**[90E][25][R17\_sidelink\_scope]**

**Goal: Generate an agreeable way forward and potential revised WID.**

**Issue 1: Mode 2 enhancement for enhanced reliability and reduced latency**

The current objective for Mode 2 enhancement for enhanced reliability and reduced latency is as follows:

|  |
| --- |
| * Study the feasibility and benefit of the enhancement(s) in mode 2 for enhanced reliability and reduced latency in consideration of both PRR and PIR defined in TR37.885 (by RAN#91), and specify the identified solution if deemed feasible and beneficial [RAN1, RAN2]
	+ Inter-UE coordination with the following until RAN#90.
		- A set of resources is determined at UE-A. This set is sent to UE-B in mode 2, and UE-B takes this into account in the resource selection for its own transmission.
	+ Note: The study scope after RAN#90 is to be decided in RAN#90.
	+ Note: The solution should be able to operate in-coverage, partial coverage, and out-of-coverage and to address consecutive packet loss in all coverage scenarios.
	+ Note: RAN2 work will start after RAN#89.
 |

The moderator observed that many companies proposed to extend the study on the inter-UE coordination while there are also proposals to start normative work on this topic or defer this study to a future release.

Q1: Do you agree that the study on the inter-UE coordination is extended to RAN#91?

|  |  |  |
| --- | --- | --- |
| Company | Answer | Comment |
| LGE | Yes | On top of the progress made in the last WG meetings, we expect RAN1 can draw meaningful conclusion on the feasibility and benefit of the inter-UE coordination so that normative work scope can be decided in RAN#91. |
| vivo | Yes | We expect that RAN1 can achieve a conclusion in the next quarter, so that the normative work (including RAN2) can start properly. |
| Xiaomi | Yes | We also expect that RAN1 can achieve conclusion on feasibility and benefit of inter-UE coordination until next RAN meeting.  |
| OPPO | Yes | As it is already RAN1’s conclusion indicated in the received LS (RP-202153), “*further study for this WI objective topic on the feasibility/benefit of inter-UE coordination is required*”, the RAN plenary should take this conclusion into account and extend this study accordingly as recommended by RAN1. Based on our observation of work progress so far in RAN1, one more quarter of study until RAN#91 should be sufficient to reach a final conclusion. |
| Huawei, HiSilicon | Objective is study&specify, so allow RAN1 to continue. | There may be some misunderstandings in the moderator analysis compared to the existing WID:1. The objective already leads to normative work where it says “…and specify the identified solution…”, subject to feasibility/benefit.
2. The current wording of the second sub-bullet is only to decide the “***study*** scope after RAN#90”, and not to decide whether there is normative work (it is already agreed to follow).
3. The timeline of the study is *already* RAN#91 (main bullet). RAN#90 is only to consider the scope of what is studied between RAN#90 and RAN#91.

Based on the RAN1 conclusions, there were a number of schemes categorized for inter-UE coordination, in addition, a number of companies provided simulation results to show that there are benefits and feasibility. Since RAN1 now understands how to discuss and analyze the schemes, there is no need for further checkpoints in RAN, and the references to RAN#90 and RAN#91 can be simply deleted, allowing RAN1 to complete the work until the ‘RAN1 freeze’. |
| Ericsson | Yes | Study continues for one more meeting without changing the scope |
| Qualcomm | Yes |  |
| Nokia, NSB | Yes | Current WID states “Inter-UE coordination with the following until RAN#90 … study scope after RAN#90 is to be decided in RAN#90”. So the WID needs to be updated to make it clear that inter-UE coordination continues until RAN1#91.  |
| InterDigital | Yes | We also think that RAN1 can a meaningful conclusion in the next quarter. Fine either update the WID accordingly or continue study one more meeting without change WID as mentioned by Ericsson |
| Futurewei | Yes | The study can continue for one quarter, based on the agreements reached so far in the WGs. The focus should be on feasibility since the benefits of UE coordination are clear (cf. our contribution RP-202217) |
| Fujitsu | Yes | We agree that the related study for one more quarter. |
| Panasonic | Yes | Some more mutual understanding is necessary. |
| Apple | Yes | We expect that RAN1 can achieve conclusion on feasibility and benefit of inter-UE coordination until RAN #91. |
| Lenovo, Motorola Mobility | Yes | We are fine with the extending the scope of the study phase until next quarter and then in the next quarter normative objective scope can be defined. |

Q2: If you answered yes in Q1, what is your preference to update the objective?

Option 1: Keep the current wording on the scope of inter-UE coordination and just update the study timeline (an example is in [9]).

Option 2: List the schemes in the RAN1 LS [1] as the candidates of the study (an example is in [7]). In this case, please indicate whether to list all the schemes or down select some schemes.

Option 3: Others (please specify).

|  |  |  |
| --- | --- | --- |
| Company | Answer | Comment |
| LGE | Option 1 | As RAN1 progress in Q1/2021 will be made on the basis of the conclusion made so far, no further wording is necessary to refine the scope of the inter-UE coordination. We think the change in [9] is enough. |
| vivo | Option 2 | Listing the schemes identified by RAN1 helps to eliminate some unnecessary arguments in the WG discussions. Nevertheless, it is not necessary to down scope in RAN – that can be handled by RAN1. |
| Xiaomi | Option 1 | The current wording on scope of inter-UE coordination is enough. |
| OPPO | Option 1 or 2 (down scope) | The categories of schemes so far reached in RAN1 need some down selection in our understanding, as it is impractical to specify all of them in R17. In our understanding, RAN1 should do this down selection in the next quarter or at RAN#91e when converting into normative work. While we think it is sufficient to just update the study timeline as in [9], we are open to do this down selection in this RAN#90e meeting. Having said this, therefore, it is not preferred and not necessary to list all of the identified categories of schemes (without down selection) in the WID, since this may give an impression that all of these should be included/specified in the end. |
| Huawei, Hisilicon | Option 1 | The study scope should be based on RAN1’s agreements, and there is no need for RAN to restrict at WID level what particular detailed techniques can be discussed for feasibility, benefits, and specification.The objective is already study & specify, so the timeline can be the ‘RAN1 Rel-17 freeze’. |
| Ericsson | Option 1 | RAN1 can continue working based on existing agreements/conclusions. There is no need to update the WID regarding this. |
| Qualcomm | Option 2 | The RAN1 agreements were made in accordance with the existing wording of the WID. While Option 1 is consistent with and wouldn’t affect RAN1 agreements or next steps, we think that limiting the options in the WID to those identified in the RAN1 agreements per Option 2 would help focus the RAN1 efforts. |
| Nokia, NSB | Option 1 | The proposed update in [9] is fine |
| InterDigital | Option 1 | Update the timeline would be good enough |
| Futurewei | Option 1 | The current wording is fine. Work in the WGs can proceed based on the previous agreements reached so far |
| Fujitsu | Option 1 | We can keep the current WID, and the working scope can be based on RAN1’s agreements. |
| Panasonic | Option 1 | As some conclusions were reached described in RAN1 LS, it can be used for further discussion. No need of the update of WID. |
| Apple | Option 1 | We only need to update the timeline. The study scope can be based on RAN1’s agreements.  |
| Lenovo, Motorola Mobility | Option 1 | The current wording is fine. |

**Issue 2: Sidelink DRX**

The current objective for sidelink DRX is as follows:

|  |
| --- |
| . Sidelink DRX for broadcast, groupcast, and unicast [RAN2]* Define on- and off-durations in sidelink and specify the corresponding UE procedure
* Specify mechanism aiming to align sidelink DRX wake-up time among the UEs communicating with each other
* Specify mechanism aiming to align sidelink DRX wake-up time with Uu DRX wake-up time in an in-coverage UE
 |

The moderator observed that there are proposals to add RAN1 as a secondary WG for this objective.

Q3: Do you agree that RAN1 is added as a secondary WG for the objective of sidelink DRX?

|  |  |  |
| --- | --- | --- |
| Company | Answer | Comment |
| LGE | No | We agree that there can be some issues for RAN1 to look into pertaining to sidelink DRX. However, in our view, so far the potential issue is limited to the resource allocation aspect which is already covered in another objective of the approved SID, and having a separate agenda/objective may lead to undesirable parallel discussion on the same topic in RAN1. We think sidelink DRX impact on the resource allocation needs to be treated under the agenda of the power efficient resource allocation considering other RAN1-origniated topics, and if necessary, we can clarify that the existing objective of the resource allocation enhancement also needs to consider impact from other functionalities including sidelink DRX. |
| vivo | Yes | We think it is better to add RAN1 as a secondary WG.Firstly, DRX may affect not only the resource allocation, but also others such as measurement (CBR/CR, etc.). Putting the RAN1 as a secondary WG encourage RAN1 to check further potential issues. Otherwise, it is risk of potential critical issues being found at a very last stage or even after the stage-2 frozen of RAN1, especially considering that RAN2 has a three-month shift after RAN1 frozen. Secondly, it helps RAN1 to better manage the work load (e.g., mail threads, etc.), compared with the case of handling the per-meeting LS from RAN2. |
| Xiaomi | Yes | There are already many contributions discussing DRX impact in the last two RAN1 meeting, but not treated. Setting RAN1 as 2nd WG helps RAN1 to manage the workload and arrange the discussion.  |
| OPPO | No | We tend to have the same view as LGE that RAN1 aspect and impact of SL DRX design on resource allocation can be handled directly under the relevant agenda item(s). Otherwise, we may artificially create another AI in RAN1 with overlapping scope. Furthermore, since RAN2 has agreed to send an LS to RAN1 regarding the impact of SL DRX on sensing, in our view this coordination between RAN1/2 is established. And we can utilize this for further communication regarding SL DRX between WGs. I think at most we are OK with suggestion from LGE that “we can clarify that the existing objective of the resource allocation enhancement also needs to consider impact from other functionalities including sidelink DRX”. |
| Huawei, Hisilicon | Not essential | It is necessary to allow RAN1 to discuss impacts from SL DRX on the physical layer, whereas there seems to be some confusion over this at present. Based on the RAN2 LS that SL DRX should take PSCCH monitoring also for sensing (in addition to data reception) into account, it is already clear that this has RAN1 impact, particularly on sensing and resource selection, which can be handled in the agenda item on power saving. Given the LS, it is not critical to add RAN1 as a secondary WG for the objective of sidelink DRX, as it can rely on coordination between RAN1 and RAN2. |
| Ericsson | Yes |  |
| Qualcomm | No | RAN1 can address the LS from RAN2 and take it into account as it would any other LS. There’s no need to add RAN1 as a working group for DRX. |
| Nokia, NSB |  | It is important that RAN1 aspects of SL DRX don’t fall through the cracks. Either of the following options could work:* Update objective on “resource allocation to reduce power consumption” to include RAN1 aspects of DRX
* Update SL DRX objective to add RAN1 as a secondary WG
 |
| InterDigital | Yes | We think sidelink DRX has be considered for resource allocation as resource allocation has to be aligned with the DRX period. As long as the sidelink DRX is considered in RAN1 for resource allocation, we are fine with either clarifying the resource allocation enhancement objective to include sidelink DRX or adding RAN1 as seconding WG for the sidelink DRX. |
| Futurewei | Yes | While we agree with LGE that this is not an absolutely needed clarification, this will make it clear that RAN1 has to discuss DRX on the sidelink. Given that the WID will be modified anyway (cf Q1 and Q2), we do not see any harm in adding RAN1 as secondary WG |
| Fujitsu | Yes | Adding RAN1 as a secondary WG can make the DRX work more efficient. We already know the strong relation in between, especially for the resource selection in/out DRX On-Duration after sensing procedure, that needs some interwork between RAN1 and RAN2. |
| Panasonic | Yes | To add secondary WG or to clarify that the existing objective of the resource allocation enhancement also needs to consider impact from other functionalities including sidelink DRX is necessary to clarify RAN1 scope. |
| Apple | Yes | We support to have RAN1 as a secondary WG to make this point clear to RAN1. RAN1 needs to discuss how to enhance sensing and resource allocation when SL-DRX is configured.  |
| Lenovo, Motorola Mobility | Yes | We support to have RAN1 as a secondary WG to manage the workload and arrange the related discussion. |

Q4: If RAN1 is added, do you think the objective content also needs to be updated (an example is in [5])?

|  |  |  |
| --- | --- | --- |
| Company | Answer | Comment |
| vivo | No |  |
| Xiaomi | Yes |  |
| Huawei, HiSilicon | No | The objective is fine. RAN1 can determine the necessary work, aided by RAN2 agreements as necessary. |
| Ericsson | Limit scope in RAN1  | For SL DRX, RAN1 should only address the topics of sensing and resource allocation, reusing the functionality introduced for reducing power consumption |
| InterDigital | Yes |  |
| Futurewei | No |  |
| Fujitsu | No |  |
| Panasonic | Yes | To add secondary WG or to clarify that the existing objective of the resource allocation enhancement also needs to consider impact from other functionalities including sidelink DRX is necessary to clarify RAN1 scope. |
| Apple | Yes | RAN1 need only address “Sensing and resource allocation issue when SL-DRX is configured”. |
| Lenovo, Motorola Mobility | Yes | The update in [5] is fine to us.• Specify mechanism aiming to enhance sensing and resource allocation when sidelink DRX is configured [RAN1, RAN2] |

**Others**

Q5: If there are any other aspects that need to be considered in the scope of this email discussion, please specify them.

|  |  |
| --- | --- |
| Company | Comment |
| LGE | The target completion of the impacted TR/TS needs to be updated in accordance with Rel-17 timeline which is expected to be updated in this meeting. But this is not an urgent issue in our view and update in the next meeting might be okay as well. |
| vivo | Regarding the fifth objective of WID (i.e., to ensure sidelink operation to be confined in a predetermined geographic area), RAN2 confirms that no extra standard efforts need to be done in RAN towards this objective, as stated in the LS to SA2.Consequently, the objective can be deleted so that RAN2 can release the related TUs for other objectives. |
| Huawei, Hisilicon | Given that the WGs have progressed substantially, there is no need for scope changes nor timeline extension. Administrative points are fine to update.On vivo’s suggestion relating to geo-area restriction, in a procedural sense it may not be necessary to remove the objective, because all that has happened is the work has been completed, rather than that the objective has been cancelled. The TUs are already released, thanks to the clear RAN2 agreement on no further work. |
| Apple | We agree with Huawei that there is no need to remove objective 5 from WID. RAN2 has completed the objective based on company contributions, so those efforts cannot be ignored. We do not foresee any TU will be wasted by not deleting the objective. |

**References**

[1] RP‑202153 LS on Mode 2 enhancements in NR sidelink RAN1

[2] RP‑202217 Scope update for R17 Sidelink Enhancements Futurewei

[3] RP‑202354 Discussion on inter-UE coordination for Rel-17 SL enhancement Intel Corporation

[4] RP‑202378 Views on the WI on NR sidelink enhancement Ericsson

[5] RP‑202562 Discussion of Sidelink DRX on Rel-17 NR Sidelink Enhancements Apple Inc.

[6] RP‑202571 Scope of Rel-17 WI on sidelink enhancement Huawei, HiSilicon

[7] RP‑202644 Discusison on Rel-17 SL enhancememt WID scope vivo

[8] RP‑202673 Views on work scope of Rel-17 NR sidelink enhancement ZTE, Sanechips

[9] RP‑202253 Revised WID on NR Sidelink enhancement LG Electronics