

3GPP TSG RAN Meeting #97-e RP-222674

Electronic Meeting, September 12 - 16, 2022

Title: Moderator's summary for discussion [97e-20-R18-SLEvo]

Source: Moderator (OPPO)

Agenda item: 9.3.1.5

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1 Background / Introduction

According to the latest WID for R18 SL-Evo item [1], two objectives #1 and #3 (SL carrier aggregation and FR2 beam management) are currently on hold for further checking in RAN#97-e based on the progress on the other two already started objectives #2 and #4 (SL-U and LTE/NR V2X Co-Ex). From the submitted status reports to RAN#97-e [2][3], it is reported that 20% completion level has achieved since the start of the WI (from two WG meetings ago), representing a reasonable / adequate progress for the work done so far. Especially for the Co-Ex work, during the most recent RAN1 meeting it has been concluded that TDM-based resource pool partitioning is a possible solution to ensure co-channel coexistence between LTE-V and NR-V UEs [2].

Based on contributions submitted to RAN#97-e, discussing commencement of the remaining two objectives (CA and FR2), this summary report captured main points expressed/proposed in these contributions on how to start these two objectives in the WGs, views/comments raised in this email discussion thread and moderator's proposals at the end of each round of discussion.

Please note, it has been announced over the RAN email reflector by the RAN Chair as a general guideline that "No expectation of TU increase for existing R18 items". Considering the work progress achieved so far and no TU increase is expected for the WI, the following questions are formulated for the initial round in Section 2.

2 Initial Round

2.1 Handling of LTE/NR V2X co-channel coexistence (objective #4)

From the discussions in RAN1#110, the following conclusion was achieved under the Co-Ex agenda.

Conclusion For co-channel coexistence in Rel-18, RAN1 concludes that the TDM-based semi-static resource pool partitioning is a possible solution to ensure co-channel coexistence between LTE-V and NR-V UEs.
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Question 2.1-1: Given the current progress status/conclusion, do you think this objective can be closed now (i.e., to free-up some TU for other objectives)?

Feedback Form 1: Feedback form for Question 2.1-1

1 – NTT DOCOMO INC.

[DCM] We are fine to close this objective if majority want to do so. Our concern is to start FR2/CA without any close. To start FR2/CA (even either only), coex shall be closed.

2 – vivo Communication Technology

From our perspective it is OK to close this objective to reallocate the TU for others.

3 – Ericsson LM

No. In our view the co-channel coexistence item is not finalized yet. The conclusion made by RAN1 states a fact that was well known before the start of this WI. The automotive industry has expressed a strong interest in solutions for NR/LTE co-channel coexistence. In our view, there are still important aspects, e.g., dynamic resource pool sharing and the device types for coexistence, that need to be studied based on the already reached agreements.

4 – ROBERT BOSCH GmbH

We don't agree that the objective can be closed or even concluded yet. What we have considered so far is one possible semi-static co-channel coexistence approach, i.e., TDM-based approach. However, from our view, it is still important to continue studying dynamic co-channel coexistence as it seems very crucial for the automotive sector. Yet, we encourage further studying dynamic co-channel coexistence including identifying possible device types that fits various automotive requirements. We have already started our discussion in Rel-18 SL Evo WI and it needs to be concluded.

5 – VODAFONE Group Plc

we would also like to see dynamic LTE/NR co-channel coexistence item to be finalised, even it is good we have already a semi-static approach there.

6 – Continental Automotive GmbH

We definitely echo the need and importance of finalizing co-channel co-existence. It is not just an optimization, but a necessary feature for gradual and flexible adaptation to the market penetration of each RAT. We support **continue studying and specify dynamic resource pool sharing**.

7 – TOYOTA Info Technology Center

We do not agree to close the objective, but prefer to continue as agreed in the WID. We would like to emphasize an important agreement from RAN1-110:

“RAN1-110 Agreement: For co-channel coexistence in Rel-18, dynamic resource pool sharing is studied...
“.

Dynamic co-existence is very important for the car industry for flexible, efficient spectrum usage and long-term technology migration/evolution. There were some simulations at RAN1-110 (R1-2207235) that showed that TDM could impair both systems. This is (twice) against the WID that says “*it is important*

that there is mechanism to efficiently utilize resource allocation by the two technologies without negatively impacting the operation of each technology. This requirement was also mentioned as part of the input from 5G Automotive Association to the Rel-18 RAN Workshop”.

3GPP usually does not close any objectives as soon as one possible solution has been found.

3GPP normally does not restrict a WI at the beginning without considering the associated impact, just because we have other objectives. By doing so this would create a precedent.

8 – Volkswagen AG

NR_SL_enh2 objective #4 can't be closed. As outlined in RP-222369 a TDM-based semi-static solution is in conflict with current regional standards which define the regional resource allocations. A dynamic co-channel coexistence solution is expected to be necessary for most of the markets.

9 – Mitsubishi Electric RCE

We are against closing this objective. Semi-static TDM does not really solve the problem of coexistence: it has serious impairments from both regulation/applicability and performance point of view, it is neither efficient nor futureproof. The study and specification phase of dynamic solutions for coexistence should continue.

10 – CableLabs

We are not there yet. The dynamic co-channel solution should also be addressed.

11 – CATT

In general we think closing the objective in plenary after positive agreement and strong support of the objective in WG meeting is not a good practice.

12 – Classon Consulting

[for FUTUREWEI] The FR2 objective should start from now. We are OK with a (constrained) continuation of the coexistence objective for dynamic coexistence, for example till next RAN, but if the companies use dynamic coexistence not to start FR2, our preference is for FR2.

13 – ETRI

We do not agree to close the coexistence objective at this point. Dynamic resource sharing should be discussed continuously and supported.

14 – Apple GmbH

We are fine to close this objective in RAN#97 if it is majority view. We are also fine to define the timeline on this objective to conclude on dynamic resource pool sharing. In this way, we can use the saved TUs for the other two objectives (SL CA and SL FR2).

15 – SHARP Corporation

No. We don't think the co-channel co-existence objective should be closed now. Study for the dynamic resource pool sharing solutions should be continued until some conclusions are reached in RAN1.

16 – Panasonic Corporation

Our view is to progress dynamic pool sharing in order to use efficient resource sharing between LTE and NR.

17 – China Mobile Com. Corporation

We are fine to close this objective in RAN#97, but if it is agreed to be continued, a target completion date should be set as in Q2.1-3.

18 – InterDigital

No. We just finished small part of the objective and there are more important topics (e.g., dynamic resource pool sharing) to be studied to finish the objective from our perspective.

19 – Transion Holdings

If it is the majority view, we agree to close the objective. This will save TUs for other objectives.

20 – Spreadtrum Communications

We are fine to close this objective to start FR2/CA.

21 – Intel Korea

In our view, the conclusion made by RAN1 only captures the status quo of the current specification (with its limitations) to possibly mitigate co-existence between LTE V2X UEs and NR V2X UEs. However, as pointed out and motivated by the automotive industry, this may not be sufficient considering that potentially the ITS band may be mostly allocated by regulators to LTE V2X use cases making the currently available approach (i.e, TDM-based approach) not future proof and practically feasible. Therefore, we see value in continuing to study dynamic co-channel co-existence solutions as also agreed in RAN1.

22 – LG Electronics UK

We are fine with continuing this objective in WGs.

23 – Guangdong OPPO Mobile Telecom.

In our view, this objective can be closed to save time. If continued, the work needs to follow the objective description closely and time bounded. It is observed that there have been attempts to expand the solution scope and applicable scenarios of this objective beyond the original intention. Consequently, this will continue to burn TUs in RAN1 on schemes that are irrelevant.

24 – National Spectrum Consortium

We prefer closing this objective to focus on FR2 and CA.

25 – Facebook

We prefer further discuss to address the automotive industry needs to support dynamic co-channel co-existence solutions.

26 – Nokia Denmark

No. The conclusion from RAN1 on the suitability of TDM based semi-static resource allocation to address LTE and NR coexistence issues did not take into account the lack of mechanisms to update the TDM configuration once it has been established. Therefore, TDM based semi-static resource allocation is not suitable as a future proof solution to address coexistence issues. In contrast, dynamic resource pool sharing does not have this limitations and therefore the work in this objective should continue.

27 – KT Corp.

KT is happy with moderators conclusion to focus on FR2 and CA

28 – Beijing Xiaomi Mobile Software

We are fine to close the objective if majority agree to do so.

29 – TELECOM ITALIA S.p.A.

Looking to the feedback from the main customers of PC5 (the automotive industry) we CANNOT close the activity at this meeting

30 – ZTE Corporation

The objective cannot be closed now. The synchronization issues that come with the TDM solution should be further investigated. Considering companies' input and interest on CA and FR2 topics, discussion on the close of this objective can be done next RAN meeting, i.e. RAN#98-e.

31 – ZTE Corporation

The objective cannot be closed now. The synchronization issues that come with the TDM solution should be further investigated. Considering companies' input and interest on CA and FR2 topics, discussion on the close of this objective can be done next RAN meeting, i.e. RAN#98-e.

32 – MediaTek Inc.

We think the objective could be closed to make time available for other areas. If the coexistence objective does continue, its scope/timing should be restrained as discussed in the subsequent questions.

33 – Fraunhofer HHI

As stated in our joint contribution in RP-222369, TDM-based resource pool partitioning is not a feasible solution for deployments in Europe and US. It would also lead to the system not being able to seamlessly adapt to traffic changes between NR SL and LTE SL, due to improper resource divisions between their respective resource pools. Thus, we should continue to study and specify a dynamic solution for co-channel coexistence. We also believe that other markets would benefit from such a solution.

34 – NEC Corporation

The discussion and agreement are not completed, we prefer to further study the schemes for SL co-existence.

35 – Huawei Tech.(UK) Co.. Ltd

No, the objective should not be closed. See other answers.

36 – Lenovo (Beijing) Ltd

We don't agree to close Objective 4 now. As strong interest shown by automotive industry in Monday's online discussion, we agree with them to continue studying and specify dynamic resource pool sharing. Only TDM-based semi-static resource pool portioning is not sufficient for this coexistence study.

37 – Samsung Electronics Romania

We are fine to close this objective because either FR2 or CA cannot be started without any close of existing agendas that have been discussed so far, or adding additional TU. Please note that it might not be feasible to reduce scope of co-channel coexistence since there are many open issues for dynamic co-channel coexistence.

38 – SDI Squared

We prefer to close this objective in RAN#97. The saved TUs can be used for the SL FR2 and SL CA objectives.

Question 2.1-2: If this work continues in RAN1 after RAN#97-e, do you think further restriction on the scope should be applied (e.g., focus on the remaining work for dynamic resource pool sharing for Type A devices only)?

Feedback Form 2: Feedback form for Question 2.1-2

1 – NTT DOCOMO INC.

[DCM] If this topic continues, we prefer to study/discuss this topic sufficiently. Deprioritizing a part of important scenarios due to such a reason would not be good way. In addition, even if this restriction is agreed, still time is not sufficient for CA/FR2. This direction would not help to solve the current situation.

2 – vivo Communication Technology

Yes, if this work would continue after RAN#97-e, it is desirable to focus on the non-controversial part.

3 – Ericsson LM

No. There is no need to further restrict the scope of the objective, agree with NTT DoCoMo. The objective should continue its progress as agreed in the WID and based on current agreements.

4 – ROBERT BOSCH GmbH

Agree with DCM and Ericsson. The restriction would not help to shrink the time adequately and will not result in covering all essential scenarios. Therefore, we propose to continue studying all proposed options discussed in RAN1. We need to give an indication here that this objective is very critical for real NR V2X deployment in ITS bands in most of the regions.

5 – VODAFONE Group Plc

We also do not see a need to further restrict the scope

6 – Continental Automotive GmbH

We do not see need for re-scope.

7 – TOYOTA Info Technology Center

We do not agree to close the objective, but prefer to continue as agreed in the WID. We would like to emphasize an important agreement from RAN1-110:

“RAN1-110 Agreement: For co-channel coexistence in Rel-18, dynamic resource pool sharing is studied...
“.

Dynamic co-existence is very important for the car industry for flexible, efficient spectrum usage and long-term technology migration/evolution. There were some simulations at RAN1-110 (R1-2207235) that showed that TDM could impair both systems. This is (twice) against the WID that says “*it is important that there is mechanism to efficiently utilize resource allocation by the two technologies without negatively impacting the operation of each technology. This requirement was also mentioned as part of the input from 5G Automotive Association to the Rel-18 RAN Workshop*”.

3GPP usually does not close any objectives as soon as one possible solution has been found.

3GPP normally does not restrict a WI at the beginning without considering the associated impact, just because we have other objectives. By doing so this would create a precedent.

8 – TOYOTA Info Technology Center

(Sorry, this is our comments for 2.1-2 below):

We agree with DoCoMo and Ericsson, there is no need to restrict the scope of co-channel co-existence, the work should be done properly.

9 – Volkswagen AG

3GPP is encourage to study and to specify co-channel coexistence solution(s) which suffice the market needs of the automotive industry. It doesn't help to reduce the scope of one topic and to finish maybe with a solution only fitting to subset of markets / deployment scenarios. This would require a re-addressing of the issue in the next release and could lead to a loss of this release cycle, from an automotive perspective.

10 – Mitsubishi Electric RCE

No. RAN1 should be able to properly continue its work towards a solid technical solution. Reducing the scope of co-channel coexistence wouldn't save a significant amount of time anyhow

11 – CableLabs

No need to downscope this SI.

12 – CATT

we prefer to finish the study without restriction.

<p>13 – Classon Consulting</p> <p>[for FUTUREWEI] A lot of time has been spent on device types etc, such a restriction would be beneficial.</p>
<p>14 – Qualcomm Incorporated</p> <p>Yes, we support explicitly limiting the scope. RAN1 has expended a significant amount of time debating about scenarios other than the primary one of NR/LTE in-device coex capable UE that is using Mode 2 NR RA and has to coexist with an LTE V2X Mode 4 RA system.</p>
<p>15 – ETRI</p> <p>We also think downscoping is not necessary.</p>
<p>16 – Apple GmbH</p> <p>We think further restriction on the scope is necessary. We could focus on Type A devices only. Also, we may restrict to the combination of NR resource allocation mode 2 and LTE resource allocation mode 4. Finally, no work on FDM-based semi-static resource pool partitioning is needed.</p>
<p>17 – SHARP Corporation</p> <p>No. Restrictions on the scope of the study, if any, can be done in RAN1, based on technical input.</p>
<p>18 – SHARP Corporation</p> <p>No. Restrictions on the scope of the study, if any, can be done in RAN1, based on technical input.</p>
<p>19 – Panasonic Corporation</p> <p>To limit to Type A device only would not reduce the work so much. In spite of this, we are also ok to focus for Type A device only.</p>
<p>20 – China Mobile Com. Corporation</p> <p>Yes, only type A UE should be considered to limit the workload.</p>
<p>21 – InterDigital</p> <p>We don't need to discuss any restriction on device type in RAN level at this point, RAN1 just had two meetings. If any restriction is needed, it should be done in RAN1 based on the technical discussion.</p>
<p>22 – Spreadtrum Communications</p> <p>Yes. Restriction is necessary. We prefer to focus on Type A device only.</p>

23 – Transsion Holdings

Yes, RAN1 has spent a lot of time in past meetings discussing device types, modes of operation, etc. We support limiting the scope explicitly.

24 – Intel Korea

If it is decided that this topic should be continued, we are OK to restrict its scope, e.g. target only Type A device and Combination A.

25 – LG Electronics UK

In our view, limiting the scope to Type A device is in line with the approved WID which states "Reuse the in-device coexistence framework defined in Rel-16 as much as possible." This is because other device types are not equipped with LTE+NR module thus Rel-16 in-device coexistence framework is not applicable.

26 – Guangdong OPPO Mobile Telecom.

Yes, the remaining work on Co-Ex (if continued) should be limited to dynamic resource pool sharing for Type A devices only, as according to existing agreements and working assumption made in RAN1.

27 – Facebook

We support to study the limited scopes based on RAN1 agreements to save the time.

28 – Nokia Denmark

No need to restrict the scope.

29 – Beijing Xiaomi Mobile Software

If the study on the objective will continue, we think it should be WG decision on how to downselect the scenarios/solutions, based on technical analysis and evaluation results. It is time consuming to discuss how to restrict the scope in RAN, and it is not clear how much TUs can actually be saved.

30 – TELECOM ITALIA S.p.A.

No. fully support the view of DOCOMO and Volkswagen

31 – ZTE Corporation

To finalize the work in the remaining TUs in Q4, the restriction on type A device for dynamic resource pool partitioning can be considered. Moreover, it should be pointed out the remaining work also includes the following aspects: the support of different devices for semi-static resource pool partitioning, the support of NR mode 1 plus LTE mode 3 or mode 4, the support of NR mode 2 plus LTE mode 3 combinations.

32 – MediaTek Inc.

Some scope restriction to help limit the time usage would be beneficial. We support restricting to type A devices as suggested.

33 – Fraunhofer HHI

We don't see the need to re-scope but would prefer to avoid repetitive discussions about supported device types and combinations. Hence, some plenary guidance might be helpful.

34 – NEC Corporation

We think both FDM-based semi-static resource pool partitioning and dynamic resource pool sharing need to be studied, while FDM-based schemes may be considered with limited standard effort.

35 – Huawei Tech.(UK) Co.. Ltd

RAN should provide project management for coexistence, as the discussions in RAN1 have been on the basis of not knowing clearly the target of the effort. It should be guided as follows:

For a dynamic coexistence solution:

- Support Type A device only
- Support combination A (NR SL mode 2+ LTE SL mode 4) only
- Support mechanisms only where the NR SL UE uses sensing and resource reservation information from its LTE SL module, i.e. to be based on the Rel-16 framework as already stated in the WID.

For semi-static coexistence: no further discussion is needed.

For the timeline, we can compromise to allow 3 further WG meetings, i.e. until RAN#99. This should be easily enough to complete any reasonable solution. If that is not enough, then it seems coexistence could easily come to dominate the whole release, which would not be a reasonable balance of interest between different companies, MRPs, etc.

On the other hand, if companies will not agree to any reasonable management, we would reluctantly need to bring the objective to a close now, to ensure the smooth running of the remaining time in the WI.

36 – Huawei Tech.(UK) Co.. Ltd

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On the other hand, if companies will not agree to any reasonable management, we would reluctantly need to bring the objective to a close now, to ensure the smooth running of the remaining time in the WI.

37 – Lenovo (Beijing) Ltd

We prefer no restriction for this objective. If majority companies support down-scoping, our suggestion is (1) Don't support Combination B (Mode 1 NR SL + Mode 4 LTE SL) and Combination C (Mode 2 NR SL + Mode 3 LTE SL) in Rel-18 SL; (2) For dynamic resource pool sharing only support 15kHz SCS of NR sidelink in Rel-18 SL.

38 – Samsung Electronics Romania

For TDM resource partitioning, there is no restriction to Type-A UEs. Hence, if we restrict dynamic resource sharing to Type-A only, it become more restrictive than TDM resource partitioning. Hence, there is less reason to continue with objective.

39 – SDI Squared

We do not support further restrictions on the scope for SL CA. Current scope clarification is sufficient.

40 – SDI Squared

We prefer to close the objective.

Question 2.1-3: If this work continues in RAN1 after RAN#97-e, can we set a target completion date to finalize the remaining work on dynamic resource pool sharing (e.g., by RAN#98-e with two RAN1 meetings)?

Feedback Form 3: Feedback form for Question 2.1-3

1 – NTT DOCOMO INC.

[DCM] We do not think two meetings are sufficient. We faced long maintenance phase in Rel-16/17 sidelink. Even if completion data is set to earlier, anyway time would be consumed for this topic in subsequent meetings.

2 – vivo Communication Technology

Yes, it is desirable to set the RAN#98-e as the target completion date. Given the previous two RAN1 meetings, companies should have good understanding on the scenarios and potential solutions on the table. It is reasonable to complete the work in two more meetings if solution besides semi-static TDM partitioning is needed.

3 – Ericsson LM

No. In our view, adding a target completion with such a short deadline will likely not be met based on the

progress in previous meeting and the open issues. We prefer to keep the original target completion date, i.e., by the end of the release.

4 – ROBERT BOSCH GmbH

The topic should be discussed as originally planned without a new deadline.

5 – VODAFONE Group Plc

agree with E///

6 – Continental Automotive GmbH

We support continue with the planned work until end of the release.

7 – TOYOTA Info Technology Center

We agree with DoCoMo, Bosch, Ericsson and Vodafone: This objective should be handled as initially planned, we do not understand the attempt to give the co-existence objective a specific restrictive treatment. We should work on this objective until the end of the Release, as initially planned.

8 – Volkswagen AG

It is not expected that an extra completion date helps in specifying co-channel coexistence solution (s) which suffice the market needs. Therefore 3GPP is encouraged not to put extra restrictions on this topic.

9 – Mitsubishi Electric RCE

Dynamic co-channel coexistence is important for ITS bands. Setting unreasonably short completion deadlines would only disguise specification work into maintenance work. We are in favour of keeping the original timeline (end of release). If there is a workload issue, we would rather limit or drop the items not started yet instead of botching the job on both coexistence and new items.

10 – CableLabs

As a trade-off solution, the co-channel coexistence status could be re-visited during RAN #98. If not agreeable, then no restrictions should be imposed on this item.

11 – CATT

we agree the topic should be discussed as originally planned without a new deadline.

12 – Classon Consulting

[for FUTUREWEI] a deadline would help progress, next RAN (two more RAN1 meetings) is OK if the objective continues. In any case, time will be made for drafting the specs at the end of the release c.f. DSS.

13 – Apple GmbH

We support to set up a target completion date to finalize the remaining work on dynamic resource pool sharing. RAN #98-e could be the option of target completion date.

<p>14 – SHARP Corporation</p> <p>We don't think such a new deadline is necessary. The status of the work can be re-visited in every RAN meeting as business as usual.</p>
<p>15 – Panasonic Corporation</p> <p>We prefer to keep the original target.</p>
<p>16 – China Mobile Com. Corporation</p> <p>Yes, agree to set a completion date and RAN#98-e could be an option.</p>
<p>17 – InterDigital</p> <p>It is very strange to put a new/shorter deadline for the objective which is originally planned to be finished by end of the release. A shorter deadline will lead to incomplete/sub-optimal design which doesn't seem to be desirable.</p>
<p>18 – Johns Hopkins University APL</p> <p>We prefer to set RAN#98-e as the target completion date for this objective as it is important to focus on other SL objectives: SL-U, SL-FR2 and SL-CA.</p>
<p>19 – Transsion Holdings</p> <p>We share the view of most companies that it is better to keep the original target.</p>
<p>20 – Intel Korea</p> <p>We do agree with other companies, that based on progress in prior meetings such a short deadline will likely lead to uncompletion of this study, and we also prefer to keep original target completion date.</p>
<p>21 – LG Electronics UK</p> <p>We are not sure if setting a short deadline would help the progress.</p>
<p>22 – Guangdong OPPO Mobile Telecom.</p> <p>Given the remaining work should focus on dynamic resource pool sharing is for Type A devices only, in our view it is possible to complete the work by RAN#98-e with two RAN1 meetings.</p>
<p>23 – Facebook</p> <p>we can keep the original completion deadline to make progress for the limited scopes.</p>

<p>24 – Nokia Denmark</p> <p>No, the target completion should be the end of Rel.18.</p>
<p>25 – ETRI</p> <p>No, we think only two WGs are not enough to finish this objective.</p>
<p>26 – Beijing Xiaomi Mobile Software</p> <p>We are fine to come back to examine the progress at RAN#98, but do not think setting a shorter deadline can help to complete the work.</p>
<p>27 – TELECOM ITALIA S.p.A.</p> <p>No, we should keep the original timeline</p>
<p>28 – ZTE Corporation</p> <p>The completion date would of course be helpful in terms of the overall work management. At least the remaining issues for further study is quite clear as we replied in the previous question: 1. the necessity and solutions to support dynamic resource pool sharing 2. the support of combination NR mode 1 plus LTE mode 3/4, the combination NR mode 2 plus LTE mode 3 3. The timing issues associated of semi static solutions. Relevant solution and considerations have been discussed during the previous WG meetings, Thus it's reasonable to set RAN98#e as the completion date for the study phase.</p>
<p>29 – MediaTek Inc.</p> <p>We think completing the objective by RAN#98 is reasonable, especially if we limit the scope as suggested in the previous question.</p>
<p>30 – Fraunhofer HHI</p> <p>We would like to keep the original time plan.</p>
<p>31 – NEC Corporation</p> <p>We prefer to keep the original plan.</p>
<p>32 – Huawei Tech.(UK) Co.. Ltd</p> <p>For the timeline, we can compromise to allow 3 further WG meetings, i.e. until RAN#99. This should be easily enough to complete any reasonable solution. If that is not enough, then it seems coexistence could easily come to dominate the whole release, which would not be a reasonable balance of interest between different companies, MRPs, etc.</p>
<p>33 – Lenovo (Beijing) Ltd</p> <p>We agree the topic should be discussed as originally planned without a new deadline.</p>

2.2 Scope of carrier aggregation operation (objective #1)

According to the current description for the CA objective #1, the intention is to reuse existing LTE sidelink CA features only for NR sidelink. However, it may be interpreted by some that PSFCH for SL-HARQ feedback can be further enhanced at least for R18 unicast UEs, since PSFCH / SL-HARQ feedback is a new feature introduced in NR sidelink only. From reviewing the contributions, it was suggested that the scope could be further limited.

Question 2.2: Do you agree that further restriction on the scope for SL CA should be added (e.g., no PSFCH enhancement compared to R16)?

Feedback Form 4: Feedback form for Question 2.2

<p>1 – NTT DOCOMO INC.</p> <p>[DCM] We do not think 'no PSFCH enhancement' is enough to restrict the scope since still there are large impacts on SL HARQ feedback on UL for mode 1 (e.g. HARQ-ACK CB construction, SAI, etc.). In addition, RAN2 impact would also be not so small. Decision of dropping some of CA/FR2/Coex is necessary rather than considering scope restriction for each.</p>
<p>2 – vivo Communication Technology</p> <p>The current scope is already a limited set. By further removing the NS SL specific features, we are not sure what the advantages of NR SL CA are over the LTE SL CA. Then it becomes questionable why we spend the efforts just to duplicate a solution, instead of using the existing R15 feature.</p>
<p>3 – Ericsson LM</p> <p>It is unclear what the restrictions included in the question would be. Nevertheless, we are open to discuss further restrictions on the scope for SL CA if it is agreed that the item will start.</p>
<p>4 – ROBERT BOSCH GmbH</p> <p>We agree with Vivo whether restrictions could produce any enhancements on the top of Rel-15 LTE v2X SL CA. Otherwise, we may accept that this release only reuses existing LTE SL CA and future release considers further enhancements.</p>
<p>5 – Continental Automotive GmbH</p> <p>We consider the current scope is well-defined and we also do not fully understand what limitations should be added. we support, continue with LTE SL CA.</p>
<p>6 – TOYOTA Info Technology Center</p> <p>It is hard to agree on an "e.g.", we do not know what are the specific restrictions suggested. This could be discussed in RAN1. We are ok to discuss some restrictions to SL CA, at least for this Release.</p>
<p>7 – AT&T GNS Belgium SPRL</p> <p>With the ambiguity of what the further restriction on the scope for SL CA would entail, we do not agree to this proposal.</p>

8 – CableLabs

Not clear what is required here.

9 – CATT

For CA, if we are discussing down-scope , instead of discussing further removing the key components, we should discuss whether to start the whole objective or not . Otherwise we could end up with useless , or incomplete feature.

10 – Classon Consulting

[for FUTUREWEI] agree with some other comments that we should discuss first whether the item should start. Our preference is FR2 over CA.

11 – Qualcomm Incorporated

Yes. We think further restrictions are needed if SL-CA work is to start. Otherwise, the scope and workload could both increase and significant time would be spent in the WGs debating what to prioritize. Overall, we prefer SL FR2 to SL CA.

12 – Apple GmbH

We agree to further restrict the scope of SL CA. We are open to any restrictions.

13 – SHARP Corporation

This should be discussed in RAN2/RAN1, after the work is started on SL CA.

14 – Panasonic Corporation

We are not sure the meaning of no PSFCH enhancement compared to R16. If it means the PSFCH is limited to the same carrier (i.e. no cross carrier related operation), we agree such restriction. Mode 1 is limited to one carrier is also ok with us to limit the scope.

15 – China Mobile Com. Corporation

We think at this stage it is too early to make restrictions on the design of PSFCH for CA scenario, further study may be needed.

16 – InterDigital

We can discuss on any further restriction or clarification of the scope after the group agrees to start CA objective.

17 – Johns Hopkins University APL

We do not support further restrictions on the scope for SL CA.

18 – Spreadtrum Communications

We are fine to restrict the scope of SL CA, and the restriction can be further discussed after starting the work.

19 – Transion Holdings

It is better to decide first whether to start one of SL CA or SL FR2 in future meetings. If SL CA is determined to be started, then discuss whether to limit the scope in conjunction with the available TUs.

20 – Intel Korea

If it is agreed that this item will start, we are OK to discuss restricting the scope of this AI further so that to limit it to straight harmonization with LTE SL CA.

21 – LG Electronics UK

We would like to reiterate the motivation of SL CA expressed in RP-222016 from the automotive perspective. ETSI ITS is introducing the multi-channel operation in order to utilize a large portion of 5.9 GHz ITS band in which a single channel (carrier from 3GPP viewpoint) has only 10 MHz bandwidth now and the ongoing discussion on the larger bandwidth support is still limited to 20 MHz. We think 3GPP support for NR sidelink CA would be needed to make more than 20 MHz available to V2X operations based on NR sidelink.

We are open to discussing restriction if the group agrees to start this objective.

22 – Guangdong OPPO Mobile Telecom.

Yes, it seems necessary to have such restriction on no PSFCH enhancement compared to R16 to restrict the scope of the CA objective. For the other SL-HARQ reporting issue to gNB as mentioned by DOCOMO, this work anyhow needs to be done since the existing R16 reporting scheme in the UL does not consider more than one SL-HARQ bit from multiple carriers.

23 – National Spectrum Consortium

We prefer having this discussion in RAN1; it is too early to decide on plenary-level restrictions (if any).

24 – Nokia Denmark

No, the discussion should be on whether the objective starts or it is postponed. Reducing the scope of the objective will not reduce significantly the effort.

25 – ETRI

We also prefer to discuss any restriction if we agree to start the CA objective.

26 – Facebook

We prefer to study SL CA since European regulation only allow single carrier with 10MHz CBW. So need to support NR CA feature or DC CA with LTE SL + NR SL operation. Also we can modify the TU budget with other scopes such as FR2 SL and others.

27 – KT Corp.

Reusing LTE Sidelink CA as a baseline is common understanding and no further modification necessary.

28 – CEWiT

We should discuss whether to start CA item or not before scope reduction discussion. We prefer FR2 enhancement to start over CA.

29 – Beijing Xiaomi Mobile Software

We are fine to add further restrictions on the scope as suggested.

30 – ZTE Corporation

The discussion of CA has barely started. Whether to support a certain enhancement of feedback can be considered in WG discussion.

31 – Sony Group Corporation

We think the current scope is OK but we are open to discuss further restriction if necessary.

32 – MediaTek Inc.

If the CA objective is started, we support such a restriction. However, we think the available time does not really support starting the objective now, and we see more value in starting the FR2 objective.

33 – Fraunhofer HHI

We think that this can be discussed once the group agrees to start SL CA in Rel-18.

34 – NEC Corporation

No, the study scope of SL CA is clear and limited and no further restriction is needed.

35 – Huawei Tech.(UK) Co.. Ltd

With limitation to current FR1 licensed and ITS spectrum, the benefit of SL CA is small (at least from data rate perspective), and thus SL CA work in Rel-18 should not be allocated too many TUs.

Discussions on scope of CA look certain to occur, and they can either consume WG TUs, or be settled in RAN. Settling it in RAN will leave more room for proponents to develop good solutions in WGs. Hence, RAN should set some simplifying constraints, including:

- For SL CA, physical layer operations of new NR features (e.g. SL HARQ-ACK) beyond LTE SL are performed per CC independently.
- NR SL CA is limited to mode 2 operation only.

Where the second bullet is to address 5GAA's requested scenario on ITS spectrum, and thus avoid complication of involvement of NR Uu CCs.

36 – Lenovo (Beijing) Ltd

We think it is too early to make such restriction as even RAN1/RAN2 has not started this objective. Furthermore, we think HARQ-ACK feedback is an important feature which we firstly specified in NR SL. PSFCH enhancement should be considered if it is deemed necessary.

37 – Samsung Electronics Romania

We are not sure what purpose this question is try to address. This is second step discussion after it is discussed on which agenda should be prioritized among CA/FR2/Co-existence.

38 – SDI Squared

We do not support further restrictions on the scope for SL CA. If we find current scope clarification is insufficient, we prefer WG-level assessment prior.

2.3 Scope if SL beam management in FR2 licensed spectrum (objective #3)

Similar restrictions to the scope for the FR2 beam management objective #3, it could be beneficial for efficient progress of this objective if certain work structure and aspects of the SL beam management in FR2 can be limited within R18. For example, it was suggested in some contributions to directly start the normative work without a potentially lengthy study phase of all possible solutions. Potentially, the evaluation methodology update could be skipped as well. Other examples comprise also further refine the scope of sidelink CSI enhancement of including the beam index for indicating the best beam, and no work on SL beam failure recovery in R18.

Question 2.3: Do you agree that one or more of the following restrictions on the scope for SL beam management in FR2 should be considered? E.g.,

- **Remove the study as "~~Study and specify enhanced sidelink operation on FR2 licensed spectrum ...~~"**
- **No evaluation methodology update for commercial scenarios**
- **Consider only beam index feedback for the best beam**
- **No SL beam failure recovery in R18**
- **etc**

Feedback Form 5: Feedback form for Question 2.3

1 – NTT DOCOMO INC.

[DCM] If we decide to keep/start FR2, we prefer to have sufficient discussion for FR2 rather than agreeing scope reduction since this topic is new one and thus which feature is necessary should be studied/discussed enough; otherwise, whether NR SL-FR2 is really feasible from commercial perspective would be unclear. Meanwhile, it might be OK to not update evaluation methodology.

2 – vivo Communication Technology

We are fine to directly start the FR2 without the study phase.

3 – Ericsson LM

In our view, skipping the study part and proceeding directly with specification writing is a bad idea. To a large extent, the Rel-16 study focused on FR1 only, meaning that most aspects related to FR2 have not been studied at all. If the work on FR2 were to start at all, it should be in the form of a study, leaving specification for a later release. Besides this, we are open to discuss further restrictions on the scope for SL FR2 if it is agreed that the item will start.

4 – ROBERT BOSCH GmbH

We are open for more restrictions here. However, in our view, skipping the study phase is not an accepted restriction and will not reduce the time of the discussions as many physical issues of FR2 were not handled in Rel-16.

5 – Continental Automotive GmbH

Same as for CA, we are fine with the original scope, and we think the study phase is important.

6 – TOYOTA Info Technology Center

Agree with Ericsson and Bosch. Skipping the study phase would alter the quality of the work. We can however discuss FR2 restrictions, at least for this Release.

7 – Verizon UK Ltd

It is important that SL on FR2 starts in this release. At the 4th NR release, many features are on their further optimization of previous optimizations while this one, we hope, is looking for a new solution to a fundamental but hard problem - NW coverage - a hot spot or more than that. After years of investments & engineering, we are reaching a point further enhancement of radio link, while still meaningful, is providing diminishing return and isn't likely to extend the coverage beyond a few hundred yards. That leaves our FR2 spectrum much underutilized while FR1 jam-packed. We are now very interested in alternative solutions in e.g., IAB (yes, we are still working on that), repeater (we are a leading company with traditional repeaters and are very interested in NCR), this one, and in the future RIS. Our testing also showed promising results for these topology based solutions (IAB, repeater) for coverage extension. We see SL on FR2 a promising device driven solution and could be a major motivation for us to consider deploying Sidelink.

As for why it is important to start in this release, not the next – it is because we need to engage the customers (many of them industry partners) to build the business and engage the vendor community to build up the

ecosystem. This process is inevitable and it takes time. Therefore we think it is important that SL on FR2 starts in this release to have the basic technology ready – “doing all” in the next release won’t be the same.

8 – CableLabs

Agree with Ericsson.

9 – CATT

We agree skipping the study phase for this objective is not preferred as we cannot commit to specify objectives that may not be feasible or are really needed.

10 – Classon Consulting

[for FUTUREWEI] prefer to study and specify, without restriction at this point

11 – Qualcomm Incorporated

The objective scope is clear in our view and there is no need to introduce additional restrictions.

12 – Apple GmbH

In order to keep the manageable workload, we are fine with some restrictions on the scope of SL FR2. We are open to any of the above listed restrictions. Particularly, we prefer the first bullet, i.e., remove the study phase.

13 – SHARP Corporation

Agree with other companies that the original scope should be kept.

14 – China Mobile Com. Corporation

We think at this stage it is too early to make such restrictions, and we think the study phase cannot be skipped.

15 – Johns Hopkins University APL

We support a study phase as it will help to realize a better FR2 specification. Also, do not support restrictions on the scope of FR2 objective other than those stated in the WI.

16 – InterDigital

We also think it is better to keep a short study phase as the group has never studied FR2 for sidelink. Anyhow, it is next step discussion if the group agrees to start FR2.

17 – Spreadtrum Communications

At this stage, we prefer to keep the original scope.

18 – Transsion Holdings

It is better to decide first whether to start one of SL CA or SL FR2 in future meetings. If SL FR2 is determined to be started, then discuss whether to limit the scope in conjunction with the available TUs.

19 – Intel Korea

We would prefer to have a short study phase. As for scope reduction, we are definitely open for it, but we believe this should come as an outcome of the study and followed by deep technical discussions.

20 – LG Electronics UK

We are open to discussing scope reduction including those listed as examples. If the group concludes that it is difficult to start a normative work for SL FR2 in this release for the TU issue, we propose to consider another option to update only the evaluation methodology. We think this would serve the purpose of expressing more concrete 3GPP's plan to cover FR2 in the sidelink operations in a future release.

21 – Guangdong OPPO Mobile Telecom.

In our view, we support the modification of “~~Study and specify enhanced sidelink operation on FR2 licensed spectrum ...~~” to save discussion time in RAN1. However, we think the evaluation methodology updates for commercial scenarios is still necessary.

22 – National Spectrum Consortium

Restrictions such as 'No SL beam failure recovery in R18' are not acceptable to us. Starting with a study phase will help surface any necessary scope limitations.

23 – Nokia Denmark

The use of SL communication with beams will impact several aspects of the SL design, therefore not clear what will be the benefit of proceeding directly to specification work without understanding and discussing these impacts first. The current scope of the objective is already restricted to unicast and to reuse the CSI framework, so no further scope reduction should be performed.

One way forward could be to study only during Rel.18 and leave specification work for Rel.19.

24 – Facebook

We are fine to skip the SI phase and specify the enhanced SL operation in FR2. This is good way to open the new commercial deployment service for NR SL operation in FR2 licensed bands.

25 – CEWIT

We prefer to start this objective in Rel 18 and believe that present mentioned scope is good enough. Short SI to list down the solutions with basic evaluation can be carried out followed by normative work.

26 – Beijing Xiaomi Mobile Software

We think both evaluation methodology update and study phase are needed for this objective. Some may argue that removing study phase can save the standardization time, however, without analysis and evaluations in study phase, RAN1 may need more time to get consensus on potential benefit and necessity of different alternatives.

27 – TELECOM ITALIA S.p.A.

This is a major project and the study phase is needed

28 – ZTE Corporation

The study phase would be necessary for FR2 topic. All these proposed change to the scoping of this topic is a bit early and should be outcome after the study phase discussion. The appropriate timing, to us, is the completion date for the study phase of co-existence topic, i.e. RAN#98-e.

29 – Sony Group Corporation

We think that the study phase would be needed since this is new topic for SL. We are open to discuss further restriction from the current scope for FR2 topic of this release.

30 – Fraunhofer HHI

We agree with Ericsson and prefer not to skip the study phase.

31 – MediaTek Inc.

We agree with other companies that the study phase is needed. We can discuss if any scope restrictions are necessary considering the available time.

32 – China Unicom

It fails to see the need to restrict on the SL FR2, and it's not a good idea to skip a SI phase if companies has not make consensus on the solutions.

33 – Lenovo (Beijing) Ltd

We don't agree to start normative work of FR2 directly without study phase. From Rel-16 and Rel-17, only FR1 is considered without consideration of any FR2 issues. If RAN decides to start FR2, we suggest a thorough study of FR2 sidelink first and then we can leave WI phase in Rel-19.

34 – Huawei Tech.(UK) Co.. Ltd

Firstly, it is necessary for RAN1 to update the evaluation methodology, at least for:

- UE dropping model for commercial use cases in FR2
- Traffic model to include XR services (we expect this can re-use that developed in XR, but an agreement to do so would be needed)

Where coexistence and CA scope each have a number of technical details that RAN can decide to control, the scoping of FR2 was already worked on extensively during the WI approval, and contains carefully constructed limitations. If the judgment is that even further restriction is needed due to TU allocation, then it may be worthwhile considering instead to have only the EVM update and/or FR2 be only a study in this Release (e.g. identifying sets of feasible solution directions for later selection in a normative WI), and take the normative work at a stage when adequate TU for a commercial feature are available.

35 – Samsung Electronics Romania

We are not sure what purpose this question is try to address. This is second step discussion after it is discussed on which agenda should be prioritized among CA/FR2/Co-existence. Furthermore, we think that studying phase is very important for SL FR2 since there haven't studied on this aspect in Rel-16. Thus, we have a concern on skipping "study" phase. We think that any scope reduction discussion can take place after the RAN1 starts discussing this objective.

36 – SDI Squared

We prefer a short study phase. This is a new topic and study phase should not be skipped. The current scope is sufficient for proceeding with study and does not need amendment. Should amendments become essential they can still be discussed prior to specification.

2.4 Handling of Co-Ex, CA and FR2 beam management objectives

From reviewing the contributions submitted to this meeting, given that there is only 2 TUs allocated for this WI in RAN1, the majority has a view that not all 4 objectives can be worked on concurrently in RAN1 in the same meeting. At the same time. the majority also has a view that some sort of staggered approach between the Co-Ex, CA and FR2 objectives should be considered.

Question 2.4: Assuming no TU increase for the R18 SL-Evo WI in RAN#97-e, which one of the following options should be adopted:

- **Option 1: Complete the remaining work on dynamic resource pool sharing in the Co-Ex objective in 4Q 2022, then start CA and/or FR2 from RAN#98-e (including further restrictions from Q2.1, Q2.2 and Q2.3 above, if agreed)**
 - **Further discuss the starting of CA and/or FR2 in RAN#98-e**
- **Option 2: Complete the remaining work on dynamic resource pool sharing in the Co-Ex objective in 4Q 2022, start CA in RAN2 and FR2 from RAN#97-e, then start CA in RAN1 from RAN#98-e (including further restrictions from Q2.1, Q2.2 and Q2.3 above, if agreed)**
 - **The FR2 work in 4Q 2022 focuses on evaluation methodology updates only**
- **Option 3: Close the Co-Ex objective in RAN#97-e and start CA and/or FR2 objectives from RAN#97-e (including further restrictions from Q2.2 and Q2.3 above, if agreed)**
 - **Further discuss the starting of CA and/or FR2 in the intermediate round of discussion (e.g., evaluation methodology updates for FR2 only and/or CA in RAN2 only in 4Q 2022)**
- **Option 4: Others, please elaborate**

Feedback Form 6: Feedback form for Question 2.4

1 – NTT DOCOMO INC.

[DCM] Option 4. Either the following alternatives. Two objectives would be reasonable since we saw that SL-U is a big topic.

Alt 1: SL-U + Coex (Drop CA/FR2)

Alt 2: SL-U + CA (Close Coex and Drop FR2)

Alt 3: SL-U + FR2 (Close Coex and Drop CA)

We slightly prefer Alt 3, but we can discuss among these alternatives.

2 – vivo Communication Technology

We are OK with option 2 or option 3.

3 – TELECOM ITALIA S.p.A.

other

the workload does not allow to work on all four objectives. LTE/NR coexistence is a major request from the automotive industry and should not be deprioritized/closed before full evaluation. The decision to start on new objectives should be taken at earliest at RAN#98

4 – Ericsson LM

Given the importance of SL-U and of SL coex for the automotive industry, the amount of work left, and the allocated TUs, our preferred solution is Option 4: Keep working on SL-U and Co-channel coexistence in this release. As commented in our previous replies, in our view, the co-channel coexistence item it is unlikely to be closed in two meetings based on the remaining issues.

From the remaining topics, our view is that SL-CA is more manageable and has further importance and commercial potential.

5 – ROBERT BOSCH GmbH

Inline with E// telecom Italia, we also believe that SL-U and Co-channel coexistence may continue until the end of the release. We also believe that SL-CA can be done with a reasonably limited effort.

- We propose to introduce the work of FR2 to the "others AI" as, e.g., enhancements of Rel-16 FR2, i.e., with the current FR2 restrictions.

6 – Continental Automotive GmbH

Other: we also strive for completing co-channel coexistence until the end of the release.

Proposal: SL-U + Coex (until end of release)

7 – TOYOTA Info Technology Center

We agree with Ericsson. We prefer option 4. As we stated before, we should not restrict the work on co-channel co-existence, either in the scope or number of meetings. Work on this should continue normally until the end of the Release. We can discuss reducing the options for SL CA in this Release, and have a more elaborated SL CA solution in the next Release.

8 – Verizon UK Ltd

SL on FR2 should start in this release - unlike many others, that are optimizations, this studies a new technology, enables a new set of use cases and brings in a new category of products and opportunities for market players. We are not against other works but this one, we see clear motivations allowing us to extend coverage and utilize the spectrum, without doubling the sites.

9 – Volkswagen AG

Option 4: Co-channel coexistence is an important topic for the automotive industry and should not be closed before solution(s) which fit regional standards are specified.

10 – Mitsubishi Electric RCE

We should at least properly finish what we started (SL-U and coexistence). Regarding the new items, we should only start what we can reasonably finish (e.g. not start, or limit to study only in this release, etc...)

11 – CableLabs

Complete CoEx and SL-U during this release. If un-used TUs left, further decisions could be made during the following RAN P

12 – CATT

We agree with some other companies we should first complete CoEx and SL-U during this release. As observed for the past two WG meeting, this is already a very ambitious target. Scenarios with un-used TU left is a remote possibility.

13 – Classon Consulting

[for FUTUREWEI] SL-U should not be touched. After that our preference is FR2. We disagree that an increase of TU is necessary to take on a new objective. We would likely spend a lot of time on e.g. other device types without agreement in coex, starting FR2 is more important.

14 – Qualcomm Incorporated

Potential workload and time allocation both need to be carefully considered. We are concerned in particular that Option 2 would substantially increase the workload.

15 – Apple GmbH

We prefer Option 2 since RAN2 workload is manageable. Just to clarify in Option 2, FR2 for RAN1 will start from RAN #97-e meeting, and FR2 for RAN2 will start from RAN #98-e meeting, since evaluation methodology is only in RAN1. We are also fine with Option 1 and Option 3.

16 – SHARP Corporation

We prefer Option 2.

17 – Panasonic Corporation

Our preference is to judge/evaluate the progress in the next RAN.

18 – China Mobile Com. Corporation

Other.

We think it is difficult to work on these four objectives in parallel, we prefer to start only one new objective in Rel-18; For FR2, we think only a study phase can be started.

19 – Johns Hopkins University APL

Our preference is to prioritize supporting the FR2 and CA objectives (in that order) starting from RAN #97-e. If there is no increase in the allocated TU, our preference is Option 3.

20 – InterDigital

Although we understand the interests on FR2 and CA, it makes most sense to continue SL-U and Co-Ex until the end of the release. As a compromise, we may revisit the option (finish Co-Ex and start FR2) in RAN #98-e based on the progress on Co-Ex over two RAN1 meetings.

21 – Spreadtrum Communications

We prefer option 2 and option 3.

22 – Transion Holdings

Other.

Completing SL-U and Co-Ext is an ambitious goal considering the limited TU and progress. Therefore, we prefer to start only one of them in SL CA and SL FR2 in future meetings. Among SL CA and SL FR2, we prefer SL CA, because a lot of work can be resumed from LTE SL CA

23 – Intel Korea

We share similar view with other companies that SL-U and co-channel co-existence are very pillar features for SL and should be given sufficient time to be completed and therefore they should be continued until the end of this release, without setting intermediate deadlines, that may limit further their progress.

We don't think at this moment down-selection is needed between CA and FR2 given minimal scopes for both CA and FR2 as described above.

24 – LG Electronics UK

We agree with several companies that TDM of some objectives would not help the overall progress. Our preference is to start SL CA and/or SL FR2 with manageable scopes in addition to the ongoing two objectives. (as we replied above, limiting the co-ex scope to Type A device would help). Between CA and FR2, unless FR2 scope is limited to the evaluation methodology update only, we agree with Ericsson that CA is more manageable as many works have been done in LTE and it is the only RAN2-led objective.

25 – Guangdong OPPO Mobile Telecom.

In general, we are open with all 3 options (in case of no TU increase, scope reduction seems inevitable)[QX1] with a higher preference towards Option 3 to close the Co-Ex objective in RAN#97-e. Based on the comments raised during the Monday GTW session, it seems the Co-Ex objective should be continued and it is not possible to proceed with all 4 objectives at the same time with current TU allocation. In this case, our preference is FR2.

26 – National Spectrum Consortium

Continuing with SL-U and starting on FR2/CA are our priorities.

27 – Nokia Denmark

We propose:

”Continue the remaining work on dynamic resource pool sharing in the Co-Ex objective during 4Q 2022 and evaluate progress in RAN#98-e. Discuss **in RAN#98-e the starting of CA or FR2 in RAN#98-e**”.

28 – Facebook

Currently, we are fine with Option3. Also we are acceptable for Nokia compromised proposal due to the priority from Automotive industries.

29 – KT Corp.

KT is fine with Option-3 and Option-2 is also acceptable

30 – CEWiT

We prefer option 2 or option 3. We prefer to start FR2 objective from RAN#97-e onward.

31 – Beijing Xiaomi Mobile Software

We have concern on the potential workload of option 2. We are open for other options.

32 – ZTE Corporation

A revised option 2 is proposed for consideration. The remaining study work for Co-Ex should be terminated by 4Q so that the discussion of FR2 together with the additional RAN1 TU request could be discussed by then conditioned on the clear normative scope for Co-Ex.

Option 2:

- **Complete the remaining study work ~~dynamic resource pool sharing~~ in the Co-Ex objective in 4Q 2022, start CA in RAN2 and FR2 from RAN#97-e, then start CA in RAN1 from RAN#98-e with small additional TU allocation for RAN 2, no additional TU for RAN1.**

o (The Co-Ex topic shall be limited as agreed)

- Further discuss the FR2 work in RAN#98-e including whether to focus on evaluation methodology updates only in 1Q 2023 based on TU allocation and work assessment

33 – Sony Group Corporation

We agree that not all 4 objectives can be concurrently worked considering potential workload of SL-U. Even if we decide to continue remaining work for Coex, we prefer to complete it in Q4 2022.

34 – Fraunhofer HHI

We think it is required to continue with SL-U and SL coex given the current progress and time constraints. We are also fine with the proposal by Nokia to discuss in RAN#98e the starting of CA and/or FR2. We are also fine to start CA in RAN2 after RAN#97e as proposed in Option 2.

35 – MediaTek Inc.

We tend to favour option 3, with a preference for starting FR2. However, given the discussion above, we understand that it may not be agreeable to stop the coexistence objective now, so we can accept option 1 also.

36 – NEC Corporation

We prefer to complete the study of SL-U and co-existence first, then start the discussion of SL CA and/or FR2.

37 – Lenovo (Beijing) Ltd

RAN1 has already started SL unlicensed and coexistence and the progress for SL unlicensed is a bit slower than expected. With the prerequisite of no TU increase for Rel-18 SL, we prefer continuing to concentrate SL unlicensed and coexistence in Q4 2022.

Starting FR2 sidelink after RAN#97 is not reasonable based on current progress in Rel-18. It is better to put FR2 sidelink on hold and check later when TUs frees from finishing other objective otherwise consider it in Rel-19

Regarding Objective 1 of supporting sidelink carrier aggregation, since this objective is led by RAN2 and requires less standard effort in RAN1, it is feasible to start Objective 1 in Q4 2022 at least for RAN2. For RAN1, the starting of SL CA work can be considered together with coexistence depending on the down-scoping of coexistence work or after finishing the coexistence work in RAN1.

38 – Huawei Tech.(UK) Co.. Ltd

We suggest (i) applying the restrictions to coexistence we described above (Type A device only, combination A only, NR-SL uses only information from LTE-SL for coexistence); (ii) completion by RAN#99 and revisiting the question of starting CA at the conclusion of coexistence; as well as (iii) starting FR2 now with the evaluation methodology update only. This is similar to option 2, but since it is necessary to know

the timeline feasibility of CA in RAN1, it may not be smooth to start CA in RAN1 without knowing about RAN1 at the same time.

39 – Samsung Electronics Romania

We don't think that Q2.1/2.2/2.3 can be agreeable considering comments from other companies. We prefer to have other option (that is, option 4) as follows.

- Close the Co-Ex objective in RAN#97-e.
- Start CA in RAN2 and FR2 from RAN#97-e, then start CA in RAN1 from [RAN#98-e].

40 – SDI Squared

We should continue efforts on SL-U, and start the SL FR2 objective and then the SL CA work.

2.5 Summary of initial round

Question 2.1-1 (Co-Ex)

The Co-Ex objective is to continue for dynamic resource pool sharing: Ericsson, BOSCH, Vodafone, Continental, Toyota, VW, Mitsubishi, CableLabs, CATT, ETRI, Futurewei (constrained), Apple (timeline), Sharp, Panasonic, CMCC (target date), IDC, OPPO (time bound), Intel, LGE, Facebook, Nokia, Telecom Italia, ZTE, Fraunhofer, NEC, Huawei, Lenovo

The Co-Ex objective can be closed: DOCOMO, vivo, Futurewei (if not starting FR2), Apple, CMCC, OPPO, Transsion, Spreadtrum, NSC, KT, xiaomi, MediaTek, Samsung, SDI Squared

Question 2.1-2 (Co-Ex)

Yes, the remaining Co-Ex work should be constrained to Type A devices (non-controversial part): vivo, Futurewei, Qualcomm, Apple (only combination A and no FDM-based RP partitioning), Panasonic, CMCC, OPPO, Spreadtrum, Transsion, Intel, LGE, Facebook, ZTE, MediaTek, Fraunhofer, Huawei (Type A, Comb A, existing WID scope)

No constrain is needed in RAN (based on existing agreements): DOCOMO, Ericsson, BOSCH (all proposed options), Vodafone, Continental, Toyota, VW, Mitsubishi, CableLabs, CATT, ETRI, Sharp, IDC, Nokia, xiaomi, Telecom Italia, NEC, Lenovo, Samsung

Question 2.1-3 (Co-Ex)

No target completion date: DOCOMO, Ericsson, BOSCH, Vodafone, Continental, Toyota, VW, Mitsubishi, CableLabs (revisit in RAN#98e), CATT, Sharp, Panasonic, DCM, Transsion, Intel, LGE, Facebook, Nokia, ETRI, xiaomi (examine at RAN#98e), Telecom Italia, Fraunhofer, NEC, Lenovo

Yes, set a target completion date (e.g., RAN#98-e): vivo, Futurewei, Apple, CMCC, JHU, OPPO, ZTE, MediaTek, Huawei (RAN#99)

Question 2.2 (CA)

Open to restrictions: Ericsson, Toyota, Apple, Panasonic, OPPO, LGE, xiaomi, Sony, Huawei (per CC HARQ,

mode 2 only)

No restriction in WID: vivo, BOSCH, Continental, AT&T, CableLabs, Sharp, CMCC (at this stage), IDC (at this stage), JHU, Spreadtrum, NSC, Facebook, KT, ZTE, NEC, Lenovo, SDI Squared

To determine whether to start CA objective: DOCOMO, CATT, Futurewei (prefer FR2), Qualcomm (prefer FR2), Transsion, Intel, Nokia, ETRI, CEWiT, MediaTek, Fraunhofer, Samsung

Question 2.3 (FR2)

Remove the study: vivo, Apple, OPPO, Facebook

No removal of the study phase: DOCOMO, Ericsson, BOSCH, Continental, Toyota, CableLabs, CATT, Futurewei, CMCC, JHU, IDC, Intel, OPPO, Nokia, CEWiT, xiaomi, Telecom Italia, ZTE, Sony, Fraunhofer, MediaTek, China Unicom, Lenovo, Samsung, SDI Squared

Study only in R18: Ericsson

No evaluation methodology update for commercial scenarios: DOCOMO

Question 2.4 (way forward options)

Option 1: Apple, OPPO, Nokia/Facebook/Fraunhofer (no set completion date for Co-Ex), MediaTek

Option 2: vivo, Apple, OPPO, Sharp, Spreadtrum, KT, CEWiT, ZTE (modified)

- Concern with high workload: Qualcomm, xiaomi

Option 3: vivo, Apple, OPPO, JHU, Spreadtrum, NSC, Facebook, KT, CEWiT, MediaTek

Option 4 (close Co-Ex, drop CA, start FR2): DOCOMO

Option 5 (continue with SL-U and Co-Ex, decision for CA & FR2 in RAN#98e): Telecom Italia, BOSCH, Continental, Toyota, VW, Mitsubishi, CableLabs, CATT, Panasonic, IDC, Intel, NEC, Fraunhofer

Option 6 (no set completion date for Co-Ex, start CA): Ericsson, BOSCH, Toyota, Transsion, LGE, Lenovo

Option 7 (start FR2): Verizon, Futurewei, CMCC (study only in R18), OPPO, CEWiT, SDI Squared

Option 8 (close Co-Ex, start CA in RAN2 and FR2 from RAN#97-e, start CA in RAN1 from [RAN#98-e]): Samsung

3 Intermediate Round

Moderator's observations and comments (based on inputs in the initial round)

- While there is a significant preference to continue with the Co-Ex objective to work on the dynamic resource pool sharing scheme without setting a target completion date, it is also observed that there are

strong concerns (also raised during Monday GTW) that this objective is becoming a “time sink” with open-ended operating scenarios, device types and continuation of work on semi-static resource pool partitioning schemes.

- As for further down-scoping of the CA and FR2 objectives, the majority’s view is not to impose further constraints at this stage, as some of the listed restrictions will not really save time in the WGs. If any constraint to be imposed, they can be discussed at the time of starting the normative work or in the WG. Furthermore, there is a significant view that the study phase for the FR2 objective should not be removed (i.e., go straight into normative work).
- Since it is widely desired to work on FR2 (which includes three operators) or at least a study phase should be done in R18, the following proposals from the moderator could be considered as a way forward / package.

Way forward / package:

Proposal 1: For the Co-Ex objective, RAN1 continues the remaining work on dynamic resource pool sharing based on existing agreements and WID with high priority for Type A devices and operating combination A. Evaluate the progress in RAN#98-e.

Proposal 2: Start the FR2 objective from RAN#97-e and focus only on updating evaluation methodology in 4Q 2022. Determine in RAN#98-e, whether to continue the study or study+specification work for FR2 until the end of R18.

Proposal 3: For the CA objective, continue to put on-hold and determine whether it can be started in RAN#98-e.

- If the way forward/package is agreeable, the proposals can be endorsed in RAN#97-e and captured in the meeting minutes.
- To reflect Proposal 2 and 3 in the WID, the objective section could be updated as:

To check in RAN#978-e *whether to start the specification work* for objectives 1 and 3, taking into account the progress on objectives 2 and 4, ~~aiming to have specification work for both objective 1 and 3.~~

1. Specify mechanism to support NR sidelink CA operation based on LTE sidelink CA operation [RAN2, RAN1, RAN4] (This part of the work is put on hold until further checking in RAN#978-e)

...

3. Study and specify enhanced sidelink operation on FR2 licensed spectrum [RAN1, RAN2, RAN4] (*This part of the work is put on hold until further checking in RAN#97*)

- Update evaluation methodology for commercial deployment scenario until RAN#98-e
- ...

Feedback Form 7: Feedback form for Intermediate round way forward / package proposals

1 – TOYOTA Info Technology Center

Proposal 1:

We do not support to restrict the scope of the co-channel co-existence, those type of details (Type A, combinations) can be discussed in RAN1. What is the intention with “evaluate the progress in RAN98-e?”. Proposal 2 below implies that FR2 work would last until the end of the Release, but for this Proposal 1, the proposal is to “evaluate the progress in RAN98-e”. We think that the WI objectives should be treated in a fair way, why give a time restriction to the co-existence ?

While we are here, we would like to point out that there were less official online/offline time spent at the last RAN1 meeting for the co-existence discussions than for (for example) the SL-U discussions, therefore the argument of “time sink” seems unfair.

Proposal 2: Yes.

Proposal 3: Yes. Move SL-CA (or a part of it) to the next release can be discussed at RAN-98-e, to free-up TUs.

2 – Ericsson LM

We are supportive of Proposal 1 with a modification. We think that there are many remaining issues in the definition and procedures related to dynamic resource pool sharing that need to be addressed during Rel-18 in order to achieve a proper solution as demanded by many of the use cases and industries, e.g., the automotive industry. Some of the issues might appear once we work further in this topic, so in our view we cannot decide that we will work only on the “remaining issues” since they were not identified. Therefore, we support that the work on co-channel coexistence continues based on the current agreements but without any additional limitation on the scope.

Proposal 1: For the Co-Ex objective, RAN1 continues the remaining work on dynamic resource pool sharing based on existing agreements and WID with high priority for Type A devices and operating combination A. Evaluate the progress in RAN#98-e.

We are not supportive of Proposal 2. Based on the current workload and the open issues in SL-U and co-channel coexistence, we do not support to start any work regarding SL FR2 in the next WG meetings. Our proposal is to put on hold the decision on SL FR2 until RAN#98 and consider the progress in the other agenda items and remaining allocated time to make a decision. Additionally, since the topic of SL FR2 is completely new, if it is decided to be started in RAN#98, we propose to only have a study phase until the end of Rel-18 and the specification work can happen at a later release. This corresponds to option 5, which had the widest support during the first phase of the discussion.

Assuming the decision on SL FR2 is postponed to RAN#98, we are supportive of Proposal 3. We propose to postpone any decision on SL CA to next RAN#98 to check whether it can be started.

3 – Classon Consulting

[for FUTUREWEI] Proposal 1-3 are OK as a compromise package but must include proposal 2 to start the study of FR2. We are also OK if CA is stopped now. But given the large support for FR2, it would be best for WG progress to give clear space for both coex and FR2 (at least a study) at this RAN.

4 – Huawei Tech.(UK) Co.. Ltd

The package is OK as a compromise. To Toyota and others who seek the maximum possible scope and time for coexistence work, we would note that the Type A and combination A have been proposed by the moderator as "high priority", *not* as the exclusive scope of the objective. We would be quite fine to make the scope exclusive, but can accept the way forwards out of respect for the various interests in the Release. It means if those parts are met efficiently, time could be available for the further enhancements, directions, and features you have in mind.

If there is not a more pragmatic approach to the coexistence objective, such as that proposed by the moderator, it stands out as an anomaly having the un-managed scope compared to SL-U (very detailed scoping), FR2 (carefully limited in scope), CA (limited to LTE, though with scope questions remaining). The moderator's proposal is pragmatic, but we are open to consider other pragmatic proposals from Toyota, et al.

Since the continuation at all of the coexistence objective has been called into doubt, we would be sorry if it defaulted into a "stopped" state due to lack of consensus on how or if to continue.

5 – InterDigital

Proposal 1: we prefer not to prioritize any specific device type at this point.

Proposal 2: as commented online, we are fully loaded already with CoEx and SL-U. Without additional TU, we don't have any room for any additional topic including evaluation methodology for FR2. As a compromise, we can put on hold for FR2 until next RAN plenary meeting to make the decision whether it will be included in R18 or not.

Proposal 3: supportive if we include FR objective as following:

For the CA and FR2 objectives, continue to put on-hold and determine whether it can be started in RAN#98-e.

6 – CATT

We cannot agree with proposal 1 and proposal 2.

For proposal 1, as captured in the summary, there are 18 companies believe 'No constrain is needed in RAN', while only 16 companies prefer to impose restriction, it's not correct to go ahead to impose restriction of prioritizing any specific device type.

For proposal 2, we do not have additional TU to start any new objective for the time being.

For proposal 3, we need to include the clause that also put FR2 on hold.

7 – LG Electronics UK

For proposal 1, we are supportive of "prioritizing" the scenario. As we noted before prioritizing Type A device is aligned with the current WID "Reuse the in-device coexistence framework defined in Rel-16 as much as possible." as this is the only case where Rel-18 specification work can reuse the in-device coexistence framework which assumes a device to be equipped with both LTE and NR module. If some companies are reluctant to prioritizing Combination A, we can be okay with removing this combination in this proposal. Considering the company input on the check point, we think the text for it is not that necessary. This is because the status report will capture any open issue for this objective, and an empty open issue list will be reported to RAN when all the progress is made for this objective. Then, RAN can discuss how to use the freed TUs.

We are okay with proposal 2 and 3. If the group cannot converge on the current proposal 2 due to the scope of FR2 with the given TU, we suggest considering an alternative of updating the evaluation methodology only in Rel-18.

8 – ROBERT BOSCH GmbH

P1: We do not support prioritizing device type at this moment. Additionally, we think that such a guidance RAN plenary can easily provide to RAN1 without any viable evaluation. Therefore, it enough to mention: **"RAN1 continues work on dynamic resource pool sharing based on existing agreements and WI"**

P2: We do not support P2 as well. Work load of SL-U and Co-channel are very high.

P3: It is fine to keep CA on hold until RAN#98; however, we believe it is an attainable objective given the limited TUs.

9 – Beijing Xiaomi Mobile Software

We can accept the proposals, although our preference is to determine the workscope in this meeting to avoid uncertainty on RAN2 workplan.

To correctly capture the proposals, the WID shall be revised as following:

To check in RAN#978-e *whether to start the specification work* for objectives 1, and *whether to continue the study/specification work for objective 3*, taking into account the progress on objectives 2 and 4, ~~aiming to have specification work for both objective 1 and 3.~~

10 – Apple GmbH

We support Proposal 1. The main reason to restrict the scope of co-ex objective is that we already have a solution (i.e., TDM-based resource pool partitioning) for co-ex, and we may avoid too much unnecessary optimization of the second solution (i.e., dynamic resource pool sharing). In our view, a possible way forward is to restrict the scope of each of the 3 objectives (i.e., FR2, CA and co-ex).

For Proposal 2, although we prefer to go directly to work phase, but we can accept the proposal of focusing on the evaluation methodology in Q4 2022.

We are fine with Proposal 3. We think the timeline of CA is related with the timeline of co-ex. Basically, the CA could use the TUs saved from co-ex.

11 – Panasonic Corporation

We support the proposal as it takes various different views and we think it is reasonable direction.

12 – Johns Hopkins University APL

Our preference is to close the Co-Ex objective in RAN#98-e and to start the CA objective at that time. However, to reach an agreement, we are supportive of all three proposals.

13 – CableLabs

We are OK with Proposal 1 concerning the completion of work on dynamic resource pool sharing, based on existing agreements.

Concerning Proposal 2: we suggest to revisit this proposal during RAN #97e and dependent on the progress made on Coex, to make further appropriate decisions. Also FR2 may require a Study Phase.

We consider CA as a lower priority but being open to further negotiations, we could agree on further discussions during RAN #98, dependent on the progress made on Coex, Channel Access mechanism and eventually on FR2 SID (TBD for now).

14 – Guangdong OPPO Mobile Telecom.

We support this compromise way forward which does not preclude other device types and combinations that could be considered at a later stage. In our understanding, the evaluation of progress in RAN#98-e provides an opportunity to determine whether CA and/or FR2 objectives can be started or continued and any necessity to adjust their scope to fit within the allocated TUs. Furthermore, the timeframe for Rel-18 is also due for discussion in RAN#98-e, which may become more feasible to start CA and FR2. We agree with Huawei that this proposal package is a pragmatic way handle these 3 objectives at this point.

15 – Intel Korea

- **Proposal 1:** We are generally OK with the proposal, and to prioritize less controversial and more essential aspects of this study. However, we are not comfortable with the last part “Evaluate the progress in RAN#98-e.”, since setting such a very short deadline for time check, may actually not help to speed up the progress given the non-triviality of the issue, and given that so far in RAN1 only general discussions on targeted device type and scenarios have occurred and very little technical discussions have been conducted toward actual dynamic resource partitioning solutions.
- **Proposal 2:** We are supportive of this proposal
- **Proposal 3:** We are supportive of this proposal

16 – NTT DOCOMO INC.

At first let me thank moderator for efforts on making the proposals from divergent views.

- Proposal 1: Our preference is not to agree any restriction, but we can accept as compromise.
- Proposal 2: As commented by several companies, it is clear from the situation of the last RAN1 meeting that there is no room to have discussion on other than SL-U/Coex. Starting FR2 from the next RAN1 meeting would not be reasonable. If more TUs are allocated, we are fine with proposal 2.
- Proposal 3: OK

17 – China Mobile Com. Corporation

P1: Agree;

P2: Not agree, due to the existing workload in SL-U and Coex;

P3: Agree.

18 – Verizon UK Ltd

We are OK with the compromise. Dropping P2 is not acceptable to us.

19 – III

Proposal 1: Agree and prefer not to prioritize any specific device type

Proposal 2: Consider workload in SL-U and Co-ex. Same as P3 - continue to put on-hold and determine whether it can be started in RAN#98-e.

Proposal 3: Agree

20 – SDI Squared

Proposal 1: Our preference remains to close Co-Ex. That said, continuation of Co-Ex should be of restricted scope to make reasonable Co-Ex progress as well as allow time for FR2 and CA.

Proposal 2: Supportive.

Proposal 3: We prefer inclusion though we do not object.

21 – MediaTek Inc.

We support the package of proposals as a compromise way forward.

On P1, we have the same understanding as Huawei, that this is a prioritisation proposal rather than a hard constraint. In Q2.1-1, 13 companies were open to closing the objective now, so P1 represents a compromise for a significant number of companies on that side of the discussion, while leaving the objective open to address the concerns expressed by other companies. We don't really see the concern with the compromise proposal—work on the principal case for dynamic resource sharing is prioritised, and if there are serious concerns for other cases, addressing them is not excluded. Do companies consider that there is something we would not be able to do?

We do not have a strong view on P2, but we see some value in allowing work to start on FR2 to support a more informed scoping decision at RAN#98-e, and the proposal seems to represent a reasonable balance.

We support P3 as it is.

22 – Nokia Denmark

Nokia is fine with all three proposals. Good compromise.

23 – Facebook

We are fine with the Moderator proposals.

24 – Spreadtrum Communications

We are fine with the proposals.

25 – vivo Communication Technology

Although not preferable, given the current situation the package of these proposals as a compromise is acceptable to us.

26 – Sony Group Corporation

We are supportive of the proposals as compromisation.

27 – ZTE Corporation

For proposal 1, similar view as LGE that the discussion of combination for either semi static or dynamic resource pool partitioning should be left open to WG discussion. This issue should be one of remaining issues at least for semi static resource pool partitioning. Prefer to reflect that point in the proposal

Proposal 1: For the Co-Ex objective, RAN1 continues the remaining work on dynamic resource pool sharing based on existing agreements and WID with high priority for Type A devices and ~~operating combination A~~ and semi static resouce pool sharing. Evaluate the progress in RAN#98-e.

For proposal 2, we are not supportive. Current RAN1 TU in Q4 cannot support the study and thus it would be better to further discuss FR2 in RAN#98-e considering the overall progress in other topics, e.g. the termination of the study phase of coexistence topic. CA topic in RAN2, on the other hand, can be initiated without additional TU.

28 – Transsion Holdings

Proposal 1, Yes.

Proposal 2, Given the workload of SL-U and co-channel coexistence in RAN 1, we are inclined to put FR2 on hold until Q4 2022 and decide whether to start it after RAN#98-e.

Proposal 3, Yes.

29 – SHARP Corporation

We are fine with the package proposed by the Moderator.

30 – Samsung Electronics Romania

We are fine with the proposal 2. But, we think that it doesn't increase TU in RAN2 aspect because it is focusing on EVM update.

31 – Fraunhofer HHI

P1: We prefer not to introduce any restrictions but are ok to compromise by at least restricting the operating combinations. We are ok with the modifications from Ericsson to strike out "remaining". We feel that the last line of the proposal to "Evaluate the progress..." is not required because it is normal plenary procedure to evaluate the progress of objectives at each meeting.

P2: Given the workload of SL-U and co-channel coexistence in RAN 1, we propose to put FR2 on hold and decide whether to start it after RAN#98-e.

P3: Agree in principle. We still think that starting SL CA in RAN2 in Q4 could be an option.

32 – VODAFONE Group Plc

Proposal1: We think that it is better if we do not put any restrictions in regards to the handling of dynamic Co-Ex. We can of course verify progress on any RAN Plenary, but does it need to be captured?

33 – Mitsubishi Electric RCE

Proposal 1: We do not agree with the current version. " **For the Co-Ex objective, RAN1 continues the remaining work on dynamic resource pool sharing based on existing agreements**" should be enough. RAN1 is in the process of having technical assessments on which device types and mode combinations are beneficial and recommended to be specified. Limiting the specification work to certain device types/combinations is part of the normal WG workflow and it is currently the ongoing process in RAN1, we don't think that plenary intervention to shut down part of the technical process is useful only one quarter into the WI. There is no need to capture any specific checkpoint (progress verification in plenary is part of the regular process).

Proposal 2: Decide at the next plenary whether to start FR2 (and possibly limit to study only in Rel.18) is our favourite option.

Proposal 3: OK

34 – CEWiT

We tend to support proposed compromised proposals but we feel evaluations till RAN 98 for FR2 will not be sufficient. So another suggestion could be to continue study on FR2 for Rel 18 and normative part can be take in next release.

35 – Lenovo (Beijing) Ltd

For Proposal 1, we are supportive if Type B device can be considered together with Type A.

For Proposal 2, as commented in the initial round, our views are not changed. We don't support starting FR2 sidelink after RAN#97 because RAN1 Sidelink is fully loaded now. Based on current status in Rel-18 on sidelink unlicensed and coexistence, the progress is slow. Starting new objective Sidelink FR2 will

inevitably occupy the TU for SL-U and coexistence and lead to slower progress on Sidelink unlicensed and coexistence. From our side, sidelink CA, sidelink unlicensed and sidelink FR2 are aiming for same target of increasing data rate. We suggest putting FR2 sidelink on hold and check it later when TU is sufficient or freed up. We are also OK if starting Sidelink FR2 in the later stage of Rel-18 or Rel-19.

For Proposal 3, for sidelink CA, we suggest starting it in Q4 2022 only in RAN2 and put it hold in RAN1. The starting of SL CA work in RAN1 can be decided in RAN#98.

36 – Volkswagen AG

P1: This is not supported. It is proposed not to put any restrictions on the scope of the co-channel co-existence objective. RAN1 is expected to be capable of taking the information of regional standards (outlined in RP-222369) into account and to find appropriate solutions. RAN1 is already in the process of assessing which device types and mode combinations need to be specified. There is no need to impose a restriction on this matter.

Further there is no need to explicitly mention an evaluation checkpoint since it is a normal process to report each WI status at RAN TSG meetings.

P2: This is not supported. Operation of FR2 is understood to be a bigger topic compared to objectives targeting FR1 and the operation in the ITS frequency band (e.g. CA or co-channel coexistence). 3GPP is encouraged to support first a solid foundation for operation in the already utilized ITS frequency band rather than working on, maybe just fragmentarily, FR2 support.

P3: Given the current discussion proposal 3 can be supported. Nevertheless it is reminded that CA is an important topic for the automotive industry, as also outlined by 5GAA in RP-213511.

37 – NEC Corporation

We are fine with proposal 1 and proposal 3.

For proposal 2, as the TUs reserved for Rel-18 SL-evo is tight for just SL-U and co-existence discussion, we prefer to start the study on FR2 later, e.g., similar to proposal 3 for CA, continue to put on-hold and determine whether it can be started in RAN#98-e.

3.1 Summary of intermediate round and updated proposals

Two main discussion points from the inputs in the Intermediate round:

1. In Co-Ex, higher priority for Type A devices and Combination A
 - a) Support / OK (align with WID, more focused discussion): Ericsson, Futurewei, Huawei, LGE, xiaomi, Apple, Panasonic, JHU, CableLabs, OPPO, Intel, DOCOMO, CMCC, Verizon, SDI Squared, MediaTek, Nokia, Facebook, Spreadtrum, vivo, Sony, Transsion, Sharp, Fraunhofer (at least the combination), CEWiT, NEC
 - b) No prioritization (to consider all possibilities): Toyota, IDC, CATT, BOSCH, ZTE, Vodafone, Mitsubishi, VW

c) Support proposal 1 if Type B is also included: Lenovo

undefined

2. Start evaluation methodology update for FR2 from RAN#97-e

- a) Support / OK (large support, minimal work, no guarantee to have specification work): Toyota, Futurewei, Huawei, LGE, xiaomi, Apple, Panasonic, JHU, OPPO, Intel, Verizon, SDI Squared, MediaTek, Nokia, Facebook, Spreadtrum, vivo, Sony, Sharp, Samsung, CEWiT
- b) FR2 on-hold until RAN#98-e (due to workload and lack of TU): Ericsson, IDC, CATT, BOSCH, CableLabs, DOCOMO, CMCC, III, ZTE, Transsion, Fraunhofer, Mitsubishi, Lenovo, VW, NEC

Moderator's comments:

- It should be clarified the use of “with higher priority” does not mean other device types and combinations are precluded. It merely allows discussion to be more focused in the WG on aspects that we already have common consensus. From project management’s perspective, this guidance from RAN would be useful in preventing discussion in the WG diverging into different directions and for more efficient use of allocated TUs.
- It should be also clarified that the evaluation of progress in RAN#98-e is not a time bound / target completion date for the Co-Ex objective. Since naturally we will review the SR and progress in every plenary, and that the start/continuation of CA and FR2 is subject to the progress of SL-U and Co-Ex, it would be OK to remove this.
- There is still a large support to work on just the evaluation methodology updates for the FR2 objective in 4Q 2022. Since the updates should not take up too much time in RAN1, as we have evaluation methodology for SL commercial cases already from the past and from Uu beam management, the workload is expected to be manageable.
- There were suggestions to start CA in RAN2 first in Proposal 3, but there was also suggestion from some to drop CA from Rel-18 entirely. It is best to keep Proposal 3 as it is.

Updated way forward / package proposals for Wednesday GTW

Proposal 1: For the Co-Ex objective, RAN1 continues the remaining work on dynamic resource pool sharing based on existing agreements and WID with high priority for Type A devices and operating combination A. Evaluate the progress in RAN#98-e.

Proposal 2: Start the FR2 objective from RAN#97-e and focus only on updating evaluation methodology in 4Q 2022. Determine in RAN#98-e, whether to continue the study or study+specification work for FR2 until the end of R18.

Proposal 3: For the CA objective, continue to put on-hold and determine whether it can be started in RAN#98-e.

4 Final Round

To reflect in the WID the agreed way forward proposals from RP-222580, the moderator proposes the following changes to the objective section. The moderator has tried to reused the same wording as the agreed way forward proposals as much as possible. Please indicate any mistake or suggest a better approach to modify the objectives (if any).

Update the WID objective section as:

~~To check in RAN#97 for objectives 1 and 3, taking into account the progress on objectives 2 and 4, aiming to have specification work for both objective 1 and 3.~~

1. Specify mechanism to support NR sidelink CA operation based on LTE sidelink CA operation [RAN2, RAN1, RAN4] (This part of the work is put on hold until further checking in RAN#978-e)
2. ...
3. Study and specify enhanced sidelink operation on FR2 licensed spectrum [RAN1, RAN2, RAN4] (~~This part of the work is put on hold until further checking in RAN#97~~Determine in RAN#98-e, whether to continue the study or study+specification work for FR2 until the end of R18.)
 - ~~Focus only on updating~~Update evaluation methodology for commercial deployment scenario in 4Q 2022.
 - ...
4. Study and specify, if necessary, mechanism(s) for co-channel coexistence for LTE sidelink and NR sidelink including performance, necessity, feasibility, and potential specification impact if any [RAN1, RAN2, RAN4]
 - Reuse the in-device coexistence framework defined in Rel-16 as much as possible
 - Note, RAN1 continues the work on dynamic resource pool sharing based on existing agreements and WID with high priority for Type A devices and operating combination A

Feedback Form 8: Feedback form for the WID objective updates

1 – NTT DOCOMO INC.

Basically fine, but probably it would be better to define 'Type A devices' and 'Combination A' since people not following RAN1 might not understand the meaning.

2 – ZTE Corporation

For the first sentence, it seems just fine to change the date to RAN#98-e given both objectives shall be checked in RAN#98-e.

To check in RAN#97 98-e for objectives 1 and 3, taking into account the progress on objectives 2 and 4, aiming to have specification work for both objective 1 and 3.

For the change to co-existence, similar view as DOCOMO, another option is that this proposal can be just

there for guidance without necessarily changing the WID.

3 – ZTE Corporation

For the change to co-existence, if kept, can be finetuned as follows. (The 'existing agreement' and 'based on WID' saying seems not common WID objective description, we prefer to drop those. To us, a WID objective should be clear and self explainable)

Note, RAN1 continues the work on dynamic resource pool sharing with high priority for device with both NR and LTE SL modules and operating combination of NR mode 2 plus LTE mode 4

4 – Intel Korea

The proposed updated text for the WID is OK for us. However, here a few minor editorials and suggested edits (highlighted in bold):

- (~~Determine in RAN#98-e, whether to continue the study or study+specification work for FR2 until the end of R18.~~)
- Focus only on updating ~~Update~~ **the** evaluation methodology for commercial deployment scenario in 4Q 2022.
- ~~Note.~~ **Note:** RAN1 continues the work on dynamic resource pool sharing based on existing agreements and WID with high priority for Type A (**i.e., device with dual NR SL and LTE SL module**) devices and operating combination A (**i.e., mode 2 NR SL + mode 4 LTE SL**)

5 – InterDigital

Agree with companies that good to clarify what Type A and combination A mean. Intel's suggested updates look good to us.

6 – InterDigital

Agree with companies that good to clarify what Type A and combination A mean. Intel's suggested updates look good to us.

7 – InterDigital

Agree with companies that good to clarify what Type A and combination A mean. Intel's suggested updates look good to us.

8 – Facebook

Generally, we are fine with the revised WID from Moderator. Also it can acceptable with updating the wording from Intel.

9 – vivo Communication Technology

Intel's updates look good to us.

For the co-ex part, we are also fine with simply having the guidance instead of updating the WID as suggested by ZTE.

<p>10 – Johns Hopkins University APL</p> <p>We are fine with the proposed updated to the WID.</p>
<p>11 – Sony Group Corporation</p> <p>We are fine with the updated WID with some clarifications for Type A device and combination A as commented by other companies.</p>
<p>12 – CEWiT</p> <p>We are fine with updated WID objectives.</p>
<p>13 – Huawei Tech.(UK) Co.. Ltd</p> <p>This is fine, but it is not necessary to update the WID for coexistence since there is already a RAN conclusion - RAN routinely operates in that way. If the WID is going to be updated (unnecessarily) the current wording is perfectly sufficient, or the RAN1 agreements/conclusions can be copied in directly. We should not remove the type A/combination A wording, however.</p>
<p>14 – China Mobile Com. Corporation</p> <p>It is agreeable, and we are also fine with Intel’s updates.</p>
<p>15 – Panasonic Corporation</p> <p>We support the proposal.</p>
<p>16 – Nokia Denmark</p> <p>We are fine with the proposed updated to the WID.</p>
<p>17 – MediaTek Inc.</p> <p>We are generally fine with the proposed updates, including Intel’s edit above. However, we also think the note should have some clear time scoping; someone reading the WID at another time should be able to understand from what point ”RAN1 continues the work”. We would suggest ”RAN1 continues the work on dynamic resource pool sharing <u>from 4Q 2022</u>, based on existing agreements...” (or ”from RAN#97-e” would also be OK).</p>
<p>18 – MediaTek Inc.</p> <p>We are generally fine with the proposed updates, including Intel’s edit above. However, we also think the note should have some clear time scoping; someone reading the WID at another time should be able to understand from what point ”RAN1 continues the work”. We would suggest ”RAN1 continues the work on dynamic resource pool sharing <u>from 4Q 2022</u>, based on existing agreements...” (or ”from RAN#97-e” would also be OK).</p>
<p>19 – MediaTek Inc.</p> <p>We are generally fine with the proposed updates, including Intel’s edit above. However, we also think the note should have some clear time scoping; someone reading the WID at another time should be able to understand from what point ”RAN1 continues the work”. We would suggest ”RAN1 continues the work</p>

on dynamic resource pool sharing from 4Q 2022, based on existing agreements...” (or ”from RAN#97-e” would also be OK).

20 – Transsion Holdings

We are fine with the updated WID.

21 – Fraunhofer HHI

We support the proposed changes to the WID. We are also fine with the updates provided by Intel.

22 – CATT

We are ok with intel’s version.

23 – Mitsubishi Electric RCE

We are OK with the updates to objective 1 and 3.

Concerning the modifications to objective 4/coexistence, we would rather not modify the WID but take the already endorsed WF as guidance from the plenary.

- First of all, wording such ”based on WID and current agreements” is quite unusual for a WID, which should be clear and stand-alone.
- Second of all, having to define Type A in the WID opens up a new can of worms: although RAN1 has some common understanding about how a device type A behaves, it didn’t manage to agree on a proper definition (having a dual device is necessary but not sufficient, if the NR/LTE devices don’t communicate in a given manner, or if the NR device doesn’t use the info from the LTE device in a given manner, that’s probably not a type A device). In order to avoid having such discussions here, it’s better to skip the note and rely on RAN guidance based on the endorsed WF.

We would also prefer keeping at least part of the first phrase (above the bullet points): ”To check in RAN#9798-e for objectives 1 and 3, taking into account the progress on objectives 2 and 4” should be accurate enough.

24 – Ericsson LM

The updated WID from the moderator looks OK to us.

25 – Ericsson LM

The updated WID from the moderator looks OK to us.

26 – Volkswagen AG

It’s okay to update the WID on the CA and FR2 objectives also with the corresponding additions/corrections proposed by Intel. The coexistence objective doesn’t need to be updated as the note is already covered by the endorsed WF.

If the majority still sees a need for the coexistence note, then a rewording is recommended. PC5 doesn’t need necessarily modules, a simple priority should suffice to express the need for type A devices.

Note: RAN1 continues the work on dynamic resource pool sharing based on existing agreements and WID with high priority for Type A (i.e., devices supporting ~~with dual NR SL and LTE SL module~~) devices and operating combination A (i.e., mode 2 NR SL + mode 4 LTE SL)

27 – NEC Corporation

We are fine with the updated WID.

28 – LG Electronics UK

We are fine with the updated WID.

29 – LG Electronics UK

We are fine with the updated WID.

30 – Lenovo (Beijing) Ltd

We are fine with the intention.

Further suggestions from our side are listed below:

- For 1st sentence, agree with ZTE to simply change the date to RAN#98e considering both Objective 1 and 3 shall be checked in next plenary.
- For Objective 4, we prefer adding detailed definition of Type A and combination A for more readable.

31 – Classon Consulting

[for FUTUREWEI] Agree with some others that it is not necessary to modify the WID for the conclusion on coex from the GTW, RAN1 will follow the RAN guidance. The other updates are fine.

4.1 Moderator's comments

- Regarding the note for Co-Ex objective #4, after further checking existing RAN1 agreements, the definition for Type A includes more than just dual LTE SL and NR SL modules. Without repeating / copying the definition for Type A and Combination A into the WID, as preferred by many companies, we can leave the note out knowing that Proposal 1 of RP-222580 is agreed. After checking/clarifying with RAN secretary, all agreements from [97e-20-R18-SLEvo] are to be captured in a new document. So, all of the three agreed WF proposals from Wed. GTW session are now uploaded in RP-222642 which is to be used as a recording keeping. We can refer to this document later, if needed.
- Regarding the (first) sentence above the bullets, if this is to be kept, then we will have to get into discussion of how to modify the sentence to correctly reflect Proposal 2 (for FR2). Since this sentence also deals with objective #1 (CA), I foresee in the end the sentence will get complicated and potentially messy. Since most of company is fine with the current updates, I will not modify it.
- For other parts, I follow Intel's suggestions.
- In addition, additional supporting companies are listed.

5 Outcome / Conclusion

The following way forward proposals are endorsed during the Wednesday GTW session.

Proposal 1: For the Co-Ex objective, RAN1 continues the work on dynamic resource pool sharing based on existing agreements and WID with high priority for Type A devices and operating combination A.

Proposal 2: Start the FR2 objective from RAN#97-e and focus only on updating evaluation methodology in 4Q 2022. Determine in RAN#98-e, whether to continue the study or study+specification work for FR2 until the end of R18.

Proposal 3: For the CA objective, continue to put on-hold and determine whether it can be started in RAN#98-e.

6 References

- [1] RP-221798 "WID revision: NR sidelink evolution", OPPO, RAN#96
- [2] RP-221937 "Status report for WI NR sidelink evolution; rapporteur: OPPO", RAN1, RAN#97-e
- [3] RP-221886 "Status Report RAN WG1", RAN1 Chair, RAN#97-e
- [4] RP-222016 "Discussion on the scope of Rel-18 sidelink evolution", LG Electronics, RAN#97-e
- [5] RP-222075 "On starting sidelink CA and FR2 objectives", OPPO, RAN#97-e
- [6] RP-222149 "Discussion on NR sidelink evolution WI", vivo, RAN#97-e
- [7] RP-222227 "Discussion on Release-18 NR Sidelink evolution", KT Corp., RAN#97-e
- [8] RP-222233 "On the work scope of Rel-18 NR sidelink evolution", Samsung, RAN#97-e
- [9] RP-222247 "Views on scope of NR sidelink evolution WI", xiaomi, RAN#97-e
- [10] RP-222253 "Discussion on Rel-18 NR sidelink evolution", NTT DOCOMO, INC., RAN#97-e
- [11] RP-222260 "On the Scope of Rel-18 NR Sidelink Evolution", Intel Corporation, RAN#97-e
- [12] RP-222283 "On Rel-18 Sidelink Evolution", Lenovo, RAN#97-e
- [13] RP-222359 "On the NR Sidelink Evolution WID objectives", Nokia, Nokia Shanghai Bell, RAN#97-e
- [14] RP-222369 "Discussion on Co-Channel Coexistence for LTE Sidelink and NR Sidelink", Continental Automotive GmbH, Toyota Info Technology Center, Robert Bosch GmbH, Mitsubishi, Volkswagen AG, Deutsche Telekom, Fraunhofer HHI, Fraunhofer IIS, RAN#97-e
- [15] RP-222393 "Discussion on WID scope of Rel-18 NR sidelink evolution", CATT, GOHIGH, RAN#97-e
- [16] RP-222449 "Discussion on NR sidelink evolution scope", ZTE, Sanechips, RAN#97-e

[17] RP-222455 "On progress of Rel-18 NR sidelink evolution work item", Huawei, HiSilicon, RAN#97-e

[18] RP-222484 "Discussion on Rel-18 NR Sidelink Evolution", Apple, RAN#97-e