# **[101-e-NR-5G\_V2X\_NRSL-SL\_PHY\_Procedure-03] Email discussion/approval regarding HARQ operation + Sidelink CSI**

[101-e-NR-5G\_V2X\_NRSL-SL\_PHY\_Procedure-03] Email discussion/approval regarding HARQ operation + Sidelink CSI

* + Issue 3-1: Details of indicating SL HARQ feedback related information
  + Issue 4-2: How to determine the CQI table used for CSI reporting

Till 5/28, with potential TPs by 6/3 – Hanbyul (LGE)

**1. Details of indicating SL HARQ feedback related information**

Q1: Which SCI format includes the indication of HARQ feedback enable/disable and which 2nd SCI format can be used when HARQ feedback is disabled?

* Option 1-1: SCI format 1-A includes the indicator, and both SCI format 2-A and SCI format 2-B can be used when HARQ feedback is disabled
* Option 1-2: SCI format 1-A includes the indicator, and SCI format 2-A is used when HARQ feedback is disabled
* Option 1-3: Both SCI format 2-A and SCI format 2-B includes the indicator, and both SCI format 2-A and SCI format 2-B can be used when HARQ feedback is disabled
* Option 1-4: Only SCI format 2-A includes the indicator, and SCI format 2-A is used when HARQ feedback is disabled
* Option 1-5: Others (please specify)

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| Company | Preferred option | Comment |
| Intel | 1-3  2nd priority: 1-4 | It is preferred to indicate switching between blind and FB-based modes in 2nd stage SCI.  There is no L1 procedure requiring knowledge of the feedback request after 1st stage SCI.  Furthermore, putting the feedback request flag to the 2nd stage is aligned with the two-stage concept where the 1st stage is transparent to cast types and is release independent.  The 1st preference goes to 1-3, since in case a mix of blind and FB-based regimes is supported (pending RAN2 decision), it is better to have both options supported by format B in order to keep consistent TBS and 2nd stage SCI size between retransmissions. Otherwise, a UE needs to switch SCI formats between retransmissions that makes it more difficult to maintain same TBS. |
| LG | Option 1-4 | HARQ feedback enabling/disabling field is not necessary for all the cast type. Considering total SCI overhead, it would be efficient that only SCI format 2-A has this field. |
| Apple | 1-3 | To support the mixed blind reTx and feedback-based reTx, it is preferred to allow SCI format 2B to indicate no HARQ feedback. This could avoid the SCI format switch between initial transmission and retransmissions, which facilitates the TBS determination.  Furthermore, to save the signaling overhead, SCI format 2B indicates no HARQ feedback by a codepoint of communication range requirement (i.e., 0 meter).  We do not think it is necessary to indicate HARQ feedback in first stage SCI, since UEs interested in re-using other UEs’ reserved but not to be used resources due to HARQ-ACK, can decode the second stage SCI of those UEs. |
| OPPO | Option 1-2 is 1st priority;  Option 1-4 is 2nd priority | Considering forward compatibility, it is possible that a sensing UE can do resource selection/exclusion based on whether SL FB is enabled or not with the received 1st SCI. if the indicator in included in 2nd SCI, that requires sensing UE to decode both 1st SCI and 2nd SCI. that will increase the complexity and not suitable for forward compatibility. |
| NTT DOCOMO | Option 1-3 | We understand that the motivation of option 1-3 is to support mixed blind reTx and feedback-based reTx. We support option 1-3.  1st stage SCI should not have the information. Less payload size is preferable. |
| QC | Option 1-1  2nd priority:  Option 1-3 | All cast types except broadcast should be possible to use with or without feedback per the working assumption from RAN1 98bis. We don’t see the need to revert the working assumption and introduce restrictions.  Working assumption:   * For HARQ feedback in groupcast and unicast, when PSFCH resource is (pre-)configured in the resource pool,   + SCI explicitly indicates whether HARQ feedback is used or not for the corresponding PSSCH transmission.   Knowledge of the feedback request can potentially be used in resource selection, whether it is in R16 or future releases. So we prefer 1-1 over 1-3. |
| vivo | Option 1-1  Or option 1-3 (2nd priority) | The importance is that, the enable/disable should be achieved when using a single 2nd SCI format. so both option 1-1 and 1-3 are fine in the discussion of procedure AI.  However which one to be down-selected should be made in mode-2 AI. It depends on whether the booked but unused resource needs to be treated specially somehow. If yes option 1-1 is good, otherwise option 1-3 is fine as pointed by Intel/Apple… |
| Huawei,  HiSilicon | Option 1-2 | One bit indicator should be contained in SCI format 1-A. Apart from the function of indicating whether HARQ feedback is used to the receiver, this bit can also be used by a sensing UE to determine whether a reservation in SCI is for HARQ feedback based retransmission or blind retransmission and UE could treat the reservation priority respectively even they have same priority value.  When HARQ is disabled, RX UE does not need Zone ID and Communication range requirement information (16 bits in total), thus in this case SCI format 2-B will not be used, i.e. SCI format 2-A is used. |
| Samsung | Option 1-4 | Considering SCI overhead, it’s no gain to use SCI format 2-B when HARQ is disabled. So there is no need to introduce HARQ enabling/disabling indicator in SCI format 2-B. |
| CATT | Option 1-3  or option 1-4 | It is not necessary to carry the enable/disable flat in 1st SCI.  if mixed transmission between blind and HARQ feedback-based transmission is supported(pending by RAN2 decision), we prefer option 1-3.  Otherwise, option 1-4 is prefered. |
| Lenovo, MotM | Option 1-5 (other) | The 1st Stage SCI (format 1-A) should carry 2 bits indicating:   1. Feedback required – Option 1 2. Feedback required – Option 2 3. No feedback required: Blind Re-Tx 4. No feedback required: One shot transmission (no re-transmission)   The 1st Stage also carries Cast-type  Only one second stage format. When the distance based feedback is not used, the MCR and Tx location fields are dummy (especial value), otherwise some ‘valid’ value. |
| Fraunhofer | Option 1-4 | A single 2-bit parameter can be included in SCI format 2-A to indicate different feedback options:  • Feedback is disabled (or blind re-transmissions),  • Groupcast HARQ feedback option 1 without the distance-based criteria,  • Groupcast HARQ feedback option 2, and  • Unicast HARQ feedback.  This parameter includes explicit HARQ disabling and also addresses the issues raised by companies for mixed-mode operations, where the same SCI format can be used for switching between blind and HARQ-based retransmissions.  SCI format 2-B should be used only when HARQ is enabled and for GC option 1 with the distance-based criteria enabled. |
| Ericsson | Option 1-3 | The indication should be in the 2nd stage SCI. |
| ZTE, Sanechips | Option 1-4 | There is no need to include Zone ID and communication range requirement fields for blind(FB disabled) transmission. |
| InterDigital | Option 1-4 |  |
| FUTUREWEI | Option 1-3 | This feedback information is not useful for UEs performing sensing, therefore should not be in the first stage |
| Panasonic | Option 1-3 Option 1-4(2nd preference) | This information is not necessary for neighbour UEs other than Rx UE.  For No HARQ feedback in 2nd SCI format A, in usual case, No HARQ feedback is not operated with Zone ID and Communication range requirement. However, 2nd SCI format A is long SCI, additional 1 bit to indicate No HARQ feedback would be no significant issue. We are ok with either to support NO HARQ feedback case in 2nd SCI format A. |
| MediaTek | Option 1-4 | Firstly, there is no need of using 2nd SCI format 2-B in case of no HARQ. TBS issue can be handled by Tx UE as discussed in the other AI.  Secondly, reusing the reserved but unused resources will require the detection of ACK/NACK information which is transmitted over the resources determined by UE IDs. However, UE IDs are carried in the 2nd SCI. So anyway the other UEs reusing the reserved but unused resources have to decode the 2nd SCI.  So Option 1-4 is preferred. |
| Fujitsu | Option 1-4 | SCI format 2-B is only used for the HARQ enabling case. SCI format 2-A can indicate whether HARQ-ACK is enabled or not. |
| Nokia, NSB | Option 1-1 | The benefit of ON/OFF indication in the 1st SCI is that the Rx UE can prepare its HARQ feedback before it decodes the 2nd SCI. For unicast case when blind retransmission is applied, this could be beneficial for UE implementation. On the other hand, an extra 1-bit payload is needed for the 1st SCI, which has limited payload size. If this indication is conveyed in the 2nd stage SCI, 1-bit is saved in the 1st stage SCI, but the Rx UE needs to decode the full 2nd stage SCI to retrieve this 1-bit information. With this consideration, we support the indication at the 1st stage SCI. |

Observation: Indication of HARQ feedback enable/disable

* Option 1-1: QC, vivo, Nokia, NSB (4 companies)
* Option 1-2: OPPO, Huawei, HiSi (3 companies)
* Option 1-3: Intel, Apple, DOCOMO, QC (2nd), vivo (2nd), CATT, Ericsson, Futurewei, Panasonic (9 companies)
* Option 1-4: Intel (2nd), LG, OPPO (2nd), Samsung, CATT, Fraunhofer, ZTE, Sanechips, InterDigital, Panasonic (2nd), MediaTek, Fujitsu (12 companies)
* Option 1-5: Lenovo, MotM (2 companies)

Q2: Do you think Groupcast HARQ option 1 (i.e., NACK-only feedback) is supported when Zone ID or Communication range requirement are not provided? If yes, please specify how to support Groupcast HARQ option 1 in that case. If no, please specify how to operate HARQ when Groupcast HARQ option 2 is not applicable.

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| Company | Answer | Comment |
| Intel | Slight preference for to support NACK-only w/o range | This regime can be used when TX location is not yet available for connection-less groupcast. In this case, 0 distance is assumed for NACK-only regime and the rest of the procedure is the same as for the range-based regime. |
| LG | Yes | SCI format 2-A can be used to schedule groupcast with HARQ feedback Option 1, and the indicator to indicate HARQ feedback option will be present in the SCI format 2-A. |
| Apple | Support non-distance-based NACK-only feedback based on (pre)configuration | An infinite value is (pre)configured for communication range requirement per resource pool. The non-distance-based groupcast HARQ feedback option 1 is triggered if the communication range requirement field in the corresponding second stage SCI is set as infinite. |
| OPPO | Yes. | GC feedback option1 can be used in connection-based groupcast. If the number of PSFCH resource is less than the number of RX UEs within the group, TX UE can indicate to use GC feedback option 1 in SCI format 2-A, so that GC FB can be enabled. |
| NTT DOCOMO | Yes | Even in this case, SCI format 2-B is used so that the same TBS is ensured when zone ID is available for retransmissions |
| QC | Yes | SCI format 2-B is used. UE sends NACK when TB cannot be decoded and does not transmit feedback when TB is successfully decoded. |
| Huawei,  HiSilicon | No | It appears to be an attempt to reverse a previously and repeatedly discussed outcome of no agreement to introduce the new feature. We summarize our views again below, and please refer to our previous extensive email replies. The existing outcome remains in place on this issue.  Groupcast HARQ feedback options are decide by high layer and GC HARQ option 2 is determined only when group size and member ID are provided by AS layer and the group size is not greater than the number of candidate PSFCH resources associated with the selected PSSCH resource. Therefore, no other conditions would result to GC HARQ option 2 is not applicable in physical layer if it has determined in MAC layer.  If there is no distance information for sidelink groupcast with HARQ feedback option 1, each of the groupcast receivers that can receive the related PSCCH will feedback NACK when corresponding PSSCH is not correctly decoded. The whole system performance would be impact due to remote UE unstable feedback. Moreover, sidelink groupcast with HARQ feedback option 1 is connection-less link which means that the transmitter does not know each specific receiver. If there is no distance information, such groupcast transmission will be uncontrollable and its transmission performance cannot be predicted. Therefore, existing agreements to associate HARQ feedback option 1 with distance information are sufficient. No need to support GC HARQ option 1 when distance information is not available. |
| Samsung | No | Non-distance-based NACK-only feedback may impact system performance due to unnecessary retx triggered by NACK from a distant UE.  The motivation of introducing distance-based restriction in the very early stage of V2X study is to avoid this scenario above, and we cannot understand the benefit of designing the system in a reversed way. |
| CATT | Yes | According to the LS from RAN2, in SL HARQ operation, even when the group size and member ID is passed to AS layer, TX UE has the flexibility to select either option 1 or option 2. Therefore, NACK-based feedback shall be supported when zone Id and communication range are not provided.  Regarding to which SCI-format is used for this cases, we prefer SCI format 2-A with a indicator of HARQ feeback option, which has less overhead than SCI format 2-B. |
| Lenovo, MotM | Yes | HARQ option 1 (i.e., NACK-only feedback) is supported even when Zone ID or Communication range requirement are not provided since “reliability” is important. In this case non-distance based feedback will be requested and based on our reply to Q1, the MCR and Tx location fields are dummy (especial value), otherwise some ‘valid’ value. |
| Fraunhofer | Yes | For GC option 1 without the TX-RX distance constraint, SCI format 2-A can be used. As mentioned in Q1, the feedback option indicator can include a value to indicate using SCI format 1-A with GC option 1, without the distance constraint (see answer to Q1). |
| Ericsson | Yes | Include 1 bit to show option for HARQ in SCI 2-B. |
| ZTE, Sanechips | yes | This aligns with RAN2 agreements (RAN1 agreed that both HARQ enable/disable and HARQ options are determined by RAN2).  If distance-based operation is not used, to save the signaling overhead, format 2-A should be used. |
| InterDigital | Yes | RAN2 has already agreed that although Tx UE has no location information, the Tx UE can still enable HARQ feedback for groupcast option 1 without distance constraint.  UE uses same SCI format 2-B for both distance and non-distance based groupcast option 1. When non-distance based group cast option 1 is used, zone-ID field is set to specific value to indicate non-distance based groupcast option 1 (i.e., one codepoint of zone-ID is reserved to indicate non-distance based groupcast option 1). |
| FUTUREWEI | No | We view groupcast option 1 as being used only with distance/range. For all the other cases, option 2 is preferable. |
| Panasonic | Yes | SCI format 2-A can be used. One bit indication is included in SCI format 2-A. |
| MediaTek | Yes | In general, groupcast option 2 can fall back or switch to Option 1 up to Tx UE. Such switching can also be used for the case that the group size is over the limit. To be noted, the group size may change dynamically. |
| Fujitsu | Yes | For groupcast option 1, both HARQ-ACK enabling and disabling should be supported. As SCI format 2-B only indicates the HARQ enabling case, SCI format 2-A can indicate HARQ enabling or HARQ disabling. |
| Nokia, NSB | Yes | Tx UE can still enable HARQ Option 1 w/o distance information. |

Observation: Support of Groupcast option 1 when Zone ID or Communication range requirement is not provided

* Yes: Intel, LG, Apple, OPPO, DOCOMO, QC, CATT, Lenovo, MotM, Fraunhofer, Ericsson, ZTE, Sanechips, InterDigital, Panasonic, MediaTek, Fujitsu, Nokia, NSB (19 companies)
* No: Huawei, HiSi, Samsung, Futurewei, (4 companies)

Q3: In LS from RAN2 [R1-2003255], followings are provided for the cast type indication:

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| * + RAN2 recently agreed the following working assumption:     - The V field is supported in a SL-SCH MAC subheader at least for future extensibility.   + In addition, when a NR MAC entity receives a MAC PDU, the MAC entity needs to understand the cast type associated to the received MAC PDU in order to determine the appropriate Rx UE behaviour e.g. to correctly perform packet filtering. When the MAC PDU is successfully decoded, RAN2 assumes that the V field in the SL-SCH MAC subheader can be used to explicitly indicate the cast type of the received MAC PDU for NR sidelink. However, when the MAC PDU is not successfully decoded, the corresponding cast type in SL-SCH MAC subheader could not be obtained.   + RAN2 recently made the following agreement that will be specified in 38.321:     - Sending HARQ ACK after checking the Layer-1 IDs in the SCI of the received MAC PDU, regardless of a result of checking the Layer-2 IDs in the MAC header, like sending HARQ NACK.   + Some companies think that an Rx UE should check the cast type as well as the Layer-1 IDs to correctly send HARQ feedback to a TX UE. As such, RAN2 would like to ask RAN1 if cast type information is useful from RAN1 perspective and will be provided in L1. |

From RAN1 perspective, the case type and M\_ID in the equation for the PSFCH resource index is determined by

* Option 3-1: SCI includes an explicit indication for the cast type.
  + If you support this option, please specify which SCI includes this indication.
* Option 3-2: SCI does not include an explicit indication for the cast type but includes an indication on whether M\_ID should be set to zero or a high layer provided parameter in the corresponding PSFCH transmission.
  + If you support this option, please specify which SCI includes this indication.
* Option 3-3: SCI includes no explicit indication for the cast type or M\_ID setting. M\_ID used for the corresponding PSFCH transmission is determined based on L1 ID(s).
  + If you support this option, please specify which layer will specify the L1 ID checking for M\_ID determination.
* Option 3-4: Others (please specify)

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| Company | Preferred option | Comment |
| Intel | 3-3 | Non-zero M\_ID can only be applied for unicast and groupcast option 2 which should have higher layer established context in order to operate. During this operation, a UE can associate L1/L2 identities and required M\_ID regime. L2 can be in charge of this association.  Further, the space of L1 IDs of 16+8 bit is sufficient to resolve ID ambiguities. |
| LG | Option 3-2 | According to the LS from RAN2, even for the MAC layer, they are trying to introduce cast type indicator in MAC subheader. In this case, it is unclear how the UE can decide the value of M\_ID by using the truncated version of L2 ID especially when the UE supports both unicast and groupcast with HARQ feedback Option 2 simultaneously.  In our view, for Option 3-1, SCI format 2-A can have indicator to indicate whether the value of M\_ID is zero or higher layer parameter. |
| Apple | 3-1 | In our view, L1 ID(s) are not guaranteed to distinguish between unicast and groupcast HARQ option 2, because they are derived from L2 ID(s) and their lengths are smaller. Hence, we prefer the second stage SCI format A has an explicit indication of cast-type (i.e., only between unicast and groupcast HARQ feedback option 2) so that PSFCH resource index is determined subsequently. We are also open to Option 3-2. |
| OPPO | Option 3-1 | Cast type is indicated in SCI format 2-A.  The ID set for unicast/groupcast/broadcast maybe overlap, in that case, ID cannot be used to differentiate the cast type. Furthermore, L1-ID is truncated from higher layer ID, which will make ID ambiguity even worse. If the PSSCH cannot be decode correctly, the V field proposed in RAN2 in MAC CE cannot be used to differentiate the cast type. |
| NTT DOCOMO | Option 3-1 | Based on the following agreements in RAN2, M\_ID should be provided by higher layer. Once cast type is determined and group information is provided by higher layer, M\_ID is determined. Regarding cast type, L1 ID is smaller than L2 ID; hence L1 ID is not enough. SCI format 2-A should indicate cast-type.   |  | | --- | | Recommendation E1: Groupcast HARQ option 2 can be selected only when the following conditions are met:  - The V2X layer passes the group size and the member ID to the AS layer; and  - The group size is not greater than the number of candidate PSFCH resources associated with the selected PSSCH resource.   * Agreed. | |
| QC | Option 3-1 | Format 2B is already used for GC option 1. We can add a field in format 2A to distinguish between GC Option 2/Unicast. |
| vivo | Option 3-4 | Different SCI formats can be used for different cast types, cast type can be indicated via 2nd SCI format indicator. |
| Huawei | Option 3-2 | The indication for cast-type is unnecessary. UE only needs to know that the M\_ID should be zero or the value provided by higher layers considering that the cast-type cannot be decided solely based on the L2 ID. The indication bit for M\_ID can be carried in SCI 2-A because such value is only needed when HARQ is enabled. |
| Samsung | Option 3-3 | We assume only for format 2A the differentiation between GC option 2 and UC is needed.  Since L2 indicator is already introduced by RAN2, it’s unnecessary to repeat the function in L1 signal. L1-ID collision between GC and UC is a corner case and in the case UE still could acquire cast type from RAN2.  For the case of failed to decode PSSCH, UE could send NACK with M\_ID as either zero or in-group ID, it has no impact on performance since the absence of PSFCH in GC option 2 and UC will be understood as NACK. |
| CATT | Option 3-3 | For groupcast HARQ feedback option 2, The V2X layer passes the group ID, group size and the member ID to the AS layer, and the related destination ID of the groupcast is converted from group ID, source ID is selected by Tx UE itself. For unicast, the destination ID and source ID is determined by unicast connection establishment procedure. From our understanding, the L1-IDs ambiguous issue between groupcast and unicast can be resolved by UE implementation. |
| Lenovo, MotM | Option 3-1 | In SCI format 1-A as indicated in our reply to Q1. |
| Fraunhofer | Option 3-1 | The feedback option indicator in SCI format 2-A will implicitly indicate the cast type (see answer to Q1), while SCI format 2-B would be used only for groupcast. |
| Ericsson | Option 3-3 | When it comes to determination of M\_ID in the PSFCH determination, we do not see any further work to be done. In our understanding, member ID is defined by the application layer for each member of the group and is provided to the AS layer. |
| ZTE, Sanechips | 3-3 (1st preference) and 3-2 (2nd preference) | RAN1 cares about which HARQ operation should be performed, it is good enough to determine proper HARQ operation based on 2nd SCI format and HARQ en-/disable and option indications. For the M\_ID determination for A/N, L1 destination ID collision issue could be observed and resolved by upper layer. L1 source ID could be also used by RX UE to determine whether the PSSCH is from a unicast peer TX UE. So 3-3 is preferred, while 3-2 also works but is not quite necessary. |
| Interdigital | 3-1 | The cast type indicator should be explicitly included in SCI format 2-A since L1 ID cannot differentiate cast type as it uses subset of L2 ID and there will be collision. |
| FUTUREWEI | 3-2 or 3-3 | Indicating the cast type is not needed since it can be determined by e.g., the destination ID |
| Panasonic | Option 3-3 | We have same view as CATT. In groupcast, destination ID is related to group. M\_ID is defined by the higher layer for each member. M\_ID is not necessary to be indicated in L1 layer. |
| MediaTek | Option 3-1 | In SCI format 1-A. it can be used together for SCI format indication to avoid increasing the size of the SCI format 1-A. Moreover, the SCI cast type indication provides the potential for UE power saving is the UE has no unicast/groupcast connections. |
| Fujitsu | 3-1 | The cast type is indicated by a field in SCI format 2-A. L1 ID based distinction may not be sufficient. |
| Nokia, NSB | 3-2 | M\_ID shall be provided by higher layer. |

Observation: Determination of the cast type and M\_ID

* Option 3-1: Apple, OPPO, DOCOMO, QC, Lenovo, MotM, Fraunhofer, Interdigital, MediaTek, Fujitsu (10 companies)
* Option 3-2: LG, Huawei, ZTE (2nd), Sanechips (2nd), FUTUREWEI, Nokia, NSB (7 companies)
* Option 3-3: Intel, Samsung, CATT, Ericsson, ZTE, Sanechips, FUTUREWEI, Panasonic (8 companies)
* Option 3-4: vivo (1 company)

**2. How to determine the CQI table used for CSI reporting**

Q4: How is the CQI table used for CSI reporting determined?

* Option 4-1: The CSI triggering UE sends the CQI table via PC5-RRC
* Option 4-2: The CSI reporting UE determines the CQI table and indicates the selected table via CSI reporting MAC CE
* Option 4-3: The MCS table indicated in the associated CSI trigger is used as the CQI table.
* Option 4-4: Others (please specify)

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| Company | Preferred option | Comment |
| Intel | 4-1 | There is no justification for dynamic CQI table changes. Therefore, it is sufficient to negotiate the CQI table via PC5-RRC. |
| LG | Option 4-3 | It would be beneficial to dynamically adjust which CQI table is used for CSI reporting. In the last meeting, it is agreed that the CSI measurement window will not be overlapped. In this case, the CQI table associated with the MCS table indicated in the associated CSI trigger could be used without ambiguity between CSI-triggering UE and CSI-reporting UE. This is also beneficial in that no RAN2 impact is needed. |
| Apple | 4-1 |  |
| NTT DOCOMO | 4-1 or 4-2 | In 4-3, if UE triggering CSI report wants to know 256QAM can be used or not, the UE shall use 256QAM table. We do not see the motivation to have the association. |
| QC | Option 4-4 | The CQI table is *determined based on* the signal MCS table. For example 256 QAM CQI table is used when the 256QAM MCS table is used in the triggered SCI.  The wording in 4-3 is not clear to us. CQI table has 16 entries, while MCS tables has 32 entries. |
| vivo | Option 4-2 | MCS table is selected based on CQI table and CQI value feedback. Hence, CQI table should be conveyed in the CSI feedback, option 4-2 is straightforward solution to avoid chicken-egg issue. |
| Huawei, HiSilicon | 4-1 | We think the Uu design is better to be reused. In NR Uu, the MCS table and CQI table are separately indicated by the higher layer parameters mcs-Table and cqi-Table. In NR SL, the MCS table is indicated by the RP and the TX UE SCI. For the CQI table, we think it should be indicated via another PC5-RRC signaling, e.g., sl-CQI-Table in sl-CSI-Config. Option 4-3 is lack of flexibility and is not preferred.  For Option 4-2, we believe SL CSI is a procedure oriented to the TX UE. The RX UE may not know the transport block error probability requirement of the TX UE, and therefore cannot properly determines the CQI table. |
| Samsung | Option 4-3 | If CQI table is configured by higher layer, the following scenario may happen that Tx UE is configured with one MCS table but another CQI table is configured. We don’t see a benefit for this case. Option 4-3 could avoid the misalignment between configured MCS table and CQI table used for CSI report. In addition, we prefer not to introduce RAN2 impact for this feature when it can be solved by RAN1. |
| CATT | Option 4-1 | We think it is sufficient to negotiate the CQI table via PC5-RRC. |
| Lenovo, MotM | 4-1 | The CQI table is determined by CSI triggering UE and signaled to CSI reporting UE via PC5-RRC. |
| Ericsson |  | We propose to follow the same procedure as in NR Uu and what we agreed for MCS tables:  • CQI tables is (pre-)configured per resource pool with one default table.  • If more than one CQI table is (pre-)configured, then Option 4-2 is used i.e. the CSI reporting UE determines the CQI table and indicates the selected table via CSI reporting MAC CE |
| ZTE, Sanechips | 4-3 | Share the view from LGE. |
| Interdigital | 4-1 |  |
| FUTUREWEI | 4-1 | PC5-RRC appears to be the cleanest solution. |
| Panasonic | Option 4-1 | The dynamic CQI table changes is not necessary. |
| MediaTek | 4-3 or 1 bit for CSI table indication separately. | The assumed CSI table can be the one corresponding to the indicated MCS table. Alternatively, the additional bit in 2nd SCI can be introduced to indicate the CSI table independent of the used MCS table. Because MCS switching is based on CSI measurement so that it is possible that the different CSI tables will be used for possible MCS table switching even if the same MCS table is indicated for usage. |
| Fujitsu | 4-1 |  |
| Nokia, NSB | 4-1 | This is the simplest approach to indicate CQI table. No dynamic selection of CQI table is needed here because SL CQI reporting is via MAC-CE. |

Observation: Determination of CQI table

* Option 4-1: Intel, DOCOMO, Huawei, HiSi, CATT, Lenovo, MotM, Interdigital, FUTUREWEI, Panasonic, Fujitsu, Nokia, NSB (13 companies)
* Option 4-2: DOCOMO, vivo, Ericsson (3 companies)
* Option 4-3: LG, Samsung, ZTE, Sanechips, MediaTek (5 companies)
* Option 4-4: QC (1 company)

Proposal for agreement v001

Proposal 1:

* At least SCI format 2-A includes an explicit indication of HARQ feedback enabled/disabled.
  + Whether to introduce this indication in SCI format 2-B will be decided later.

Proposal 2:

* It is supported to use Groupcast option 1 (i.e., NACK only feedback) when Zone ID or Communication range requirement is not provided.
  + SCI format 2-A includes an explicit indication on whether ACK/NACK feedback or NACK only feedback is used.

Proposal 3:

* SCI includes no explicit indication for the cast type or M\_ID setting. M\_ID used for the corresponding PSFCH transmission is determined based on L1 ID(s).

Proposal 4: The CSI triggering UE sends the CQI table via PC5-RRC.

Proposal for agreement v002

Proposal 1:

* At least SCI format 2-A includes an explicit indication of HARQ feedback enabled/disabled.
  + If RAN2 decides to support mixing blind and feedback-based retransmission of a TB, SCI format 2-B also includes an explicit indication of HARQ feedback enabled/disabled.

Proposal 2:

* It is supported to use Groupcast option 1 (i.e., NACK only feedback) when Zone ID or Communication range requirement is not provided.
  + SCI format 2-A includes an explicit indication on whether ACK/NACK feedback or NACK only feedback is used.

Proposal 3:

* SCI includes no explicit indication for the cast type or M\_ID setting. M\_ID used for the corresponding PSFCH transmission is determined based on L1 ID(s).

Proposal 3’:

* SCI does not include an explicit indication for the cast type but includes an indication on whether M\_ID should be set to zero or a high layer provided parameter in the corresponding PSFCH transmission.

Proposal 4: The CSI triggering UE sends the CQI table via PC5-RRC.

Proposal for agreement v003

Proposal 1:

* At least SCI format 2-A includes an explicit indication of HARQ feedback enabled/disabled.
  + If RAN2 decides to support mixing blind and feedback-based retransmission of a TB, SCI format 2-B also includes an explicit indication of HARQ feedback enabled/disabled.

Proposal 2:

* It is supported to use Groupcast option 1 (i.e., NACK only feedback) when Zone ID or Communication range requirement is not provided.
  + SCI format 2-A includes an explicit indication on whether ACK/NACK feedback or NACK only feedback is used.

Proposal 3:

* SCI includes no explicit indication for the cast type or M\_ID setting. M\_ID used for the corresponding PSFCH transmission is determined based on L1 ID(s).

Proposal 3’:

* SCI does not include an explicit indication for the cast type but includes an indication on whether M\_ID should be set to zero or a high layer provided parameter in the corresponding PSFCH transmission.

Proposal 4:

* The CSI triggering UE sends the CQI table via PC5-RRC.

Proposal 4’:

* The CQI table is derived based on the indicated MCS table
  + No separate configuration

Proposal for agreement v004

Proposal 1:

* At least SCI format 2-A includes an explicit indication of HARQ feedback enabled/disabled.
  + If RAN2 decides to support mixing blind and feedback-based retransmission of a TB, SCI format 2-B also includes an explicit indication of HARQ feedback enabled/disabled.

Proposal 2:

* If RAN2 decides to support Groupcast option 1 (i.e., NACK only feedback) when Zone ID or Communication range requirement is not provided,
  + SCI format 2-A includes an explicit indication on whether ACK/NACK feedback or NACK only feedback is used.

~~Proposal 3:~~

* ~~SCI includes no explicit indication for the cast type or M\_ID setting. M\_ID used for the corresponding PSFCH transmission is determined based on L1 ID(s).~~

Proposal 3’:

* SCI does not include an explicit indication for the cast type but includes an indication on whether M\_ID should be set to zero or a high layer provided parameter in the corresponding PSFCH transmission.

Proposal 3A:

* Send an LS to RAN2 in response to R1-2003255 to inform Proposal 1, 2, 3’ (if agreed) and to ask
  + Whether mixing blind and feedback-based retransmission of a TB is supported in RAN2
  + Whether Groupcast option 1 (i.e., NACK only feedback) is supported in RAN2 when Zone ID or Communication range requirement is not provided

~~Proposal 4:~~

* ~~The CSI triggering UE sends the CQI table via PC5-RRC.~~

Proposal 4’:

* The CQI table is derived based on the indicated MCS table
  + No separate configuration

Proposal for agreement v005

Proposal 1:

* SCI format 2-A includes an explicit indication of HARQ feedback enabled/disabled.
* SCI format 2-B includes an explicit indication of HARQ feedback enabled/disabled.

Proposal 2:

* From L1 signaling perspective, it is supported to use Groupcast option 1 (i.e., NACK only feedback) when Zone ID or Communication range requirement is not provided.
  + Whether to support this operation is up to RAN2.

~~Proposal 3:~~

* ~~SCI includes no explicit indication for the cast type or M\_ID setting. M\_ID used for the corresponding PSFCH transmission is determined based on L1 ID(s).~~

Proposal 3’:

* SCI does not include an explicit indication for the cast type but includes an indication on whether M\_ID should be set to zero or a high layer provided parameter in the corresponding PSFCH transmission.

~~Proposal 3’’:~~

* ~~SCI includes an explicit indication for the cast type~~

Proposal 3A:

* Send an LS to RAN2 in response to R1-2003255 to inform Proposal 1, 2, 3’ (if agreed)

~~Proposal 4:~~

* ~~The CSI triggering UE sends the CQI table via PC5-RRC.~~

Proposal 4’:

* The CQI table is derived based on the indicated MCS table
  + No separate configuration

Proposal for agreement v006

Agreements:

* SCI format 2-A includes an explicit indication of HARQ feedback enabled/disabled.
* SCI format 2-B includes an explicit indication of HARQ feedback enabled/disabled.

**Conclusion:**

* It is feasible from L1 signaling perspective to use Groupcast option 1 (i.e., NACK only feedback) when Zone ID or Communication range requirement is not provided, if RAN2 decides to support this operation.
  + No action in RAN1 unless RAN2 informs RAN1 about their decision (to support or not)
  + Note that if RAN2 decides to support it, RAN1 needs to further discuss

Proposal 3’:

* SCI does not include an explicit indication for the cast type
* SCI format 2-A includes a 1-bit indication on
  + 0: M\_ID is set to zero
  + 1: M\_ID is set to the high layer provided parameter

for the corresponding PSFCH transmission.

Proposal 3’’:

* SCI format 2-A includes a 2-bit information field providing an explicit indication for the cast type

Proposal 3A:

* Send an LS to RAN2 in response to R1-2003255 to inform
  + The conclusion on Groupcast option 1 when Zone ID or Communication range requirement is not provided.
  + Agreement on Proposal 3’ and 3’’

Proposal 4’:

* The CQI table is derived based on the indicated MCS table
  + No separate configuration

Company view on Proposal 3’ and 3’’

|  |  |  |
| --- | --- | --- |
| Company | Preferred Proposal | Comment |
| Panasonic | Proposal 3’ | Proposal 3’ can reduce the number of bits in SCI format 2A. We propose following modification on proposal 3’ to explicitly describe no action for no PSFCH transmissions.  SCI format 2-A includes a 1-bit indication on   * if indication of HARQ feedback is enable,   + 0: M\_ID is set to zero   + 1: M\_ID is set to the high layer provided parameter * ​​​​​​​if indication of HARQ feedback disable,   + 0 or 1 (no information).   We can accept proposal 3’’ also for progress if majority. |
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