**3GPP TSG-RAN WG4 Meeting # 98-e R4-210XXXX**

**Electronic Meeting, 25th January – 5th February, 2021**

**Agenda item:** 7.1.1, 7.1.2

**Source:** Moderator (Qualcomm Incorporated)

**Title:** Email discussion summary for [98e][106] NR\_unlic\_Maintenance

**Document for:** Information

# Introduction

This document summarizes the email discussion on topics related to NR-U maintenance in Agenda 7.1.1 and 7.1.2. The list of topics include

Topic #1: Wideband operation and aspects related to intra-cell guard bands and applicability of requirements in the Rel-16 specifications

Topic #2: Specification of channel raster and sync raster numbering.

# Topic #1: Wideband operation

For wideband operation, nominal intra-cell guard bands have been defined in Table 5.3.3-2 of 38.101-1. However, there has also been an understanding that the Rel-16 specifications apply in downlink Mode 1 where LBT passes on all sub-bands of the BWP or carrier and intra-cell guard bands are configured to zero.

## Companies’ contributions summary

|  |  |  |
| --- | --- | --- |
| **T-doc number** | **Company** | **Proposals / Observations** |
| [**R4-2100511**](http://ftp.3gpp.org/TSG_RAN/WG4_Radio/TSGR4_98_e/Docs/R4-2100511.zip) | Apple Inc. | **NR-U wideband operation and intra-carrier guard bands**  Observation 1a: From the UE perspective, baseline NR-U functionality assumes that a UE can receive data only if LBT succeeds in all the sub-bands.  Observation 1b: There are additional optional UE capabilities that indicate whether a UE can receive data if one or more LBT sub-bands have failed and whether a UE can receive data in intra-carrier guard bands.  Observation 2a: There are NR-U wide-band transmission modes, in which intra-carrier guard band configuration is not needed (or logically speaking, the intra-carrier guard bands are of size zero).  Observation 2b: Logically speaking, the default intra-carrier guard band configuration should correspond to zero width guard bands, while non-zero guard bands can be configured when a UE supports the corresponding wide-band transmission modes. |
| [**R4-2101932**](http://ftp.3gpp.org/TSG_RAN/WG4_Radio/TSGR4_98_e/Docs/R4-2101932.zip) | Nokia, Nokia Shanghai Bell | **NR-U - On Intra-cell guardbands**  Proposal 1: Resolve the brackets in section 5.3.3 of TS 38.101-1 as given in the TP provided in section 3 of this contribution.  Proposal 2: It is proposed to align the spelling of guard band either in one or two words . |
| [**R4-2101720**](http://ftp.3gpp.org/TSG_RAN/WG4_Radio/TSGR4_98_e/Docs/R4-2101720.zip) | Ericsson | **Applicability of minimum requirements for shared spectrum access**  The applicability of minimum requirements for the transmitter and receiver characteristics of wideband operation is not specified. For the UL, transmissions in contigous available RB sets where the intra-cell GB posibly scheduled should be assumed for the present release. For the DL, transmissions with no intra-cell GB with all RB sets of a channel scheduled and available should be assumed. |

## Open issues summary

Wideband operation is subject to certain limitations in Rel-16 version of the NR-U specifications. These limitations originate from assumptions taken in the definition of requirements on the success of LBT RB-sets and scheduling of contiguous RB-sets. At the same time, UE capabilities 4-1 and 4-2 have been defined for DL operation but without UE receiver requirements and nominal intra-cell guard bands (or guardbands) are included in the specifications. There are several proposals from companies to clarify the specifications on exactly what is supported in the Rel-16 (and Rel-17) specifications.

### Sub-topic 1-1

Clarification of wideband applicabililty and intra-cell guard bands for UL and DL in Rel-16:

### Sub-topic 1-2

Guard band? Or guardband?

## Companies views’ collection for 1st round

### Open issues

|  |  |
| --- | --- |
| **Company** | **Comments** |
| XXX | Sub topic 1-1:  Sub topic 1-2:  ….  Others: |

### CRs/TPs comments collection

*Major close-to-finalize WIs and Rel-15 maintenance, comments collections can be arranged for TPs and CRs. For Rel-16 on-going WIs, suggest to focus on open issues discussion on 1st round.*

|  |  |
| --- | --- |
| **CR/TP number** | **Comments collection** |
| [**R4-2100512**](http://ftp.3gpp.org/TSG_RAN/WG4_Radio/TSGR4_98_e/Docs/R4-2100512.zip)**,**  [**R4-2100513**](http://ftp.3gpp.org/TSG_RAN/WG4_Radio/TSGR4_98_e/Docs/R4-2100513.zip)  Apple | Company A |
| Company B |
|  |
| [**R4-2101720**](http://ftp.3gpp.org/TSG_RAN/WG4_Radio/TSGR4_98_e/Docs/R4-2101720.zip)  Ericsson | Company A |
| Company B |
|  |

## Summary for 1st round

### Open issues

*Moderator tries to summarize discussion status for 1st round, list all the identified open issues and tentative agreements or candidate options and suggestion for 2nd round i.e. WF assignment.*

|  |  |
| --- | --- |
|  | **Status summary** |
| **Sub-topic#1** | *Tentative agreements:*  *Candidate options:*  *Recommendations for 2nd round:* |

*Recommendations on WF/LS assignment*

|  |  |  |
| --- | --- | --- |
|  | **WF/LS t-doc Title** | **Assigned Company,**  **WF or LS lead** |
| #1 |  |  |

### CRs/TPs

*Moderator tries to summarize discussion status for 1st round and provides recommendation on CRs/TPs Status update*

|  |  |
| --- | --- |
| **CR/TP number** | **CRs/TPs Status update recommendation** |
| XXX | *Based on 1st round of comments collection, moderator can recommend the next steps such as “agreeable”, “to be revised”* |

## Discussion on 2nd round (if applicable)

## Summary on 2nd round (if applicable)

*Moderator tries to summarize discussion status for 2nd round and provided recommendation on CRs/TPs/WFs/LSs Status update suggestion*

|  |  |
| --- | --- |
| **CR/TP/LS/WF number** | **T-doc Status update recommendation** |
| XXX | *Based on 2nd round of comments collection, moderator can recommend the next steps such as “agreeable”, “to be revised”* |

# Topic #2: Channel raster and sync raster

The specifications 38.101-1 and 38.104 current list the channel and sync raster with a format (First – <Step size> – Last) with downsampled channels enumerated in a note in the table. It is proposed to simply refer to the Note rather than keep the (First – <Step size> – Last).

## Companies’ contributions summary

|  |  |  |
| --- | --- | --- |
| **T-doc number** | **Company** | **Proposals / Observations** |
| [**R4-2101968**](http://ftp.3gpp.org/TSG_RAN/WG4_Radio/TSGR4_98_e/Docs/R4-2101968.zip) | ZTE Corporation | **CR to TS 38.104: system parameters maintenance for NR-U**  NR-ARFCN for n46 and n96 is not defined correctly in Table 5.4.2.3-1.  GSCN for n46 and n96 is not defined correctly in Table 5.4.3.3-1. |
| [**R4-2101970**](http://ftp.3gpp.org/TSG_RAN/WG4_Radio/TSGR4_98_e/Docs/R4-2101970.zip) | ZTE Corporation | **CR to TS 38.101-1: system parameters maintenance for NR-U**  NR-ARFCN for n46 and n96 is not defined correctly in Table 5.4.2.3-1.  GSCN for n46 and n96 is not defined correctly in Table 5.4.3.3-1. |

## Open issues summary

In 38.104 and 38.101-1 specifications, the channel raster and sync raster for Bands n46 and n96 are specified as (First – <Step size> – Last) and then further downsampled by enumeration with notes. It is proposed to remove the (First – <Step size> – Last) values and simply refer to the note. Do companies support this proposal? Are the CR’s agreeable?

## Companies views’ collection for 1st round

### Open issues

|  |  |
| --- | --- |
| **Company** | **Comments** |
| XXX | Sub topic 2-1:  Sub topic 2-2:  ….  Others: |

### CRs/TPs comments collection

*Major close to finalize WIs and Rel-15 maintenance, comments collections can be arranged for TPs and CRs. For Rel-16 on-going WIs, suggest to focus on open issues discussion on 1st round.*

|  |  |
| --- | --- |
| **CR/TP number** | **Comments collection** |
| [**R4-2101968**](http://ftp.3gpp.org/TSG_RAN/WG4_Radio/TSGR4_98_e/Docs/R4-2101968.zip)**,**  [**R4-2101969**](http://ftp.3gpp.org/TSG_RAN/WG4_Radio/TSGR4_98_e/Docs/R4-2101969.zip)  38.104 CR | Company A |
| Company B |
|  |
| [**R4-2101970**](http://ftp.3gpp.org/TSG_RAN/WG4_Radio/TSGR4_98_e/Docs/R4-2101970.zip)**,**  [**R4-2101971**](http://ftp.3gpp.org/TSG_RAN/WG4_Radio/TSGR4_98_e/Docs/R4-2101971.zip)  38.101-1 CR | Company A |
| Company B |
|  |

## Summary for 1st round

### Open issues

*Moderator tries to summarize discussion status for 1st round, list all the identified open issues and tentative agreements or candidate options and suggestion for 2nd round i.e. WF assignment.*

|  |  |
| --- | --- |
|  | **Status summary** |
| **Sub-topic#1** | *Tentative agreements:*  *Candidate options:*  *Recommendations for 2nd round:* |

*Suggestion on WF/LS assignment*

|  |  |  |
| --- | --- | --- |
|  | **WF/LS t-doc Title** | **Assigned Company,**  **WF or LS lead** |
| #1 |  |  |

### CRs/TPs

*Moderator tries to summarize discussion status for 1st round and provided recommendation on CRs/TPs Status update suggestion*

|  |  |
| --- | --- |
| **CR/TP number** | **CRs/TPs Status update recommendation** |
| XXX | *Based on 1st round of comments collection, moderator can recommend the next steps such as “agreeable”, “to be revised”* |

## Discussion on 2nd round (if applicable)

## Summary on 2nd round (if applicable)

*Moderator tries to summarize discussion status for 2nd round and provided recommendation on CRs/TPs/WFs/LSs Status update suggestion*

|  |  |
| --- | --- |
| **CR/TP/LS/WF number** | **T-doc Status update recommendation** |
| XXX | *Based on 2nd round of comments collection, moderator can recommend the next steps such as “agreeable”, “to be revised”* |