**3GPP TSG RAN Meeting #93-e RP-21xxxx**

**Electronic Meeting, September 13 - 17, 2021**

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**Source:** LG Electronics (moderator)

**Title:** Email discussion [93e-14-Sidelink-Progress] on the progress of Rel-17 NR sidelink enhancement WI

**Document for:** Report

# **Introduction**

This contribution summarizes the email discussion [93e-14-Sidelink-Progress] on the progress of Rel-17 NR sidelink enhancement WI. Input contributions covered: RP-211782, 1783, 1790, 1807, 2034.

# **Discussion: Initial round**

2.1. SL-DRX applicability to ProSe service

Q1: [RP-211782, OPPO] proposed to confirm that the R17 SL-DRX design does not exclude ProSe direct communication, discovery, and UE-to-Network relay parts. It also proposed to send an informative LS to SA2 and CT1. A WID revision was proposed in RP-211783.

Please provide your view on this.

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| Company | Comment |
| OPPO | In R17, according to SA/CT spec, ProSe can be divided into **relay**-related and **non-relay**-related parts, for both **communication** and **discovery**.   1. For **non-relay-**related ProSe **communication**, we understand it is straightforward to be included in R17 since no additional work is needed. Otherwise, it means **no support of SL-DRX for public safety and commercial use case** at all in R17. 2. For **relay**-related ProSe **communication**, we understand it is straightforward to be included in R17 since no additional work is needed. Otherwise, we wonder how one can exclude it from the support of SL-DRX, i.e., for a UE which is involved in both relay and non-relay related ProSe communication, since the two can happen in the same resource pool, **if there is no DRX support for relay-related communication, the power saving gain for non-relay-related ProSe communication will disappear as well**. 3. For **relay**-related ProSe **discovery**, the only additional work is to agree on the usage of **default SLDRX configuration** for ProSe discovery. Otherwise, we wonder how one can exclude it from the support of SL-DRX, i.e., for a UE which is involved in both relay-related discovery and non-relay related ProSe communication, since the two can happen in the same resource pool, **if there is no DRX support for relay-related discovery, the power saving gain for non-relay-related ProSe communication will disappear as well**. 4. For **non-relay-**related ProSe **discovery**, the same logic as described above in 3) holds. But surely, it is pending the conclusion of [93e-23-SLRelay-WI], i.e., whether it is to be supported in R17.   After RAN conclude on each aspect of the four above, an informative LS is helpful for SA2/CT1 to know the RAN decision for alignment on normative work in R17. |
| Ericsson | In our view, it is not needed to add this confirmation or send an LS to SA2 and CT1. Currently, RAN1 and RAN2 are working on the design of SL-DRX for SL which could be potentially extended to other cases once the basic framework is in place. |
| Samsung | We do not agree with this proposal. At first, ProSe discovery is not the scope of Rel-17 and also is not supported in Rel-16. Only SL Relay discovery is in the scope of RAN SL Relay. However, We do not want to extend SL DRX scope for SL relay with the following reasons.  - Physically no time to consider SL relay discovery in combined with SL DRX.  - Once SL relay discovery is considered, it will introduce other discussion for other issues from SL relay.  - 3GPP normally don’t consider ongoing other WIs, otherwise we cannot complete WI in time |
| Qualcomm | Our view is that the decision on applicability of DRX to the mentioned cases needs to be made in RAN2 first. Once that decision is made, we’d be ok with sending an LS to SA2 and CT1. |
| Apple | We think that SL-DRX can be applicable to both ProSe discovery and communication and relay, as those are not meant for V2X only. This is clear from the WID as it said "The objective of this work item is to specify radio solutions that can enhance NR sidelink for the V2X, public safety and commercial use cases.” So, it seems there is no need to change the WID.  We are fine to send LS to SA2/CT1 to clarify on this. |
| Huawei,  HiSilicon | The exact impacts should be first clarified. We see some value for UE power saving to apply DRX to Prose, on the other hand it is a bit unclear what specific impacts are needed to support so. The current SL DRX dependent on QoS can be easily reused to Prose direct communication. However Prose discovery and SL relay discovery are using broadcast with no dependency on QoS, and how to make apply DRX to these two cases is not clear. If the impacts are considered not small, we think the existing DRX in scope should be first completed. Thus we suggest to only apply SL DRX to Prose direct communication, but not apply to Prose discovery and SL relay for Rel-17. |
| LGE | Our view is that SL-DRX is already applicable to ProSe discovery, communication, and relay as per the WID text Apple quoted. So we don’t think WID update is necessary.  We don’t think there is an immediate blocker which prevents SL DRX solution RAN2 is currently defining from being used for general use cases. But if something which prevent this is identified, we need to consider whether it is feasible to treat a separate solution in this WI. |
| vivo | We think the current WID does not preclude applying DRX to ProSe, thus do not see the need to change the WID.  Further, we think this issue is being discussed in RAN2 and the progress depends on the SL DRX and SL relay design progress. RAN2 can decide to send LS to SA2/CT1 if necessary. |
| ZTE | RAN2 has agreed to prioritize normal use case without consideration of relay UE use case in Rel-17. However, if the SL DRX could be used for SL relay or ProSe discovery without further enhancement, it is good to support these scenarios in Rel-17 as well.  From our perspective, whether the U2N or ProSe discovery capable UE support SL DRX can be part of SL UE capability discussion at the end of Rel-17, just as we usually do for the introduction of new features specified in other WIs. It is not necessary to change the WID or send LS to SA2/CT1. |
| Spreadtrum | We think the basic SL DRX mechanism should be finalized first before extended to ProSe discovery, especially ProSe discovery standardization is still ongoing. Thus, we need to limit the WID scope to support basic SL DRX in Rel-17 only. |
| CATT | The current WID scope should not be changed unless absolutely necessary. This is especially true considering current situation in working group. |
| MediaTek | We agree that DRX should be applicable to all cases, and we don’t see that the current WID restricts this.  For relay-related communication, we understand that RAN2 would need to ensure that the UEs have the needed information to determine a DRX configuration. In our view, this represents work that is already in scope under the QoS objective.  For discovery (whether relay or non-relay-related), we note that RAN2 already agreed to apply broadcast DRX configuration to the DCR message, with discussion expected on whether a default configuration or some other configuration is used. |
| Xiaomi | Generally, we hesitate to confirm the DRX applicability for ProSe discovery. A practical problem is current DRX for broadcast communication can’t be reused for discovery. Impact is foreseen at not only RAN2 but also in CT/SA. There is a risk the WI can’t complete in remaining two meetings. |
| Fujitsu | It seems that there were already related discussions in RAN2. The mentioned issue can be discussed in RAN2 first. |
| Intel | We suggest leaving it up to RAN2 discussion. We do not see the need to update WID or send LS to SA2/CT1 now. |
| Lenovo, Motorola Mobility | In RAN2, SL DRX combined with SL relay or ProSe discovery is not touched and discussed, since they are not in the scope of Rel-16/17 NR SL topic. We think whether there have additional issues for these cases or SL DRX can be directly used needs to be determined by RAN2 firstly. Before RAN2 determination, sending LS to SA2/CT1 or revise the WI is not needed. |
| Panasonic | There is no need to update WID. The basic functionality should be finalized. It does not prevent ProSe direct communication, discovery, and UE-to-Network relay to be covered by the basic functionality but no need of the optimization. |
| Vodafone | At this stage we do not see the need for LS to other working groups such as SA2 and CT1.  No need to update the WID and we suggest to leave it to RAN2/RAN1 to complete the work on this feature |
| Fraunhofer | We think there is currently no need to change the WID or send an LS to SA2 or CT1. |
| Philips | Although we would like to see SL DRX to be supported by ProSe in release 17, we don’t think it can currently be decided, without proper analysis and discussion in RAN2, whether it meets all requirements for ProSe, in particular for ProSe discovery and ProSe relay communication. If it is not possible to finish this in release 17, then certainly should be considered for release 18. |

2.2. RAN guidance to finalize the WI

Q1: [RP-211790, Samsung] proposed to confirm that any part not completely specified by RAN#94-e will be down scoped by default.

Please provide your view on this.

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| Company | Comment |
| OPPO | While we think this approach is possible for the inter-UE coordination objective (i.e., scheme1 with option 1 and option 2, scheme 2 with option 1), but this principle may not be applicable for the power saving RA and SL-DRX objectives, as currently for these two objectives the WGs are working on only the essential functionalities. If some of these essential functionalities are not included, then the whole feature will not function properly. We can review the progress of R17 SL enhancement WI in December again and make appropriate action based on the latest status then. |
| Ericsson | We see no need to explicitly add this confirmation. This is the normal procedure. |
| FUTUREWEI | We feel that progress was good last quarter and RAN guidance is not needed.  On the specific proposal, it would apply to all WI and not just SL, but RAN doesn’t tend to make these sorts of conclusions. The difficulty in practice with this sort of general guidance is it is always debatable whether something is complete enough to be handled by a CR. It may be enough for companies to know that it is possible that their preferred option(s) may be removed if we do not work together to complete all options. |
| Huawei, HiSilicon | Setting up potential automated reverting of agreements would not lead to constructive discussions in WGs in Q4. Before removing or changing a feature, details need to be considered fully. RAN#94e can make decisions in full knowledge of the situation at that time, if it wants to re-scope the WI. |
| InterDigital | Similar view with Futurewei that we have a reasonable progress in the last quarter and no RAN guidance is needed at this point. Downscoping of a specific feature which cannot be finalized by the end of the WI is a natural consequence and doesn’t need to be captured as an agreement. |
| Samsung | Support the proposal. Agree that this is a natural consequence. However, since Rel-17 eSL currently behind the schedule, this can be good RAN guidance. |
| Qualcomm | The WGs have shown significantly improved progress in the last quarter, and we prefer to discuss any down-scoping in RAN #94 per regular procedures. |
| Apple | Depending on the progress in RAN1 #106b-e and RAN1 #107-e meetings, we could revisit the proposal to check which parts can be down scoped. It may be too early to conclude the down scoping at this moment. |
| LGE | We think the proposal is a normal procedure, so no explicit confirmation is necessary. We can revisit the WI progress in RAN#94e. But considering the status report indicated a slow progress, it will help WGs if RAN reminds that essential functionalities should be completed in RAN1 in Q4. |
| vivo | While we understand the motivation, we do not see the need to set up a hard condition in RAN #93e. It actually does not help to make progress in the next quarter, but may unfortunately make it more difficult to have compromise between companies. |
| ZTE | Which part to down scope need to be discussed case by case. Agree with QC, Apple and LG to revisit the potential down-scoping in RAN94 if necessary. |
| NTT DOCOMO | Our view is similar to other companies, i.e. no agreement/conclusion/etc. for the normal 3GPP procedure is necessary at this meeting. |
| Spreadtrum | For this natural procedure, there is no need to have a explicit conclusion. |
| MediaTek | We have a well-established process for dealing with individual problematic objectives, and we should decide in RAN#94-e what to do with any objective whose completion is a problem, just as we normally do. |
| Xiaomi | There may still be some remaining issues even if the main work of a feature is considered complete. We agree that the details need to be considered fully before removing or changing a feature. We can follow the regular procedure to make decision in RAN#94. |
| Nokia | May not be helpful. We see no need to explicitly add this confirmation. |
| Fujitsu | We share the views of other companies that the proposal is a natural procedure. RAN guidance may not be needed. |
| Sony | We don’t think this guidance is necessary in RAN#93-e. |
| Intel | It seems the action is proposed for the next RAN meeting and in general is applicable to all SIs/WIs. Therefore, we think proposed actions can be taken directly at RAN#94 if it is necessary. |
| Lenovo, Motorola Mobility | We think big progress has been made in August meeting. For the time being, we prefer to stick to current scope and revisit it in RAN#94. |
| Telecom Italia | This is normal procedure, but we think companies must have clearly in mind the objective.  I find incredible the comment from Apple:  *Depending on the progress in RAN1 #106b-e and RAN1 #107-e meetings, we could revisit the proposal to check which parts can be down scoped. It may be too early to conclude the down scoping at this moment.*  As it is written, it appears to me that the proponent would like to continue the Work on open issues after RAN#94 !!! This is clearly not acceptable |
| Panasonic | Our understanding is this is just normal procedure and no need to have such agreement. |
| Vodafone | to early to suggest which feature should be down scoped and we suggest to leave these discussions until the next RAN Session |
| Fraunhofer | We agree with other companies that good progress was made in the last quarter, and any down-scoping can be revisited in RAN#94-e, when the actual status of the WI is clearer. |
| Philips | No need for additional guidance. |

Q2: [RP-211807, OPPO] proposed to recommend RAN1 and RAN2 to adopt simple solution whenever possible. In addition, it proposed to increase the TU for this WI in Q4 by 0.5 – 1 while minimizing Rel-16 sidelink maintenance in Q4.

Please provide your view on this.

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| Company | Comment |
| OPPO | It is always recommended to adopt simple solution whenever possible in the technical design to complete basic/essential functionalities in this work item, and not to spend time on enhancements that are “nice to have” or features that provides minimal gains or flexibility that does not have obvious technical benefits.  It is noticed that RAN1 chair has announced no maintenance discussion in October. We think this is a good idea / practice also for the November WG meeting and RAN2 as well, at least for this R17 WI. If it is too much hassle to increase to the TU in RAN for a R17 WI, then it can be up to WG chair’s best judgement to flexibly increase the amount of online and offline discussion time for this WI to speed up the progress. |
| Ericsson | We agree to the first part, i.e., to aim for a simple solution whenever possible.  We do not agree on increasing the number of TUs for this WI. Due to the progress in the last meetings, it is a reasonable to achieve a minimal/basic functionality within the allocated TUs. |
| FUTUREWEI | We feel that progress was good last quarter and RAN guidance is not needed.  On the specific proposal, we do this already, the chairs will look for this anyway during the upcoming meetings. ‘Simple’ is also debatable, especially since we have multiple use cases to support. It is a ‘simple’ design to adopt a general design with minimum standard impact that has the flexibility to cover the existing agreements.  No objection to minimizing Rel-16 maintenance giving more time to Rel-17 items, but this is not strictly necessary. |
| Huawei, HiSilicon | It seems likely that an instruction to “adopt simple solutions” will mainly add another layer of discussion into WGs on whether a solution is sufficiently simple to be adopted. The pressure to complete the WI on time will naturally lead to solutions which can be finalized in the available time, without needing qualitative statements from RAN that themselves take up time in WGs.  Chair guidance may be necessary for whether TU alterations are at all on the table, before engaging in a discussion inside one WI. |
| InterDigital | Not sure if we need this as RAN guidance although we agree with the philosophy. As HW mentioned above, it could create another layer of discussion to decide whether the proposed schemes on the table are simple enough to meet the RAN guidance.  Regarding increasing TU, we are supportive if possible. |
| Samsung | Rather than increasing TU, we prefer to focus on specifying only essential functions. (No discussion for optimization issues) |
| Qualcomm | RAN1 #106bis-e will exclude any maintenance work per the RAN1 chair’s plan. Maintenance work of Rel-16 is also important, and we prefer to not exclude maintenance work in RAN1 #107-e at this point. |
| Apple | In general, simple solutions are welcome in RAN1 and RAN2 due to the time limitation.  However, we are not sure whether increasing the TU for this WI in Q4 will be realistic. Note that no TU was allocated to Rel-16 sidelink maintenance, as it is simply done via emails. |
| LGE | We agree with recommending simple solutions but more details are necessary if it should stand as RAN guidance. We are not sure if TU increase is a viable option at this stage. |
| vivo | It is always the design principle in RAN WG to design simple solutions, no need to specifically emphasize this only for SL.  Regarding the second part, considering that the Rel-16 SL spec seems to quite stable based on the situation in RAN1#106e, it is acceptable to consider prioritizing the Rel-17 work over Rel-16 maintenance, *if the Rel-17 progress in RAN1#106bis-e is problematic*. |
| ZTE | We are fine with the principle of simple solutions whenever possible.  Whether more TUs are allocated depends on the down-scoping discussion result in this meeting and chair’s guidance. With regard to the Rel-16 maintenance, we think it is important and should not be put on hold in Q4. |
| NTT DOCOMO | Simple solutions are better, but what is simple would be unclear and the guidance might lead undesirable confusion in each WG. We believe that companies will strive to complete this WI and to be more constructive for that, which can be seen at the last RAN1 meeting. Based on this, we think the guidance is unnecessary.  Regarding TU, we are not sure whether it is possible or not. TU of some other WI can be reduced? |
| Spreadtrum | We support that adopting simple solution whenever possible to reduce the workload.  It would be better to increase TU, but we still have to consider the progress of other WIs before deciding whether to increase TU. We don’t agree to minimize Rel-16 sidelink maintenance in Q4. |
| CATT | The intention to adopt simple solution whenever possible is always good, however, in practice it is not easy because the definition of ‘simple’ is subjective.  We do not want to increase the TU , considering the situation for other agenda item in WG is also very tight. |
| MediaTek | We agree with the principle of the guidance, but it seems likely that instructing the WGs to adopt a “simple” solution will just result in disagreement about what is “simple”. We don’t see a strong need for explicit guidance from the plenary, but if there is a strong desire to clarify the work, it might be better to guide RAN1 to focus on solutions within the already agreed framework and avoid specifying new solutions.  We interpreted from RP-211807 that the proposed TU increase was only for RAN1. We don’t have a strong view on this aspect—the work could be handled with a slight TU increase or at the chair’s discretion.  Our understanding is that the Rel-16 maintenance work in RAN1 is expected to take place mostly or entirely offline, so it doesn’t seem necessary to cut it back. |
| Xiaomi | We agree that simple solution should be preferred, but we do not think we should always adopt the simplest solution. In the current WG discussion standardization complexity is already considered as an important factor. Therefore, we do not think the proposed guidance is necessary.  On TU allocation, we think it can depend on Chair’s decision. |
| Nokia | Neutral. Don’t see harm in it, but no real benefit either. |
| Fujitsu | More TU might be achieved in some other ways, e.g., “offline GTW session” mentioned in RP-211678. |
| Sony | We generally agree with the simple solution whenever possible. We are OK with increasing TU if possible. |
| Intel | Increasing amount of TUs is not the direction of work scope / work load reduction rather the opposite one. Completing the full scope in two remaining meetings seems very challenging.  In order to further increase progress and reduce amount of open issues, we would prefer to directly increase GTW online time for discussion, if it is feasible from chair perspective, certainly considering situation in other WIs/SIs.  As for simple solution, we do not see how it helps to reduce scope/workload and/or simplifies discussion. In our view, it is natural to select simple and efficient solution and we do not see the need for such explicit guidance. |
| Lenovo, Motorola Mobility | We share same views with other companies on “simple solution” and we do believe simple solution is the design target for WGs.  In addition, we think the progress in August meeting is good and tend to not increase the TU. For e-meeting, more effort is actually spent on offline discussion. Maintenance work should not be minimized as it is also important. |
| Telecom Italia | Same view as Samsung. No to add new TUs and Rel 16 maintenance cannot be replaced by Rel 17 activity (we need to ensure Rel 16 topics are available for commercial use) |
| Panasonic | The amount of maintenance is up to RAN WG1 chair decision. It is not required to have such decision. |
| Vodafone | We agree on the simple and practical solutions.  Increasing the TU could impact other work but we like to leave it to the working group and the chair. |
| Fraunhofer | We agree with Huawei that by instructing the WGs to “adopt simple solutions” will only cause further delays with discussions on what is meant by “simple”. Hence, we would prefer to not have such instructions from RAN.  We are supportive of the increase in TU, depending on the guidance from the Chair and whether it is possible when considering the status of other WIs. We are also fine to pause Rel-16 maintenance for Q4 in order to prioritize the completion of Rel-17 SL. |
| Philips | If possible, then I suggest to make a very strong plea to add more TUs. As for simple solutions: solutions should be selected based on their merits, not just because they are the simplest. |

Q3: For inter-UE coordination, [RP-211790, Samsung], [RP-212034, LGE] proposed specify/prioritize only a single solution for each of scheme 1 with preferred resources, scheme 1 with non-preferred resources, and scheme 2, respectively.

Please provide your view on this.

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| Company | Comment |
| OPPO | Generally, OK. We also would like to stop discussing FFS points on “other topics” or “other values” in both power saving RA and inter-UE coordination agendas in RAN1. |
| Ericsson | This down-selection/prioritization can be performed in RAN1 WG if needed. There is no need to have the down-selection at RAN plenary level. |
| FUTUREWEI | We feel that progress was good last quarter and RAN guidance is not needed.  We should continue from what we have in the chair notes so far as we have achieved these agreements after extensive discussions. Forced down selection or prioritization may have the opposite effect and actually slow the progress. A single solution is also hard to define, for example there may be higher layer control / configuration for each scheme which is a ‘solution’ that therefore would prevent the additional solution of PHY signaling. |
| Huawei, HiSilicon | We think it is more important to focus on the essential components of what is already agreed, rather than for RAN to delete WG agreements that are already made.  Thus, we suggest it’s better to tell RAN1 to not have discussions in Q4 on generic "*FFS other options/solutions*" points in the RAN1 agreements wherever they occur, and save time that way.  There are some FFS points which already concretely express technical details needed to finish agreed solutions, and they will necessarily continue. |
| InterDigital | It can be discussed in RAN1 if needed as it requires details of technical discussion in many aspects. |
| Samsung | Support the proposal. Based on this proposal, we can focus on specifying a single solution within the remaining two RAN1 meetings. This doesn’t revert any RAN1 agreements as all solutions agreed by RAN1 are specified, but reduces the number of combination. Moreover, introducing multiple solutions for each inter-UE coordination scheme is not desirable. |
| Qualcomm | We are ok with the suggestions in RP-212034 on combinations of transmission conditions in Scheme 1 and prioritizing completion of agreed items in general but prefer to leave the decision to RAN1. |
| Apple | We are generally fine with this proposal. |
| LGE | We support this as we see some risk if RAN1 tries to complete all the possible variants in Q4. Especially this would be important in terms of discussion time allocation as the group might spent too much discussion time for some variants and the others may not have time for discussions. One possible guidance is to recommend RAN1 to complete at least one solution for each of scheme 1 with preferred resources, scheme 1 with non-preferred resources, and scheme 2, respectively. |
| vivo | We are generally OK to have a single solution for each scheme. But we prefer to leave the decision to RAN1 – no RAN decision is needed at this point. |
| ZTE | We are fine with this proposal. Single solution for each scheme is enough to support the objective. |
| NTT DOCOMO | On scheme 1, we are OK with the suggestion since currently so many possibilities are remaining. If RAN1 decides witch option is adopted, the discussion will be quite controversial..  On scheme 2, there is only one direction, i.e. collision detection then reselection. So this kind of guidance is unnecessary for scheme 2. |
| Spreadtrum | Considering the time limitation, we are OK with the proposal. In addition, some sort of RAN guidance may help fast converge in RAN1. |
| CATT | We agree this discussion should happen in the working group if needed. RAN guidance in this regard usually is not practical and useful. |
| MediaTek | We are OK with this proposal. |
| Xiaomi | We are fine with the proposal. |
| Nokia | This may lead to non-technical discussions about what “single solution” means. Does it mean e.g. that no options are allowed?  Moreover, it may delay progress, since progress often requires a compromise which involves supporting more than one “solution” (in which ever way “solution” is defined). |
| Fujitsu | We are generally fine with the proposal. |
| Sony | We think the prioritization of the solution for their schemes could be performed in RAN1. |
| Intel | Proposal to have single solution combined with options in RP-212034 makes sense to reduce work scope / work load and can facilitate timely completion of WI. Proposed scope reduction is not our first preference technically, but we can accept proposals in RP-212034 for scheme 1 for the sake of progress. |
| Lenovo, Motorola Mobility | We are OK to stop discussing “FFS other details (if any)” and focus on schemes which have been agreed in RAN1.  The vertical market requires completeness of functionality for successful adoption and in this case, removing features from R17 Sidelink at this point would further delay the adoption timeline due to missing feature. Moreover, from the current R18 discussion it seems that there is no placeholder in Rel18 sidelink to accommodate these Rel-17 leftovers. |
| Panasonic | We think it can be discussed in RAN1.  On the combination (preferred/non-preferred) and (request/event) concern, our view on the selection between (preferred/non-preferred) is up to UE implementation choice, where the size is smaller is taking into account. Then we don't share the combination concern. |
| Vodafone | Leave the down-scoping to RAN1 working group |
| Fraunhofer | We believe that good progress was made in the last quarter, and specific guidance from RAN is not necessary. We rather prefer that this discussion takes place in RAN1. |
| Philips | We agree with this proposal. Should be sufficient for release 17. |

Q4: For power efficient resource allocation, [RP-212034, LGE] proposed to focus on introducing the baseline in the WID (i.e., “the principle of Rel-14 LTE sidelink random resource selection and partial sensing”) and deprioritize other enhancements beyond this. It also proposed to minimize RAN1 discussion time for the relation between partial sensing and sidelink DRX and strive for defining resource allocation solutions that are commonly applicable to a TX UE configured with sidelink DRX for its own data reception and a TX UE not performing its own data reception.

Please provide your view on this.

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| Company | Comment |
| OPPO | In the power saving RA agenda in RAN1, we followed closely the R14 LTE-V based random selection and partial sensing schemes for NR sidelink, and incorporated some enhancements (as needed and allowed by the WID) to take into account of small reservation periodicities and aperiodic transmissions. In this sense, we don’t need to remind RAN1 that R14 principle should be used as the baseline. From LGE’s proposal, we should focus on the sidelink DRX part only.  For the topic on relation between partial sensing and sidelink DRX, it can be categorized in two technical aspects. Firstly, the relation between the actual monitoring of slots (including RSRP measurement) and SL-DRX has been discussed for many meetings due to the LS from RAN2. In the last meeting, RAN1 finally reached the following agreement and replied to RAN2.  ***Agreement***  A UE can perform SL reception of PSCCH and RSRP measurement for sensing during its SL DRX inactive time.   * FFS: When such reception and measurement is performed, whether it is subject to specification, or is up to UE implementation * FFS: Other details   For this first technical aspect, it seems to adopt the rule that “the monitoring of slots is commonly applicable to a TX UE configured with sidelink DRX for its own data reception and a TX UE not performing its own data reception.” That is, when the reception and measurement is performed, it is up to UE implementation, to close the first FFS bullet. And there is no need to treat the second FFS bullet.  The second technical aspect is related to determination of the candidate resource set *SA* and its relation to RX UE sidelink DRX. While it is possible to leave everything to UE implementation to align with SL-DRX on duration, but a specific question / action has been asked by RAN2 in an LS R2-2108997 for which RAN1 should provide a response LS. We think at least for this issue, we should have a technical discussion in the next RAN1 meeting. If a simple agreement can be reached, this issue can be closed. If not, everything is leave it to UE implementation regarding partial sensing in sidelink DRX.  If the intention is to completely decouple the relationship between partial sensing and sidelink DRX, then we suggest to remove the following bullet from the WID objective and instruct RAN1 not to spend time in finding solution and replying to RAN2’s LS in R2-2108997.  This work should consider the impact of sidelink DRX, if any. |
| Ericsson | There is no need to include any clarification/observation in the WID regarding the aspects to focus on the power efficient resource allocation. The potential down-selection of the topics can be done during the normal WG progress. |
| FUTUREWEI | The power saving discussion was focusing on the baseline, i.e., based on Rel-14 LTE random resource selection and partial sensing. However, given the higher flexibility for periodic transmission and dynamic resource allocation for aperiodic transmissions in Rel-16 NR V2X design, the enhancement is necessary. We made good progress on both PBPS and CPS, as well as random resource selection. We should continue from what we have in the chair notes so far. We do not need to prioritize or down selection for discussions on power saving other than DRX.  For SL-DRX, regarding the relationship between partial sensing and sidelink DRX, we have reached an agreement. We are ok with the proposal to consider only the sidelink DRX at the TX UE. In order to fulfill the design objective in WID, some specification is needed for partial sensing in sidelink DRX off instead of leaving it to UE implementation. |
| Huawei, HiSilicon | RAN1 has already agreed that sensing will be performed in SL-DRX inactive time, and apart from finalizing the necessary details of when that should be mandated, we think enhancements to optimize the relationship between partial sensing and SL-DRX is not needed in Rel-17. The generic FFS points on this relationship which occur in a few agreements can be stopped by RAN |
| InterDigital | We also think down-selection of topics can be discussed in the working group level. Regarding relationship between partial sensing and S-DRX, both RAN1 and RAN2 recently made relatively good progress and it can be finalized within the rest of the time. |
| Samsung | For power efficient resource allocation (random selection and partial sensing), we think that the agreements we made already beyond the baseline. However, we believe that some remaining issues can be resolved without RAN guidance within remaining two RAN1 meetings.  For sidelink DRX, introducing different UE sensing behavior with and without DRX seems optimization. If we do not provide a RAN1 DRX solution (related to UE sensing behavior) to RAN2 in the next meeting, it would be difficult to finalize in time. So, providing RAN guidance for sidelink DRX would be good. |
| Qualcomm | RAN1’s progress on power saving has been very good. We don’t see the need for changes at this point. |
| Apple | We agree that the relation between partial sensing and sidelink DRX has been discussed for several meetings. Some agreement has been achieved in last RAN1 meeting and reply LS is in R1-2108580. We are generally fine to minimize RAN1 further discussions along this line in Rel-17.  One comment on “solutions that are commonly applicable to a TX UE configured with sidelink DRX for its own data reception and a TX UE not performing its own data reception”: The TX UE which has been configured with SL-DRX cannot be simply treated as same as the TX UE not configured with SL-DRX for data reception, in either sensing or resource selection. If there is no time to work on a proper solution for the SL-DRX case, RAN1 can claim that partial sensing and resource allocation in Rel-17 are meant for work for non-DRX TX UEs, and leave the DRX-related enhancements and considerations to Rel-18 sidelink enhancement.  On the other hand, there is a new LS from RAN2 to RAN1 (R2-2108997): Tx UE should select the resources taking into account the active time of the Rx UE. It is open whether RAN1 or RAN2 implement this restriction. Hence, we think the corresponding discussions should be conducted.  Finally, it is unclear whether “deprioritize **other enhancements** beyond this” only indicates the relation between partial sensing and sidelink DRX. |
| LGE | We see some risk on the power efficient resource allocation topic as there are many pending FFS and new topics are raised continuously (e.g., those by RAN2 LS). At least some high level guidance is necessary to complete the essential part of the operation while deprioritizing optimization. |
| vivo | The proposal is not clear but confusing especially on the part of “deprioritize other enhancements” and “strive for defining resource allocation solutions that are commonly applicable”. If it means that UE should always perform sensing regardless of DRX on or off, the proposal would result in defining two separate features (i.e., partial sensing in RAN1 and DRX in RAN2) but gaining nothing when integrating them together, as the power saved by DRX off would be unfortunately consumed by sensing. The WG should try not only to introduce a solution, but also to define a really useful system…  Secondly, unlike the inter UE cooperation, the progress of power saving seems to be quite good. The current discussion seems to already touch many stage-3 design aspects. Therefore, we don’t see the need to restrict the design of WG at this point. |
| ZTE | We are basically fine with this proposal.  During last RAN1 meeting, it is agreed that a UE can perform SL reception of PSCCH and RSRP measurement for sensing during its SL DRX inactive time. With regard to the relevant FFS, such as when such reception and measurement is performed, whether it is subject to specification, or is up to UE implementation, we may leave it to UE implementation and no more discussion is necessary in RAN1.  On the other hand, for the latest LS (R2-2108997) from RAN2, RAN2 asks RAN1 to consider how to enable the TX UE selects the resources taking into account the active time (current or future) of the RX UE(s) determined by the timers maintained at the TX UE. In our opinion, the resource selection and DRX configuration are generally specified in MAC and RRC layer, and physical layer has no ideas of the timers of DRX. So the DRX restriction of resource selection should be done by RAN2, other than RAN1. To be specific, the Tx UE may perform sensing based on implementation and provide the full or partial sensing result to MAC layer without considering the Rx UE’s on duration. For the resource selection, MAC layer may consider the potential on duration of Rx UE for initial transmission. Based on this observation, it is suggested not to spend time in RAN1 to discuss this issue or simply reply to RAN2 that it is up to RAN2. |
| NTT DOCOMO | On power saving scheme, we think that each WG already is discussing on top of LTE mechanism. However, many aspects of NR-SL Rel-16 are not same as LTE-SL, so corresponding modification is discussed. This would be the current situation. Based on this, we do not see the benefit by the guidance.  On DRX, it is unclear for us what is the intention of the suggestion. Rather, the guidance might lead to confusions and more discussions... At the last meeting, we had progress on DRX, and in this meeting, subsequent and last agreement is expected. We do not see some issue here. |
| Spreadtrum | For the baseline, the progress on power saving was good in the past, and the previous discussion was based on Rel-14 LTE sidelink random resource selection and partial sensing. So there is no need to emphasize this at this stage.  For the relation between partial sensing and sidelink DRX, we support to minimize RAN1 discussion time. |
| CATT | We prefer to follow the wid , i.e, discussion should be allowed as long as it falls in the scope of the WID. Implicitly changing the wid via any RAN guidance at this stage is not practical. |
| MediaTek | For the power efficient resource allocation part, we generally agree with OPPO’s analysis and don’t see a need for RAN guidance on this objective.  For DRX, we are OK with the principle of minimising the RAN1 discussion time on DRX+partial sensing, but we also agree with others that some work is needed to handle the RAN2 LS and satisfy the bullet cited by OPPO from the WID. Leaving the coordination of reception and measurement up to UE implementation seems like a reasonable balance, and we would be OK with guidance in this direction. |
| Xiaomi | There are a lot of difference between NR sidelink and LTE V2x, and we think it may be impractical to only focus on introducing the baseline based on the principle of Rel-14 LTE V2x. For example, we have agreed to introduce contiguous partial sensing, and consider the impact of partial sensing on preemption and reevaluation. All these discussions are beyond the baseline design from Rel-14 LTE V2x.  On relation between partial sensing and DRX, we are fine with the proposal although we think the decision should be made based on the technical discussion made in WG. |
| Fujitsu | The relationship between sensing and DRX has been well discussed in RAN1. An important FFS is whether sensing in inactive time is subject to Spec. or up to UE implementation. As for whether sensing methods commonly applicable to a TX UE with DRX and a TX UE without DRX are defined, it can be further discussed in RAN1. We are not sure whether we can conclude on that now. Regarding “resource selection commonly applicable to a TX UE with DRX and a TX UE without DRX”, its relationship with the FFS may be not clear enough. |
| Sony | RAN1 and RAN2 have made some good progresses for the partial sensing and the SL DRX. We don’t think the down-scoping for this feature is necessary in RAN#93-e. |
| Intel | In order to save time in RAN1, we prefer to avoid further RAN1 discussion on sidelink DRX. We suggest this objective to be finalized by RAN2 in the remaining meetings. |
| Lenovo, Motorola Mobility | We agree with OPPO that at least RAN1 needs to have technique discussion and response LS in R2-2108997, in which a question is relates to whether RAN1 or RAN2 implement the restriction that the resource selection taken into account of Rx UE active time. Other enhancement beyond this issue can be de-prioritized. |
| Panasonic | We slightly prefer to support it. |
| Vodafone | We would prefer to leave these discussions and any possible down scoping to RAN1, at this stage we see no need to change or alter the WID |
| Fraunhofer | We feel that the power saving aspect has made good progress, and any down-selection can be handled at the WG level. |
| Philips | We support the proposal. |

Q5: If you think there are any other topics to discuss, please specify them.

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| Company | Comment |
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2.3. Summary of the initial round

**SL-DRX applicability to ProSe service**

Q1: [RP-211782, OPPO] proposed to confirm that the R17 SL-DRX design does not exclude ProSe direct communication, discovery, and UE-to-Network relay parts. It also proposed to send an informative LS to SA2 and CT1. A WID revision was proposed in RP-211783.

The moderator observes that the majority expressed the view that WID update is not necessary and WGs need to finalize the DRX scope RAN2 is currently designing.

**RAN guidance to finalize the WI**

Q1: [RP-211790, Samsung] proposed to confirm that any part not completely specified by RAN#94-e will be down scoped by default.

The moderator observes that most companies think the proposal is a usual process and an explicit confirmation is not necessary.

Q2: [RP-211807, OPPO] proposed to recommend RAN1 and RAN2 to adopt simple solution whenever possible. In addition, it proposed to increase the TU for this WI in Q4 by 0.5 – 1 while minimizing Rel-16 sidelink maintenance in Q4.

The moderator observes that most companies agreed with the principle of “simple solutions” but some companies questioned whether it will be helpful in practice due to the different interpretation in different companies. On the TU increase, its feasibility is unclear to the moderator as several companies responded.

Q3: For inter-UE coordination, [RP-211790, Samsung], [RP-212034, LGE] proposed specify/prioritize only a single solution for each of scheme 1 with preferred resources, scheme 1 with non-preferred resources, and scheme 2, respectively.

The moderator observes that the opinions are divided over the necessity of this RAN guidance. A group of companies agreed with the proposal while another group of companies reponsded that such discussion can take place in WGs. Several companies commented that discussion on FFS for other options needs to be avoided for better progress.

Q4: For power efficient resource allocation, [RP-212034, LGE] proposed to focus on introducing the baseline in the WID (i.e., “the principle of Rel-14 LTE sidelink random resource selection and partial sensing”) and deprioritize other enhancements beyond this. It also proposed to minimize RAN1 discussion time for the relation between partial sensing and sidelink DRX and strive for defining resource allocation solutions that are commonly applicable to a TX UE configured with sidelink DRX for its own data reception and a TX UE not performing its own data reception.

The moderator observes that most companies want to leave this discussion to WGs.

# **Discussion: Intermediate round**

Based on the input collected during the initial round, the moderator would like to propose the following as RAN guidance:

Proposal 1 is a general guidance and may be helpful in addressing concerns on the number of different cases WGs are currently handling, especially by trying to make common solutions and saving discussion time on “FFS other options.” The moderator understands opinions from some companies that this wouldn’t be limited to this specific WI, but given that the status report already indicated “progress behind schedule,” a reminder would be useful.

Proposal 2 is more specific for the inter-UE coordination, and, in order not to preclude the possibility of supporting all the possible combinations, the proposal is reworded such that at least one solution should be defined for each case. the moderator thinks that at least this would enable fair discussion time allocation across different schemes/solutions; if time remains after RAN1 completes one solution for each case, additional solutions could be discussed.

**Proposal 1: TSG RAN reminds that WGs should focus on essential functionalities for timely completion of the objectives in the WID. TSG RAN recommends WGs to specify solution(s) applicable to as many cases as possible and avoid introducing additional options for optimization.**

**Proposal 2: For inter-UE coordination, RAN1 should strive for completing at least one solution for each of scheme 1 with preferred resources, scheme 1 with non-preferred resources, and scheme 2, respectively.**

Please provide your view on the two proposals above.

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| Company | Comment |
| OPPO | As replied in the reflector, we did not receive the clarification by moderator when this reply is provided, so raise our question here as well.  **For Q1 (of the initial round) on SL-DRX applicability, RAN need to make it clear whether WGhas the right/power to discuss SL-DRX for ProSe or not.**  By reading P1 for the intermediate round (since it is clarified P2 is clearly not related to SL-DRX), not sure whether/how intermediate round discussion can further clarify this aspect? Our thought/reading of the initial round reply on Q1 is that it would be good to clarify what is the part that requires additional work (e.g., ProSe discovery) and what is not (e.g., ProSe communication), so that to not impose artificial restriction on the applicability for ProSe on the latter one while further work on the concern on the former one, e.g., whether it is possible to enable ProSe discovery with minimum effort or not.  Otherwise, if w/o RAN clear guidance, **the practical difficulty is that the debate on “whether WG has the right to discuss ProSe related aspect” may continue in WG and the question remains**, which is the reason we brought this issue to plenary. So, to solve that, RAN has to make the message clear that **whether the said many cases include ProSe or not**, i.e., otherwise, there is still difficulty for WG to progress on this  **Proposal 1: TSG RAN reminds that WGs should focus on essential functionalities for timely completion of the objectives in the WID. TSG RAN recommends WGs to specify solution(s) applicable to as many cases as possible and avoid introducing additional options for optimization.** |
| ZTE | We appreciate the effort of moderator to make proposals and try to balance the different point of views. However, according to the expression of the two proposals, e.g. “applicable to as many cases as possible”, “complete at least one solution for each scheme”, the intention seems not to down scope the WI. It looks like more cases should be considered for the solution design. One solution is not enough and more solutions should be strive for.  Since this email discussion is for down scope purpose, it is suggested to make the RAN guidance more specific. The potential wording change is presented as follows.  **Proposal 1: TSG RAN reminds that WGs should focus on essential functionalities for timely completion of the objectives in the WID. TSG RAN recommends WGs to specify basic solution(s) ~~applicable to as many cases as possible~~ and avoid introducing additional options for optimization.**  **Proposal 2: For inter-UE coordination, RAN1 should strive for completing ~~at least~~ one solution for each of scheme 1 with preferred resources, scheme 1 with non-preferred resources, and scheme 2, respectively. Additional solutions could be discussed only if time allows.** |
| Apple | For proposal 1, we are fine with the first sentence. For the latter part, we prefer not to restrict to a unified solution for many cases. If we could not finish the solutions for all possible cases in Rel-17, we could leave it for a later release, rather than a conclusion of completeness of the work.  We are fine with Proposal 2, considering limited time for Rel-17. |
| CATT | Firstly, we think the current WID scope should not be extended unless absolutely necessary. As for down-scope, high level guidance from RAN is not useful as there could be different interpretations during WG discussion. Therefore , it is better to be handled in WG level. |
| NTT DOCOMO | On proposal 1, we are not sure the guidance is really beneficial. Among companies, what is essential and what is optimization would be different... If this kind of guidance is preferable, more concrete guidance should be found.  On proposal 2, it will be good for scheme 1. However, what is the motivation for scheme 2? Currently scheme 2 has only one solution, i.e. collision detection then collision indication then reselection. The guidance is needed for scheme 2? To exclude e.g. post-collision indication? |
| InterDigital | We tend to agree with CATT that the high level guidance from RAN doesn’t help much for the progress in RAN1 as each company may have a different understanding. Therefore, the Proposal 1 doesn’t seem to be needed.  We are ok with the Proposal 2, but also fine not to have this guidance and leave it to the WG. |
| Qualcomm | We’re generally ok with the proposals and note that the WGs have been largely following them in Q3. |
| Samsung | For proposal 1, we suggest to add ‘common’ as below. We think that this is the intension of this proposal.  **Proposal 1: TSG RAN reminds that WGs should focus on essential functionalities for timely completion of the objectives in the WID. TSG RAN recommends WGs to specify common solution(s) applicable to as many cases as possible and avoid introducing additional options for optimization.**  We are O.K for Proposal 2. |
| vivo | For Proposal-1, we are not sure if it is helpful. It may not help to make compromise between companies, but instead may bring in new arguments such as which solution is basic solution (or optimization) or can apply to a larger scope…  We are basically OK for the Proposal-2, but are also fine not to have this guidance. |
| Huawei, HiSilicon | Proposal 1: We don’t think that generic statements from RAN are particularly helpful. They were tried in Rel-16 NR V2X to no obvious effect, other than generating fresh discussions in RAN1 over to how interpret their wording. We see the beginnings of that in some of the other comments. It would be better to simply take this discussion and the evident opinions of companies as sending a basically-equivalent message.  Proposal 2: This is likely to create an unhealthy race condition among solutions, and require discussions on when to switch discussions between different solutions and schemes. We understand the intention, but do not support the methodology. Let RAN#94e decide what to do, in possession of all the information at the time. |
| Sharp | In general we are fine with having some RAN guidance for WG work on SL enhancement.  Regarding Proposal 1, in our view the principle of the first sentence has been followed by WGs, hence we don’t see how it helps WG work. And as can be already seen in companies’ input to the intermediate round so far, “solution(s) applicable to as many cases as possible” could be interpreted in completely different ways by different companies, and is thus prone to confusions and debates in WGs. For a same purpose, it may be better to guide WGs not to unnecessarily restrict the applicable use cases of a specified feature, unless well justified.  Regarding Proposal 2, it is not crystal clear what the word “solution” means here. We think this is also one place prone to confusions and debates in WGs. Our understanding is that WG should be guided to avoid specifying multiple configurable (and equally fully functional) options for each (sub) feature as much as possible. |
| Ericsson | For Proposal 1: We are supportive of the first sentence. For the second one, we do not see helpful to go into such details at RAN plenary level. In our view, keeping only the first sentence achieves the same purpose as guidance from RAN level.  For Proposal 2: We are supportive of the proposal. |
| Spreadtrum | For proposal 1, we have the similar view with CATT, InterDigital and vivo. Different companies prefer different solutions. Based on this guidance, we will spend a lot of time discussing which solution is more applicable to as many cases as possible in RAN1 meeting. So, we think this proposal is not needed.  We are OK with Proposal 2. And we are also OK with the revision from ZTE. |
| MediaTek | We are generally fine with P1 and a little dubious about fine-tuning it. This is general guidance to the WGs to keep the workload under control, not a hard limit on the topics that shall be considered, and we tend to think companies understand the message at this point.  For P2, ZTE’s formulation may be better; we have some concern that saying “at least one solution” invites introducing multiple solutions. There seems to be general agreement that we should cover all three of the enumerated cases, secure a solution for each, and only then consider whether additional solutions are useful.  Finally, we think OPPO’s question above is valid; we have the understanding expressed in the first round, that the existing WIDs do not block the applicability of DRX to the relaying and discovery cases. |