# **[100b-e-NR-5G\_V2X\_NRSL-SL\_PHY\_Procedure-02] SL/UL prioritization and UL/SL power sharing**

[100b-e-NR-5G\_V2X\_NRSL-PHY-Procedure-02] Email discussion/approval regarding SL/UL prioritization and UL/SL power sharing

* Prioritization in the cases mentioned in RAN2 LS ([R1-2000161](file:///C:\Users\wanshic\OneDrive%20-%20Qualcomm\Documents\Standards\3GPP%20Standards\Meeting%20Documents\TSGR1_100b\Docs\R1-2000161.zip)), i.e., “how to handle all other physical channels in UL/SL prioritization”
* Prioritization between UL TX and SL TX in case of simultaneous TXs of UL and SL across difference carriers

till 4/23, with potential TPs by 4/28 (Hanbyul, LGE)

**1. SL/UL prioritization for dropping**

Q1 (PSFCH): When PSFCH TX overlaps with UL TX, what is the prioritization rule for dropping?

- Option 1: Use the prioritization rule for UL SCH and SL SCH collision (i.e., the SL transmission is prioritized if the highest priority value of UL LCH(s) with available data is larger than the UL priority threshold and the highest priority value of SL LCH(s) with available data is lower than the SL priority threshold. Otherwise the UL transmission is prioritized.)

- Option 2: Use the LTE rule (i.e., UL TX is down-prioritized if SL-TX is higher than SL-threshold, otherwise prioritized)

- Option 3: Others (please specify it)

Q1-1: Which option do you prefer when PSFCH TX overlaps with UL TX assigned with UL SCH priority by the RAN2 agreements in R1-2000161? Feature lead understands that UL TX in this case includes UL data and UL-triggered SR.

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| Company | Preferred option | Comments |
| NTT DOCOMO | Option 1 | Following collision handling for SL data seems to be reasonable. NR-Uu supports URLLC data. In some cases, UL TX should be prioritized even when SL TX is higher than SL-threshold. |
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Q1-2: Which option do you prefer when PSFCH TX overlaps with UL TX NOT assigned with UL SCH priority by the RAN2 agreements in R1-2000161? Feature lead understands that UL TX in this case includes PUCCH with HARQ feedback for DL, CSI, LRR, PUSCH without UL-SCH, and SRS. Note that PUCCH carrying SL HARQ reporting will be discussed in a separate question Q3.

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| Company | Preferred option | Comments |
| NTT DOCOMO | Option 3 | Option 2 is applied for CSI report, LRR, PUSCH without UL-SCH, SRS.  For PUCCH with HARQ feedback for DL, the highest priority value of DL LCH(s) corresponding to the HARQ-ACK bits should be used as option 1. Otherwise, HARQ-ACK for URLLC DL data would be dropped. It is undesirable. |
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Q1-3: At least Option 1 and Option 2 require a priority of PSFCH TX. Do you agree that the priority of PSFCH TX is the highest priority of the associated PSCCH/PSSCH?

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| Company | Answer |
| NTT DOCOMO | OK |
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Q2 (S-SSB): When S-SSB TX overlaps with UL TX, what is the prioritization rule for dropping?

- Option 1: Use the prioritization rule for UL SCH and SL SCH collision (i.e., the SL transmission is prioritized if the highest priority value of UL LCH(s) with available data is larger than the UL priority threshold and the highest priority value of SL LCH(s) with available data is lower than the SL priority threshold. Otherwise the UL transmission is prioritized.)

- Option 2: Use the LTE rule (i.e., UL TX is down-prioritized if SL-TX is higher than SL-threshold, otherwise prioritized)

- Option 3: Others (please specify it)

Q2-1: Which option do you prefer when S-SSB TX overlaps with UL TX assigned with UL SCH priority by the RAN2 agreements in R1-2000161? Feature lead understands that UL TX in this case includes UL data and UL-triggered SR.

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| Company | Preferred option | Comments |
| NTT DOCOMO | Option 1 | Reason is the same as that for above. URLLC UL data should be prioritized. |
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Q2-2: Which option do you prefer when S-SSB TX overlaps with UL TX NOT assigned with UL SCH priority by the RAN2 agreements in R1-2000161? Feature lead understands that UL TX in this case includes PUCCH with HARQ feedback for DL, CSI, LRR, PUSCH without UL-SCH, and SRS. Note that PUCCH carrying SL HARQ reporting will be discussed in a separate question Q3.

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| Company | Preferred option | Comments |
| NTT DOCOMO | Option 3 | Similarly to Q1-2, Option 2 is applied for CSI report, LRR, PUSCH without UL-SCH, SRS.  For PUCCH with HARQ feedback for DL, the highest priority value of DL LCH(s) corresponding to the HARQ-ACK bits should be used as option 1. Otherwise, HARQ-ACK for URLLC DL data would be dropped. It is undesirable. |
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Q2-3: At least Option 1 and Option 2 require a priority of S-SSB TX. How is the priority of S-SSB determined?

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| Company | Answer |
| NTT DOCOMO | (Pre-)configured.  Flexibility to set priority for S-SSB is preferred since priority of SL operation and that of UL operation are up to scenarios/services/etc. |
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Q3 (PUCCH carrying SL HARQ reporting): Do you agree that the priority of PUCCH carrying SL HARQ reporting is the highest priority of the associated PSFCH?

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| Company | Answer |
| NTT DOCOMO | Not support for collision with UL.  OK for collision with SL.  The priority should be known to gNB. Otherwise, gNB needs blind decoding for many UL channels since the PUCCH may be dropped or UL channel other than the PUCCH may be dropped. In addition, UL TX for URLLC-type could be dropped due to the PUCCH for SL HARQ report. The collision is unpredictable at gNB and unavoidable. |
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Q3-1: If answer to Q3 is yes, when PUCCH carrying SL HARQ reporting overlaps with SL TX, do you agree that the one with a higher priority is transmitted?

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| Company | Answer |
| NTT DOCOMO | OK. |
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Q3-2: If answer to Q3 is yes, when PUCCH carrying SL HARQ reporting overlaps with UL TX, do you agree that the rule of UL/SL prioritization applies by treating PUCCH carrying SL HARQ reporting as SL TX?

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Q3-3: If answer to Q3 is no, what is the prioritization rule when PUCCH carrying SL HARQ reporting overlaps with SL TX and when overlaps with another UL TX?

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| Company | Answer |
| NTT DOCOMO | For collision with SL TX, our answer to Q3 is yes.  For collision with UL TX, DCI format 3\_0 includes priority indication field as DL assignment/UL grant. Based on the priority value, which transmission is prioritized is determined. |
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Q4: For handling the case where more than one SL and UL transmissions overlap, do you agree the following proposal?

* Proposal
  + For more than one SL transmissions overlapping with a UL transmission, the highest priority of SL transmissions is used for the prioritization.
  + For more than one UL transmissions overlapping with a SL transmission, the highest priority of UL transmissions is used for the prioritization.

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| Company | Answer |
| NTT DOCOMO | Direction is OK.  One comment is, the proposal should be clarified that the assumed case is collision between SL TX and UL TX, where at least either TX or RX is more than one.  Question is saying that, while proposal does not. We believe that other case does not use the above rule. |
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**2. Prioritization between UL TX and SL TX in case of simultaneous TXs of UL and SL across difference carriers**

Q5: Do you agree that the prioritization rule between UL TX and SL TX for power sharing reuses the prioritization rule for dropping?

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| Company | Answer |
| NTT DOCOMO | Support. |
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Q5-1: If the answer to Q5 is yes, do you think the prioritization behavior for power sharing needs to be captured in the physical layer specifications for the cases where RAN2 made agreements for dropping (e.g., UL SCH and SL SCH)?

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| Company | Answer |
| NTT DOCOMO | Should be captured. |
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Q5-2: If the answer to Q5 is no, what is the prioritization rule for power sharing?

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