RAN1-110bis-e-NWM-AI5-LSs-01 - Version 0.0.5

RAN1

https://nwm-trial.etsi.org/#/documents/8224

3GPP TSG RAN WG1#110bis-e R1-2210419

e-Meeting, October 10th – 19th, 2022

Source: Moderator (vivo)

Title: Moderator Summary of [110bis-e-AI5-LSs-01] Email discussion on resource pool index in DCI Format 3_0

Agenda item: 5

Document for: Discussion and Decision

1 Introduction

This document is to summarize the discussion of the following email thread.

[110bis-e-AI5-LSs-01] Email discussion on resource pool index in DCI Format 3_0 by Oct 14 – Siqi (vivo)

Companies are highly appreciated providing your inputs before the 1st checkpoint for the 1st round discussion. A GTW session in Oct 12th may be allocated to handle this issue.

- 1st checkpoint: 11:59 AM UTC, Oct 11

2 Discussion

In the LS sent from RAN2 [1], RAN2 informs the issue that the current DCI Format 3_0, as specified in TS 38.212, cannot schedule any resource in the pool(s) indicated by *sl-DiscTxPoolScheduling* that is introduced in R17. And RAN2 agreed that the parameter "*I*" related to the "Resource pool index" field in DCI Format 3_0 in TS 38.212 is the number of resource pools for transmission configured by the higher layer parameter *sl-TxPoolScheduling*, if configured, and *sl-DiscTxPoolScheduling*, if configured. Also, according to TS 38.331, the total number of the resource pools configured in *sl-TxPoolScheduling* and *sl-DiscTxPoolScheduling* is no larger than 8.

A list of contributions [2]~[13] figures out that RAN1 spec changes are needed to capture how to interpret the field "Resource pool index" when *sl-DiscTxPoolScheduling* is configured. However, as pointed out in [3] [8], the relationship between the value of the "Resource pool index" field in DCI Format 3_0 and the scheduled pool is not clear if both *sl-TxPoolScheduling* and *sl-DiscTxPoolScheduling* are configured. In R16 V2X, "Resource pool index" refers to the index of a Tx pool in the list of pools provided by *sl-TxPoolScheduling*.

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Given that "Resource pool index" associates two types of Tx pools, it should be clarified how to determine the resource pool index when two lists (i.e., *sl-TxPoolScheduling* and *sl-DiscTxPoolScheduling*) are configured. One simple solution is to first number the pools provided by *sl-TxPoolScheduling*, and continue with the ones provided by *sl-DiscTxPoolScheduling*.

Alternatively, as proposed in [8], "Resource pool index" can be changed to directly indicate the resource pool ID(i.e., *sl-ResourcePoolID*), which is a unique identifier for a Tx pool, instead of the index in the list(s) configured. [8] also suggests clarifying the definition of "Resource pool index" in 38.331.

In summary, there are two options:

- **Option1. "Resource pool index" in a DCI format 3_0 always refers to the index of a Tx pool:**
    - When only *sl-DiscTxPoolScheduling* is configured, "Resource pool index" in a DCI format 3_0 refers to the index of a Tx pool in the Tx pools configured by *sl-DiscTxPoolScheduling*. When both *sl-TxPoolScheduling* and *sl-DiscTxPoolScheduling* are configured, "Resource pool index" in a DCI format 3_0 refers to the index of a Tx pool in all the Tx pools configured by *sl-TxPoolScheduling* and *sl-DiscTxPoolScheduling*, and the indexes of the Tx pools are determined based on the following order:
        - first, in increasing order of Tx resource pools provided in *sl-TxPoolScheduling*;
        - second, in increasing order of Tx resource pools provided in *sl-DiscTxPoolScheduling*.
- **Option2."Resource pool index" in a DCI format 3_0 refers to the pool ID(i.e.,*sl-ResourcePoolID*) of a Tx pool**

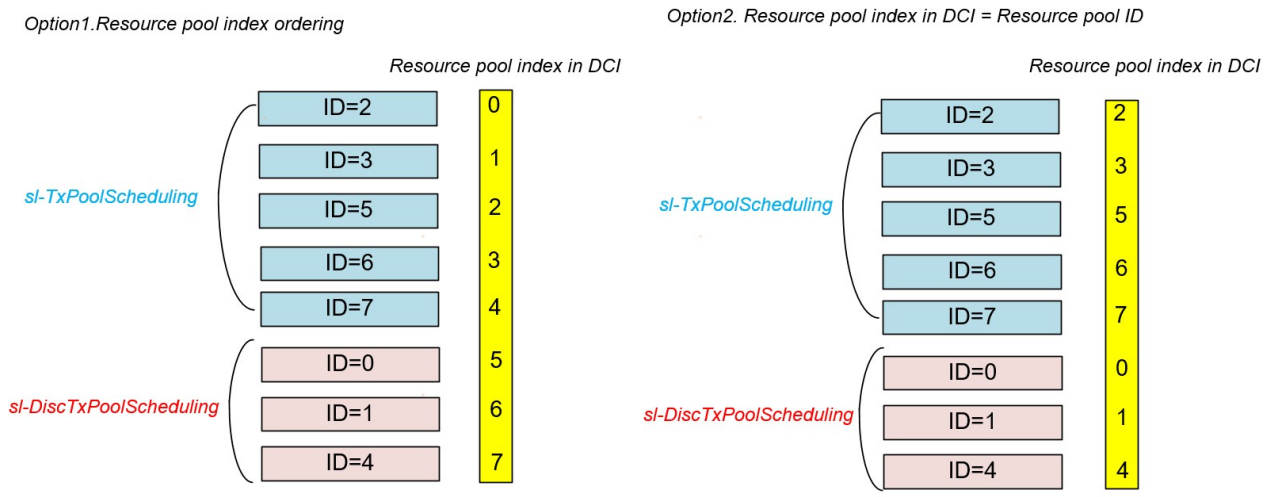

Figure 1: Figure 1. Example of option1 and option2

An example of option1 and option2 can be found in Figure1. It should be noted that the resource pool ID of Tx pools included in *sl-TxPoolScheduling* and the ones included in *sl-DiscTxPoolScheduling* should be non-overlapped.

Option1 is compatible with the design of "Resource pool index" agreed in R16 V2X, while option2 changes the definition of "Resource pool index" field in DCI Format 3_0. Especially when only *sl-TxPoolScheduling*

is configured, the UE behavior is changed between different releases, which generally is undesirable. Moreover, option1 may save more DCI bits than option2 in some cases. For example, when 4 Tx pools are provided but one of the Tx pools has been assigned with *sl-ResourcePoolID*>3, option2 would consume more bit than option2 in DCI.

On the other hand, option 2 has the advantage of simplicity over option 1, since it does not require a new rule for the index order of the Tx pool when two types of pools are configured for a mode-1 UE.

For option1, it is also proposed in [8] that the order of index can be up to RAN2. However, this order should be known by the UE to decode this DCI. Then, either a dedicated RRC parameter is needed to configure the order to UE, which is not desirable at this stage, or a fixed order should be specified in RAN2 specification. In the latter case, considering that the DCI processing is in the physical layer, it seems preferable to capture the order rule in RAN1 instead of RAN2, as the description of the pool index is defined in 38.212 since R16. The following ***change(underlined and bolded)*** is provided for reference.

Table 1: Proposed spec change1 for "Resource pool index" in 38.212

- Resource pool index –□log_2I □ bits, where I is the number of resource pools for transmission configured by the higher layer parameter sl-TxPoolScheduling**, if configured, and sl-DiscTxPoolScheduling, if configured. If both sl-TxPoolScheduling and sl-DiscTxPoolScheduling are provided, the UE determines the resource pool index in the following order:** **- first, in increasing order of resource pools provided in sl-TxPoolScheduling;** **- second, in increasing order of resource pools provided in sl-DiscTxPoolScheduling.**

It should be noted that RAN1 spec change is inevitable regardless of which option is taken because DCI size alignment among DCI format 3_0s scheduling different resource pools should also take the dedicated discovery pool into account. The following **change(underlined and bolded)** is provided for reference.

Table 2: Proposed spec change2 for size alignment in 38.212

If multiple transmit resource pools are provided in *sl-TxPoolScheduling* **if configured, and *sl-DiscTxPoolScheduling* if configured**, zeros shall be appended to the DCI format 3_0 until the payload size is equal to the size of a DCI format 3_0 given by a configuration of the transmit resource pool resulting in the largest number of information bits for DCI format 3_0.

2.1 Round1

From the submitted contribution, moderator observes that most companies proposed changes with keeping the "Resource pool index" as the pool index, so moderator suggest to go with **option1**. Moderator would like to ask companies to provide feedback if any on each of the following proposals. If you disagree with a certain proposal, please provide the reason or suggestions on how to move forward.

Once we have reached a consensus on the proposals, moderator will prepare a draft LS.

Proposal 1: "Resource pool index" in a DCI format 3_0 refers to the index of a Tx pool when at least *sl-DiscTxPoolScheduling* is configured.

Feedback Form 1: Feedback form for proposal1

1 – NTT DOCOMO INC.

Either would work, then our preference is Option 2 for simplicity and also for avoiding further spec update in future release. If new type of resource pool is introduced, further update of RAN1 spec would be unnecessary in Option 2. We do not think we can say that Option 1 is compatible since anyhow spec update is necessary and thus UE behavior becomes different.

(But not strong view. If it is found that there is big issue in Option 2, we are fine with Option 1.)

2 – Guangdong OPPO Mobile Telecom.

In our view, the current spec wording is clear as it refers to "... resource pools for transmission configured by the higher layer ...". There is no need to make any change or try to further clarify the meaning.

3 – GOHIGH DATA NETWORKS TECH.

We are not sure why the porposal just mention "**when at least *sl-DiscTxPoolScheduling* is configured** ", it is also used for when ***sl-TxPoolScheduling* is configured** .

and we prefer option 1, and pool ID order is configured by RAN2, from RAN1 perspective, there is no need to mention the pool ID order.

4 – Ericsson GmbH

In our view, there is no need to mention the operation the UE will use to determine resource pool order.

We simply need to include the changes defined in Table 2 in order to include the resource pools for discovery. We should not change the behavior or design defined in Rel-16.

5 – Qualcomm Incorporated

We agree with CATT's comment that the proposal should also include sl-TxPoolScheduling. One potential wording (based on the suggested example for Option 1) could be:

- "Resource pool index" in a DCI format 3_0 refers to the index of a Tx pool in either sl-TxPoolScheduling or sl-DiscTxPoolScheduling, when only one of the parameters is configured, or to index of a Tx pool in the concatenation of sl-TxPoolScheduling and sl-TxDiscPoolScheduling when both are configured.
- A UE capability is introduced to indicate that the UE supports "resource pool index" supports indicating a resource pool index in sl-TxDiscPoolScheduling

There is a number of issues with using the resource pool ID instead of its index. The first is that the ID is not restricted to be <= number of resource pools in sl-TxPoolScheduling (or sl-TxDiscPoolScheduling) and might not indexable by the number of bits available in the "resource pool index" field. For example sl-TxPoolScheduling could contain two resource pools, making "resource pool index" a single bit, but one of pools has the ID 14. Addressing this issue requires Introducing a restriction that the ID is smaller than the pool list size, which is not needed by Option 1. Another issue is the impact on implementation of Option 2 is even larger than Option 1 in that it would also affect UEs that do not support discovery pools.

We raise the issue of UE capability indication in our discussion contribution R1-2209952. Either option is an NBC change and should be accompanied by a UE feature so that the network is aware which version of DCI interpretation is implemented by the UE.

6 – Intel Korea

We are fine with option 1 and agree with Qualcomm and CATT's comments related to option 2, which may be a non-backward compatible solution.

7 – ZTE Wistron Telecom AB

Either option 1 or option 2 works, but we slightly prefer option 2 for the considering on spec. impact. For option 1, it can be handled by RAN1 only. Whilst for option 2, we think the order should be determined by RAN2 and there may be some spec. impacts on RAN2. Regarding the resource pool ID issue, according to TS 38.331, the total number of the resource pools configured in *sl-TxPoolScheduling* and *sl-DiscTxPoolScheduling* is no larger than 8, then it can be up to network implementation to ensure the maximum resource pool ID is not larger than 8.

8 – vivo Communication Technology

A quick question to the companies commenting that no need to mention the operation to determine resource pool order:

Assuming that 4 SL communication pools and 2 SL discovery pools are configured to a mode-1 UE, according to the RRC, there are two lists of pools, sl-TxPoolScheduling (with pool index 0,1, 2, 3) and sl-DiscTxPoolScheduling (with pool index 0, 1) respectively, configured to the UE. Then, the size of "Resource pool index" in DCI is 6=2+4. For the codepoint of the "Resource pool index" (0, 1, …, 5), how can the UE know which pool is referred by each of the codepoint, it the order of the two pool lists are not defined?

For example, when the "Resource pool index" indicates a value of '1' to the UE, how can the UE know which resource pool is referred to? Is it the 2nd pool in the sl-TxPoolScheduling list, or the 2nd pool in the sl-DiscTxPoolScheduling list? How about the case when the field "Resource pool index" a value of '5', given that for each of the configured pool list there is no any pool having a pool index of '5'?

9 – Nokia UK

We prefer option 1 since it means that the behaviour when only sl-TxPoolScheduling is configured remains unchanged compared to Rel-16.

Agree with CATT that the proposal text needs to mention both sl-TxPoolScheduling and sl-DiscTxPoolScheduling.

Regarding Qualcomm's argument that a new UE capability indication is required:

Why are the existing indications supportedBandCombinationListSL-NonRelayDiscovery and supportedBandCombination RelayDiscovery not sufficient? If the UE does not indicate support for discovery using at least one of these indications them presumably the gNB won't include sl-DiscTxPoolScheduling in the dedicated configuration and there'll be no problem.

10 – SAMSUNG R&D INSTITUTE JAPAN Either option works and we slightly prefer option 1 for backward compatibility.
11 – Huawei Tech.(UK) Co.. Ltd ok
12 – Huawei Tech.(UK) Co.. Ltd This is OK, but need to be the ”total” number of resource pools, as otherwise it is still unclear.

Proposal 2:

- **When both *sl-TxPoolScheduling* and *sl-DiscTxPoolScheduling* are configured, the indexes of the configured Tx pools are determined based on the following order:**
  - **first, in increasing order of Tx resource pools provided in *sl-TxPoolScheduling*;**
  - **second, in increasing order of Tx resource pools provided in *sl-DiscTxPoolScheduling*.**
- **And the proposed spec change1 in table1 is adopted to capture the index order.**

Feedback Form 2: Feedback form for proposal2

1 – Guangdong OPPO Mobile Telecom. It is unclear to us at this stage as to why do we need to concern ourselves with how a sidelink TX resource pool is indexed in 38.212. In our understanding, the indexing method aspect can be left to RAN2 to determine. Currently in 212, even when only sl-TxPoolScheduling is configured, there is no text to describe how the resource pool is indexed. I think we have gone beyond what is asked by RAN2.
2 – Qualcomm Incorporated Generally, we’re ok with the proposal but we note the UE capability issue we mentioned in our reply to Q1
3 – Intel Korea We agree with OPPO’s comments and we also think that this aspect can be left up to RAN2.
4 – ZTE Wistron Telecom AB We agree with OPPO and intel’s comments. If option 1 is adopted, we think the order should be determined by RAN2.
5 – Nokia UK OK

6 – Huawei Tech.(UK) Co.. Ltd Let RAN2 choose to specify a single order. No (pre-)configuration is necessary.

Proposal 3: Adopt the proposed spec change2 in table2 for size alignment.

Feedback Form 3: Feedback form for proposal3

1 – Guangdong OPPO Mobile Telecom. This is fine to us.
2 – Qualcomm Incorporated An update to DCI 3_0 alignment is necessary.
3 – Intel Korea Ok with FL's proposal.
4 – ZTE Wistron Telecom AB Fine with FL's proposal.
5 – Nokia UK The proposed text seems ambiguous: If both sl-TxPoolScheduling and sl-DiscTxPoolScheduling are configured then one reading of the proposed text is that the condition applies only if multiple transmit resource pools are provided by each of these parameters (so the condition would not apply e.g. if sl-TxPoolScheduling provides 1 TX pool and sl-DiscTxPoolScheduling provides multiple TX pools).
6 – Huawei Tech.(UK) Co.. Ltd This is OK, but need to be the "total" number of resource pools, as otherwise it is still unclear.

2.2 Round2

~~Based on the first round of responses, proposal3 seems agreeable.~~

~~**Proposal 3(offline consensus): Adopt the spec change2 for size alignment in 38.212**~~

2.2.1 Option1 and option2

With regard to option1 and option2, 2 companies support option2 as they felt option2 is more straightforward, but they seem also ok to accept option1. 8 companies support option1.

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As commented by Qualcomm and moderator, option2 has several issues:

1. **Ambiguity on field interpretation in R17**: In R16, 'Resource pool index' is the index of a pool in a pool list. If this parameter is changed to indicate pool ID in R17, it leads to ambiguity in the field interpretation for R17 UE configured with *sl-TxPoolScheduling* only. For example, for an R17 UE with *sl-TxPoolScheduling* only, when it receives a DCI carrying Resource pool index=2, it is not clear whether the DCI is to schedule the pool with index=2 in *sl-TxPoolScheduling* as specified in R16 or the pool with *sl-ResourcePoolID*=2 as specified in R17.

    a) To resolve the ambiguity, a RRC parameter or additional rule is needed to inform the UE which interpretation to take. For example, it can be specified in the spec that a R17 UE always interprets the field as ID, regardless of whether the dedicated discovery pools are provided or not.

2. **Additional restriction on the value configured pool ID:** If option2 is adopted, the value of IDs of configured pools for mode-1 scheduling **must be less than the total number of resource pools configured** by the list(s), otherwise, the bit size required to indicate the pool ID will be larger than the number of configured resource pools, and "*I*" should be changed to the number of bits to indicate the maximum value of *sl-ResourcePoolID* of all the resource pool configured by the list(s), which is contradictory with RAN2 LS that 'parameter *I* related to the "Resource pool index field in DCI Format 3_0 in TS 38.212 is the number of resource pools for transmission'. Besides, there is no such restriction in R16.

Regarding the comment on why '*sl-TxPoolScheduling* only case' is included in proposal 1, moderator was considering that the existing spec already specifies that the parameter is an index when there is only *sl-TxPoolScheduling*, so clarification is needed only for the case ' when at least *sl-DiscTxPoolScheduling* is configured'. However, several companies have argued that the *sl-TxPoolScheduling* should be included, and the proposal is updated as follows.

2.2.1.1 Proposal 1(I)

Please check the moderator's reply in 2.2.1 to the companies' comments.

Proposal 1(I):

"Resource pool index" in a DCI format 3_0 refers to the index of a configured Tx pool when at least one of sl-TxPoolScheduling and sl-DiscTxPoolScheduling is configured.

Feedback Form 4: Feedback form for proposal1(I)

1 – Huawei Tech.(UK) Co.. Ltd Agree.
2 – Guangdong OPPO Mobile Telecom. I am not sure the meaning or intention of this proposal. Is this meant to be a TP for the DCI format 3_0 in 38.212, or a clarification of what is the common understanding of the current resource pool indexing method when one or two pool lists are configured? For either intention, we don't think it is necessary. In our understanding, there is already a common understanding in RAN2 how the pools will be indexed. At least, there is no FFS in the LS to RAN1 or a request to RAN1 to define a indexing method. This aspect

can be left to RAN2 to decide and captured in RAN2 spec.

3 – Intel Ireland

Agree with FL's proposal.

4 – vivo Communication Technology

Reply to OPPO

This proposal is to confirm that the DCI should provide an index instead of a pool ID. And yes, if companies are ok to clarify the indexing of pools when two lists are configured in RAN1 spec, there would be a TP for 38.212. If the conclusion is to clarify the indexing in RAN2 spec, there would be additional agreement or request to RAN2 to define this rule.

Regarding OPPO's comment, 'there is already a common understanding in RAN2 how the pools will be indexed', moderator has a different view**, Please check figure 2 and the discussion in R2-2208934**, **it can be seen that pool indexing for two lists had been discussed in RAN2 last meeting, but the companies commented that this indexing details should be discussed in RAN1. So in the moderator's view, this issue is still open.** As you said RAN2 has reached a common understanding on this aspect, could you please kindly show the relevant agreements or spec text?

5 – Qualcomm Incorporated

We're ok with the principle. The proposal would be clearer if it defined what the index points to:

"Resource pool index" in a DCI format 3_0 refers to the index of a configured Tx pool ~~**when at least one of**~~ **in** sl-TxPoolScheduling and**/or** sl-DiscTxPoolScheduling **when at least one of them** is configured**.**

6 – Qualcomm Incorporated

We would also like to discuss the UE capability part. To answer Nokia's question in the previous round, the UE could be implemented according to v17.3 of spec. In which case it would support discovery pools, but not the signaling being introduced here and will only go into specifications starting in v17.4

7 – Qualcomm Incorporated

Please ignore our reply #6. It should go in Proposal 5

8 – Guangdong OPPO Mobile Telecom.

Currently, the 'Resource pool index' field in 38.212 is described as: **Resource pool index – ceil (log_2 *I*) bits, where *I* is the number of resource pools for transmission configured by the higher layer parameter *sl-TxPoolScheduling*.** It does not mention the field refers to the index of a configured Tx pool, although logically it would be. Going forward, in our view, we only need to include an additional higher layer parameters*sl-DiscTxPoolScheduling* to this parameter field description. Whether it is a pool index, pool ID or it has a dependency on the order in which the pools are configured, these can be decided by RAN2 without mentioning them in DCI format 3_0. Regarding the request from RAN2 in the LS, they have only mentioned that currently the "Resource pool index" field is unable to refer to any pool configured by *sl-DiscTxPoolScheduling*, and request to make necessary spec changes and provide feedback (if any). Since they have not mentioned about the indexing method or request for us to discuss/work on this, we should just do what they asked. They can decide the rest.

Regarding there is already a common understanding on the indexing method in RAN2, it is according to our understanding. The cited text below from RAN2 is about no consensus to include further description from vivo. And we don't think further change to RAN2 spec should be discussed in RAN1.

9 – ZTE Wistron Telecom AB

We share the same view with OPPO. We can live with this proposal if the order is captured in RAN2, an example in TS 38.331 could be simply to say that:

When both *sl-TxPoolScheduling* and *sl-DiscTxPoolScheduling* are configured, the value of "Resource pool index in DCI Format 3_0 is indexed sequentially from 0 in *sl-TxPoolScheduling* and *sl-DiscTx-PoolScheduling*.

In RAN1 spec, only the update on the description of the number of resource pools 'I' in DCI Format 3_0 is expected.

10 – Ericsson GmbH

We are in principle OK with the intention of the proposal. However, we think the wording is unclear. We prefer a formulation similar to the proposed by Qualcomm in their first comment.

11 – Nokia UK

OK. The wording is a bit unclear, but it becomes clear with the later proposals, so we can live with the current wording.

2.2.2 Order of two lists

Some companies commented that they are not clear why the order needs to be specified for option1.

In R16, an index value uniquely corresponds to a pool of a list (in moderator's understanding, the index can be an internal number within the list). But when both lists are configured, the two lists need to be cascaded as per RAN2 LS, **and the order of concatenation of the two lists needs to be specified**, otherwise, it is ambiguous whether a certain index value corresponds to a pool in the discovery pool list or a pool in the normal pool list (An example is given in the feedback form of proposal1 in round). But the moderator is also aware that there may be no need to define ordering within the list, the two sentences '…**in increasing order of resource pools provided in**' in proposed spec change1 can be removed.

Regarding the order of concatenation, either indexing sl-DiscTxPoolScheduling after sl-TxPoolScheduling, or indexing sl-TxPoolScheduling after sl-DiscTxPoolScheduling would work.

Several companies have commented that this order could be specified in RAN2 rather than RAN1, so moderator would therefore like to check companies' views on the following alternatives based on an assumption that sl-TxPoolScheduling is cascaded after sl-DiscTxPoolScheduling for determining the index.

- Alt1. With regard to the interpretation of 'Resource pool index' in DCI format 3-0, clarify the order of concatenation between sl-TxPoolScheduling and sl-DiscTxPoolScheduling in RAN1 spec
    - For example, alt1 leads to spec change in 38.212 as below

      "- Resource pool index –□log_2I □ bits, where *I* is the number of resource pools for transmission configured by the higher layer parameter *sl-TxPoolScheduling*, **if configured, and sl-DiscTxPoolScheduling, if configured. If both sl-TxPoolScheduling and**

sl-DiscTxPoolScheduling are provided, the UE determines the resource pool index by assuming that sl-TxPoolScheduling is first indexed, and then sl-DiscTxPoolScheduling."

- Alt2. With regard to the interpretation of 'Resource pool index' in DCI format 3-0, clarify the order of concatenation between sl-TxPoolScheduling and sl-DiscTxPoolScheduling in RAN2 spec (e.g., in field description of sl-TxPoolScheduling or sl-DiscTxPoolScheduling in 38.331)

  - For example, alt2 may lead to spec change in 38.331 as below

    "sl-TxDiscPoolScheduling

    When both sl-TxPoolScheduling and sl-DiscTxPoolScheduling are configured, 'Resource pool index' in DCI format 3-0(TS 38.212 [17], clause 7.3.1.4.1) refers to the index of a resource pool, UE determines the resource pool index by assuming that sl-TxPoolScheduling is first indexed, and then sl-DiscTxPoolScheduling"

It should be noted that changes based on alt1 for RAN1 spec were discussed at the last RAN2 meeting, and some companies commented that **these DCI details should be discussed by RAN1**. The relevant discussion can be found in **R2-2208934 [AT119-e][418][Relay] Remaining proposals on discovery and (re)selection. Given this situation, in moderator's understanding, it is prefered to fix this issue in RAN1 spec.**

- Beside the change mentioned by OPPO, vivo further suggests adding the following description. Some companies think further change can be discussed by RAN1.

  ****

  If both sl-DiscTxPoolScheduling and sl-TxPoolScheduling are configured, the resource pool(s) in sl-TxPoolScheduling are indexed first, and then the resource pool(s) in sl-DiscTxPoolScheduling.

  ****

Figure 2: Conclusion on the order of two lists in RAN2

2.2.2.1 Proposal 4

Please check the moderator's reply in 2.2.2 on why clarification of the concatenation order between the lists is needed

Proposal 4: For determining the interpretation of 'Resource pool index' in a DCI format 3-0 in the case when both *sl-TxPoolScheduling* and *sl-DiscTxPoolScheduling* are configured:

- **Alt1. clarify the order of concatenation between sl-TxPoolScheduling and sl-DiscTxPoolScheduling in RAN1 spec.**
- **Alt2. clarify the order of concatenation between sl-TxPoolScheduling and sl-DiscTxPoolScheduling in RAN2 spec.**

Feedback Form 5: Feedback form for proposal4

1 – Huawei Tech.(UK) Co.. Ltd

Leave it up to RAN2 to specify. There is no need for a RAN1 decision on this; the operation of the physical is not affected by whichever ordering choice is made.

2 – Guangdong OPPO Mobile Telecom.

As commented in the last round and in the first table of this round 2, the indexing method should be decided by RAN2. The configuration of the resource pools, the index of the resource pools and the order in which they are configured are all higher layer aspects. We don't need to further discuss these as they are transparent to L1.

3 – Intel Ireland

Would be better if this can be implemented by RAN2 as otherwise future changes to this would trigger a similar discussion again. If implemented in RAN1 this might lead to unnecessary dependency of RAN1 specification on RAN2 discussion.

4 – vivo Communication Technology

This proposal is to confirm that the DCI should provide an index instead of a pool ID . And yes, if companies are ok to clarify the indexing of pools when two lists are configured in RAN1 spec, there would be a TP for 38.212. If the conclusion is to clarify the indexing in RAN2 spec, there would be additional agreement or request to RAN2 to define this rule.

Regarding OPPO's comment, 'there is already a common understanding in RAN2 how the pools will be indexed', moderator has a different view**, Please check figure 2 and the discussion in R2-2208934**, **it can be seen that pool indexing for two lists had been discussed in RAN2 last meeting, but the companies commented that this indexing details should be discussed in RAN1. So in the moderator's view, this issue is till open.** As you said if RAN2 has reached a common understanding on this aspect, could you please kindly show the relevant agreements or spec text?

5 – Huawei Tech.(UK) Co.. Ltd

To followup on the excerpt of a company's views in RAN2 provided by the moderator. It does not show a consensus view in RAN2, and is not mentioned in the LS they sent us. Thus we do not believe it can be inferred there is such a "preference" in RAN2.

Therefore, our view remains as indicated earlier, i.e. that since the operation of the physical layer is not affected by the choice, we can leave it to RAN2 to decide. This is a similar point made by others that we do not need to create a dependency between layers here.

6 – vivo Communication Technology

[Please ignore the moderator's first comment in this table, it was supposed to be in response to OPPO's comment on proposal1(I)]

7 – Qualcomm Incorporated We prefer to have the order handled in RAN1, but would be ok leaving it to RAN2. Separate from the order, there is the issue of DCI field size. Would that be part of this proposal or Proposal 1(I)?
8 – ZTE Wistron Telecom AB We have the same understanding with Huawei, so we suggest leaving it up to RAN2.
9 – SHARP Corporation Agree with other companies that this should be left up to RAN2.
10 – GOHIGH DATA NETWORKS TECH. Agree with other companies, it is better to leave it by RAN2.
11 – Ericsson GmbH Alt.2 this should be left to be defined by RAN2.
12 – Nokia UK Either option works, OK to leave it up to RAN2

2.2.2.2 Proposal 5

One company commented additional capability is needed. As the agreement to schedule the discovery pool by DCI was reached in the August RAN2 meeting and it was clarified by RAN chair that the September TS version shall be regarded as the Rel-17 baseline, thus moderator considers this change has no NBC issue as it can be predicted that the interpretation of DCI content needs to be modified. Besides, considering that the agreement that DCI needs to schedule the dedicated discovery pool was made by RAN2, and RAN1 is not included in the WID of R17 SL relay, it should be up to RAN2 to decide whether to introduce a corresponding UE capability.

Proposal 5: Whether a new UE capability is needed to indicate that UE supports DCI format 3_0 scheduling on dedicated discovery resource pools should be up to RAN2.

Feedback Form 6: Feedback form for proposal5

1 – Huawei Tech.(UK) Co.. Ltd This seems to expand beyond what we were asked to deal with. Presumably, if a capability is needed, RAN2 will be able to handle it or they would have requested further action from RAN1.
2 – Guangdong OPPO Mobile Telecom. This can be also discussed in RAN2 directly. UE capability is in RAN2 spec and SL discovery is a RAN2 feature.

3 – Intel Ireland Agree.
4 – Qualcomm Incorporated To answer Nokia's question in the previous round, the UE could be implemented according to v17.3 of spec. In which case it would support discovery pools, but not the signaling being introduced here and will only go into specifications starting in v17.4. We think the capability should be introduced in RAN1 since it's a capability about DCI interpretation and size, which is a RAN1 issue.
5 – ZTE Wistron Telecom AB Agree.
6 – SHARP Corporation Agree.
7 – GOHIGH DATA NETWORKS TECH. Agree
8 – Ericsson GmbH Agree.
9 – Nokia UK OK

2.3 Round3

Based on discussions so far, no technical argument was raised on the issue of how to indicate a specific pool by 'Resource pool index' when both *sl-TxPoolScheduling* and *sl-DiscTxPoolScheduling* are configured. All companies (12) agreed that the indexing rule can be determined by RAN2. 1 company commented that RAN2 already has a common understanding of the ordering between the two lists, but no relevant agreement or spec text has been founded, while other companies support proposal4 to implement this order in RAN2 spec (i.e., alt2).

2.3.1 Proposal 1(II) with TPs

To answer Qualcomm's question: proposal1 is related to the DCI field size issue, it clarifies the field should be index with the new list, and moderator has prepared a TP based on this proposal.

Moderator also noted that two other comments on the previous spec change2 had been overlooked: One from Huawei suggests the use of "total" and one from Nokia points out that the text might exclude the case where one of the two lists has only one pool.

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Proposal1 and Proposal3 are merged for simplicity.

@Qualcomm: I removed 'and' from your proposal as the index points to a pool from one of the lists.

@all: changes for DCI size alignment and field size are merged as below. If the NWM is not convenient for you to check the change mark, you can find a draft CR doc including the same changes on the FTP: draft/5(Inc_LS)/[110bis-e-AI5-LSs-01].

Proposal 1(II)

- **"Resource pool index" in a DCI format 3_0 refers to the index of a configured Tx pool ~~when at least one of~~ in sl-TxPoolScheduling ~~and/~~or sl-DiscTxPoolScheduling when at least one of them is configured.**
    - **Adopt the proposed spec change3 in 38.212**

========== proposed spec change3 starts==========

7.3.1.4.1 Format 3_0

DCI format 3_0 is used for scheduling of NR PSCCH and NR PSSCH in one cell.

The following information is transmitted by means of the DCI format 3_0 with CRC scrambled by SL-RNTI or SL-CS-RNTI:

- Resource pool index – bits, where *I* is the **total** number of resource pools for transmission configured by the higher layer parameter *sl-TxPoolScheduling*, **if configured, and *sl-DiscTxPoolScheduling*, if configured**.

****unchanged part omitted****

If ~~multiple transmit resource pools are~~**the total number of transmit resource pools** provided in *sl-TxPoolScheduling*, **if configured, and *sl-DiscTxPoolScheduling*, if configured, is larger than one**, zeros shall be appended to the DCI format 3_0 until the payload size is equal to the size of a DCI format 3_0 given by a configuration of the transmit resource pool resulting in the largest number of information bits for DCI format 3_0.

If the UE is configured to monitor DCI format 3_1 and the number of information bits in DCI format 3_0 is less than the payload of DCI format 3_1, zeros shall be appended to DCI format 3_0 until the payload size equals that of DCI format 3_1.

========== proposed spec change3 ends==========

Feedback Form 7: Feedback Form for Proposal1(II) and TPs.

1 – Huawei Tech.(UK) Co.. Ltd

OK to both.

(There is a math symbol missing before the word "bits" in the TP, but no matter since this will be fine in

the resultant CR).
2 – Qualcomm Incorporated We're ok with the proposal and TP
3 – SHARP Corporation OK
4 – NTT DOCOMO INC. OK
5 – Guangdong OPPO Mobile Telecom. OK for us
6 – ZTE Wistron Telecom AB OK
7 – ZTE Wistron Telecom AB OK
8 – GOHIGH DATA NETWORKS TECH. OK
9 – Ericsson GmbH OK
10 – Nokia UK OK
11 – Intel Korea We agree with both proposal and TP.

2.3.2 Proposal 4(I)

Based on the discussion, moderator thinks the group has a common understanding that the ordering should be specified by RAN2 for determining the scheduled pool, but 2 companies expressed concerns about requesting RAN2 spec change in RAN1.

To address these concerns, moderator revisited the proposal to reflect RAN1's common understanding.

@all: please if this is acceptable

Proposal 4(I)

- **For determining the scheduled Tx resource pool corresponding to the 'Resource pool index' in a**

DCI format 3-0 when both sl-TxPoolScheduling and sl-DiscTxPoolScheduling are configured, it is up to RAN2 to decide whether/how to specify the indexing of the configured Tx resource pools.

Feedback Form 8: Feedback Form for Proposal8 and TPs.

1 – vivo Communication Technology there is a typo of table name, should be 'feedback form for proposal4'
2 – Huawei Tech.(UK) Co.. Ltd Yes, this is acceptable to us.
3 – SHARP Corporation OK
4 – NTT DOCOMO INC. OK
5 – Guangdong OPPO Mobile Telecom. OK for us
6 – ZTE Wistron Telecom AB OK
7 – GOHIGH DATA NETWORKS TECH. OK
8 – Ericsson GmbH OK
9 – Nokia UK OK
10 – Intel Korea OK

2.3.3 Proposal 5

Regarding the additional capability, 8 companies agreed that this should be discussed in RAN2, 1 company commented this in RAN1 as it is related to DCI. From RAN1's perspective, although this is related to DCI, RAN2 can discuss if a capability is needed as they are moderating this WID. Thus, **Propsoal5 is unchanged**.

@Qualcomm, is this acceptable for you?

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Proposal 5

Whether a new UE capability is needed to indicate that UE supports DCI format 3_0 scheduling on dedicated discovery resource pools should be up to RAN2.

Feedback Form 9: Feedback Form for Proposal5

1 – Qualcomm Incorporated
Due to the potential difference DCI size and the different interpretation of the index, this change is not backwards compatible with the September version of specifications. If RAN1 does not capture a UE capability to address the NBC change, at least RAN2 should be informed of the NBC issue.

3 Summary

The following agreements are made

Agreement

- "Resource pool index" in a DCI format 3_0 refers to the index of a configured Tx pool in sl-TxPoolScheduling or sl-DiscTxPoolScheduling when at least one of them is configured.
    - Text proposal in R1-2210487 is endorsed for 38.212. Final CR is in R1-2210524.

Agreement

- For determining the scheduled Tx resource pool corresponding to the 'Resource pool index' in a DCI format 3_0 when both sl-TxPoolScheduling and sl-DiscTxPoolScheduling are configured, it is up to RAN2 to decide whether/how to specify the indexing of the configured Tx resource pools.

Agreement

Reply LS on resource pool index in DCI Format 3_0 is agreed. Final LS is in R1-2210585.

4 Reference

1. R1-2208329 LS on resource pool index in DCI Format 3_0 RAN2, vivo
2. R1-2208587 Draft reply LS on resource pool index in DCI Format 3_0 vivo
3. R1-2208625 Corrections on resource pool index for sl-TxPoolScheduling vivo
4. R1-2208814 Discussion on resource pool index in DCI Format 3_0 for SL discovery OPPO
5. R1-2208913 Draft Reply LS on resource pool index in DCI Format 3_0 CATT, GOHIGH

https://nwm-trial.etsi.org/#/documents/8224

6. R1-2208930 Correction on resource pool index in DCI Format 3_0 CATT, GOHIGH
7. R1-2209171 Draft reply LS on resource pool index in DCI Format 3_0 ZTE, Sanechips
8. R1-2209172 Discussion on resoure pool index in DCI format 3_0 ZTE, Sanechips
9. R1-2210123 [Draft] Reply LS on resource pool index in DCI Format 3_0 Ericsson
10. R1-2210129 [Draft] Modification on Resource Pool index for DCI Format 3_0 Ericsson
11. R1-2210205 Discussion on RAN2 LS on resource pool index in DCI format 3_0 Huawei, HiSilicon
12. R1-2208930 Correction on resource pool index in DCI Format 3_0 CATT, GOHIGH
13. R1-2209951 Draft CR on Resource Pool Index in DCI 3_0 for Discovery Qualcomm Incorporated