**3GPP TSG RAN WG1 Meeting #100bis-e R1-2002700**

**E-meeting, April 20 – 30, 2020**

**Agenda Item: 6.2.2.4**

**Source: Huawei**

**Title: Feature lead summary #1 on coexistence of NB-IoT with NR**

**Document for: Discussion and Decision**

# Introduction

Agreements and conclusions in previous meeting for the coexistence of NB-IoT with NR are summarized in [1]. And in RAN1#100-E meeting, the agreements are shown below.

Agreement

For issue #1 (NB-IoT downlink/uplink subframe): If Rel-16 resource reservation is configured, the unicast NPDCCH/NPDSCH/NPUSCH transmission follow resource reservation of Rel-16, regardless of the Rel-13 valid/invalid configuration

Conclusion

For issue #2 (Whether to use resources which cannot be indicated by bitmaps in a reserved resource period): The subframes not indicated by bitmaps by R16 resource reservation parameters are considered as not reserved, and are available to UEs configured with resource reservation.

Agreement

For issue #6 (UE-specific configuration and presence of DCI resource reservation field): It should be possible to configure or enable the resource reservation feature using UE-specific signaling for uplink and downlink separately. The details are up to RAN2.

The resource reservation field in DCI formats N0 or N1 is only present if resource reservation is configured and the corresponding DCI is mapped onto the UE specific search space given by the C-RNTI.

Agreement

* Text proposal in Annex C of [R1-2001280](../Docs/R1-2001280.zip) is endorsed for TS 36.213 section 16.4. TP to be included in 36.213 editor’s CR.
* Text proposal in Annex D of [R1-2001280](../Docs/R1-2001280.zip) is endorsed for TS 36.213 section 16.5. TP to be included in 36.213 editor’s CR.
* Text proposal in Annex E of [R1-2001280](../Docs/R1-2001280.zip) is endorsed for TS 36.212 sections 6.4.3.1 and 6.4.3.2. TP to be included in 36.212 editor’s CR.

Agreement

* Text proposal in proposal 1 of [R1-2001339](../Docs/R1-2001339.zip) is endorsed for TS 36.211 section 10.1.3.6, with following change. TP to be included in 36.211 editor’s CR.

“If higher layer parameter *valid-subframe-config-UL* or *slot-reserved-resource-config-UL* is configured, then in case of NPUSCH format 1 transmission associated with C-RNTI or SPS C-RNTI with the Resource reservation field in the DCI ~~is~~ set to 1, or in case of NPUSCH format 2 transmission associated with C-RNTI”

* Text proposal in proposal 2 of [R1-2001339](../Docs/R1-2001339.zip) is endorsed for TS 36.211 section 10.1.3.6. TP to be included in 36.211 editor’s CR.

Agreement

* The resource reservation applies also to NPDCCH with CRC scrambled by SPS C-RNTI
* The text proposal in proposal 1 of [R1-2001282](../Docs/R1-2001282.zip) is endorsed for TS36.211 subclause 10.2.5.5. TP to be included in 36.211 editor’s CR.

This paper summaries the views about the coexistence in RAN1#100bis-e meeting. The guidance from chairman is below.

* April 13-17: preparation phase
  + April 13th – 14th: FLs to prepare summary
  + April 15th – 17th: FLs to lead the discussion identifying the set of email threads

# Discussion

Issue #1: whether to support symbol-level resource reservation for TDD special subframe

For symbol-level resource reservation in TDD special subframe, [2] propose to support it for special subframe configuration {1, 2, 6, 7}, and discuss whether to support it or not for special subframe configuration {3, 4, 8, 9, 10}. [3] [6] propose to not apply symbol-level granularity to special subframes.

The corresponding TP proposed by [2] is below if special subframe configuration {3, 4, 8, 9, 10} does not support symbol-level resource reservation.

**-----------------------------------------------------Start of Text Proposal-----------------------------------**

10.0.1.2 Frame structure type 2

Frame structure type 2 is applicable to TDD operation only.

The following restrictions apply:

- Uplink-downlink configuration 0 and 6 are not supported.

- UpPTS is not used for NPUSCH or NPRACH.

- DwPTS and UpPTS in special subframe configuration 10 is not used for transmissions.

- On an NB-IoT carrier for which higher-layer parameter *operationModeInfo* indicates *inband-SamePCI* or *inband-DifferentPCI*, or higher-layer parameter *inbandCarrierInfo* is present, or on an NB-IoT carrier for *SystemInformationBlockType1-NB* for which *sib1-carrierInfo* indicates *non-anchor* and the value of the higher layer parameter *sib-GuardbandInfo* is set to *sib-GuardbandInbandSamePCI* or *sib-GuardbandinbandDiffPCI*, DwPTS in special subframe configuration 0 and 5 for normal cyclic prefix is not used for NPDCCH and NPDSCH transmission.

- Higher layer parameter *symbolBitmap-r16* if configured is not applied to a special subframe with special subframe configurations {3, 4, 8, 9 and 10}.

**------------------------------------------------------End of Text Proposal------------------------------------**

Issue #2: UL DMRS

For the spec “In a slot that is fully reserved, the demodulation reference signal transmission is dropped.” [2] points out that it may be misunderstood to drop DMRS in a subframe that is fully reserved, but actually NPUSCH in this subframe is postponed. For the spec “In a SC-FDMA symbol that is reserved, the demodulation reference signal transmission is dropped.”, [2] [5] propose to consider 3.75kHz case as it is not clear whether the whole DMRS or only the overlapped part of DMRS is dropped. And [5] proposes to correct some typo.

The corresponding TP proposed by [2] is as below.

**-----------------------------------------------------Start of Text Proposal---------------------------------------------**

10.1.4.2 Mapping to physical resources

**Unchanged part is omitted**

If higher layer parameter *valid-subframe-config-UL* or *slot-reserved-resource-config-UL* is configured, then in case of NPUSCH transmission format 1 associated with C-RNTI or SPS C-RNTI using UE-specific NPDCCH search space and the Resource reservation field in the DCI is set to 1, or in case of NPUSCH format 2 transmission associated with C-RNTI using UE-specific NPDCCH search space,

- In a subframe that is partially reserved, the demodulation reference signal transmission in a SC-FDMA symbol overlapping with the reserved symbols is dropped.

**-----------------------------------------------------End of Text Proposal---------------------------------------------**

The corresponding TP proposed by [5] is as below.

------------------------------------------------------------- Start -------------------------------------------------------------

If higher layer parameter *valid-subframe-config-UL* or *slot-reserved-resource-config-UL* is configured, then in case of NPUSCH format 1 transmission associated with C-RNTI or SPS C-RNTI using UE-specific NPDCCH search space and the Resource reservation field in the DCI is set to 1, or in case of NPUSCH format 2 transmission associated with C-RNTI using UE-specific NPDCCH search space,

- In a slot that is fully reserved, the demodulation reference signal transmission is dropped.

- In a SC-FDMA symbol that is reserved, the demodulation reference signal transmission is dropped.

-------------------------------------------------------------- End -------------------------------------------------------------

Issue #3: NRS presence

In [2], it is proposed that for slot-level resource reservation, if only one slot within a subframe is reserved, NRS is not transmitted in the reserved slot since the current spec seems to imply NRS is transmitted as it is a NB-IoT DL subframe.

The corresponding TP proposed by [2] is below.

**------------------------------------------------Start of Text Proposal----------------------------------------**

10.2.6 Narrowband reference signal (NRS)

**Unchanged part is omitted**

An NB-IoT UE may assume NRSs are not transmitted in subframes that are configured by higher layer parameter *nprsBitmap* for narrowband positioning reference signal transmission.

If higher layer parameter *valid-subframe-config-DL* or slot-reserved-resource-config-DL is configured, the UE shall assume NRSs are not transmitted in a fully reserved slot of a NB-IoT DL subframe.

**------------------------------------------------End of Text Proposal------------------------------------------**

Issue #4: SIB1-NB in TDD NB-IoT

[2] [6] think the resource reservation is not applied to SIB1-NB transmission for TDD NB-IoT. [2]’s view is that the spec needs to be updated and [6]’s view is that the specification is clear and no clarification is needed for this issue.

The corresponding TP proposed by [2] is below.

**-----------------------------------------------------Start of Text Proposal-----------------------------------**

16.4 Narrowband physical downlink shared channel related procedures

A NB-IoT UE shall determine whether a downlink subframe or a TDD special subframe configured for NB-IoT DL transmission is a NB-IoT DL subframe as follows

- If higher layer parameter *valid-subframe-config-DL* or *slot-reserved-resource-config-DL* is configured

- for a higher layer configured TDD NB-IoT carrier, the subframe containing *SystemInformationBlockType1-NB* transmission is not assumed as a NB-IoT DL subframe

- for NPDSCH transmission associated with C-RNTI using UE-specific NPDCCH search space

- if the Resource reservation field in the DCI is set to 0, then the subframe is assumed as a NB-IoT DL subframe

- if the Resource reservation field in the DCI is set to 1, then the subframe is assumed as a NB-IoT DL subframe if it is not fully reserved according to the higher layer parameters.

- for NPDCCH transmission associated with C-RNTI or SPS C-RNTI using UE-specific NPDCCH search space

- the subframe is assumed as a NB-IoT DL subframe if it is not fully reserved according to the higher layer parameters.

- In all other cases, a NB-IoT UE shall assume a subframe as a NB-IoT DL subframe if

- the UE determines that the subframe does not contain NPSS/NSSS/NPBCH/ *SystemInformationBlockType1-NB* transmission, and

- for a NB-IoT carrier that a UE receives higher layer parameter *operationModeInfo,* the subframe is configured as NB-IoT DL subframe or the subframe is a TDD special subframe configured for NB-IoT DL transmission after the UE has obtained *SystemInformationBlockType1-NB*.

- the subframe is configured as NB-IoT DL subframe by the higher layer parameter *downlinkBitmapNonAnchor*.

- except when the UE is configured with higher layer parameter *additionalTxSIB1-Config* set to *TRUE*, subframe #3 not containing additional *SystemInformationBlockType1-NB* transmission is assumed as a NB-IoT DL subframe if the UE monitors a NPDCCH UE-specific search space or decodes NPDSCH transmission scheduled by NPDCCH in the UE-specific search space.

For a NB-IoT UE that supports *twoHARQ-Processes-r14* or the UE is configured with higher layer parameter *multi-TB-Unicast-config*, there shall be a maximum of 2 downlink HARQ processes.

**------------------------------------------------------End of Text Proposal------------------------------------**

Issue #5: SPS transmission

[5] propose to discuss and agree how to update “associated with C-RNTI or SPS C-RNTI using UE-specific NPDCCH search space” in the current spec to also cover NPDCCH-less SPS NPUSCH transmission.

Issue #6: Fully reserved subframe

[5] proposes to define the term “fully reserved subframe” to align with LTE-MTC since in NB-IoT the term “ fully reserved subframe” is used but without any definition.

The corresponding TP proposed by [5] is below.

------------------------------------------------------------- Start -------------------------------------------------------------

A NB-IoT UE shall determine whether a downlink subframe or a TDD special subframe configured for NB-IoT DL transmission is a NB-IoT DL subframe as follows

- If higher layer parameter *valid-subframe-config-DL* or *slot-reserved-resource-config-DL* is configured

- for NPDSCH transmission associated with C-RNTI using UE-specific NPDCCH search space

- if the Resource reservation field in the DCI is set to 0, then the subframe is assumed as a NB-IoT DL subframe

- if the Resource reservation field in the DCI is set to 1, then the subframe is assumed as a NB-IoT DL subframe if it is not fully reserved according to the higher layer parameters (a subframe is considered fully reserved if and only if all non-NRS OFDM symbols of the NPDSCH transmission are reserved in the subframe).

- for NPDCCH transmission associated with C-RNTI or SPS C-RNTI using UE-specific NPDCCH search space

- the subframe is assumed as a NB-IoT DL subframe if it is not fully reserved according to the higher layer parameters (a subframe is considered fully reserved if and only if all non-NRS OFDM symbols of the NPDCCH transmission are reserved in the subframe).

- In all other cases, a NB-IoT UE shall assume a subframe as a NB-IoT DL subframe if

- the UE determines that the subframe does not contain NPSS/NSSS/NPBCH/ *SystemInformationBlockType1-NB* transmission, and

- for a NB-IoT carrier that a UE receives higher layer parameter *operationModeInfo,* the subframe is configured as NB-IoT DL subframe or the subframe is a TDD special subframe configured for NB-IoT DL transmission after the UE has obtained *SystemInformationBlockType1-NB*.

- the subframe is configured as NB-IoT DL subframe by the higher layer parameter *downlinkBitmapNonAnchor*.

- except when the UE is configured with higher layer parameter *additionalTxSIB1-Config* set to *TRUE*, subframe #3 not containing additional *SystemInformationBlockType1-NB* transmission is assumed as a NB-IoT DL subframe if the UE monitors a NPDCCH UE-specific search space or decodes NPDSCH transmission scheduled by NPDCCH in the UE-specific search space.

-------------------------------------------------------- Text omitted --------------------------------------------------------

A NB-IoT UE shall determine whether a subframe is a NB-IoT UL subframe as follows

- If higher layer parameter *valid-subframe-config-UL* or *slot-reserved-resource-config-UL* is configured

- for NPUSCH format 1 transmission associated with C-RNTI or SPS C-RNTI using UE-specific NPDCCH search space

- if the Resource reservation field in the DCI is set to 0, then the subframe is assumed as a NB-IoT UL subframe

- if the Resource reservation field in the DCI is set to 1, then the subframe is assumed as a NB-IoT UL subframe if it is not fully reserved according to the higher layer parameters (a subframe is considered fully reserved if and only if all SC-FDMA symbols of the NPUSCH format 1 transmission are reserved in the subframe).

- for NPUSCH format 2 transmission

- the subframe is assumed as a NB-IoT UL subframe if it is not fully reserved according to the higher layer parameters (a subframe is considered fully reserved if and only if all SC-FDMA symbols of the NPUSCH format 2 transmission are reserved in the subframe).

- In all other cases,

- for TDD, a NB-IoT UE shall assume a subframe as a NB-IoT UL subframe if, for a NB-IoT carrier, it is configured as NB-IoT UL subframe by higher layers

- for FDD, a NB-IoT UE shall always assume a subframe as a NB-IoT UL subframe.

-------------------------------------------------------------- End -------------------------------------------------------------

------------------------------------------------------------- Start -------------------------------------------------------------

If higher layer parameter *valid-subframe-config-UL* or *slot-reserved-resource-config-UL* is configured, then in case of NPUSCH format 1 transmission associated with C-RNTI or SPS C-RNTI using UE-specific NPDCCH search space with the Resource reservation field in the DCI set to 1, or in case of NPUSCH format 2 transmission associated with C-RNTI using UE-specific NPDCCH search space,

- In a subframe that is fully reserved as defined in clause 16.5 in [4],

- for , the NPUSCH transmission is postponed until the next NB-IoT uplink subframe that is not fully reserved.

- for , the NPUSCH transmission in the slot is postponed until the next slot spanning over two contiguous uplink subframes not overlapping with any uplink subframe that is fully reserved.

- In a subframe that is partially reserved, the SC-FDMA symbols overlapping with reserved symbols shall be counted in the NPUSCH mapping but not used for transmission of the NPUSCH.

-------------------------------------------------------- Text omitted --------------------------------------------------------

If higher layer parameter *valid-subframe-config-UL* or *slot-reserved-resource-config-UL* is configured, then in case of NPUSCH transmission format 1 associated with C-RNTI or SPS C-RNTI using UE-specific NPDCCH search space and the Resource reservation field in the DCI is set to 1, or in case of NPUSCH format 2 transmission associated with C-RNTI using UE-specific NPDCCH search space,

- In a slot that is fully reserved, the demodulation reference signal transmission is dropped (a slot is considered fully reserved if and only if all SC-FDMA symbols are reserved in the slot).

- In a SC-FDMA symbol that is reserved, the demodulation reference signal transmission is dropped.

-------------------------------------------------------- Text omitted --------------------------------------------------------

If higher layer parameter *valid-subframe-config-DL* or *slot-reserved-resource-config-DL* is configured, then in case of NPDSCH transmission associated with C-RNTI using UE-specific NPDCCH search space with the Resource reservation field in the DCI set to 1,

- In a subframe that is fully reserved as defined in clause 16.4 in [4], the NPDSCH transmission is postponed until the next NB-IoT downlink subframe that is not fully reserved.

- In a subframe that is partially reserved, the reserved OFDM symbols shall be counted in the NPDSCH mapping but not used for transmission of the NPDSCH.

-------------------------------------------------------- Text omitted --------------------------------------------------------

If higher layer parameter *valid-subframe-config-DL* or *slot-reserved-resource-config-DL* is configured, then in case of NPDCCH transmission associated with C-RNTI or SPS C-RNTI using UE-specific NPDCCH search space,

- In a subframe that is fully reserved as defined in clause 16.4 in [4], the NPDCCH transmission is postponed until the next NB-IoT downlink subframe that is not fully reserved.

- In a subframe that is partially reserved, the reserved OFDM symbols shall be counted in the NPDCCH mapping but not used for transmission of the NPDCCH.

-------------------------------------------------------------- End -------------------------------------------------------------

Issue #7: NPRACH transmission

For the resource reservation in NPRACH subframes, [6]’s view is that the current spec is clear and no clarification is needed.

Issue #8: LS response on NR coexistence

RAN1 received an LS [7] asking questions below about NR coexistence for both NB-IoT and LTE-MTC.

**Question 1: For NB-IoT, which, if any, resource reservation parameters for NR are likely to be the same across different carriers?**

**Question 1.1: If some resource reservation parameters for NR can be same across different NB-IoT carriers then can all the parameters be the same for all the NB-IoT carriers configured via dedicated signalling?**

**Question 2: For NB-IoT and eMTC, which, if any, parameters are likely to be the same for uplink and downlink?**

**Question 3: For NB-IoT and eMTC, which, if any, parameters are likely to be the same in neighbour cells on the same carrier frequency?**

The response from tdocs in Agenda Item 6.2.2.4 and 5 is summarized below.

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| **Response to Question 1** | |
| [4] | Table 1 below lists the resource reservation parameters for NB-IoT coexistence with NR. It can be seen there is a maximum 49 bits for subframe level configuration and maximum 103 bits for symbol level configuration. There is too much information to carry when the resource configuration is signalled per non-anchor carrier. It may also be quite a lot for dedicated signalling since the number of bits is over 100. In the current 36.331 spec, the reservation parameters are configured via dedicated signalling. Probably the same parameters are configured to different non-anchor carriers to different UEs thus requiring a lot of signalling. It is useful to know which parameters can be cell common (i.e. apply to any NB-IoT carrier used for connected mode only) and whether they can be overridden by the dedicated signalling.  Generally, the parameters periodicity, startPosition and granularity (i.e. resource reservation at subframe/slot with 10ms/40ms time domain granularity) can be cell common (i.e. same for any NB-IoT carrier used for connected mode only), and the bitmap parameters can also be cell common but can be overridden with dedicated signalling if necessary. The parameters common to different non-anchor carriers can be provided in the SIB to save the bits in dedicated signalling.  **Table 1: List of resource reservation parameters for coexistence with NR**   |  |  |  |  | | --- | --- | --- | --- | | **Parameter name** | **#bits** | **Description** | **Cell common** | | periodicity | 3 bits | Periodicity of the reserved resource. | Yes | | startPosition | 4 bits | Start time of the resource reservation pattern in one period | Yes | | Subframe (or slot) level resource reservation | 1 bit | Configuration of subframe or slot- level time-domain resource reservation | Yes | | Time domain resource reservation granularity | 1 bit | Configuration of time domain resource reservation granularity of 10ms or 40ms | Yes | | subframeBitmap | 10 or 40 bits | Subframe level resource reservation over 10ms or 40ms | Yes, but can be overridden by dedicated RRC | | slotBitmap | 20 or 80 bits | Slot level resource reservation over 10ms or 40ms | Yes, but can be overridden by dedicated RRC | | symbolBitmapFddDl | 5 bits + 5 bits | Downlink symbol-level resource reservation over the first or the second slot of one subframe | Yes, can be overridden by dedicated RRC | | symbolBitmapFddUlorTDD | 7 bits + 7 bits | Uplink symbol-level resource reservation over the first or the second slot of one subframe | Yes, but can be overridden by dedicated RRC | |
| [8] | For NB-IoT, RAN1 has not identified that any resource reservation parameters are likely to be the same across different carriers. |
| [9] | Ideally, the values for the NB-IoT resource reservation configuration parameters (periodicity, start position, bitmap patterns) should only be the same across different carriers if they experience the same overlap with NR transmission(s). If RAN2 deems it necessary to reduce higher-layer signalling overhead by having multiple carriers share the same resource reservation configuration, it should be ensured somehow that not all carriers have to share the same configuration, for example by allowing each carrier to take on one configuration selected from a small set of (at least two) different configurations, so that there is still some flexibility to adapt the resource reservation to at least a couple of different NR transmissions simultaneously.  Furthermore, for carriers that do not experience any overlap with any transmission, no resource reservation is needed, and any resource reservation results in efficiency loss. For such carriers, RAN1 assumes that it will be possible to avoid resource reservation completely by simply not enabling it using the UE-specific signalling requested in the L1 parameter list in [R1-2001479](https://www.3gpp.org/ftp/tsg_ran/WG1_RL1/TSGR1_100_e/Docs/R1-2001479.zip).  Finally, it can be noted that it may be a reasonable assumption that the subframe-level bitmap (*valid-subframe-config-DL/UL*) and the slot/symbol-level bitmaps (*slot-reserved-resource-config-DL/UL*, *symbol-reserved-resource-config-DL/UL-first-slot*, and *symbol-reserved-resource-config-DL/UL-second-slot*) are not likely to need to be possible to configure simultaneously. |
| [10] | It depends on the deployment of the NB-IoT carriers and NR. For example, all the resource reservation parameters are likely to be the same across different NB-IoT carriers if all these NB-IoT carriers are deployed within PRBs of the same NR SSB in downlink or the same configured grant in uplink. However, if some of them are within PRBs of one NR SSB or the same configured grant in uplink but others are not, then all the resource reservation parameters may not be the same across different NB-IoT carriers. Thus from RAN1 perspective it should be allowed that all the resource reservation parameters can be different across different carriers to ensure the flexibility for network deployment. |

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| **Response to Question 1.1** | |
| [4] | Since the parameters of periodicity, startPosition and granularity defines a high-level configuration of time domain resource reservation, it can be assumed to be same for all the non-anchor carriers and signalled in the SIB. |
| [8] | For NB-IoT, RAN1 does not assume that all the resource reservation parameters can be the same for all the NB-IoT carriers configured via dedicated signalling. |
| [9] | Same as response to Question 1 |
| [10] | Similar to the answer to question 1, whether some or all the parameters can be the same across different NB-IoT carriers depends on the deployment. If the NB-IoT carriers are deployed in PRBs of the same NR SSB in downlink or the same configured grant in uplink, all resource reservation can be the same. |

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| **Response to Question 2** | |
| [4] | Currently, the resource reservation is independently configured for downlink and uplink. This allows reserved resources configured only in one of the directions but not both. However, coexistence in uplink and downlink can be different, e.g. SSB in downlink and control in uplink, and it may be difficult to share the same configuration between downlink and uplink. Although we think some parameters (e.g. periodicity, startPosition and granularity) may be same for uplink and downlink, it is desirable to configure uplink and downlink separately. |
| [8] | For NB-IoT and eMTC, RAN1 does not assume any resource reservation parameters are likely to be the same for uplink and downlink. |
| [9] | It cannot be assumed that any NB-IoT/LTE-MTC resource reservation configuration parameters are likely to have the same values for uplink and downlink, since the resource reservation features should allow reservation around NR transmissions that may have completely different resource mapping in uplink and downlink. |
| [10] | The purpose of resource reservation for uplink and downlink are different. For downlink, the main purpose is to avoid collision with SSB and potential downlink transmission for URLLC. For uplink, the main purpose is to avoid collision with URLLC transmission, e.g. transmission with configured grant. There is no relation between downlink and uplink configuration.  For NB-IoT and eMTC, the following parameters may be the same for uplink and downlink:   * *periodicity* * *startPosition* * *subframeBitmap* * *slotBitmap*   For NB-IoT, the parameter *symbolBitmap* is different for downlink and uplink.  For eMTC, the parameter *symbolBitmap* may be the same for downlink and uplink, and the parameter *resourceReservationFreq* is only for downlink. |

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| **Response to Question 3** | |
| [4] | This may be dependent on whether neighbour cell is also inband with NR on the same carrier frequency. If so, it should be okay to assume the same resource reservation configuration used in neighbour cells. It shall also be possible to overwrite these parameters if they are different in neighbour cells. In such case, only the parameters that are different in neighbour cells are provided in the handover configuration to save the bits. |
| [8] | For NB-IoT and eMTC, RAN1 does not assume any resource reservation parameters are likely to be same in neighbour cells on the same frequency carrier. |
| [9] | It cannot be assumed that any NB-IoT/LTE-MTC resource reservation configuration parameters are likely to have the same values in neighbour cells, since the resource reservation features should allow reservation around NR transmissions (e.g. SSB) that may have different patterns in different neighbour cells. |
| [10] | Whether parameters can be the same in neighbor cells depends on the NR configuration. If the same SSB pattern is configured in neighbor cells, all the downlink resource reservation parameters are the same on the same carrier frequency. |

# Summary

FL’s view on the issues that are prioritized for discussion in this e-meeting are as following:

* Email discussion #1: Resource reservation for TDD NB-IoT
  + Issues #1, #4.
* Email discussion #2: Reference signal transmission including NRS and DMRS
  + Issues #2, #3.
* Email discussion #3: Clarification for SPS and fully reserved subframe (Editorial)
  + Issues #5, #6.
* Email discussion #4: discussion related to RAN2 LS
  + Issues #8
  + Note: how to manage the discussion on LS (i.e., Issue#8) is up to Chairman’s decision. And as per Chairman’s guideline, the discussion on LS does not consume the email thread budget for the respective WI

FL’s view on other issues is below:

* Issue #7: the current spec is clear and no clarification is needed.

# References

1. R1-1913595, “RAN1 agreements for Rel-16 Additional Enhancements for NB-IoT”, Futurewei, Reno, USA, November 2019.
2. R1-2001572 Corrections on coexistence of NB-IoT with NR Huawei, HiSilicon
3. R1-2001856 Remaining issues on NB-IoT resource reservation ZTE
4. R1-2002177 Coexistence of NB-IoT with NR Qualcomm Incorporated
5. R1-2002509 Corrections for NR coexistence performance improvements for NB-IoT Ericsson
6. R1-2002647 Remaining issues for co-existence of NB-IoT with NR Nokia, Nokia Shanghai Bell
7. R1-2001518 LS on NR coexistence, From: RAN2, To: RAN1, e-Meeting, April 20th-30th, 2020.
8. R1-2001848 Discussion on RAN2 LS on NR coexistence ZTE
9. R1-2002502 On the LS on NR coexistence for NB-IoT/eMTC Ericsson
10. R1-2002602 Draft reply LS on NR coexistence Huawei, HiSilicon