GPP%20Standards\Meeting%20Documents\TSGR1_100b\Docs\R1-2002453.zip) Summary on UE features for two-step RACH Moderator (NTT DOCOMO, INC.)

[100b-e-NR-UEFeatures-2Step-01] Email discussion/approval on feature group structure for two step RACH (20th-24th April) – (DCM, Hiroki)

* Confirm to keep FG9-1 as single FG
* Confirm to keep FG9-2 as single FG
* Confirm to keep FG9-3 as single FG
* Discuss whether or not to keep FG9-4 as single FG
* Discuss whether or not to add following new feature groups. If there is no consensus to add a new feature group at the end of this email discussion, the new feature group is not introduced in Rel-16.
  + 60 kHz SCS for msgA PUSCH as an optional UE feature in FR1
  + PUSCH transmission with frequency hopping
  + max number msgB to be monitored/decoded per slot

**Agreement:**

* FG9-1 is kept as a single FG for basic support of Rel-16 2 step RACH.
  + Components and capability signaling impacts are discussed in [100b-e-NR-UEFeatures-2Step-02]

[100b-e-NR-UEFeatures-2Step-02] Email discussion/approval on Basic channel structure and procedure for two step RACH (dates TBD) – (DCM, Hiroki)

* Down select following alternatives, and discuss whether/how to change the description of components.
  + Alt 1: detailed feature group
  + Alt 2: simplified basic feature group

[R1-2001714](file:///C:\Users\Hiroki%20Harada\wanshic\OneDrive%20-%20Qualcomm\Documents\Standards\3GPP%20Standards\Meeting%20Documents\TSGR1_100b\Docs\R1-2001714.zip) Discussion on the UE features for two-step RACH ZTE, Sanechips

[R1-2002015](file:///C:\Users\Hiroki%20Harada\wanshic\OneDrive%20-%20Qualcomm\Documents\Standards\3GPP%20Standards\Meeting%20Documents\TSGR1_100b\Docs\R1-2002015.zip) Discussion on UE features for two-step RACH Intel Corporation

[R1-2002068](file:///C:\Users\Hiroki%20Harada\wanshic\OneDrive%20-%20Qualcomm\Documents\Standards\3GPP%20Standards\Meeting%20Documents\TSGR1_100b\Docs\R1-2002068.zip) Discussion of NR Rel-16 UE features for two-step RACH CATT

[R1-2002150](file:///C:\Users\Hiroki%20Harada\wanshic\OneDrive%20-%20Qualcomm\Documents\Standards\3GPP%20Standards\Meeting%20Documents\TSGR1_100b\Docs\R1-2002150.zip) UE features for two-step RACH Samsung

[R1-2002349](file:///C:\Users\Hiroki%20Harada\wanshic\OneDrive%20-%20Qualcomm\Documents\Standards\3GPP%20Standards\Meeting%20Documents\TSGR1_100b\Docs\R1-2002349.zip) Views on NR 2-step RACH UE feature Apple

[R1-2002372](file:///C:\Users\Hiroki%20Harada\wanshic\OneDrive%20-%20Qualcomm\Documents\Standards\3GPP%20Standards\Meeting%20Documents\TSGR1_100b\Docs\R1-2002372.zip) UE Features for Two-Step RACH Ericsson

[R1-2002562](file:///C:\Users\Hiroki%20Harada\wanshic\OneDrive%20-%20Qualcomm\Documents\Standards\3GPP%20Standards\Meeting%20Documents\TSGR1_100b\Docs\R1-2002562.zip) Discussion on two step RACH UE features Qualcomm Incorporated

[R1-2002588](file:///C:\Users\Hiroki%20Harada\wanshic\OneDrive%20-%20Qualcomm\Documents\Standards\3GPP%20Standards\Meeting%20Documents\TSGR1_100b\Docs\R1-2002588.zip) Rel-16 UE features for 2-step RACH Huawei, HiSilicon

***7.2.11.2 UE features for NR-U (6)***

[R1-2002458](file:///C:\Users\Hiroki%20Harada\wanshic\OneDrive%20-%20Qualcomm\Documents\Standards\3GPP%20Standards\Meeting%20Documents\TSGR1_100b\Docs\R1-2002458.zip) Summary on UE features for NR-U Moderator (NTT DOCOMO, INC.)

[100b-e-NR-UEFeatures-NRU-01] Email discussion/approval on the basic feature groups structure for NR-U (20th-24th April) – (DCM, Hiroki)

* Discuss on how to define basic FGs to cover all deployment scenarios
  + Options 1 and 2 stated below are the starting point
    - Option 1: define new basic FGs in addition to current basic FGs to cover all deployment scenarios (e.g., [3] and [5])
    - Option 2: define new basic FGs with components that have tightly related functionality to replace current basic FGs (e.g., [8])
* Discuss whether/how following FGs can be included in basic FGs
  + 10-3, 10-11, 10-14, 10-15, 10-16, 10-16a, 10-17, 10-18, 10-19, 10-20, 10-20a, 10-24, 10-25, 10-28, 10-29, 10-30
  + Whether or not “Support of RAR extension from 10ms to [40ms] by decoding of the 2-bit SFN indication in DCI 1\_0” can be separate capability from basic FGs
  + Whether or not “Type 2B channel access” can be separate capability from basic FGs

**Agreements:**

* Define new basic FGs with components that have tightly related functionality to replace current basic FGs
  + In “mandatory/optional” column for the possible basic FGs, it should be clarified that the FG may be a part of basic operation for a particular scenario
    - If the FG is decided as a basic FG, the note will be updated to clarify that the FG is “optional with capability signaling and is required to be supported for the scenario”
  + Note: each basic FG will have capability bit
* [Working assumption] Take either one of following alternatives

Alt.1:

* Define a table to capture the basic FGs required for a certain NR-U deployment scenario in specification
  + Note: the table does not have impact on capability signaling
  + Note: the grouping of FGs in the table does not have impact on “prerequisite FGs” column in features list

Alt.2:

* Capture an association between the basic FGs required to be supported and a certain NR-U deployment scenario in the UE features list

**Agreements:**

* Replace FG10-1/1a/2/2a/2b by following FGs
  + UL channel access for dynamic channel access mode
  + UL channel access for semi-static channel access mode
  + SSB-based RRM [for dynamic channel access mode]
  + SSB-based RRM [for semi-static channel access mode]
  + MIB reading
  + SSB-based RLM [for dynamic channel access mode]
  + SSB-based RLM [for semi-static channel access mode]
  + SIB1 reception
* Introducing the separated FG for “Support of RAR extension from 10ms to [40ms] by decoding of the 2-bit SFN indication in DCI 1\_0”
* Not introducing the separate FG for “Type 2B channel access”, i.e., it is merged with new basic FG for “UL channel access for dynamic channel access mode”
* FG10-11 is kept for “SRS starting position at any OFDM symbol in a slot”
* FG10-20 is kept for “Support search space set configuration with freqMonitorLocation-r16”
* FG10-20a is kept for “Support coreset configuration with rb-Offset”
* FG10-25 is kept for “Enable configured UL transmission out of COT”
* FG10-29 is kept for “Support available RB set indicator field in DCI 2\_0”
* FG10-30 is kept for “Support channel occupancy duration indicator field in DCI 2\_0”
* FG10-7 is kept for “UL channel access for 10 MHz SCell”
* FG10-10 is kept for “RSSI and channel occupancy measurement and reporting”
* FG10-23 is kept for “CGI reading on unlicensed cell [based on off-sync raster SSB] for ANR functionality”
* FG10-27 is kept for “Wideband PRACH”

[100b-e-NR-UEFeatures-NRU-02] Email discussion/approval on feature groups structure related to DL operation for NR-U (20th-24th April) – (DCM, Hiroki)

* Discuss on whether or not “Support fixed frame period of 5ms and 10ms” and “Support fixed frame periods shorter than 5ms” can be separate capabilities.
* Discuss whether or not the capability FG10-8 are separate for each length or some groups are formed to signal the capability together
* Discuss whether or not 10-9/9a/9b/9c can be combined into a single FG
* Discuss whether or not 10-14/10-15/10-16/10-16a/10-17 can be combined into a single FG
  + If no, whether or not 10-15 can be further split under other group DAI/NFI configured or not
* Discuss whether or not 10-19/10-19a/10-19b/10-19c are needed
* Discuss whether or not 10-26 is needed
* Discuss whether or not 10-31 is needed

**Agreements:**

* Not introducing the separate FGs for each length, i.e., FG 10-8 is kept for “Type B PDSCH length {3, 5, 6, 8, [9, 10,] 11, 12, 13} without DMRS shift due to CRS collision”
* FG10-16 and FG10-16a are combined into a single FG for “One-shot HARQ ACK feedback”
* FG10-14 is kept for “Non-numerical PDSCH to HARQ-ACK timing”
* FG10-17 is kept for “Multi-PUSCH UL grant”
* FG10-15 is kept for “Enhanced dynamic HARQ codebook”

**Agreements:**

* FG10-9c is kept for “Joint search space group switching across multiple cells”
* For FG10-9/9a/9b
  + Alt.1: merge them into a single FG
  + Alt.2: keep two separate FGs: one for explicit (10-9) and another for implicit (10-9a/9b)
  + Alt.3: keep two separate FGs: one for 10-9/9a and another for 10-9b
  + Alt.4: keep two separate FGs: one for based on PDCCH detection in first 3 symbols and another for others
  + Alt.5: keep three original FGs

**Agreements:**

* Remove 10-19c

**FL proposal:**

* Both “fixed frame period of 5ms and 10ms” and “fixed frame periods shorter than 5ms” are covered by new FG for “UL channel access for semi-static channel access mode”.
* FG10-19a is kept for “Support DL reception in a carrier with intra-cell guard-bands”
* FG10-19b is kept for “Support UL transmission with subset of RB sets passing LBT”
* Remove 10-19
* Further discuss whether or not 10-26 is needed
* Further discuss whether or not 10-31 is needed

[100b-e-NR-UEFeatures-NRU-03] Email discussion/approval on feature groups structure related to DL+UL operation for NR-U (20th-24th April) – (DCM, Hiroki)

* Discuss on followings regarding 10-3 to 10-3b and [10-12]
  + Whether or not 10-3/10-3a/10-3b/10-3c can be combined into a single FG
  + Whether or not 10-12 can be combined into 10-3b/10-3c
    - If not, whether or not 10-12 can be split for PF2 and PF3 separately
* Discuss whether or not 10-13a is needed as a FG
* Discuss whether or not 10-18/10-24/10-28 can be combined into a single FG
* Discuss whether or not following update can be applied

|  |  |  |
| --- | --- | --- |
| 10-21a | Support using ED threshold for UL to DL COT sharing | 1. Use ULtoDL-CO-SharingED-Threshold-r16 for cat 4 LBT for scheduled UL to share COT with gNB for DL  2. Use ULtoDL-CO-SharingED-Threshold-r16 for cat 4 LBT for CG-PUSCH to share COT with gNB for DL  3. Indicate in CG-UCI the COT sharing information |
| 10-21b | Support UL to DL COT sharing | 1. Support cat 4 LBT for scheduled UL to share COT with gNB for DL without ULtoDL-CO-SharingED-Threshold-r16  2. Support cat 4 LBT for CG-PUSCH to share COT with gNB for DL without ULtoDL-CO-SharingED-Threshold-r16  3. Indicate in CG-UCI the COT sharing information |

* Discuss whether or not 10-22 is needed

**Agreements:**

* FG10-3 is kept for “PRB interlace mapping for PUSCH”
* Combine 10-3a, 10-3b, and 10-3c into a single FG for “PRB interlace mapping for PUCCH”
* FG10-13a is kept for “Extended CP range of more than one symbol for CG-PUSCH”
* FG10-21a is kept for “Support using ED threshold given by gNB for UL to DL COT sharing”

**Agreements:**

* Keep 10-18/24/28 as separate FGs

**FL proposal:**

* Combine 10-12 into the FG combining 10-3a, 10-3b, and 10-3c
* FG10-21b is kept for “Support without using ED threshold given by gNB for UL to DL COT sharing”
* Further discuss whether or not 10-22 is needed

[100b-e-NR-UEFeatures-NRU-04] Email discussion/approval on issues with capability signaling impacts on basic FGs for NR-U (dates TBD) – Hiroki (DCM)

* Discuss on component(s) of each FG that need to be reported and candidate values for the component(s)
* Discuss on reporting type of each FG
* Discuss on the need of xDD and/or FRx differentiation for each FG of per-UE type
* Note that discussed FGs in this email discussion are derived by outcome of high priority email discussion in FL proposal 1

[100b-e-NR-UEFeatures-NRU-05] Email discussion/approval on issues with capability signaling impacts on FGs related to DL operation for NR-U (dates TBD) – Hiroki (DCM)

* Discuss on component(s) of each FG that need to be reported and candidate values for the component(s)
* Discuss on reporting type of each FG
* Discuss on the need of xDD and/or FRx differentiation for each FG of per-UE type
* Note that discussed FGs in this email discussion are derived by outcome of high priority email discussion in FL proposal 2

[100b-e-NR-UEFeatures-NRU-06] Email discussion/approval on issues with capability signaling impacts on FGs related to DL+UL operation for NR-U (dates TBD) – Hiroki (DCM)

* Discuss on component(s) of each FG that need to be reported and candidate values for the component(s)
* Discuss on reporting type of each FG
* Discuss on the need of xDD and/or FRx differentiation for each FG of per-UE type
* Note that discussed FGs in this email discussion are derived by outcome of high priority email discussion in FL proposal 3

[R1-2001715](file:///C:\Users\Hiroki%20Harada\wanshic\OneDrive%20-%20Qualcomm\Documents\Standards\3GPP%20Standards\Meeting%20Documents\TSGR1_100b\Docs\R1-2001715.zip) Discussion on the UE features for NR-U ZTE, Sanechips

[R1-2001720](file:///C:\Users\Hiroki%20Harada\wanshic\OneDrive%20-%20Qualcomm\Documents\Standards\3GPP%20Standards\Meeting%20Documents\TSGR1_100b\Docs\R1-2001720.zip) Discussion on Rel-16 NRU UE features vivo

[R1-2001765](file:///C:\Users\Hiroki%20Harada\wanshic\OneDrive%20-%20Qualcomm\Documents\Standards\3GPP%20Standards\Meeting%20Documents\TSGR1_100b\Docs\R1-2001765.zip) Discussion on UE feature for NRU OPPO

[R1-2001826](file:///C:\Users\Hiroki%20Harada\wanshic\OneDrive%20-%20Qualcomm\Documents\Standards\3GPP%20Standards\Meeting%20Documents\TSGR1_100b\Docs\R1-2001826.zip) Views on Rel-16 UE features for NR-U MediaTek Inc.

[R1-2001941](file:///C:\Users\Hiroki%20Harada\wanshic\OneDrive%20-%20Qualcomm\Documents\Standards\3GPP%20Standards\Meeting%20Documents\TSGR1_100b\Docs\R1-2001941.zip) Discussion on UE features for NR-U LG Electronics

[R1-2002016](file:///C:\Users\Hiroki%20Harada\wanshic\OneDrive%20-%20Qualcomm\Documents\Standards\3GPP%20Standards\Meeting%20Documents\TSGR1_100b\Docs\R1-2002016.zip) UE features for NR-U Intel Corporation

[R1-2002037](file:///C:\Users\Hiroki%20Harada\wanshic\OneDrive%20-%20Qualcomm\Documents\Standards\3GPP%20Standards\Meeting%20Documents\TSGR1_100b\Docs\R1-2002037.zip) UE features for NR-U Ericsson

[R1-2002151](file:///C:\Users\Hiroki%20Harada\wanshic\OneDrive%20-%20Qualcomm\Documents\Standards\3GPP%20Standards\Meeting%20Documents\TSGR1_100b\Docs\R1-2002151.zip) UE features for NR-U Samsung

[R1-2002350](file:///C:\Users\Hiroki%20Harada\wanshic\OneDrive%20-%20Qualcomm\Documents\Standards\3GPP%20Standards\Meeting%20Documents\TSGR1_100b\Docs\R1-2002350.zip) Discussions on NR-U UE features Apple

[R1-2002393](file:///C:\Users\Hiroki%20Harada\wanshic\OneDrive%20-%20Qualcomm\Documents\Standards\3GPP%20Standards\Meeting%20Documents\TSGR1_100b\Docs\R1-2002393.zip) Discussion on UE feature for NR-U Sharp

[R1-2002480](file:///C:\Users\Hiroki%20Harada\wanshic\OneDrive%20-%20Qualcomm\Documents\Standards\3GPP%20Standards\Meeting%20Documents\TSGR1_100b\Docs\R1-2002480.zip) On UE features NR Unlicensed Nokia, Nokia Shanghai Bell

[R1-2002563](file:///C:\Users\Hiroki%20Harada\wanshic\OneDrive%20-%20Qualcomm\Documents\Standards\3GPP%20Standards\Meeting%20Documents\TSGR1_100b\Docs\R1-2002563.zip) Discussion on NR-U UE features Qualcomm Incorporated

[R1-2002589](file:///C:\Users\Hiroki%20Harada\wanshic\OneDrive%20-%20Qualcomm\Documents\Standards\3GPP%20Standards\Meeting%20Documents\TSGR1_100b\Docs\R1-2002589.zip) Rel-16 UE features for NR-U Huawei, HiSilicon

[R1-2002683](file:///C:\Users\Hiroki%20Harada\wanshic\OneDrive%20-%20Qualcomm\Documents\Standards\3GPP%20Standards\Meeting%20Documents\TSGR1_100b\Docs\R1-2002683.zip) UE Features for NR-U TCL Communications

***7.2.11.5 UE features for URLLC/IIoT (10)***

[R1-2002459](file:///C:\Users\Hiroki%20Harada\wanshic\OneDrive%20-%20Qualcomm\Documents\Standards\3GPP%20Standards\Meeting%20Documents\TSGR1_100b\Docs\R1-2002459.zip) Summary on UE features for URLLC/IIoT Moderator (NTT DOCOMO, INC.)

[100b-e-NR-UEFeatures-URLLC/IIoT-01] Email discussion/approval on the feature groups structure related to PDCCH enhancements for URLLC (20th-24th April) – Hiroki (DCM)

* Confirm to keep 11-1/1a/2/2b
* Discuss following on 11-1a
  + Whether or not to introduce separate capabilities for DL and UL DCI format
* Discuss following on 11-2b
  + Confirm to introduce separate capabilities for support of mixed Rel-16 PDCCH monitoring capability and Rel-15 PDCCH monitoring capability on different serving cells.
  + Whether to introduce separate capabilities for mixed Rel-16 capability with Rel-15 PDCCH monitoring capability FG 3-1, FG 3-2, FG 3-5b on different serving cells.
    - If the separate capabilities are introduced,
      * Candidate values for capability on number of CCs with FG 3-1, FG3-2, and FG3-5b

**Agreements**:

FG11-2 is kept

**Agreements:**

* Following FGs are included in UE features list for URLLC.
  + 11-1 Monitoring DCI format 1\_2 and DCI format 0\_2
  + 11-1a Monitoring both DCI format 0\_1/1\_1 and DCI format 0\_2/1\_2 in the same search space
  + 11-2 Rel-16 PDCCH monitoring capability (already agreed)

**Proposal**:

FG11-2b is not split for FG3-1, 3-2, 3-5b, but adding note in FG11-2b “Rel-15 monitoring capability here is subjected to the capability of FG 3-1, FG 3-2 and FG 3-5b”

Supported by: Huawei, Nokia, DOCOMO, Intel, Ericsson, ZTE

Objected by: Qualcomm, Apple

[100b-e-NR-UEFeatures-URLLC/IIoT-02] Email discussion/approval on the feature groups structure related to UCI enhancements for URLLC (20th-24th April) – Hiroki (DCM)

* Confirm to keep 11-3/4
* Discuss following on 11-3
  + Whether to introduce separate FGs for the simultaneous use of CBG-based UL transmission and minimum processing capability 2 (e.g., 11-3a/3b/3c/3d/3e)
* Discuss following on 11-4
  + Whether or not to merge 11-4 with 12-1
    - If not merged, whether or not to introduce separate UE capabilities for DCI format 0\_1 and DCI format 0\_2 based on 12-1
  + Whether or not to introduce separate UE capabilities for DL priority and UL priority for component 4)
  + Whether or not to introduce separate UE capabilities for DCI format 0\_1/1\_1 and DCI format 0\_2/1\_2 for component 4)
* Discuss whether or not to keep FG11-4x for two sub-slot based HARQ-ACK codebook construction
* Discuss whether or not to keep FG11-4a, and if yes, whether to split it into two rows, one for DL and one for UL

**Agreements**:

FG11-3 is kept

**Conclusion:**

Following is discussed in AI 7.2.11.13.

* Whether to introduce separate FGs for the simultaneous use of CBG-based UL transmission and minimum processing capability 2 (e.g., 11-3a/3b/3c/3d/3e)

**Agreements**

* Following FGs are included in UE features list for URLLC.
  + 11-4 Two HARQ-ACK codebooks simultaneously constructed for supporting PDSCH reception with different priorities at a UE (slot + slot, slot + sub-slot)
    - FFS: Component may include supported combinations
  + 11-4x Two HARQ-ACK codebooks simultaneously constructed for supporting PDSCH reception with different priorities at a UE (sub-slot + sub-slot)
    - FFS: Component may include supported combinations

**FL proposals:**

* Following FGs are included in UE features list for URLLC.
  + 11-4a DL[/UL] priority indication in DCI with mixed DCI formats
  + [11-4b UL priority indication in DCI with mixed DCI formats]

[100b-e-NR-UEFeatures-URLLC/IIoT-03] Email discussion/approval on the feature groups structure related to enhanced UL configured grant transmission for URLLC (20th-24th April) – Hiroki (DCM)

* Confirm to keep 11-9/10
* Discuss whether or not to merge FG11-9a with FG12-2a
* Discuss whether or not to FG11-10 is merged with FG11-11
  + Discuss whether or not to further merge FG11-10 with FG12-3

**Agreements**:

FG11-9 is kept

**Agreements**:

FG11-9a is kept

**Agreements**:

FG11-9a is not merged with FG12-2a, i.e., FG12-2a is kept

**Agreements**:

FG11-10 and FG11-11 are kept as separate FGs for DCI format 0\_1 and DCI format 0\_2

[100b-e-NR-UEFeatures-URLLC/IIoT-04] Email discussion/approval on the feature groups structure related to other enhancements for URLLC (20th-24th April) – Hiroki (DCM)

* Confirm to keep 11-5/6/7/8
* Discuss whether to introduce a separate capability signaling for the support of InvalidSymbolPattern for 11-5
* Discuss followings on 11-7
  + Whether or not to introduce separate UE capability for cross-carrier UL CI indication
  + Whether or not to introduce separate UE capability for the support of more than one monitoring occasion for DCI 2\_4 per slot
  + Whether to introduce a FG (e.g. 11-7b) that a UE is not expected to be scheduled with a CBG-based HARQ retransmission that does not include the full TB if the initial HARQ transmission was cancelled in case of inter-UE cancelation
* Discuss whether or not to keep FG11-7a
  + If removed, if UE reports to support FG11-7 and 6-23, it should automatically support the feature of FG 11-7a.
* Discuss whether or not to introduce following as new FG. If there is no consensus to add a new feature group at the end of this email discussion, the new feature group is not introduced in Rel-16.
  + “UL intra-UE multiplexing/prioritization of overlapping channel/signals with two priority levels in physical layer”
  + “Fixed TB CRC for interrupted initial PUSCH”

**Agreements:**

* Following FGs are included in UE features list for URLLC.
  + 11-6 PUSCH repetition Type A

**Proposals:**

* Following FGs are included in UE features list for URLLC.
  + 11-5 PUSCH repetition type B
    - PUSCH repetition type B with 1 unicast PUSCHs per slot per CC with UE processing time capability 1
    - PUSCH repetition type B with up to 2 unicast PUSCHs per slot per CC with UE processing time capability 1
    - PUSCH repetition type B with up to 7 unicast PUSCHs per slot per CC with UE processing time capability 1
    - PUSCH repetition type B with up to 4 unicast PUSCHs per slot per CC with UE processing time capability 1
  + 11-7 UL cancelation scheme [for self-carrier]
    - UL cancelation scheme [for cross-carrier]
  + 11-7a Independent cancellation of the overlapping PUSCHs in an intra-band UL CA

[100b-e-NR-UEFeatures-URLLC/IIoT-05] Email discussion/approval on the feature groups structure for NR IIoT (20th-24th April) – Hiroki (DCM)

* Confirm to keep 12-2/2a/5
* Discuss whether to introduce a FG (e.g. 12-1a) that a UE is not expected to be scheduled with a CBG-based HARQ retransmission that does not include the full TB if the initial HARQ transmission was cancelled in case of intra-UE prioritization
* Discuss whether or not to define following FGs:
  + Support of SPS periodicity shorter than 10 ms
  + Support of SPS activation by DCI format 1\_2
* Discuss whether or not to introduce separate UE capabilities for support of SPS release by DCI format 1\_1 and 1\_2

**Agreements**:

FG12-3 are split into two separate FGs, as one for DCI format 1\_1 and another for DCI format 1\_2

**Agreements:**

* Following FGs are included in UE features list for IIoT.
  + 12-1 UL intra-UE multiplexing/prioritization of overlapping channel/signals with two priority levels in physical layer
  + 12-2 Multiple SPS configurations
  + 12-2a Joint release in a DCI for two or more SPS configurations for a given BWP of a serving cell (already agreed)
  + 12-3 SPS release by DCI format 1\_1 (already agreed)
  + 12-3a SPS release by DCI format 1\_2 (already agreed)
  + 12-5 Configuration of aggregation factor per SPS configuration
  + New FG Support of SPS periodicity shorter than 10 ms

[100b-e-NR-UEFeatures-URLLC/IIoT-06] Email discussion/approval on issues with capability signaling impacts on FGs related to PDCCH enhancements for URLLC (dates TBD) – Hiroki (DCM)

* Discuss whether or not FG11-1 needs “FDD/TDD differentiation” and “FR1/FR2 differentiation”
  + If differentiation is needed for both,
    - Whether/how to clarify capability interpretation for “support mixture of FDD/TDD and/or FR1/FR2”
* Discuss whether or not FG11-1a needs “FDD/TDD differentiation” and “FR1/FR2 differentiation”
  + If differentiation is needed for both,
    - Whether/how to clarify capability interpretation for “support mixture of FDD/TDD and/or FR1/FR2”
* Discuss followings on 11-2
  + Whether or not reporting type is FSPC for FG11-2
    - For component 5), whether different reporting type should be defined for component 5)
  + Whether or not to merge component 1) and 3), and component 2) and 4)
  + Whether or not to add a new component to indicate if the UE can support non-aligned spans
* Discuss whether or not report type of 11-2b is per UE per FSPC
  + If it is per UE,
    - Whether or not FG11-2b needs “FDD/TDD differentiation” and “FR1/FR2 differentiation”
* Note that discussed FGs in this email discussion are derived by outcome of high priority email discussion in FL proposal 1

[100b-e-NR-UEFeatures-URLLC/IIoT-07] Email discussion/approval on issues with capability signaling impacts on FGs related to UCI enhancements for URLLC (dates TBD) – Hiroki (DCM)

* Discuss followings on 11-3
  + Confirm to remove component 3) and accordingly the note for component 3)
  + Whether report type should be per UE or per FSPC or per band
    - If it is per UE,
      * It can be confirmed that FG11-3 does not need “FDD/TDD differentiation” and “FR1/FR2 differentiation”
* Discuss followings on 11-4
  + Whether or not to include component 6) in FG 11-4
  + Whether or not report type should be per UE or per FS
    - If it is per UE,
      * Confirm FG11-4 does not need “FDD/TDD differentiation” and “FR1/FR2 differentiation”
* Discuss whether report type of 11-4x should be per UE or per FSPC
  + If it is per UE,
    - Confirm that FG11-4x does not need “FDD/TDD differentiation” and “FR1/FR2 differentiation”
* Discuss whether FG11-4a needs “FDD/TDD differentiation” and “FR1/FR2 differentiation”
  + If differentiation is needed for both,
    - Whether/how to clarify capability interpretation for “support mixture of FDD/TDD and/or FR1/FR2”
* Note that discussed FGs in this email discussion are derived by outcome of high priority email discussion in FL proposal 2

[100b-e-NR-UEFeatures-URLLC/IIoT-08] Email discussion/approval on issues with capability signaling impacts on FGs related to enhanced UL configured grant transmission for URLLC (dates TBD) – Hiroki (DCM)

* Discuss followings on 11-9
  + Whether the brackets of component 2 and 3 can be removed.
    - Candidate value for component 2) and 3).
    - Whether or not UE capability signaling should be on the number of ‘active’ CG configurations rather than ‘configured’ CG configurations.
  + Whether or not report type should be per UE or per FSPC
    - If it is per UE,
      * Whether FG11-9 needs “FDD/TDD differentiation” and “FR1/FR2 differentiation”
        + If differentiation is needed for both,

Whether/how to clarify capability interpretation for “support mixture of FDD/TDD and/or FR1/FR2”

* Discuss whether or not FG11-9a needs “FDD/TDD differentiation” and “FR1/FR2 differentiation”
  + If differentiation is needed for both,
    - Whether/how to clarify capability interpretation for “support mixture of FDD/TDD and/or FR1/FR2”
* Discuss whether FG11-10 needs “FDD/TDD differentiation” and “FR1/FR2 differentiation”
  + If differentiation is needed for both,
    - Whether/how to clarify capability interpretation for “support mixture of FDD/TDD and/or FR1/FR2”
* Note that discussed FGs in this email discussion are derived by outcome of high priority email discussion in FL proposal 3

[100b-e-NR-UEFeatures-URLLC/IIoT-09] Email discussion/approval on issues with capability signaling impacts on FGs related to other enhancements for URLLC (dates TBD) – Hiroki (DCM)

* Discuss followings on 11-5
  + Whether or not FG11-5 includes component 3, 6, 8, and 9
  + Whether report type should be per UE or per band
    - If it is per UE,
      * Confirm FG11-5 does not need “FDD/TDD differentiation” and “FR1/FR2 differentiation”
* Discuss followings on 11-6
  + Whether to add “a component for the supported maximum number of PUSCH repetitions” or to remove it
  + Whether or not report type should be per UE or per band
    - If it is per UE,
      * Whether FG11-6 needs “FDD/TDD differentiation” and “FR1/FR2 differentiation”
        + If differentiation is needed for both,

Whether/how to clarify capability interpretation for “support mixture of FDD/TDD and/or FR1/FR2”

* Discuss followings on 11-7
  + Whether report type should be per UE or per FS
    - If it is per UE,
      * whether FG11-7 needs “FDD/TDD differentiation” and “FR1/FR2 differentiation”
        + If differentiation is needed for both,

Whether/how to clarify capability interpretation for “support mixture of FDD/TDD and/or FR1/FR2”

* + - Confirm to remove the following FFS “FFS: Whether to add new FG with FG11-7 as prerequisite for the support of more than one monitoring occasion for DCI 2\_4 per slot? Can we just add the following note to address the concern?”
* Discuss followings on 11-8
  + Whether or not FG11-8 needs “FDD/TDD differentiation” and “FR1/FR2 differentiation”
    - If differentiation is needed for both,
      * Whether/how to clarify capability interpretation for “support mixture of FDD/TDD and/or FR1/FR2”
* Note that discussed FGs in this email discussion are derived by outcome of high priority email discussion in FL proposal 4

[100b-e-NR-UEFeatures-URLLC/IIoT-10] Email discussion/approval on issues with capability signaling impacts on FGs for NR IIoT (dates TBD) – Hiroki (DCM)

* Discuss followings on 12-1
  + Whether or not report type is per FSPC or per UE
  + Whether or not to modify the description of note “A UE supporting this feature shall also support ~~the LCP restriction based on DCI priority indication ([~~*~~lch-ToGrantPriorityRestriction-r16~~*~~]) and~~ intra-UE prioritization in MAC ([*lch-PriorityBasedPrioritization-r16*]).”
* Discuss followings on 12-2
  + Clarify that the component 3 is about all serving cells within a cell group or across different cell groups
    - Candidate value for component 3)
  + Whether report type should be per UE or per FSPC
    - If it is per UE,
      * whether FG11-1 needs “FDD/TDD differentiation” and “FR1/FR2 differentiation”
        + If differentiation is needed for both,

Whether/how to clarify capability interpretation for “support mixture of FDD/TDD and/or FR1/FR2”

* Discuss whether FG12-2a needs “FDD/TDD differentiation” and “FR1/FR2 differentiation”
  + If differentiation is needed for both,
    - Whether/how to clarify capability interpretation for “support mixture of FDD/TDD and/or FR1/FR2”
* Discuss whether or not FG12-3 needs “FDD/TDD differentiation” and “FR1/FR2 differentiation”
  + If differentiation is needed for both,
    - Whether/how to clarify capability interpretation for “support mixture of FDD/TDD and/or FR1/FR2”
* Discuss whether or not FG12-5 needs “FDD/TDD differentiation” and “FR1/FR2 differentiation”
  + If differentiation is needed for both,
    - Whether/how to clarify capability interpretation for “support mixture of FDD/TDD and/or FR1/FR2”
* Note that discussed FGs in this email discussion are derived by outcome of high priority email discussion in FL proposal 5

[R1-2001632](file:///C:\Users\Hiroki%20Harada\wanshic\OneDrive%20-%20Qualcomm\Documents\Standards\3GPP%20Standards\Meeting%20Documents\TSGR1_100b\Docs\R1-2001632.zip) Discussion on UE feature for URLLC/IIoT ZTE

[R1-2001721](file:///C:\Users\Hiroki%20Harada\wanshic\OneDrive%20-%20Qualcomm\Documents\Standards\3GPP%20Standards\Meeting%20Documents\TSGR1_100b\Docs\R1-2001721.zip) Discussion on Rel-16 URLLC/IIOT UE features vivo

[R1-2001782](file:///C:\Users\Hiroki%20Harada\wanshic\OneDrive%20-%20Qualcomm\Documents\Standards\3GPP%20Standards\Meeting%20Documents\TSGR1_100b\Docs\R1-2001782.zip) Discussion on UE features for URLLC/IIoT OPPO

[R1-2001791](file:///C:\Users\Hiroki%20Harada\wanshic\OneDrive%20-%20Qualcomm\Documents\Standards\3GPP%20Standards\Meeting%20Documents\TSGR1_100b\Docs\R1-2001791.zip) On UE Features for URLLC and IIoT Ericsson

[R1-2001795](file:///C:\Users\Hiroki%20Harada\wanshic\OneDrive%20-%20Qualcomm\Documents\Standards\3GPP%20Standards\Meeting%20Documents\TSGR1_100b\Docs\R1-2001795.zip) UE features for URLLC China Unicom

[R1-2001828](file:///C:\Users\Hiroki%20Harada\wanshic\OneDrive%20-%20Qualcomm\Documents\Standards\3GPP%20Standards\Meeting%20Documents\TSGR1_100b\Docs\R1-2001828.zip) Views on Rel-16 UE features for NR URLLC/IIoT MediaTek Inc.

[R1-2001927](file:///C:\Users\Hiroki%20Harada\wanshic\OneDrive%20-%20Qualcomm\Documents\Standards\3GPP%20Standards\Meeting%20Documents\TSGR1_100b\Docs\R1-2001927.zip) Discussion on UE features for URLLC/IIoT LG Electronics

[R1-2002019](file:///C:\Users\Hiroki%20Harada\wanshic\OneDrive%20-%20Qualcomm\Documents\Standards\3GPP%20Standards\Meeting%20Documents\TSGR1_100b\Docs\R1-2002019.zip) On UE features for Rel-16 eURLLC and IIoT Intel Corporation

[R1-2002070](file:///C:\Users\Hiroki%20Harada\wanshic\OneDrive%20-%20Qualcomm\Documents\Standards\3GPP%20Standards\Meeting%20Documents\TSGR1_100b\Docs\R1-2002070.zip) Discussion of UE features for NR URLLC/IIoT CATT

[R1-2002154](file:///C:\Users\Hiroki%20Harada\wanshic\OneDrive%20-%20Qualcomm\Documents\Standards\3GPP%20Standards\Meeting%20Documents\TSGR1_100b\Docs\R1-2002154.zip) UE features for URLLC/IIoT Samsung

[R1-2002352](file:///C:\Users\Hiroki%20Harada\wanshic\OneDrive%20-%20Qualcomm\Documents\Standards\3GPP%20Standards\Meeting%20Documents\TSGR1_100b\Docs\R1-2002352.zip) Discussions on UE Features for URLLC/IIoT Apple

[R1-2002399](file:///C:\Users\Hiroki%20Harada\wanshic\OneDrive%20-%20Qualcomm\Documents\Standards\3GPP%20Standards\Meeting%20Documents\TSGR1_100b\Docs\R1-2002399.zip) UE features for URLLC/IIoT Panasonic Corporation

[R1-2002482](file:///C:\Users\Hiroki%20Harada\wanshic\OneDrive%20-%20Qualcomm\Documents\Standards\3GPP%20Standards\Meeting%20Documents\TSGR1_100b\Docs\R1-2002482.zip) On UE features for URLLC/IIOT Nokia, Nokia Shanghai Bell

[R1-2002566](file:///C:\Users\Hiroki%20Harada\wanshic\OneDrive%20-%20Qualcomm\Documents\Standards\3GPP%20Standards\Meeting%20Documents\TSGR1_100b\Docs\R1-2002566.zip) Discussion on eURLLC and IIOT UE features Qualcomm Incorporated

[R1-2002591](file:///C:\Users\Hiroki%20Harada\wanshic\OneDrive%20-%20Qualcomm\Documents\Standards\3GPP%20Standards\Meeting%20Documents\TSGR1_100b\Docs\R1-2002591.zip) Rel-16 UE features for URLLC Huawei, HiSilicon

***7.2.11.8 UE features for NR positioning (5)***

[R1-2002460](file:///C:\Users\Hiroki%20Harada\wanshic\OneDrive%20-%20Qualcomm\Documents\Standards\3GPP%20Standards\Meeting%20Documents\TSGR1_100b\Docs\R1-2002460.zip) Summary on UE features for NR positioning Moderator (NTT DOCOMO, INC.)

[100b-e-NR-UEFeatures-Positioning-01] Email discussion/approval on reconstructing the feature group structure for NR positioning (20th-24th April) – Hiroki (DCM)

* Reconstruct the features list to align with agreed capability signaling in RAN2
  + Starting from rapporteur’s updated features list below
  + In this email discussion, the target is to confirm reconstructed FGs that cover all the feature groups in [R1-2001484](file:///C:\Users\Hiroki%20Harada\wanshic\OneDrive%20-%20Qualcomm\Documents\Standards\3GPP%20Standards\Meeting%20Documents\TSGR1_100b\Docs\R1-2001484.zip)

|  |  |
| --- | --- |
| 13-1 | NR E-CID DL SSB RRM measurements for NR Positioning |
| 13-2 | NR E-CID DL CSI-RS RRM measurements for NR Positioning |
| 13-3 | Basic DL PRS Processing Capability |
| 13-4 | DL PRS QCL Processing Capability |
| 13-5 | DL PRS Resources for DL AoD |
| 13-6 | DL PRS Measurement Report for DL-AoD |
| 13-7 | DL PRS Resources for DL-TDOA |
| 13-8 | DL PRS RSTD Measurement Report for DL-TDOA |
| 13-9 | SRS Resources for Positioning |
| 13-10 | OLPC for SRS for Positioning |
| 13-11 | Spatial Relation for SRS for Positioning |
| 13-12 | DL PRS Resources for Multi-RTT |
| 13-13 | UE Rx-Tx Measurement Report for Multi-RTT |

**Agreements:**

* Following FGs are included in UE features list for positioning.
* [NR E-CID DL SSB RRM measurements with LPP support for NR Positioning]
* [NR E-CID DL CSI-RS RRM measurements with LPP support for NR Positioning]
* Common DL PRS Processing Capability
* DL PRS Resources for DL AoD
* DL PRS Resources for DL-TDOA
* DL PRS Resources for Multi-RTT
* SRS Resources for Positioning
* [Support of SSB from neighbor cell as QCL source of a DL PRS]
  + This does not imply UE is required to perform SSB measurement for Positioning purpose
* [Support of DL PRS from serving/neighbor cell as QCL source of a DL PRS]
* DL PRS Measurement Report for DL-AoD
* Inter-frequency measurements for [DL-AoD]
* [DL PRS RSTD/[RSRP] Measurement Report for DL-TDOA]
* Inter-frequency measurements for [DL-TDOA]
* Support of Aperiodic SRS Resources for positioning
* Support of Semi-persistent SRS Resources for positioning
* [Support of OLPC for SRS for positioning from neighbor cell]
* [Support of Spatial relation for SRS for positioning from serving cell]
* [Support of Spatial relation for SRS for positioning from neighbor cell]
* [UE Rx-Tx Measurement Report for Multi-RTT]
* Inter-frequency measurement for [Multi-RTT]

[100b-e-NR-UEFeatures-Positioning-02] Email discussion/approval on the need of possible new FGs for NR positioning (20th-24th April) – Hiroki (DCM)

* Discuss whether or not to introduce following new FGs. If there is no consensus to add a new feature group at the end of this email discussion, the new feature group is not introduced in Rel-16.
  + Support of the dedicated transmission of SRS for positioning
  + Support of simultaneous processing of LTE PRS and NR PRS
  + Support of simultaneous transmissions of SRS for positioning on a symbol
  + Support of concurrent measurements (DL RSRP, DL RSTD, UE Rx-Tx Time Difference)
  + Indication of concurrent configuration of list of measurements in supported CA Band Combination in the BandCombinationList

[100b-e-NR-UEFeatures-Positioning-03] Email discussion/approval on issues with capability signaling impacts for NR positioning based on DL PRS (dates TBD) – Hiroki (DCM)

* Discuss on component(s) of each FG that need to be reported and candidate values for the component(s)
* Discuss on reporting type of each FG
* Discuss on the need of xDD and/or FRx differentiation for each FG of per-UE type
* Note that discussed FGs in this email discussion are derived by outcome of high priority email discussions (e.g., FG13-3~8 in FL proposal 1)

[100b-e-NR-UEFeatures-Positioning-04] Email discussion/approval on issues with capability signaling impacts for NR positioning based on SRS (dates TBD) – Hiroki (DCM)

* Discuss on component(s) of each FG that need to be reported and candidate values for the component(s)
* Discuss on reporting type of each FG
* Discuss on the need of xDD and/or FRx differentiation for each FG of per-UE type
* Note that discussed FGs in this email discussion are derived by outcome of high priority email discussions (e.g., FG13-9~11 in FL proposal 1)

[100b-e-NR-UEFeatures-Positioning-05] Email discussion/approval on issues with capability signaling impacts for NR positioning based on ECID and for multi-RTT (dates TBD) – Hiroki (DCM)

* Discuss on component(s) of each FG that need to be reported and candidate values for the component(s)
* Discuss on reporting type of each FG
* Discuss on the need of xDD and/or FRx differentiation for each FG of per-UE type
* Note that discussed FGs in this email discussion are derived by outcome of high priority email discussions (e.g., FG13-1/2/12/13 in FL proposal 1)

[R1-2001605](file:///C:\Users\Hiroki%20Harada\wanshic\OneDrive%20-%20Qualcomm\Documents\Standards\3GPP%20Standards\Meeting%20Documents\TSGR1_100b\Docs\R1-2001605.zip) NR positioning UE features ZTE

[R1-2001723](file:///C:\Users\Hiroki%20Harada\wanshic\OneDrive%20-%20Qualcomm\Documents\Standards\3GPP%20Standards\Meeting%20Documents\TSGR1_100b\Docs\R1-2001723.zip) Discussion on UE features for Rel-16 NR positioning vivo

[R1-2001739](file:///C:\Users\Hiroki%20Harada\wanshic\OneDrive%20-%20Qualcomm\Documents\Standards\3GPP%20Standards\Meeting%20Documents\TSGR1_100b\Docs\R1-2001739.zip) Discussion on UE features for NR Positioning OPPO

[R1-2001831](file:///C:\Users\Hiroki%20Harada\wanshic\OneDrive%20-%20Qualcomm\Documents\Standards\3GPP%20Standards\Meeting%20Documents\TSGR1_100b\Docs\R1-2001831.zip) Views on Rel-16 UE features for NR positioning MediaTek Inc.

[R1-2001956](file:///C:\Users\Hiroki%20Harada\wanshic\OneDrive%20-%20Qualcomm\Documents\Standards\3GPP%20Standards\Meeting%20Documents\TSGR1_100b\Docs\R1-2001956.zip) Discussion on UE features for NR positioning LG Electronics

[R1-2002022](file:///C:\Users\Hiroki%20Harada\wanshic\OneDrive%20-%20Qualcomm\Documents\Standards\3GPP%20Standards\Meeting%20Documents\TSGR1_100b\Docs\R1-2002022.zip) Input to discussion on UE features for NR Positioning Intel Corporation

[R1-2002073](file:///C:\Users\Hiroki%20Harada\wanshic\OneDrive%20-%20Qualcomm\Documents\Standards\3GPP%20Standards\Meeting%20Documents\TSGR1_100b\Docs\R1-2002073.zip) Discussion of UE features for NR positioning CATT

[R1-2002156](file:///C:\Users\Hiroki%20Harada\wanshic\OneDrive%20-%20Qualcomm\Documents\Standards\3GPP%20Standards\Meeting%20Documents\TSGR1_100b\Docs\R1-2002156.zip) UE features for NR positioning Samsung

[R1-2002479](file:///C:\Users\Hiroki%20Harada\wanshic\OneDrive%20-%20Qualcomm\Documents\Standards\3GPP%20Standards\Meeting%20Documents\TSGR1_100b\Docs\R1-2002479.zip) On UE features for NR Positioning Nokia, Nokia Shanghai Bell

[R1-2002569](file:///C:\Users\Hiroki%20Harada\wanshic\OneDrive%20-%20Qualcomm\Documents\Standards\3GPP%20Standards\Meeting%20Documents\TSGR1_100b\Docs\R1-2002569.zip) Discussion on NR Positionign UE features Qualcomm Incorporated

[R1-2002712](file:///C:\Users\Hiroki%20Harada\wanshic\OneDrive%20-%20Qualcomm\Documents\Standards\3GPP%20Standards\Meeting%20Documents\TSGR1_100b\Docs\R1-2002712.zip) Rel-16 UE features for NR positioning Huawei, HiSilicon

Revision of [R1-2002587](file:///C:\Users\Hiroki%20Harada\wanshic\OneDrive%20-%20Qualcomm\Documents\Standards\3GPP%20Standards\Meeting%20Documents\TSGR1_100b\Docs\R1-2002587.zip)

[R1-2002624](file:///C:\Users\Hiroki%20Harada\wanshic\OneDrive%20-%20Qualcomm\Documents\Standards\3GPP%20Standards\Meeting%20Documents\TSGR1_100b\Docs\R1-2002624.zip) View on UE feature description for NR positioning Ericsson

***7.2.11.10 UE features for MR-DC/CA (5)***

[R1-2002454](file:///C:\Users\Hiroki%20Harada\wanshic\OneDrive%20-%20Qualcomm\Documents\Standards\3GPP%20Standards\Meeting%20Documents\TSGR1_100b\Docs\R1-2002454.zip) Summary on UE features for MR-DC/CA Moderator (NTT DOCOMO, INC.)

[100b-e-NR-UEFeatures-MRDCCA-01] Email discussion/approval on feature group structure for UL power sharing for NR-DC (20th-24th April) – Hiroki (DCM)

* Discuss whether to adopt FG18-1/18-1a/18-1b or FG[18-1]/[18-1a]/[18-1b]
  + Alt.1: Adopt FG18-1/18-1a/18-1b (i.e., remove FG[18-1]/[18-1a]/[18-1b])
    - It is clarified that FG18-1 is for both synchronous and asynchronous NR-DC scenarios
    - It is clarified that FG18-1a is for synchronous NR-DC scenario only
    - It is clarified for FG18-1b that T\_offset is only used for dynamic power sharing with look-ahead
  + Alt.2: Adopt FG[18-1]/[18-1a]/[18-1b] (i.e., remove FG18-1/18-1a/18-1b)
    - Whether [18-1] is removed or not, and whether it should be discussed in RAN or RAN1
  + Alt.3: Other if any

Proposal:

* Following FGs are included in UE features list
  + FG18-1 for Synchronous NR-DC operation
  + FG[18-1a] for Non-SFN synchronous NR-DC operation
  + FG18-1b for Asynchronous NR-DC operation

[100b-e-NR-UEFeatures-MRDCCA-02] Email discussion/approval on feature group structure for cross-carrier operation with different SCS (20th-24th April) – Hiroki (DCM)

* Confirm that FG[18-5a] for “Default QCL assumption for cross-carrier scheduling” is kept (i.e., remove bracket)
  + It is clarified that FG18-5a is only for same SCS
* Discuss whether new FG for “UL CA with mixed numerologies” is added or not
* Discuss whether new FG for “Cross-carrier scheduling with different SCS for URLLC” is added or not
* Discuss whether FG[18-6a] for “Default QCL assumption for cross-carrier A-CSI-RS triggering” is kept (i.e., remove bracket) or removed (i.e., added in 18-6)
* Discuss whether new FG for “Cross-carrier A-CSI-RS triggering with different SCS for URLLC” is added or not
* Confirm to keep FG18-5/6

[100b-e-NR-UEFeatures-MRDCCA-03] Email discussion/approval on feature group structure for other MR-DC/CA enhancements than UL power sharing for NR-DC and cross-carrier operation with different SCS (20th-24th April) – Hiroki (DCM)

* For 18-2 component 3, discuss whether or not to clarify HARQ subframe offset is optional for EN-DC with LTE TDD PCell
* Discuss whether new FG18-4b for “SCell dormancy indication without data scheduling within active time” is added or not
* Confirm to keep FG18-2/2a/3/3a/4/4a/7/8

[100b-e-NR-UEFeatures-MRDCCA-04] Email discussion/approval on issues with capability signaling impacts for Enhancements to Single Tx Switched Uplink Solution for EN-DC (dates TBD) – Hiroki (DCM)

* Discuss followings on FG18-2/2a/3/3a
  + Whether 18-3a is per band combination or per UE
  + Whether the component 5 “if UE indicates that it does not support simultaneous UL transmissions as defined in TS 38.101-3 [4] using single UL-Transmission, NR (SCG) UL transmission is dropped when an overlapping LTE (MCG) UL transmission is present (for type 1 UE)” for FG18-2/2a is kept (i.e., remove bracket) or removed
  + Whether/how the FG18-2a/3a are modified so that the capabilities generally allow LTE UL transmissions outside the HARQ-ACK designated subframes for single-Tx operation
  + Whether/how to clarify some details for FG18-2/2a/3/3a as below
    - Whether or not to clarify that EN-DC single-Tx operation is for synchronous EN-DC
    - For 18-2, whether or not “intra-band” in the name of FG should be removed
    - For 18-2a, whether “TDD” should be removed from “Applicable to in FDD-LTE TDD-NR EN-DC” or not
    - What is prerequisite for 18-3a

[100b-e-NR-UEFeatures-MRDCCA-05] Email discussion/approval on issues with capability signaling impacts for other MR-DC/CA enhancements than single Tx switched uplink solution for EN-DC (dates TBD) – Hiroki (DCM)

* Discuss whether FG18-4/4a/[4b] are per band combination or per UE
* Discuss followings on FG18-5
  + Whether per band is added for FG18-5/[5a] or not
  + Whether the component 2 of 18-5 “Processing up to X unicast DCI scheduling (DL and UL) per scheduled CC” is kept or removed
  + Whether the component 3 of 18-5 is added to FG[18-5a] or not
  + Whether or not to define the maximum number of unicast DCIs in one scheduling slot/span across all scheduled cells
* Discuss whether per band is added for FG18-6/[6a] or not
* Discuss whether/how to define a signaling structure where the UE can indicate the grouping of cells across which the UE is capable of applying time offsets

[R1-2001631](file:///C:\Users\Hiroki%20Harada\wanshic\OneDrive%20-%20Qualcomm\Documents\Standards\3GPP%20Standards\Meeting%20Documents\TSGR1_100b\Docs\R1-2001631.zip) Discussion on UE feature for MR-DC CA ZTE

[R1-2001833](file:///C:\Users\Hiroki%20Harada\wanshic\OneDrive%20-%20Qualcomm\Documents\Standards\3GPP%20Standards\Meeting%20Documents\TSGR1_100b\Docs\R1-2001833.zip) Views on Rel-16 UE features for MR-DC/CA MediaTek Inc.

[R1-2002024](file:///C:\Users\Hiroki%20Harada\wanshic\OneDrive%20-%20Qualcomm\Documents\Standards\3GPP%20Standards\Meeting%20Documents\TSGR1_100b\Docs\R1-2002024.zip) UE feature for MR-DC Intel Corporation

[R1-2002426](file:///C:\Users\Hiroki%20Harada\wanshic\OneDrive%20-%20Qualcomm\Documents\Standards\3GPP%20Standards\Meeting%20Documents\TSGR1_100b\Docs\R1-2002426.zip) Discussion on UE features for MR-DC Ericsson

[R1-2002477](file:///C:\Users\Hiroki%20Harada\wanshic\OneDrive%20-%20Qualcomm\Documents\Standards\3GPP%20Standards\Meeting%20Documents\TSGR1_100b\Docs\R1-2002477.zip) On UE features for MR-DC/CA Nokia, Nokia Shanghai Bell

[R1-2002571](file:///C:\Users\Hiroki%20Harada\wanshic\OneDrive%20-%20Qualcomm\Documents\Standards\3GPP%20Standards\Meeting%20Documents\TSGR1_100b\Docs\R1-2002571.zip) Discussion on UE features for MR-DC/CA Qualcomm Incorporated

[R1-2002595](file:///C:\Users\Hiroki%20Harada\wanshic\OneDrive%20-%20Qualcomm\Documents\Standards\3GPP%20Standards\Meeting%20Documents\TSGR1_100b\Docs\R1-2002595.zip) Rel-16 UE features for MR-DC/CA Huawei, HiSilicon

***7.2.11.11 UE features for CLI/RIM (1)***

[R1-2002455](file:///C:\Users\Hiroki%20Harada\wanshic\OneDrive%20-%20Qualcomm\Documents\Standards\3GPP%20Standards\Meeting%20Documents\TSGR1_100b\Docs\R1-2002455.zip) Summary on UE features for CLI/RIM Moderator (NTT DOCOMO, INC.)

[100b-e-NR-UEFeatures-CLIRIM-01] Email discussion/approval on issues with capability signaling impacts for CLI/RIM (20th-24th April) – Hiroki (DCM)

* Confirm to keep FG17-1/2/3/4
* Discuss following on FG17-1
  + Whether the maximum number of measurement resources configured for CLI-RSSI measurement is reported or not
    - Alt.1: UE reports both maximum number of measurement resources configured for CLI-RSSI measurement and maximum number of measurement resources configured for CLI-RSSI measurement within one slot
    - Alt.2: UE reports maximum number of measurement resources configured for CLI-RSSI measurement
    - Alt.3: UE has to support 64 CLI-RSSI measurement resource in order to support CLI-RSSI
  + If the maximum number of measurement resources configured for CLI-RSSI measurement is reported in FG17-1, what are candidate values
  + Whether the component 2 “Subcarrier spacing for CLI-RSSI measurement is same as subcarrier spacing for active BWP” is necessary or not
  + Whether FG17-1 is reported per band or per UE
* Discuss followings on FG17-2
  + Whether the maximum number of measurement resources configured for SRS-RSRP measurement is reported or not
    - Alt.1: UE reports both maximum number of measurement resources configured for SRS-RSRP measurement and maximum number of measurement resources configured for SRS-RSRP measurement within one slot
    - Alt.2: UE reports maximum number of measurement resources configured for SRS-RSRP measurement
    - Alt.3: UE has to support 32 SRS-RSRP measurement resource in order to support SRS-RSRP
  + If the maximum number of measurement resources configured for SRS-RSRP measurement is reported in FG17-2, what are candidate values
  + Whether FG17-2 is reported per band or per UE
  + Whether a joint limit for CLI SRS, SSB and CSI-RS for RSRP measurement in a slot is necessary or not
  + Whether NR supports multi-port SRS-RSRP measurement or not

[R1-2001588](file:///C:\Users\Hiroki%20Harada\wanshic\OneDrive%20-%20Qualcomm\Documents\Standards\3GPP%20Standards\Meeting%20Documents\TSGR1_100b\Docs\R1-2001588.zip) Discussion on UE feature for CLI ZTE

[R1-2001740](file:///C:\Users\Hiroki%20Harada\wanshic\OneDrive%20-%20Qualcomm\Documents\Standards\3GPP%20Standards\Meeting%20Documents\TSGR1_100b\Docs\R1-2001740.zip) Discussion on UE features for CLI/RIM OPPO

[R1-2002158](file:///C:\Users\Hiroki%20Harada\wanshic\OneDrive%20-%20Qualcomm\Documents\Standards\3GPP%20Standards\Meeting%20Documents\TSGR1_100b\Docs\R1-2002158.zip) UE features for CLI/RIM Samsung

[R1-2002279](file:///C:\Users\Hiroki%20Harada\wanshic\OneDrive%20-%20Qualcomm\Documents\Standards\3GPP%20Standards\Meeting%20Documents\TSGR1_100b\Docs\R1-2002279.zip) UE features for CLI/RIM Ericsson

[R1-2002404](file:///C:\Users\Hiroki%20Harada\wanshic\OneDrive%20-%20Qualcomm\Documents\Standards\3GPP%20Standards\Meeting%20Documents\TSGR1_100b\Docs\R1-2002404.zip) Discussion on Rel-16 CLI UE features vivo

[R1-2002488](file:///C:\Users\Hiroki%20Harada\wanshic\OneDrive%20-%20Qualcomm\Documents\Standards\3GPP%20Standards\Meeting%20Documents\TSGR1_100b\Docs\R1-2002488.zip) On UE features for CLI/RIM Nokia, Nokia Shanghai Bell

[R1-2002572](file:///C:\Users\Hiroki%20Harada\wanshic\OneDrive%20-%20Qualcomm\Documents\Standards\3GPP%20Standards\Meeting%20Documents\TSGR1_100b\Docs\R1-2002572.zip) Discussion on UE features for CLI Qualcomm Incorporated

[R1-2002596](file:///C:\Users\Hiroki%20Harada\wanshic\OneDrive%20-%20Qualcomm\Documents\Standards\3GPP%20Standards\Meeting%20Documents\TSGR1_100b\Docs\R1-2002596.zip) Rel-16 UE features for CLI/RIM Huawei, HiSilicon

[R1-2002686](file:///C:\Users\Hiroki%20Harada\wanshic\OneDrive%20-%20Qualcomm\Documents\Standards\3GPP%20Standards\Meeting%20Documents\TSGR1_100b\Docs\R1-2002686.zip) UE features for CLI/RIM Intel Corporation

***7.2.11.12 UE features for TEIs (2)***

[R1-2002456](file:///C:\Users\Hiroki%20Harada\wanshic\OneDrive%20-%20Qualcomm\Documents\Standards\3GPP%20Standards\Meeting%20Documents\TSGR1_100b\Docs\R1-2002456.zip) Summary on UE features for TEIs Moderator (NTT DOCOMO, INC.)

[100b-e-NR-UEFeatures-TEIs-01] Email discussion/approval on feature group structure for NR TEI (20th-24th April) – Hiroki (DCM)

* Confirm to keep FG14-1/2/3/4/5/6
* Discuss whether the bracket for FG14-1a is removed or FG14-1a is removed
* Discuss whether FG14-5 includes component 2 “Support for directional collision handling between reference and other cell(s) for half-duplex operation in CA with different SCS” (i.e., 14-5a is removed) or 14-5a is separately defined (i.e., component 2 for FG14-5 is removed)
* Discuss whether the bracket for FG14-7 is removed or FG14-7 is removed
* Discuss whether the FG for CSI trigger states containing non-active BWP is introduced or not. If there is no consensus to add the new feature group at the end of this email discussion, the new feature group is not introduced in Rel-16.

[100b-e-NR-UEFeatures-TEIs-02] Email discussion/approval on issues with capability signaling impacts for NR TEI (dates TBD) – Hiroki (DCM)

* Discuss whether/how to report capability signaling for the component 2 “Up to 3 LTE-CRS non-overlapping rate matching patterns within a NR carrier” of FG14-1
  + Alt.1: UE reporting component 1 for 14-1 also reports component 2 from {1, 2, 3}.
  + Alt.2: UE reporting component 1 for 14-1 also reports component 2 from {2, 3}.
  + Alt.3: UE does not report component 2, i.e., UE reporting component 1 larger than 2 supports component 2 (up to 3 patterns within a NR carrier), and UE reporting component 1 as 2 supports up to 2 patterns within a NR carrier
* Discuss whether FG14-2 is reported per band or per UE
* Discuss whether FG14-3 is reported per UE or per band
* Discuss followings for FG14-4
  + Whether or not FG14-4 includes component 2 and 3
  + Whether or not component 1 for FG14-4 i.e., signaling of xTyR configuration in Rel-16, only supports downgraded xTyR configurations which are decoupled from highest xTyR reported in Rel-15
* Discuss whether FG14-5 (and FG14-5a if defined) is reported per band combination or per UE
* Discuss followings for FG14-7 (if the bracket for FG14-7 is removed)
  + What is the component(s) of FG14-7
  + Whether the FG14-7 is per band or per UE
* Confirm following updates
  + For 14-1 and [14-1a]
    - The bracket for the note “The number of the additional CRS rate matching patterns reported in Rel-16 is accounted in the total number of rate matching pattern reported by the UE for Rel-15 by using pdsch-RE-MappingFR1-PerSymbol/pdsch-RE-MappingFR1-PerSlot and pdsch-RE-MappingFR1-PerSymbol/pdsch-RE-MappingFR1-PerSlot” can be removed.
    - For “Need of FR1/FR2 differentiation”, it can be clarified that FG14-1 is only for FR1, i.e., “N/A (FR1 only)”.
  + The FG14-4 is reported per band combination.
  + For 14-5 and [14-5a]
    - For “Need of FDD/TDD differentiation”, it can be clarified that FG14-5 is only for TDD, i.e., “N/A (TDD only)”.
    - For “Need of FR1/FR2 differentiation”, it can be “N/A” in case that “type” is per band or can be “No” in case that “type” is per UE.
  + For “Need of FR1/FR2 differentiation” of FG14-6, “N/A (FR1only]” should be revised to “N/A (FR1 only)”.

[R1-2001724](file:///C:\Users\Hiroki%20Harada\wanshic\OneDrive%20-%20Qualcomm\Documents\Standards\3GPP%20Standards\Meeting%20Documents\TSGR1_100b\Docs\R1-2001724.zip) Discussion on UE TEI feature 14-7 vivo

[R1-2001741](file:///C:\Users\Hiroki%20Harada\wanshic\OneDrive%20-%20Qualcomm\Documents\Standards\3GPP%20Standards\Meeting%20Documents\TSGR1_100b\Docs\R1-2001741.zip) Discussion on Rel-16 UE features for TEIs OPPO

[R1-2001834](file:///C:\Users\Hiroki%20Harada\wanshic\OneDrive%20-%20Qualcomm\Documents\Standards\3GPP%20Standards\Meeting%20Documents\TSGR1_100b\Docs\R1-2001834.zip) Views on Rel-16 UE features for NR TEIs MediaTek Inc.

[R1-2002025](file:///C:\Users\Hiroki%20Harada\wanshic\OneDrive%20-%20Qualcomm\Documents\Standards\3GPP%20Standards\Meeting%20Documents\TSGR1_100b\Docs\R1-2002025.zip) UE features for NR TEI Intel Corporation

[R1-2002280](file:///C:\Users\Hiroki%20Harada\wanshic\OneDrive%20-%20Qualcomm\Documents\Standards\3GPP%20Standards\Meeting%20Documents\TSGR1_100b\Docs\R1-2002280.zip) UE features for TEIs Ericsson

[R1-2002573](file:///C:\Users\Hiroki%20Harada\wanshic\OneDrive%20-%20Qualcomm\Documents\Standards\3GPP%20Standards\Meeting%20Documents\TSGR1_100b\Docs\R1-2002573.zip) Discussion on UE features for TEI Qualcomm Incorporated

[R1-2002597](file:///C:\Users\Hiroki%20Harada\wanshic\OneDrive%20-%20Qualcomm\Documents\Standards\3GPP%20Standards\Meeting%20Documents\TSGR1_100b\Docs\R1-2002597.zip) Rel-16 UE features for TEIs Huawei, HiSilicon

***7.2.11.13 Others (2)***

*Including interactions among UE features across WIs*

[R1-2002457](file:///C:\Users\Hiroki%20Harada\wanshic\OneDrive%20-%20Qualcomm\Documents\Standards\3GPP%20Standards\Meeting%20Documents\TSGR1_100b\Docs\R1-2002457.zip) Summary on NR UE features for others Moderator (NTT DOCOMO, INC.)

[100b-e-NR-UEFeatures-Others-01] Email discussion/approval on updates for Rel-15 capabilities (20th-24th April) – Hiroki (DCM)

* Confirm the updated FG8-1
* Discuss whether the FGs [5-11c]/[5-12c]/[5-13g]/[5-13h] for up to 3 unicast PDSCHs (PUSCHs) per slot per CC for different TBs are introduced or removed. If there is no consensus to add a new feature group at the end of this email discussion, the new feature group is not introduced in Rel-16.
* Discuss whether the FG [5-35] for simultaneously enabling CBG and multiple PDSCHs per slot is introduced or removed. If there is no consensus to add a new feature group at the end of this email discussion, the new feature group is not introduced in Rel-16.

[100b-e-NR-UEFeatures-Others-02]: Email discussion/approval on general issues having capability signaling impact (dates TBD) – Hiroki (DCM)

* Whether to convert most per-UE capability to per-band capability

[R1-2001634](file:///C:\Users\Hiroki%20Harada\wanshic\OneDrive%20-%20Qualcomm\Documents\Standards\3GPP%20Standards\Meeting%20Documents\TSGR1_100b\Docs\R1-2001634.zip) Remaining issues on Rel-16 NR UE features ZTE

[R1-2001742](file:///C:\Users\Hiroki%20Harada\wanshic\OneDrive%20-%20Qualcomm\Documents\Standards\3GPP%20Standards\Meeting%20Documents\TSGR1_100b\Docs\R1-2001742.zip) Discussion on the support of SRS transmission in all symbols of a slot OPPO

[R1-2002026](file:///C:\Users\Hiroki%20Harada\wanshic\OneDrive%20-%20Qualcomm\Documents\Standards\3GPP%20Standards\Meeting%20Documents\TSGR1_100b\Docs\R1-2002026.zip) On UE feature list Intel Corporation

[R1-2002159](file:///C:\Users\Hiroki%20Harada\wanshic\OneDrive%20-%20Qualcomm\Documents\Standards\3GPP%20Standards\Meeting%20Documents\TSGR1_100b\Docs\R1-2002159.zip) UE features for other aspects Samsung

[R1-2002281](file:///C:\Users\Hiroki%20Harada\wanshic\OneDrive%20-%20Qualcomm\Documents\Standards\3GPP%20Standards\Meeting%20Documents\TSGR1_100b\Docs\R1-2002281.zip) Potential change/update on existing UE features for Rel-16 UE Ericsson

[R1-2002656](file:///C:\Users\Hiroki%20Harada\wanshic\OneDrive%20-%20Qualcomm\Documents\Standards\3GPP%20Standards\Meeting%20Documents\TSGR1_100b\Docs\R1-2002656.zip) High-level discussion on Rel-16 UE features Futurewei

[R1-2002674](file:///C:\Users\Hiroki%20Harada\wanshic\OneDrive%20-%20Qualcomm\Documents\Standards\3GPP%20Standards\Meeting%20Documents\TSGR1_100b\Docs\R1-2002674.zip) Other aspects of Rel-16 UE features Huawei, HiSilicon

[R1-2002687](file:///C:\Users\Hiroki%20Harada\wanshic\OneDrive%20-%20Qualcomm\Documents\Standards\3GPP%20Standards\Meeting%20Documents\TSGR1_100b\Docs\R1-2002687.zip) Discussion on UE features Qualcomm Incorporated