3GPP RAN WG2 Meeting #116e R2-2111354

eMeeting November 1st – 12th, 2021

Agenda Item: 8.10.2.2

Source: InterDigital (offline rapporteur)

Title: Summary of [AT116-e][101][NTN] Other MAC aspects: Phase 2

Document for: Discussion, Decision

# Introduction

This document is a intended to continue discussion on the following aspects:

* [AT116-e][101][NTN] Other MAC aspects (InterDigital)

Updated scope: Continue the discussion on remaining aspects of timers, HARQ, and LCP including CG/SPS aspects, based on the outcome of the discussion in R2-2111339

Updated intended outcome: Summary of the offline discussion with e.g.:

* List of proposals for agreement (if any)
* List of proposals that require online discussions
* List of proposals that should not be pursued (if any)

The following deadline for company feedback has been provided:

* Initial deadline (for companies' feedback): **Monday 2021-11-08 1600 UTC**
* Initial deadline (for rapporteur's summary in R2-2111354): Monday 2021-11-08 2000 UTC

Please also note the following chair guidance:

* Proposals marked "for agreement" in R2-2111354 not challenged until **Tuesday 2021-11-09 0800 UTC** will be declared as agreed via email by the session chair (for the rest the discussion will continue in the CB session in Week2).

Companies are encouraged to review Phase 1 discussion summary in [R2-2111339](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_116-e/Inbox/R2-2111339.zip) for relevant background.

# Summary

## P7

*Question 1: Do you agree to the following proposal?:*

*“If uplinkHARQ-DRX-LCP-Mode-r17 is configured, the following LCH to HARQ process mapping rules are supported:*

1. *LCH is mapped only to a HARQ process configured with HARQ mode A;*
2. *LCH is mapped only to a HARQ process configured with HARQ mode B;*
3. *If an LCH is not configured with a mapping rule, it may be mapped to any HARQ process (HARQ mode A or B)."*

Out of 19 responding companies, the following table presents a summary of responses to the above question (one additional company did not provide an explicit response, however is okay to go with majority):

|  |
| --- |
| ***Agree to proposed LCH to HARQ processing rules when uplinkHARQ-DRX-LCP-Mode-r17 is configured?*** |
| Agree | Disagree |
| 19 | - |

Based on consensus among companies providing an explicit response, the following is proposed:

**Proposal 1: If *uplinkHARQ-DRX-LCP-Mode-r17* is configured, the following LCH to HARQ process mapping rules are supported: (consensus)**

**1) LCH is mapped only to a HARQ process configured with HARQ mode A;**

**2) LCH is mapped only to a HARQ process configured with HARQ mode B;**

**3) If an LCH is not configured with a mapping rule, it may be mapped to any HARQ process (HARQ mode A or B).**

## P10/P11/P13

*Question 2: Do you agree to the following proposal?:*

*“It is up to network implementation to ensure downlinkHARQ-FeedbackDisabled, if configured, has the same value for each HARQ process used in an SPS configuration (i.e. no specification impact)."*

Out of 18 responding companies, the following table presents a summary of responses to the above question:

|  |
| --- |
| ***Up to network implementation to ensure downlinkHARQ-FeedbackDisabled has the same value for each HARQ process used in an SPS configuration?*** |
| Agree/Agree with comment | Disagree |
| 13 | 5 |

The following is further commented (detailed review in Section 3):

* (3) When network configures HARQ states it cannot predict what SPS configurations will be. Network must calculate/reconfigure HARQ states according to (re)configuration of an SPS.
* (3) Should not force NW to guarantee same value for each HARQ process used in an SPS configuration/UE should not assume this as it’s up to NW implementation.
* (2) Per HARQ process is simpler.

Based on large majority, it is suggested the original proposal be treated. However, it is expected that further discussion is necessary (e.g. in online session) whether this behaviour needs to be guaranteed by NW or left to proper NW configuration (e.g. to reduce number of reconfigurations):

**Proposal 2: It is up to network implementation to ensure *downlinkHARQ-FeedbackDisabled*, if configured, has the same value for each HARQ process used in an SPS configuration (i.e. no specification impact). (13/18)**

*Question 3: Do you agree to the following proposal?:*

*“It is up to network implementation to ensure uplinkHARQ-DRX-LCP-Mode-r17, if configured, has the same value for each HARQ process used in a configured grant configuration (i.e. no specification impact)."*

Out of 19 responding companies, the following table presents a summary of responses to the above question:

|  |
| --- |
| ***Up to network implementation to ensure uplinkHARQ-DRX-LCP-Mode-r17 has the same value for each HARQ process used in a configured grant configuration?*** |
| Agree/Agree with comment | Disagree |
| 14 | 5 |

Based on large majority, it is suggested the original proposal be treated. However, it is expected that further discussion is necessary (e.g. in online session) whether this behaviour needs to be guaranteed by NW or left to proper NW configuration (e.g. to reduce number of reconfigurations):

**Proposal 3: It is up to network implementation to ensure *uplinkHARQ-DRX-LCP-Mode-r17*, if configured, has the same value for each HARQ process used in a configured grant configuration (i.e. no specification impact). (14/19)**

## P16

*Question 4: Do you agree that if uplinkHARQ-DRX-LCP-Mode-r17 is configured, proper setting/ configuration of the configuredGrantTimer is left to network implementation?*

Out of 20 responding companies, the following table presents a summary of responses to the above question:

|  |
| --- |
| ***if uplinkHARQ-DRX-LCP-Mode-r17 is configured, proper setting/ configuration of the configuredGrantTimer is left to network implementation?*** |
| Agree | Disagree |
| 19 | 1 |

Based on near consensus, the following is proposed (refer to Section 3 for detailed summary):

**Proposal 4: if *uplinkHARQ-DRX-LCP-Mode-r17* is configured, proper configuration of the *configuredGrantTimer* is left to network implementation. (19/20)**

## Other proposals

### SR-Prohibit Timer

*Question 5: What are possible values to be included in the sr-ProhibitTimerExt-r17 IE ?*

Out of 17 responding companies, 14 suggest this be postponed/kept FFS/discussed during ASN.1

Based on the large number of companies suggesting that this discussion be postponed (e.g. during ASN.1 discussion) Rapporteur suggests that this be decided later. No proposal is made at this time as there is already an “values FFS” in previous agreement.

### RRC details

*Question 6: Do you agree to the following proposal?:*

*“downlinkHARQ-FeedbackDisabled shall be included in PDSCH-ServingCellConfig."*

Out of 20 responding companies, the following table presents a summary of responses to the above question:

|  |
| --- |
| ***downlinkHARQ-FeedbackDisabled shall be included in PDSCH-ServingCellConfig?*** |
| Agree | Disagree |
| 20 | - |

Based on consensus, the following is proposed:

**Proposal 5: *downlinkHARQ-FeedbackDisabled* shall be included in *PDSCH-ServingCellConfig.* (consensus)**

## Topics requiring further discussion

*Question 7: Do you agree the following proposals are be taken as baseline for further discussion (e.g. in contributions to RAN2#116bise)?*

* *RAN2 to down-select between the following options to support blind retransmission for HARQ process(es) configured with HARQ state B: 1) Rely on UE being in DRX Active Time via other means (e.g. Inactivity Timer); or 2) Start drx-RetransmissionTimerUL at the end of PUSCH transmission;*
* *RAN2 to down-select between the following options to support blind retransmission for HARQ process(es) configured with disabled HARQ feedback: 1) Rely on UE being in DRX Active Time via other means (e.g. Inactivity Timer); or 2) Start drx-RetransmissionTimerDL in the first symbol after the end of the reception of the last PDSCH or slot-aggregated PDSCH plus X (X = T\_proc,1);*
* *For RACH in RRC\_CONNECTED mode, it is FFS whether UE ignores HARQ process configuration (e.g. configured HARQ mode) for the case of a PUSCH transmission scheduled by RAR.*
* *RAN2 to down-select between the following options to extend configuredGrantTimer: 1) Introducing value(s) of configuredGrantTimer larger than 64; 2) Value of the configuredGrantTimer is extended by UE-gNB-RTT;*

Out of 19 responding companies, the following table presents a summary of responses to the above question:

|  |
| --- |
| ***Proposals are be taken as baseline for further discussion?*** |
| Agree | Disagree |
| 18 | 1 |

Based on near consensus, Rapporteur suggests that the above proposals be captured in Chair notes as guidance for contributions to next meeting.

# Discussion

## P7

In Phase 1 discussion, possible LCH to HARQ process mappings were discussed and considered all possible configurations of LCH and HARQ. The following agreement was made based on outcome of Phase 1:

* *If uplinkHARQ-DRX-LCP-Mode-r17 is configured, a HARQ process may be mapped to either ‘HARQ mode A’ or ‘HARQ mode B’.*

Based on this agreement, if *uplinkHARQ-DRX-LCP-Mode-r17* is configured then all HARQ processes will either be HARQ mode A or HARQ mode B. If *uplinkHARQ-DRX-LCP-Mode-r17* is not configured, then no HARQ process is configured with a HARQ mode.

For the case *uplinkHARQ-DRX-LCP-Mode-r17* is not configured, an existing agreement from RAN2#115e covers the mapping behaviour:

* *If HARQ process has not been configured with an UL HARQ retransmission state, new LCH mapping rule has no effect (i.e. UE applies legacy behaviour).*

Therefore, the original proposal 7 can be simplified to describe behaviour when *uplinkHARQ-DRX-LCP-Mode-r17* is configured (i.e. all HARQ processes are either Mode A or B). Based on comments received, Rapporteur suggests the following behaviour:

If*uplinkHARQ-DRX-LCP-Mode-r17*is configured,the following LCH to HARQ process mapping rules are supported:

1. LCHismapped only to a HARQ process configured with HARQ mode A;
2. LCHismapped only to a HARQ process configured with HARQ mode B;
3. If an LCH is not configured with a mapping rule, it may be mapped to any HARQ process (HARQ mode A or B)."

Combing existing agreed behaviour with this proposal would result in the following mapping restriction:



**Question 1: Do you agree to the following proposal?:**

**“*If uplinkHARQ-DRX-LCP-Mode-r17 is configured, the following LCH to HARQ process mapping rules are supported:***

1. ***LCH is mapped only to a HARQ process configured with HARQ mode A;***
2. ***LCH is mapped only to a HARQ process configured with HARQ mode B;***
3. ***If an LCH is not configured with a mapping rule, it may be mapped to any HARQ process (HARQ mode A or B)."***

|  |  |  |
| --- | --- | --- |
| **Company** | **Agree/Disagree** | **Additional comments**  |
| MediaTek | Agree |  |
| Huawei, HiSilicon | Agree |  |
| Apple | Agree |  |
| Qualcomm | Agree |  |
| Xiaomi | Agree |  |
| Samsung | Agree |  |
| Lenovo, Motorola Mobility | Agree |  |
| Spreadtrum | Agree |  |
| LG | Agree |  |
| OPPO | Agree |  |
| ZTE | - | Our understanding on phase 1 agreements is that HP with/without a state is still allowed, therefore would like to keep not configured in 3). However, if majority agrees that when uplinkHARQ-DRX-LCO-Mode configured, it shall be configured for HPs, we are fine to go with the majority. |
| Nokia | Agree | For the right figure, our understanding is that: if uplinkHARQ-DRX-LCP\_Mode=r17 is NOT configured, the LCH mapping restriction allowedHARQ-DRX-LCPmode should not be configured (i.e. ModeA and ModeB should not be illustrated in the right figure). |
| ITL | Agree |  |
| Ericsson | Agree |  |
| Turkcell | Agree |  |
| vivo | Agree |  |
| CATT | Agree |  |
| Sequans | Agree |  |
| ETRI | Agree |  |
| InterDigital | Agree |  |

***Rapporteur’s summary:***

*Out of 19 responding companies, the following table presents a summary of responses to the above question (one additional company did not provide an explicit response, however is okay to go with majority):*

|  |
| --- |
| ***Agree to proposed LCH to HARQ processing rules when uplinkHARQ-DRX-LCP-Mode-r17 is configured?*** |
| *Agree* | *Disagree* |
| *19* | *-* |

*The following is further commented:*

* *Would like to keep “not configured” in case 3) as understanding is HP with/without a state is allowed.*
* *if uplinkHARQ-DRX-LCP\_Mode=r17 is NOT configured, the LCH mapping restriction allowedHARQ-DRX-LCPmode should not be configured*

*Based on consensus among companies providing an explicit response, the following is proposed:*

***Proposal 1: If uplinkHARQ-DRX-LCP-Mode-r17 is configured, the following LCH to HARQ process mapping rules are supported: (consensus)***

***1) LCH is mapped only to a HARQ process configured with HARQ mode A;***

***2) LCH is mapped only to a HARQ process configured with HARQ mode B;***

***3) If an LCH is not configured with a mapping rule, it may be mapped to any HARQ process (HARQ mode A or B).***

## P10/P11/P13

The HARQ-processes ID of both CG and SPS are calculated from parameters of radio resource allocation in time domain, e.g. configured periodicity, start off in time domain, configured HARQ process number. This is different from dynamic scheduling, where there is no relationship between HARQ ID and radio resource allocation in time domain.

As noted in Phase 1, this may result in the HARQ processes used by an SPS configuration to have different HARQ feedback behaviour, or HARQ processes used by a CG configuration to have different a UL HARQ mode. There seems to be a general understanding that this is not desired behaviour.

In Phase 1 input, two main options were discussed to address this issue: Configure HARQ behaviour per CG/SPS configuration, or leave it to network implementation. From Phase 1 company feedback, a majority agreed that network configuration would be sufficient in both cases.

**Question 2: Do you agree to the following proposal?:**

**“*It is up to network implementation to ensure downlinkHARQ-FeedbackDisabled, if configured, has the same value for each HARQ process used in an SPS configuration (i.e. no specification impact)."***

**If ‘Disagree’, please provide technical justification why the above would not work and additional specified behaviour is required.**

|  |  |  |
| --- | --- | --- |
| **Company** | **Agree/Disagree** | **Additional comments**  |
| MediaTek | Agree |  |
| Huawei, HiSilicon | Disagree | We don’t think leaving it to the network implementation is a good choice. When the network configures the HARQ states for HARQ processes, It cannot predict what the SPS configuration will be. Therefore, the network has to calculate and reconfigure the HARQ states for HARQ processes according to the configuration/reconfiguration of an SPS each time. This will pose big restriction and complexity to NW implementation.What’s worse, the HARQ state reconfiguration will affect the ongoning feedbacks of HARQ processes and lead to low throughput for the services whose HARQ state is different from that of the configured grant. Considering the drawbacks above, per SPS HARQ state configuration is a clean and simple way with little specs effort to make sure that the HARQ processes used by an SPS configuration have the same HARQ feedback behaviour. |
| Apple | Disagree | Agree with Huawei, HiSilicon |
| Qualcomm | Disagree | At least it has to be clarified how network implementation guarantees it and whether this results in HARQ stall within a SPS configurations due to long RTT. There can be as many as 8 SPS configurations.maxNrofSPS-Config-r16 INTEGER ::= 8 -- Maximum number of SPS configurations per BWPSo, we also prefer to have a simple per SPS HARQ state configuration. |
| Xiaomi | Agree | No matter DG or SPS, they can share the same HARQ state configuration bitmap(32bits), some bits are for DG, some for SPS，depending on the HARQ configured for SPS. |
| Samsung | Agree | We don’t see or understand a real reason that we cannot leave it to NW implementation. We prefer simple option with no specification impact.  |
| Lenovo, Motorola Mobility | Agree |  |
| Spreadtrum | Agree |  |
| OPPO | Agree |  |
| ZTE | Disagree | Similar to DG, per HARQ state SPS feedback disabling is simpler. |
| Nokia | Agree |  |
| ITL | Disagree | Agree with Huawei.And, we also support NW implementation not force to guarantee same value for each HARQ process used in an SPS configuration. (i.e., NW flexibly allocate HARQ process to an SPS, either one of HARQ mode or both of them) |
| Ericsson | Agree with comment | The UE shall not be allowed to assume all HARQ processes have the same DL fedback state, it is up to NW implementation. Therefore we prefer a modified version:***~~It is up to~~ The network implementation ~~to ensure~~ may configure downlinkHARQ-FeedbackDisabled, if configured, ~~has~~with the same value for each HARQ process used in an SPS configuration (i.e. no specification impact).*** |
| Turkcell | Agree | Ericsson text proposal is ok.  |
| vivo | Agree |  |
| Sequans | Agree |  |
| ETRI | Agree |  |
| InterDigital | Agree |  |

***Rapporteur’s summary:***

*Out of 18 responding companies, the following table presents a summary of responses to the above question:*

|  |
| --- |
| ***Up to network implementation to ensure downlinkHARQ-FeedbackDisabled has the same value for each HARQ process used in an SPS configuration?*** |
| *Agree/Agree with comment* | *Disagree* |
| *13* | *5* |

*The following is further commented:*

* *(3) When network configures HARQ states it cannot predict what SPS configurations will be. Network must calculate/reconfigure HARQ states according to (re)configuration of an SPS.*
	+ *Would affect ongoing feedbacks of HARQ processes and lead to low throughput*
* *(3) Should not force NW to guarantee same value for each HARQ process used in an SPS configuration/UE should not assume this as it’s up to NW implementation.*
* *(2) Per HARQ process is simpler.*
* *Needs to be clarified how network implementation guarantees it and whether it results in a HARQ stall.*
* *DG/SPS can share the same HARQ state configuration bitmap, with some bits for DG others for SPS.*

*Based on large majority, it is suggested the original proposal be treated. However, it is expected that further discussion is necessary in online session whether this behaviour needs to be guaranteed by NW or left to NW implementation (e.g. to reduce number of reconfigurations):*

***Proposal 2: It is up to network implementation to ensure downlinkHARQ-FeedbackDisabled, if configured, has the same value for each HARQ process used in an SPS configuration (i.e. no specification impact). (13/18)***

**Question 3: Do you agree to the following proposal?:**

**“*It is up to network implementation to ensure uplinkHARQ-DRX-LCP-Mode-r17, if configured, has the same value for each HARQ process used in a configured grant configuration (i.e. no specification impact)."***

**If ‘Disagree’, please provide technical justification why the above would not work and additional specified behaviour is required.**

|  |  |  |
| --- | --- | --- |
| **Company** | **Agree/Disagree** | **Additional comments**  |
| MediaTek | Agree |  |
| Huawei, HiSilicon | Disagree | See our reply to Q2. |
| Apple | Disagree | Agree with Huawei’s reply to Q1 |
| Qualcomm | Disagree | See our response in Q2 and Q4. |
| Xiaomi | Agree | No matter DG or CG, they can share the same HARQ state configuration bitmap(32bits), some bits are for DG, some for CG，depending on the HARQ configured for CG. |
| Samsung | Agree |  |
| Lenovo, Motorola Mobility | Agree |  |
| Spreadtrum | Agree |  |
| LG | Agree |  |
| OPPO | Agree |  |
| ZTE | Disagree | CG case is not the same as SPS. In our understanding, NW can already control whether retransmission is expected for a CG by proper configuration of CGT, thus we don’t see a need to configure a UL HARQ mode for CG configuration. Also, we don’t see the need to restrict NW’s implementation |
| Nokia | Agree |  |
| ITL | Disagree | See our respone in Q2. |
| Ericsson | Agree with comment | The UE shall no assume all HARQ process will be configured with the same mode. It is up to NW implementation. Tgherfore we prefer a modified version:***~~It is up to~~ The network implementation ~~to ensure~~ may configure uplinkHARQ-DRX-LCP-Mode-r17, if configured, ~~has~~ with the same value for each HARQ process used in a configured grant configuration (i.e. no specification impact).*** |
| Turkcell | Agree | Ericsson proposal is ok.  |
| vivo | Agree |  |
| Sequans | Agree |  |
| ETRI | Agree |  |
| InterDigital | Agree |  |

***Rapporteur’s summary:***

*Out of 19 responding companies, the following table presents a summary of responses to the above question:*

|  |
| --- |
| ***Up to network implementation to ensure uplinkHARQ-DRX-LCP-Mode-r17 has the same value for each HARQ process used in a configured grant configuration?*** |
| *Agree/Agree with comment* | *Disagree* |
| *14* | *5* |

*The following is further commented:*

* *Multiple companies have provided similar comments/reference comments in Q2.*
* *NW can already control whether retransmission is expected for a CG by proper configuration of CGT, so no need to configure HARQ state for CG.*
* *No need to restrict NWs implementation.*

*Based on large majority, it is suggested the original proposal be treated. However, it is expected that further discussion is necessary in online session whether this behaviour needs to be guaranteed by NW or left to NW implementation/proper configuration (e.g. to reduce number of reconfigurations):*

***Proposal 3: It is up to network implementation to ensure uplinkHARQ-DRX-LCP-Mode-r17, if configured, has the same value for each HARQ process used in a configured grant configuration (i.e. no specification impact). (14/19)***

## P16

In Phase 1 it was discussed whether to link the HARQ mode configuration with CG timer configuration (i.e. require the CGT setting / CGT not configured to match the HARQ mode uplinkHARQ-DRX-LCP-Mode-r17 of each HARQ process that belongs to the CG-config). For example:

* For the configured grant for which the *configuredGrantTimer* is configured, the HARQ retransmission state is considered to be “mode A”.
* For the configured grant for which the *configuredGrantTimer* is NOT configured, the HARQ retransmission state is considered to be “mode B”.

Justification for this is that for configured grant associated with HARQ state B, HARQ RTT timer is not used because retransmission is not expected. Then it is not clear why *configuredGrantTimer* needs to be used for this. It should be clarified that the network should not configure this timer for such CG configuration, otherwise it will block any new transmission in any CG associated with the same HARQ process. Considering the possible RTT in NTN, this could lead to large delay.

Rapporteur understanding is that the above is valid reasoning and that this would indeed be the intended behaviour. However, the question is whether this association needs to be specified or may be left to network implementation. Based on large majority from in Phase 1 responding an association is not needed, it is suggested that this be left to proper network configuration.

**Question 4: Do you agree that if *uplinkHARQ-DRX-LCP-Mode-r17*****is configured, proper setting/ configuration of the *configuredGrantTimer*  is left to network implementation?**

**If ‘Disagree’, please provide technical justification why the above would not work and additional specified behaviour is required.**

|  |  |  |
| --- | --- | --- |
| **Company** | **Agree/Disagree** | **Additional comments**  |
| MediaTek | Agree |  |
| Huawei, HiSilicon | Agree |  |
| Apple | Agree |  |
| Qualcomm | Disagree | We need to think how retransmission using CS-RNTI works considering there can be as many as 12 CG configurations possible and RTT is not as small as what we have today in TN (so issue in TN and NTN would not be same). We do not want UL HARQ state within a CG be stalled for UL traffic.maxNrofConfiguredGrantConfig-r16 INTEGER ::= 12 -- Maximum number of configured grant configurations per BWPIf network guarantees that multiple CG configurations never have to re-use the same HARQ process ID, network can set any proper value of CG timer. Otherwise, not for the same reason Rapportuer explained. |
| Xiaomi | Agree |  |
| Samsung | Agree |  |
| Lenovo, Motorola Mobility | Agree |  |
| Spreadtrum | Agree |  |
| LG | Agree |  |
| OPPO | Agree |  |
| ZTE | Agree |  |
| Nokia | Agree |  |
| ITL | Agree |  |
| Ericsson | Agree | The ***uplinkHARQ-DRX-LCP-Mode-r17*** only controls the starting of the DRX timer, it is completely NW responsibility to configure it correctly. If it does not correspond to the setting for CGT (retx possible or not), will only affect the UEs active time, and retransmissions will always be possible but in wrong config – there is some extra delay.  |
| Turkcell | Agree |  |
| vivo | Agree |  |
| CATT | Agree |  |
| Sequans | Agree |  |
| ETRI | Agree |  |
| InterDigital | Agree |  |

***Rapporteur’s summary:***

*Out of 20 responding companies, the following table presents a summary of responses to the above question:*

|  |
| --- |
| ***if uplinkHARQ-DRX-LCP-Mode-r17 is configured, proper setting/ configuration of the configuredGrantTimer is left to network implementation?*** |
| *Agree* | *Disagree* |
| *19* | *1* |

*The following is further commented:*

* *Need to think how retransmission using CS-RNTI works considering there can be as many as 12 CG configurations possible and RTT larger than TN.*
* *uplinkHARQ-DRX-LCP-Mode-r17 only controls the starting of the DRX timer, so will only affect UE’s active time.*

*Based on near consensus, the following is proposed:*

***Proposal 4: if uplinkHARQ-DRX-LCP-Mode-r17 is configured, proper configuration of the configuredGrantTimer is left to network implementation. (19/20)***

## Other proposals

### SR-Prohibit Timer

So far in RAN2#116e, the following has been agreed regarding extension of the *sr-ProhibitTimer* in NTN:

* *The extended values for sr-ProhibitTimer in NTN can include values less than UE-gNB RTT (as in legacy). FFS on the actual values and how this is extended*
* *Introduce a new sr-ProhibitTimerExt-r17 IE. Values FFS*

Taking the above agreements into consideration, companies are invited to propose a candidate set of additional values for the new *sr-ProhibitTimerExt-r17* IE.

**Question 5: What are possible values to be included in the *sr-ProhibitTimerExt-r17* IE ?**

|  |  |
| --- | --- |
| **Company** | **Possible values**  |
| MediaTek | Currently the value range for the sr-ProhibitTimer in NR is: {ms1, ms2, ms4, ms8, ms16, ms32, ms64, ms128}The maximum round trip delay in NTN is 541.46 ms for GEO, 41.77 ms for LEO in 1200 km orbit, and 25.77 ms for LEO in 600 km orbit.To support max legacy value + max RTD LEO(1200): 128+42=170msTo support max legacy value + max RTD LEO(600): 128+26=154msTo support max legacy value + max RTD GEO: 128+542=670msAdditional values in between could be considered, especially for GEO, for example: 256, 384, 512, 640 msBased on these values, values for sr-ProhibitTimerExt-r17 could consist of:{ms154, ms170, ms256, ms384, ms512, ms640, ms670}[Note: As can be seen above, the resulting values look quite arbitrary, this is why it would have made much more sense to extend the legacy sr-ProhibitTimer by UE-gNB RTT] |
| Huawei, HiSilicon | We think the exact values need some some more analyse and we can keep it as FFS for now. |
| Qualcomm | We are ok to finalize the new values later. |
| Samsung | We can discuss it under ASN.1 discussion later.  |
| Lenovo, Motorola Mobility | The exact values can be decided later. |
| Spreadtrum | The value shall be didcussed later. |
| LG | Considering the propagation delay for GEO, i.e., 540ms, the proper value range can be [180, 270, 540, 1080, 2160, spare3, spare2, spare1] |
| OPPO | This could be postponed until the ASN.1 discussion.  |
| ZTE | The new values can be further discussed |
| Nokia | Can be further discussed. |
| Ericsson | Allow the gNB to configure the K and let timer value Offset by UE-gNB RTT \* K, K can be a sr-ProhibitTimerExt-r17 which can have values {0.1 0.25 0.33 0.5 1 2 spare2 spare1}  |
| Turkcell | The exact values can be decided later. |
| vivo | This can be postponed to stage-3 RRC running CR discussion later as one of the ASN.1 related issues. |
| CATT | The additional values can be discussed later. |
| Sequans | This can be discussed later |
| ETRI | It can be discussed lather.  |
| InterDigital | Okay to postpone discussion |

***Rapporteur’s summary:***

*Out of 17 responding companies, the following presents a summary of responses to the above question:*

* *(14) Postpone/keep FFS/discuss during ASN.1*
* *MTK: {ms154, ms170, ms256, ms384, ms512, ms640, ms670}*
* *LG: [180, 270, 540, 1080, 2160, spare3, spare2, spare1]*
* *Ericsson: Allow the gNB to configure the K and let timer value Offset by UE-gNB RTT \* K*
	+ *{0.1 0.25 0.33 0.5 1 2 spare2 spare1}*

*Based on the large number of companies suggesting that this discussion be postponed (e.g. during ASN.1 discussion) Rapporteur suggests that this be decided later. No proposal is made at this time as there is already an “values FFS” in previous agreement.*

### RRC details

In Phase 1 discussion the following was agreed with consensus:

* *uplinkHARQ-DRX-Mode shall be included in PUSCH-ServingCellConfig.*

Several companies also suggested revised placement for parameter *downlinkHARQ-FeedbackDisabled*. In light of the above agreement, Rapporteur thinks this proposal may be confirmed prior to session to save online time.

**Question 6: Do you agree to the following proposal?:**

**“*downlinkHARQ-FeedbackDisabled shall be included in PDSCH-ServingCellConfig.”***

|  |  |  |
| --- | --- | --- |
| **Company** | **Agree/Disagree** | **Additional comments**  |
| MediaTek | Agree |  |
| Huawei, HiSilicon | Agree |  |
| Apple | Agree |  |
| Qualcomm | Agree | For now it looks fine. We think this can also be looked at more closely later. |
| Xiaomi | Agree |  |
| Samsung | Agree |  |
| Lenovo, Motorola Mobility | Agree |  |
| Spreadtrum | Agree |  |
| LG | Agree |  |
| OPPO | Agree | As similar as the agreement we has approved for UL. |
| ZTE | Agree |  |
| Nokia | Agree |  |
| ITL | Agree |  |
| Ericsson | Agree |  |
| Turkcell | Agree |  |
| vivo | Agree |  |
| CATT | Agree |  |
| Sequans | Agree |  |
| ETRI | Agree |  |
| InterDigital | Agree |  |

***Rapporteur’s summary:***

*Out of 20 responding companies, the following table presents a summary of responses to the above question:*

|  |
| --- |
| ***downlinkHARQ-FeedbackDisabled shall be included in PDSCH-ServingCellConfig?*** |
| *Agree* | *Disagree* |
| *20* | *-* |

*The following is further commented:*

* *Can double check later.*
* *Similar as for UL.*

*Based on consensus, the following is proposed:*

***Proposal 5: downlinkHARQ-FeedbackDisabled shall be included in PDSCH-ServingCellConfig. (consensus)***

## Topics requiring further discussion

In Phase 1 discussion several topics had nearly split opinion, and resulting proposals were put under the ‘Requires further discussion’ section. To save online time, Rapporteur suggests that these topics be addressed via contribution to next meeting with the current set of proposals as baseline. If companies agree, then this may be captured in Chair notes as guidance for RAN2#116bis-e.

**Question 7: Do you agree the following proposals are be taken as baseline for further discussion (e.g. in contributions to RAN2#116bise)?**

* ***RAN2 to down-select between the following options to support blind retransmission for HARQ process(es) configured with HARQ state B: 1) Rely on UE being in DRX Active Time via other means (e.g. Inactivity Timer); or 2) Start drx-RetransmissionTimerUL at the end of PUSCH transmission;***
* ***RAN2 to down-select between the following options to support blind retransmission for HARQ process(es) configured with disabled HARQ feedback: 1) Rely on UE being in DRX Active Time via other means (e.g. Inactivity Timer); or 2) Start drx-RetransmissionTimerDL in the first symbol after the end of the reception of the last PDSCH or slot-aggregated PDSCH plus X (X = T\_proc,1);***
* ***For RACH in RRC\_CONNECTED mode, it is FFS whether UE ignores HARQ process configuration (e.g. configured HARQ mode) for the case of a PUSCH transmission scheduled by RAR.***
* ***RAN2 to down-select between the following options to extend configuredGrantTimer: 1) Introducing value(s) of configuredGrantTimer larger than 64; 2) Value of the configuredGrantTimer is extended by UE-gNB-RTT;***

|  |  |  |
| --- | --- | --- |
| **Company** | **Agree/Disagree** | **Additional comments**  |
| MediaTek | Agree |   |
| Huawei, HiSilicon | Agree, but | Not sure that this helps saving online time as they are only guidance for RAN2#116bis-e contributions. Does repporteur recommend that discussions of related issues should be limited within the scope of the guidance?  |
| Apple | Agree |  |
| Qualcomm | Agree |  |
| Xiaomi | Agree |  |
| Samsung | Agree |  |
| Lenovo, Motorola Mobility | Agree | We are OK to have an FFS on HARQ mode handling for PUSCH transmission scheduled by RAR. |
| Spreadtrum | Agree |  |
| LG | Agree  |  |
| OPPO | Agree |  |
| ZTE | Agree |  |
| Nokia | Agree |  |
| ITL | Agree |  |
| Ericsson | Disagree, shall not limited to these | Seems like a waste of time to discuss what is allowed to be submitted for next meeting.  |
| Turkcell | Agree |  |
| vivo | Agree |  |
| CATT | Agree |  |
| ETRI | Agree |  |
| InterDigital | Agree |  |

***Rapporteur’s summary:***

*Out of 19 responding companies, the following table presents a summary of responses to the above question:*

|  |
| --- |
| ***Proposals are be taken as baseline for further discussion?*** |
| *Agree* | *Disagree* |
| *18* | *1* |

*The following is further commented:*

* *Are discussions of related issues limited to scope of guidance?*
* *No need to discuss what is allowed for next meeting.*

*Based on near consensus, Rapporteur suggests that the above proposals be captured in Chair notes as guidance for contributions to next meeting.*

# Conclusion

In this contribution the following proposals are suggested based on contributions submitted to RAN2#116e AI 8.10.2.2:

## For email agreement

**Proposal 1: If *uplinkHARQ-DRX-LCP-Mode-r17* is configured, the following LCH to HARQ process mapping rules are supported: (consensus)**

**1) LCH is mapped only to a HARQ process configured with HARQ mode A;**

**2) LCH is mapped only to a HARQ process configured with HARQ mode B;**

**3) If an LCH is not configured with a mapping rule, it may be mapped to any HARQ process (HARQ mode A or B).**

**Proposal 4: If *uplinkHARQ-DRX-LCP-Mode-r17* is configured, proper configuration of the *configuredGrantTimer* is left to network implementation. (19/20)**

**Proposal 5: *downlinkHARQ-FeedbackDisabled* shall be included in *PDSCH-ServingCellConfig.* (consensus)**

## For online discussion

**Proposal 2: It is up to network implementation to ensure *downlinkHARQ-FeedbackDisabled*, if configured, has the same value for each HARQ process used in an SPS configuration (i.e. no specification impact). (13/18)**

**Proposal 3: It is up to network implementation to ensure *uplinkHARQ-DRX-LCP-Mode-r17*, if configured, has the same value for each HARQ process used in a configured grant configuration (i.e. no specification impact). (14/19)**

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