[92-e-11-DSS-WI] - Version 0.0.6
RAN

3GPP TSG RAN Meeting #92-e **RP-211552**

Electronic Meeting, June 14 - 18, 2021

Source: **RAN1 vice-chair(CMCC)**

Title: **Moderator's summary for email discussion [92-e-11-DSS-WI]**

Agenda item: **9.7.1.4**

Document for: **Discussion and decision**

1 Introduction

In RAN#92-e meeting, contribution [1], [2] are submitted for discussion on how to handle the objectives of DSS in R17 timeline. From the proposals in these two contributions, one contribution [1] is proposing to update the WID by deleting the second objective based on the conclusion from RAN1#105-e:

Conclusion (RAN1 Chair's Notes**)**

Stop the RAN1 work on two-cell PDSCH scheduling via a single DCI for specification support in Rel-17 DSS

- Due to Rel-17 WID scope only focusing on two DL carriers within FR1, RAN1 did not study the potential benefits for more than 2 carriers for both UL and DL within FR1 and FR2.

- It is up to RAN to decide whether or not the feature is studied/specified in Rel-18 with extension to more than 2 carriers for both UL and DL within FR1 and FR2.

another contribution [2] is proposing either to adopt

Alternative 1) Agree on a revised WID deleting the 2nd objective, which is same as proposed action of [1] as below:

This work item is limited to FR1, and includes the following objectives for NR Dynamic Spectrum Sharing (DSS):

- PDCCH enhancements for cross-carrier scheduling including [RAN1, RAN2]

- PDCCH of SCell scheduling PDSCH or PUSCH on P(S)Cell

- ~~Study, and if agreed specify PDCCH of P(S)Cell/SCell scheduling PDSCH on multiple cells using a single DCI~~

- ~~The number of cells can be scheduled at once is limited to 2~~

- ~~The increase in DCI size should be minimized~~

Note: The total PDCCH blind decoding budget should not be changed as a result of this work

Note: These enhancements are not specific to DSS and are generally applicable to cross-carrier scheduling in carrier aggregation,

or, to adopt

Alternative 2) Stop the work on the DSS WI completely

2 Collection of Views

Based on above observation, it is obvious that it is quite straight way forward to revise the WID by deleting the second objectives following the common proposal from these two contributions. As to the alternative 2 from contribution [2], it is a bit more radical as the source itself understood, especially when RAN1 is still progressing the first objective as RAN1 SR report [3] states "additional set of agreements on cross-carrier scheduling (from Scell to Pcell) ".

Moderator would like to check your views on Alternative 1 and Alternative 2

Alternative 1

To revise the WID by deleting the second objective, which is exactly what [1] has done, so the simple way is to approve [1]

Alternative 2

To stop the DSS WID completely

Feedback Form 1: What's your views on Alternative 1?

1 – Nokia Corporation If Alt.2 is not adopted, then we support the WID revision as in Alt.1 as minuted by RAN1#105
2 – Samsung Electronics Co. Support Alt.1. It is a straightforward WID update from RAN1 conclusion.
3 – Intel Belgium SA/NV We support Alt. 1
4 – OPPO There should be no impacts to WGs regardless whether the plenary agrees Alt-1 or not. The concerned bullet in WID reads "study and if agreed specify...", for which RAN1 indeed studied followed by a specific decision on whether to specify. So it is our understanding RAN1 completes the relavent task in WID, and

it seems not appropriate to remove a WID objective which RAN1 already completes. We think the WID can be left as is, but open to other views.

5 – Apple GmbH

Support

6 – KT Corp.

Alt.1 is acceptable

7 – Ericsson LM

We support alt 1.

8 – LG Electronics Inc.

We also support Alt 1.

9 – Huawei Tech.(UK) Co.. Ltd

Alt1 is the straightforward consequence of the RAN1 conclusion. Even without a WID update, RAN1 will not continue working on the second objective.

10 – NTT DOCOMO INC.

We support Alt.1.

11 – ZTE Corporation

We support Alt.1, which is straightforward to reflect RAN1's previous conclusion.

12 – CATT

Although we do not think the WID update is strictly necessary, we are fine with Alt.1 to reflect RAN1's conclusion.

13 – Qualcomm Incorporated

Alt.1 is acceptable to us.

We think multi-CC scheduling should be revisited in a future release as a general CA enhancement, not targeting DSS specifically.

14 – SoftBank Corp.

We support Alt.1

15 – MediaTek Inc.

Alt. 1 looks a natural consequence from RAN1 conclusion. We support Alt.1.

16 – VODAFONE Group Plc

We also support Alt. 1 as a straightforward reflection of the RAN1 conclusion.

Feedback Form 2: What's your views on Alternative 2

1 – Nokia Corporation

Support Alt.2

The initial understanding of the objective #1 was that it is merely a matter of lifting a restriction in the RRC spec so that the SCell can be configured to schedule a PCell. However, this has proven to be quite a bit more complicated than that due to the PDCCH blind decoding handling, and causes some practical issues for the cases when the scheduling SCell is made dormant, inactive, or suffers radio link failure. Hence we believe that the overall complications of integrating this functionality in the specification and the time needed to iron out the details in RAN1 are not worth keeping the WI open just for objective #1, when the freed TUs could be used for better effect elsewhere.

2 – Samsung Electronics Co.

RAN1 has progressed on objective #1. We don't think it is time to drop the whole DSS objectives.

3 – Intel Belgium SA/NV

We have concerns on Alt 2. The removal of the second objective should not impact the work on the first objective since they are independent.

4 – OPPO

We fail to see any strong-enough reason to remove the whole DSS WI.

5 – Apple GmbH

Do not fully understand this alternative. DSS has three parts (1) sSCell scheduling SpCell (2) single DCI to schedule two PDSCH in different CC (3) SCell activation enhancement. Only questionable part is (2). We do not need to discuss (1) or (3)

6 – Apple GmbH

Sorry, to correct our comment above. In RAN1, three topics are handled under eDSS agenda. But from WID, only (1) and (2) are in the WID. Either way, we agreed to stop working on (2), we do not think we need to discuss (1) in RANP at this moment

7 – KT Corp.

No strong reason to drop the whole WI.

8 – Ericsson LM

We have problems seeing the motivation for alternative 2. The second objective was "Study, and if agreed specify..." and the fact that RAN1 concluded on this should have no impact on the SCell scheduling PCell objective. There is clear commercial interest for this feature. Unlike much other Rel-17 work, it is progressing according to plan, the RAN2 impact is only signalling and no RAN4 work is needed. Hence, the work should be completed as agreed. Alternative 2 is not acceptable to Ericsson.

9 – LG Electronics Inc.

We have similar view with other companies.

No strong reason/necessity to remove the whole WI (i.e., even for cross-CC scheduling).

10 – Huawei Tech.(UK) Co.. Ltd

We considered from the start of this WI that objective 2 complements objective 1, since without objective 2 the control channel overhead is simply moved from PCell to SCell without any way to reduce the overhead on SCell. Even if companies in RAN1 were not able to conclude on the cell capacity gains of objective 2 (single DCI scheduling both PCell and SCell), all results showed that blocking probability was reduced with single DCI. However, even this blocking probability reduction will not be pursued in Rel-17 according to RAN1's conclusion. Therefore, the usefulness of objective 1 is reduced in a real network and may become questionable, especially if the SCell is also used for DSS.

It is also true, as pointed out by Nokia, that objective 1 has proven a lot more challenging to specify than originally thought, with still a lot of complex decisions being required before concluding this work. For this simple objective, RAN1 has had to discuss multiple UE capabilities, including an advanced UE capability (Type B UE) where the UE monitors PDCCH on both cells in overlapping slot/symbol. The details for defining such advanced UE capability are proving to be very complex and challenging.

So we would be ok stopping the WI, and looking at more ambitious CA enhancements in Rel-18 with a better understanding on the workload. Alternatively, to make the scope of objective 1 more reasonable, RAN could agree to only define the Type A UE capability (where the UE is not required to monitor both cells in overlapping slot/symbol).

11 – NTT DOCOMO INC.

We have similar view to other companies. We think there is no strong reason to remove the whole DSS objectives from WID.

12 – ZTE Corporation

We don't see the need of Alt.2.

RAN1 has been discussing sSCell scheduling PCell for a few meetings, although there are some diverging views on the detailed RAN1 technical discussion, this is not the reason to stop the ongoing WI. Meanwhile, sSCell scheduling PCell can be implemented separately without multi-cell scheduling, there is no strong need to bundle these two objectives together.

13 – CATT

We share the similar view as other companies. There is no need to remove PDCCH of SCell scheduling PDSCH or PUSCH on P(S)Cell.

14 – Nokia Corporation

The motivation for raising the question on the WI closure was specifically to raise the question in the context of the overall Rel-17 time allocation, but it appears that almost all companies just commented on where we are with the particular WI objective and how the RAN1 is not providing justification for closing the WI - when this is exactly what RAN should discuss as the 1st WI objective has clearly proven much more complicated than anticipated at the time of the WID approval.

That said, we assume that companies commenting have also assessed that there is no better use for this WI's TUs anywhere else, and a significant majority of the companies want to continue with the DSS WI. This is of course OK with Nokia as we don't generally have anything against the feature even though don't see it having major importance, and in what comes to DSS, we don't see a strong relation either.

One possibility could be to follow the Huawei suggestion and just specify the basic UE capability in Rel-17 although that would not much reduce the effort needed. Also it might be worthwhile to decouple the feature name and DSS as the relation between the SCell scheduling PCell and DSS is a feeble one.

15 – Qualcomm Incorporated

We don't hold a strong view but, as a co-signer of the WI, we don't think necessary justification was presented for stopping the work.

3 Intermediate Round

Based on the comments from involved companies in the initial round, majority of companies are in favor of Alternative 1 only, and they state clearly that they see no necessity or strong reason to stop the whole WID at this moment. And the proponent of the Alternative 2 expressed that they support Alternative 1 if Alternative 2 is not adopted. So Moderator would like to propose to wrap up this discussion by approving Alternative 1, and close this email thread.

Intermediate Proposal

To revise the WID by deleting the second objective, which is exactly what [1] has done, so the simple way is to approve [1].

Close this email thread.

Feedback Form 3: Any comments on the Intermediate Proposal?

1 – Qualcomm Incorporated

Agree with the proposal.

2 – vivo Communication Technology

Sorry for missing the initial round of discussion. We agree with the intermediate proposal from moderator.

3 – Samsung Electronics Co.

We agree with the intermediate proposal.

4 – ZTE Corporation

We agree with the intermediate proposal.

5 – CATT

We agree with the intermediate proposal.

6 – OPPO

Ok with the proposal from moderator.

7 – Nokia Corporation

We are OK with the moderator proposal

8 – LG Electronics Inc. We agree with the intermediate proposal.
9 – Intel Belgium SA/NV We agree with the intermediate proposal.
10 – MediaTek Inc. We support moderator proposal. Thanks for the coordination.
11 – Huawei Tech.(UK) Co.. Ltd We agree with the intermediate round proposal.
12 – Ericsson LM Agree with the proposal
13 – VODAFONE Group Plc Agree with the proposal. Thanks.

4 Finetuning Round(Conclusion)

Proposed agreement

To revise the WID by deleting the second objective in RP-193260 as below, or approve RP-211345:

- PDCCH enhancements for cross-carrier scheduling including [RAN1, RAN2]

- PDCCH of SCell scheduling PDSCH or PUSCH on P(S)Cell

- ~~Study, and if agreed specify PDCCH of P(S)Cell/SCell scheduling PDSCH on multiple cells using a single DCI~~

- ~~The number of cells can be scheduled at once is limited to 2~~

- ~~The increase in DCI size should be minimized~~

5 References

[1] RP-211345, “Revised WID on NR Dynamic spectrum sharing (DSS)”, Ericsson, RAN92-e, June 14 - 18, 2021

[2] RP-210046, “Discussion on way forward for Rel-17 DSS WI”, Nokia, Nokia Shanghai Bell, RAN92-e, June 14 - 18, 2021

[3] RP-210929, Status Report for RAN WG1 to TSG-RAN #92e, June 14 - 18, 2021