3GPP TSG-RAN WG1 Meeting #101-e R1-200xxxx

e-Meeting, May 25th – June 5th, 2020

Agenda Item: 6.2.2.1

Source: Moderator (Ericsson)

Title: Feature lead summary #2 of Group WUS for NB-IoT

Document for: Discussion, Decision

# Introduction

The summary presents one presented issue regarding Group WUS for NB-IoT. Two contributions have been presented, [1],[2], addressing the alignment of the *commonSequence* between TS 36.211 and TS 36.331.

# Discussion

## Alignment of non-group WUS between specifications

In [3], the common WUS sequence is determined as follows:

|  |
| --- |
| 10.2.6B.1 Sequence generation…For a UE not configured with group NWUS, $g=0$. For a UE configured with group NWUS, $g=14\left(N\_{group}^{WUS}+1\right)$ for $0\leq N\_{group}^{WUS}\leq 7$, where $N\_{group}^{WUS}$ is determined by the UE group to which the UE is associated as determined by higher layers [10]. The common NWUS sequence shall be determined by $ g=126$ unless the resource is shared with non-group NWUS and common NWUS is configured to be non-group NWUS in which case $g=0$. |

The present GWUS IE from the most recent running CR [3] is presented below:

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| --- |
| ***GWUS-Config-NB information element***-- ASN1STARTGWUS-Config-NB-r16 ::= SEQUENCE {  … commonSequence-r16 ENUMERATED {g0, g126} OPTIONAL, -- Need OR … |

It is identified in [1] that “*the terminology is not aligned, i.e., TS 36.211 uses “non-group NWUS”, and TS 36.331 uses “g0*”” whereas [2] identifies that “*since RAN2 changed the previous terminology, there is no misalignment issue between specifications.*”

Based on the above, there are two different proposals on how to proceed:

**Alt. 1:**Agree to the following TP:

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| --- |
| 10.2.6B.1 Sequence generation…For a UE not configured with group NWUS, $g=0$. For a UE configured with group NWUS, $g=14\left(N\_{group}^{WUS}+1\right)$ for $0\leq N\_{group}^{WUS}\leq 7$, where $N\_{group}^{WUS}$ is determined by the UE group to which the UE is associated as determined by higher layers [10]. In resource that is not shared with non-group NWUS, the common NWUS sequence shall be determined by$ g=126$. In resource that is shared with non-group NWUS, the common NWUS sequence is determined by higher layers [9]. |

**Alt. 2:**

Maintain existing description of common NWUS sequence in TS 36.211.

## Companies’ preparatory comments

|  |  |  |
| --- | --- | --- |
| **Company** | **Does the above inconsistency need discussion in RAN1?** | **Comments** |
| Huawei/HiSilicon | Yes | Support Alt1. As explained in our Tdoc, the current spec has the following problems:* The terminology is not aligned, i.e., TS 36.211 uses “non-group NWUS”, and TS 36.331 uses “g0”.
* And it seems the field description in TS 36.331, i.e., “value *g126* indicates common WUS sequence for the shared WUS resource is g=126” is duplicated with TS 36.211. According to current TS 36.211, if the configured value is not “g0”, the common WUS sequence will be g=126.

Alt1 can solve the issues above, and can avoid referencing HL parameter name directly.Ok to have a joint discussion with eMTC. |

**FL proposal following preparatory phase**

Email discussion #1: Alignment of non-group WUS between RAN1 and RAN2 specifications for both NB-IoT and LTE-MTC.

**Alt 1:** Endorse presented TP for Sect. 10.2.6B.1 (6.11B.1 for LTE-MTC) of TS 36.211.

**Alt 2:** Maintain current spec in Sect. 10.2.6B.1 (6.11B.1 for LTE-MTC) of TS 36.211.

## Companies’ positions

As presented in Sec. 2.2, there are two alternatives. Companies are invited to present their positions related to the two alternatives in the table below, including possible minor modifications of those alternatives.

|  |  |  |
| --- | --- | --- |
| **Company** | **Preference****(Alt. 1 or Alt. 2)** | **Comments** |
| Ericsson | Alt. 1 | This formulation better reflects the partition between TS 36.211 and TS 36.331. |
| Qualcomm | Alt1 | Minor comment on the TP to use ‘In the resource that …’ instead of ‘In resource that …’ |
| Huawei/HiSilicon | Alt1 | Reasons are given in Section 2.2 above. The wording in that case need to be refined as some companies pointed out. |
| ZTE,Sanechips | ALT2 | To be exact there's nothing wrong with the spec….We won't block if the majority want to have this change. |

## Feature lead proposals

Based on the discussion in Sec. 2.3, the following feature lead proposals are presented:

1. Agree to the following text proposal in TS 36.211 for NB-IoT:

|  |
| --- |
| 10.2.6B.1 Sequence generation…For a UE not configured with group NWUS, $g=0$. For a UE configured with group NWUS, $g=14\left(N\_{group}^{WUS}+1\right)$ for $0\leq N\_{group}^{WUS}\leq 7$, where $N\_{group}^{WUS}$ is determined by the UE group to which the UE is associated as determined by higher layers [10]. In a resource that is not shared with non-group NWUS, the common NWUS sequence shall be determined by$ g=126$. In the resource that is shared with non-group NWUS, the common NWUS sequence is determined by higher layers [9]. |

1. Agree to the following text proposal in TS 36.211 for LTE-MTC:

|  |
| --- |
| 6.11B.1 Sequence generation…For a UE not configured with group MWUS, $g=0$. For a UE configured with group MWUS, $g=14\left(N\_{group}^{WUS}+1\right)$ for $0\leq N\_{group}^{WUS}\leq 7$, where $N\_{group}^{WUS}$ is determined by the UE group to which the UE is associated as determined by higher layers [10]. In a resource that is not shared with non-group MWUS, the common MWUS sequence shall be determined by $ g=126$. In the resource that is shared with non-group MWUS, the common MWUS sequence is determined by higher layers [9]. |

# References

1. R1-2004164, “Corrections on UE-group wake-up signal,” Huawei, HiSilicon, RAN1 #101-e, May 2020.
2. R1-2004673 (rev. of R1-2003795), “Discussion on group WUS for NB-IoT,” ZTE, RAN1 #101-e, May 2020.
3. TS 36.211, “Physical channels and modulation,” 3GPP, V16.1.0, March 2020.
4. R2-2004040, “Miscellaneous corrections to 36.331 for Rel-16 NB-IoT,” Huawei, HiSilicon, RAN2 #109bis-e, April 2020.