# **[100b-e-NR-5G\_V2X\_NRSL-SL\_PHY\_Procedure-03] Indicating SL HARQ feedback related information**

[100b-e-NR-5G\_V2X\_NRSL-PHY-Procedure-03] Email discussion/approval regarding indicating SL HARQ feedback related information

* How to indicate HARQ feedback Option to RX UE
* How to indicate whether SL HARQ feedback is enabled or disabled to RX UE
* Whether to support mixing blind and feedback-based retransmissions of a TB

till 4/24, with potential TPs by 4/29 (Hanbyul, LGE)

**1. How to indicate SL HARQ feedback enabling/disabling and HARQ feedback Option to RX UE**

Q1: Do you agree that at least two 2nd SCI formats are defined, one containing Zone ID and Communication range requirement and another one not containing them?

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| Company | Answer |
| NTT DOCOMO | Support. |
| Huawei, HiSilicon | We think that two 2nd SCI formats are enough. One format containing Zone ID and communication range requirement is for groupcast option 1, while the other format which does not contain them is for broadcast/unicast/groupcast option 2. |
| Apple | Agree |
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Q1-1: If the answer to Q1 is yes, which HARQ operation can be selected when the 2nd SCI format contains Zone ID and Communication range requirement?

- Candidates for HARQ operation: No HARQ feedback, GC HARQ feedback Option 1, GC HARQ feedback Option 2, unicast HARQ feedback

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| Company | Answer |
| NTT DOCOMO | GC HARQ feedback Option 1 only. |
| Huawei, HiSilicon | Only GC HARQ feedback for Option 1 |
| Apple | GC HARQ feedback Option 1 is associated with the 2nd SCI format contains Zone ID and Communication range requirement. |
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Q1-2: If the answer to Q1 is yes, which HARQ operation can be selected when the 2nd SCI format does NOT contains Zone ID and Communication range requirement?

- Candidates for HARQ operation: No HARQ feedback, GC HARQ feedback Option 1, GC HARQ feedback Option 2, unicast HARQ feedback

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| Company | Answer |
| NTT DOCOMO | No HARQ feedback, GC HARQ feedback Option 2, unicast HARQ feedback. |
| Huawei, HiSilicon | No HARQ feedback, GC HARQ feedback Option 2, unicast HARQ feedback |
| Apple | No HARQ feedback, GC HARQ feedback Option 2 and unicast HARQ feedback |
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Q1-3: If the answer to Q1 is yes, how many 2nd-SCI formats are defined for those with and without Zone ID and Communication range requirement? In each format, is an explicit field included to indicate whether SL HARQ feedback is enabled or disabled, and/or which option is used?

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| Company | Answer |
| NTT DOCOMO | Two: one is with zone ID and communication range requirement, another is without.  For the first one, no field is defined for feedback = enabled/disabled. No field is defined for which option is used.  For the second one, one field is defined for feedback = enabled/disabled. No field is defined for which option is used. |
| Huawei, HiSilicon | Only two 2nd SCI formats are defined and a 1 bit length explicit field in SCI format 0-1 is used to indicate which format is used.The HARQ enable/disable indication can be done by an explicit field contained in the 1st stage SCI as well. |
| Apple | Two 2nd SCI formats are defined.  For the 2nd SCI format with zone ID and communication range requirement, no explicit field is included to indicate whether SL HARQ feedback is enabled or disabled. In this case, SL HARQ feedback with GC option 1 is always enabled.  For the 2nd SCI format without zone ID and communication range requirement, explicit field is included to indicate whether SL HARQ feedback is enabled or disabled, and which feedback option is used. |
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Q1-4: If the answer to Q1 no, do you agree that an explicit is necessary to indicate whether SL HARQ feedback is enabled or disabled, and which option is used?

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| Company | Answer |
| Huawei, HiSilicon | Enable/disable of HARQ should be a field in SCI format 0\_1. |
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Q2: How does the RX UE decide whether unicast HARQ feedback and GC HARQ feedback Option 2 is in use?

- Option 1: Different 2nd-SCI formats

- Option 2: Explicit indicator in 2nd-SCI

- Option 3: Using L1-destination ID

- Option 4: Others (please specify it)

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| Company | Preferred option | Comments |
| NTT DOCOMO | Option 3 | If it is difficult that PHY layer knows associations between L1 destination ID and cast-type, i.e. option 3 is not agreed, our preference is option 2 to option 1. Option 1 means larger size of 1st SCI format or less capability of future enhancement. |
| Huawei, HiSilicon | Option 3 | However, we would like to understand why this differentiation is needed: the only obvious effect is how the UE knows which PSFCH resources to use, but this is a matter of ID, rather than of unicast vs. groupcast option 2. |
| Apple | Option 2 | This can be distinguished by a flag in 2nd-SCI |
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**2. Whether to support mixing blind and feedback-based retransmissions of a TB**

Q3: Do you think mixing blind and feedback-based retransmission of a TB (as detailed in the following) is necessary?

Q3-1: Do you think the specification needs to support the following case? If yes, what is the motivation?

- transmission of a TB in a slot indicates “HARQ feedback disabled” but retransmission of the same TB in another slot indicates “HARQ feedback enabled”

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| Company | Answer |
| NTT DOCOMO | Not necessary.  Our original preference was to support but due to time limitation, Rel-16 should not support it. |
| Huawei, HiSilicon | This does not require specific support in RAN1 specifications. MAC indicates to PHY how to (re-)transmit the TB, so RAN2 can decide whether or not MAC has the proposed function. |
| Apple | Yes. The blind retransmission reduces the TB transmission latency by not waiting for HARQ feedback. The follow-up feedback-based retransmission further increases the reliability (with efficient spectrum usage). |
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Q3-2: Do you think the specification needs to support the following case? If yes, what is the motivation?

- transmission of a TB in a slot indicates “HARQ feedback enabled” but retransmission of the same TB takes place in another slot without considering the HARQ feedback corresponding to the first transmission

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| Company | Answer |
| NTT DOCOMO | Not necessary.  Our original preference was to support but due to time limitation, Rel-16 should not support it. |
| Huawei, HiSilicon | No, see Q3-1. |
| Apple | Yes, the feedback-based transmission increases the reliability with efficient spectrum usage. The follow-up blind retransmission reduces the TB transmission latency, especially when the PDB of the TB is approaching. |
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Q3-3: Do you think there are other cases that needs to be considered as mixing blind and feedback-based retransmissions of a TB?

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| Company | Answer |
| Huawei, HiSilicon | No, see Q3-1. |
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