# **[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%3A%5CUsers%5Cwanshic%5COneDrive%20-%20Qualcomm%5CDocuments%5CStandards%5C3GPP%20Standards%5CMeeting%20Documents%5CTSGR1_100b%5CDocs%5CR1-2000161.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 |
| Huawei, HiSicon | Option 3 | In NR Uu, the PHY of the UE cannot realize the priority of UL-SCH, because it is a logical channel priority held in MAC. However, non-fallback DCI formats in Rel-16 have a priority indicator for a PUSCH or a PUCCH in dynamic grants, and a similar field is provided in configured grants. This priority indicator indicates whether the priority of the PUCCH/PUSCH is high (e.g., URLLC) or low (e.g. eMBB) in PHY prioritization/multiplexing handling procedure.We think that any UL TX indicated as “high priority” should be prioritized over SL TX. Otherwise, LTE solution can be reused.**The proposed scheme for option 3:** UL TX is prioritized if the value of priority index of the PUCCH or PUSCH as indicated by the “Priority indicator” field in the associated DCI or provided by the associated configured grant is 1 (if provided); Otherwise, LTE rule is used.The same rules of prioritization are also applied to collision between UL Tx and SL Tx including PSSCH or PSSCH + PSFCH.  |
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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 |
| Huawei, HiSilicon | Option 3 | As in Q1-1, we think that any UL TX associated with the “high priority” indication in DCI or CG should be prioritized over SL TX. These include HARQ feedback for DL, CSI, and LRR. Otherwise, LTE solution can be reused. |
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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 |
| Huawei, HiSilicon | Yes |
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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 |
| Huawei, HiSilicon | Option 3 | Since S-SSB TX is not an emergency, UL TX should be always prioritized over S-SSB TX.This is also equivalent to taking option 2, and defining that S-SSB priority is always higher than SL-threshold. |
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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 |
| Huawei, HiSilicon | Option 3 | See comments in Q2-1. |
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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 |
| Huawei, HiSilicon | UL TX is always prioritized over S-SSB TX i.e. the priority value of S-SS/PSBCH block or LTE SLSS/PSBCH should be always larger than the SL priority threshold. |
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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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| Huawei, HiSilicon | Yes.  |
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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 |
| Huawei, HiSilicon | Yes. It shall be based on direct comparison. |
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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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| Company | Answer |
| Huawei, HiSilicon | Different cases of UL Tx should be considered separately. For the case PUCCH carrying SL HARQ overlaps with PUCCH or PUSCH without UL-SCH, rule of UL/SL prioritization is applied. For the one PUCCH including SL HARQ overlaps with PUSCH with UL-SCH, the SL HARQ should be multiplexed on the PUSCH.Another case PUSCH with SL HARQ overlaps with SL Tx should be also discussed |
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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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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 |
| Huawei, HiSilicon | Yes |
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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 |
| Huawei, HiSilicon | We agree to the extent that this is how the relative priorities are determined, e.g. to know when SL or UL (or which among each) has the higher priority. The specific power sharing behaviors are up to UE. |
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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 |
| Huawei | No, the LS from RAN2 does not ask us to specify their agreements. RAN1 needs to specify behaviors for the cases that RAN2 did not cover. |
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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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