**3GPP TSG-RAN WG2 #115bis-e *R2-21xxxxx***

Electronic meeting, 2021-08-16 - 2021-08-27

Agenda Item: 8.15.2

Source: Ericsson

Title: Summary of [AT115-e][702][V2X/SL] SL DRX configuration for UC

Document for: Discussion, Decision

# Introduction

This is to discuss the [702] as follows.

* [AT115-e][702][V2X/SL] SL DRX configuration for UC (Ericsson)

**Scope:** Discuss following FFS/TBD/open issues:

Q1: Any specification impact to set SL DRX inactivity timer value with QoS consideration?

~~Q2: Is pre-configuration needed to determine SL DRX configuration for UC?~~

Q3: Need of SL DRX assistance information REQ from TX UE to RX UE?

Q4: What information is included in the assistance information from RX UE to TX UE?

Q5: When RX UE sends SL DRX assistance information to TX UE?

Q6: Is RX UE’s SL DRX configuration failure/reject to TX UE’s SL DRX configuration needed?

**Intended outcome:** Discussion summary in R2-2108982

**Deadline:** 8/24 10:00am UTC

For rapporteur to have enough time drafting summary report, we would like to have the following two phases:

* Phase 1: collect companies’ views by 2021-08-20 22:00 UTC
* Phase 2: rapporteur will finalize summary report based on inputs of phase 1 by 2021-08-24 10:00am UTC

# Discussion on open issues

We raise questions for the open issues of unicast and summarize views from companies in this section.

## Q1 – QoS impact on the inactivity timer

RAN2 has agreed that the SL inactivity timer value may take into consideration the QoS. Whether any specification impacts are needed is FFS.

This issue has been discussed in the email discussion [POST114-e][706]. The initial discussion outcome is summarized in [1], wherein, companies agree that for RRC\_CONNECTED, NW selects the inactivity timer based on NW implementation (which is aligned with current agreements). For IDLE/INACTIVE and OOC, the following views were expressed on whether configuration in SIB (for IDLE/INACTIVE) and preconfiguration (for OOC) can be used to determine the inactivity timer:

* SL Inactivity timer is determined without the use of (pre)configuration (RX UE assistance information and/or TX UE implementation) – 7 companies (Ericsson, OPPO, Apple, Xiaomi, LG, Nokia, Lenovo)
* SL Inactivity timer can use (pre)configuration information – 6 companies (QC, AsusTek, Vivo, Huawei, ZTE, InterDigital)
* Open to using (pre)configuration – 1 company (CATT)

Based on the initial summary results in [1], all companies agree that there is no spec impact due to consideration of QoS for UE in RRC CONNECTED since NW selects the inactivity timer based on NW implementation (which is aligned with current agreements). Therefore, discussions for this issue only concern UEs in IDLE/INACTIVE and OOC. Companies have diverse views on the issue. The diverse is mainly due to that some companies believe that RX UE may not provide assistance information. In this case, it would be beneficial for the TX UE to base on configuration or preconfiguration to derive the inactivity timer setting. Or in other words, if TX UE has obtained assistance information from the RX UE prior to setup up the radio bearer, TX UE can just rely on the received assistance information to determine the setting of the inactivity timer. It is also pointed out by some companies in [1] that the received assistance information from RX UE shall override the existing configuration or preconfiguration if there is any.

Based on the above reasoning, Rapporteur would like to raise the following questions to double check companies views.

For the first question, Rapporteur would like to check companies’ views on whether assistance information is mandatory or optionally for RX UE to provide. It is worth noting that the procedure for UE to send Sidelink UE information for NR sidelink communication is not mandatory in Rel-16. It is reasonable to follow the same behaviors for RX UE to provide assistance information containing SL DRX related parameters to TX UE. In addition, RX UE may not know when TX UE will trigger configuration/establishment of the SL DRX, therefore, RX UE can not provide assistance information in time to TX UE.

**Q1-1: for unicast in IDLE/INACTIVE or OOC, do companies agree that same as Sidelink UE information for NR sidelink communication in Rel-16, RX UE may provide assistance information containing SL DRX related info to TX UE, i.e., RX UE is not mandatory to provide assistance information containing SL DRX related info to TX UE?**

|  |  |  |
| --- | --- | --- |
| Company | Yes/No | Comments |
| Xiaomi | Yes | If RX UE has no preference on SL DRX, RX UE could choose not to provide assistance information containing SL DRX info. |
| InterDigital | Yes | One example if that the RX UE has no other ongoing communications it needs to align with, and so can accept any configuration/pattern for its DRX that is allowable for that QoS. |
| Apple | No | I think RX assistance info has two layer od meaning:   1. SL-DRX is needed or not. 2. If yes in 1, Desirable DRX pattern.   RX UE need always indicate bullet 1- “whether SL-DRX is needed or not in RX UE” at the current time. This is the very important assistance info which cannot be skipped. For example, the RX UE may engage with a R16 V2X broadcast service and there is no need for SL-DRX at all even the UE capability supports SL-DRX. By providing this information, the TX UE does not need to consider SL-DRX configuration for this unicast link.  From this perspective, the RX UE assistance information is always needed. |
| OPPO | See comments | We want to clarify the Q on the following detailed aspects   1. “the same as Sidelink UE information”: is the similarity on the signalling content or the signalling trigger? For the former one, we do not think it is the case since the QoS info can be obtained in other ways already, for the latter, we are not so sure either since in Uu, SUI message is triggered by the existence of SL related SIB, which does not exist in unicast link over PC5 interface; 2. “Rx is not mandatory to provide”, if this is related to whether request from Tx-UE is needed as the trigger or it can be triggered by Rx-UE autonomously, our view is TX UE request-based triggering is needed; |
| Lenovo, MotM | Yes | Rx UE may send assistance but no need to mandate it. |
| Nokia | Yes with comments | Our understanding is that the rapporteur suggests to have no difference in the RX-UE behavior in providing the SL-DRX assistance information to the TX-UE vs in providing the SidelinkUEInformationNR to the network (for sidelink communication). We do not think that these two different “assistance messages” should be compared with each other, as they are on different interfaces (Uu vs. PC5) and for different purposes.  However, on the actual question whether the SL-DRX assistance information provided by the RX-UE to the TX\_UE should be mandatory or optional we favour optional (up to RX-UE), i.e. RX-UE MAY send SL-DRX assistance information. |
| Samsung | Yes | If RX UE does not support SL DRX capability or no preference on SL DRX, RX UE may not provide assistance information. |
| ZTE | Yes | If RX UE does not provide DRX assistant information, it means it has no preference to configure SL DRX, then the TX UE will not configure SL DRX for this RX UE. |
| vivo | Yes | We think that RX UE assistance information for SL DRX is not mandatory. If needed, RX UE may provide some power saving preference and offset suggestion to TX UE.  Furthermore, if RX UE just obtains preferred DRX parameters based on its QoS profiles after upper layer interaction with TX UE, it may not need to provide assistance information to TX because of redundancy. |
| MediaTek | Yes | Rx UE can send assistance information only when the Rx UE has preferred SL DRX configuration. If Rx UE has no preference (e.g. the Rx UE does not have power preference, the Rx UE does not support SL DRX function, or the Rx UE does not perform SL DRX operation due to communication with other UEs or GB/BC services which does not support SL DRX), the RX UE needs not send the assistance information. So, we think it is optional, not mandatory. |
| CATT | Yes | To better understand this question. We wonder what’s detail usage/definition of RX UE’s assistance information? |

If TX UE doesn’t obtain assistance information from RX UE, it would be beneficial for the TX UE to base on configuration or preconfiguration to derive the inactivity timer setting.

It is worth noting that Q1-2 would depend on the answer of Q1-1.

**Q1-2: for unicast in IDLE/INACTIVE or OOC, if TX UE doesn’t obtain assistance information from RX UE, do companies agree that TX UE can base on configuration or preconfiguration to derive the SL inactivity timer value?**

**Note:** *Q1-2 depends on the answer of Q1-1. If companies answer Q1-1 as “No”, meaning that RX UE is mandatory to provide assistance information, Q1-2 can be skipped*.

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| --- | --- | --- |
| Company | Yes/No | Comments |
| Xiaomi | No | In this case, RX UE can accept any SL DRX configuration. So, we don’t see the benefit to consider preconfiguration. |
| InterDigital | Yes, but (see comments) | For the case where the RX UE does provide assistance information, we think it may also be necessary for the TX UE to use preconfiguration, and this depends on what the contents of the assistance information is (which is not yet decided).  For instance:   * If the assistance information consists of a suggested DRX, the RX UE will suggest a DRX that is acceptable based on (pre)configuration. In that case, the TX UE may not need to consider the preconfiguration again. * If the assistance information consists of existing DRX configurations at the RX UE, the TX UE needs to consider preconfiguration when it selects the DRX configuration, even though it has received the assistance information from the RX UE. |
| Apple | No | The TX UE does not need to consider (pre)configuration. Instead, it need to choose a DRX configuration most sutiable for its TX operation. There is no need to restrict TX UE decision based on (pre)configuration |
| OPPO | No | We want to clarify the intention of this Q on the following detailed aspects:   1. Whether Tx UE can derive the SL DRX setting when no assistance information is available: Limited to the case where both UE support DRX mechanism, if the scenario is 1) Rx UE has not sent any assistance information to the Tx UE, we do not think Tx UE can derive the DRX configuration; or if the scenario is 2) Rx UE has sent an assistance information to Tx-UE already, yet no further information is sent due to no change on the preference, we think Tx UE can derive the DRX configuration; 2. Whether Tx UE derive the SL DRX setting based on (pre)configuration: we didn’t see the need for inactivity timer derivation based on configuration in SIB or pre-configuration |
| Lenovo, MotM | See comments | The Tx UE does not need assistance from the Rx UE to decide the Inactivity timer. The Inactivity timer could be left to Tx UE’s implementation or can be (pre)configured. |
| Nokia | No | We do not see a need for the TX-UE to rely on (pre)configuration for setting the value of the SL inactivity timer, if the TX-UE can not obtain the SL-DRX assistance information from the RX-UE. We assume that the default case is that the TX UE can obtain SL-DRX information (either provided by the RX-UE or requested from the RX-UE by the TX-UE). |
| Samsung | No | We think for SL operation in unicast, leaving how to set SL DRX configuration to the UE implementation is the best option. The UE takes not only QoS profile but also other aspects, e.g. observed actual traffic patterns, channel occupancy, assistance information, etc., into account to set the best SL DRX configuration. |
| ZTE | No | If RX UE does not provide DRX assistant information, it means it has no preference to configure SL DRX, then the TX UE will not configure SL DRX for this RX UE. |
| vivo | Yes with comment | By reading companies’ responses, I think there are different arguments on not support deriving value of inactivity timer i.e.   * *1 no assistance information means no need to configure any DRX configuration* * *2 the DRX configuration can be configured but no need to base on (pre)configuration, i.e. UE implementation*   For the 1st bullet we don’t think it is valid because the assistance information is just optional, it helps the TX UE to configure DRX more reasonable but it doesn’t mean the TX UE cannot configure DRX for RX UE as long as RX’s capability supports that.  For the 2nd bullet, the inactivity timer is not isolated, probably it is configured with a set of DRX parameters, and (pre)configuration can guarantee both QoS requirement and power saving requirement for SL transmission. So we should not prohibit T X UE from obtaining/deriving DRX configuration based on (pre)configuration. |
| MediaTek | No | Tx UE has knowledge about the traffic to transmit, so the Tx UE shall be able to select suitable configuration to satisfy QoS requirement. Therefore, we think it is sufficient to leave it to UE implementation in case there is no assistance information received from the Rx UE. |
| CATT | No | Same view as apple. |

If TX UE has obtained assistance information from RX UE, it is reasonable to let TX UE to only rely on assistance information to derive the inactivity timer setting, since the assistance information can better reflect the preference of power saving for RX UE.

**Q1-3: For unicast in IDLE/INACTIVE or OOC, if TX UE has obtained both assistance information from RX UE and configuration/preconfiguration which are both indicating the value of the inactivity timer for a QoS profile (e.g., PQI), do companies agree that TX UE can only base on the received assistance information to derive the SL inactivity timer value for the QoS profile, i.e., the assistance information overrides configuration/preconfiguration of SL DRX?**

|  |  |  |
| --- | --- | --- |
| Company | Yes/No | Comments |
| InterDigital | No | We think the answer to this question will depend on what is the contents of the assistance information. If the assistance information is a suggested DRX, then we agree, But if the assistance information is the current DRX configurations at the RX UE, then we do not agree.  We need to discuss what the assistance information consists of before we answer this question. |
| Apple | Yes | The RX UE assistance information needs to be respected. The (pre)configuration is only useful for broadcast/groupcast. |
| OPPO | See comments | We **do not think there is a need to include SL DRX configuration in SIB/pre-configuration for Tx-UE to derive the value of inactivity timer in unicast**, i.e., the assistance information is sufficient. Otherwise, it is not clear how to handle the collision between the configuration in assistance-information and in SIB/pre-configuration. |
| Lenovo, MotM | Yes | We agree to “Tx UE can”; therefore, it is left to Tx UE implementation; however, we do not believe assistance information from the Rx UE contains anything else than a DRX start offset (i.e., Inactivity Timer value is not signalled as part of assistance information from the Rx UE). |
| Nokia | No | We share InterDigital’s view. It need to be discussed how to interpret “SL-DRX assistance information” (e.g. whether this is a preferred SL-DRX configuration of the RX-UE or if the RX-UE mandates a SL-DRX configuration) |
| Samsung | No | We think for SL operation in unicast, leaving how to set SL DRX configuration to the UE implementation is the best option. The UE takes not only QoS profile but also other aspects, e.g. observed actual traffic patterns, channel occupancy, assistance information, etc., into account to set the best SL DRX configuration. |
| ZTE | Yes | If the suggested inactivity timer is included in the UE assistant information, it shall be considered as higher priority than the NW configuration. |
| vivo | No | It’s up to TX implementation. If the suggested DRX in RX UE’s assistance information can not guarantee QoS requirement, TX UE may reject it. |
| MediaTek | No | We prefer to leave it to TX UE implementation. The Tx UE may not be able to totally follow the suggestion from Rx UE. Besides, the configuration/pre-configuration may not be 100% suitable. Thus, the TX UE should be able to determine SL DRX configuration by itself (i.e. relying on implementation). |
| CATT | No | We call it assistance information not decision information,right? |

**Rapporteur summary**:

1. .

## Q3 - Need of SL DRX assistance information REQ from TX UE to RX UE

In the scope of this email discussion, one issue is raised on whether TX UE can send SL DRX assistance information REQ to RX UE. Rapporteur understands this REQ message can be one way to support mandatory report of SL DRX assistance information by RX UE. In this case, upon reception of a request message from TX UE, RX UE will be aware of that TX UE needs assistance information now in order to initiate configuration/reconfiguration of the SL DRX towards the RX UE. RX UE must provide assistance information as response to TX UE. However, rapporteur thinks that bigger spec changes would be required by allowing such procedure. In addition, same as the procedure of CSI reporting, a time window may be also needed to be introduced to TX UE, which would incur even bigger changes to the spec. Additional latency may be also incurred due to transmission of the request message. All in all, rapporteur tends to suggest to not support introducing REQ message for SL DRX assistance information report.

*Note: discussion for this issue is relevant to unicast in both RRC CONNECTED, RRC\_IDLE/RRC\_INACTIVE and OOC.*

**Q2-1: do companies agree that SL DRX assistance information REQ is not supported in Rel-17 in order to limit the standardization efforts?**

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| --- | --- | --- |
| Company | Yes/No | Comments |
| Xiaomi | Yes | RX UE is aware of TX UE’s capability of SL DRX. So, RX UE could autonomously send the assistance information, if SL DRX is desired. |
| InterDigital | Yes | We think we can define certain triggers for when the RX UE should send the assistance information (e.g. a change in the DRX configuration, or link establishment). |
| Apple | NO with commetns | The procedure is to be triggered by a UE which knows SL-DRX is feasible for this unicast link (by knowing the SL capabilities of both UEs). If this UE is the RX UE, then there is no need for a triggering signaling. However, it is very plausible that this UE is the TX UE because RX UE usually has no interests to enquiry TX UE’s capability. Hence, in the case of TX UE knowing the SL-DRX capabilities of both UEs, while the RX UE are not, a REQ signaling is initiated by TX UE to asking for SL-DRX assistance information. An alternative way to avoid this REQ signaling is to always force TX UE to disclose its capability first, which may have some other side effects. |
| OPPO | Disagree (REQ should be supported) | We do not agree with the analysis by rapp:   1. We do not think the spec change is a problem since it just mimics the configuration to trigger UAI information in Uu interface; 2. We do not get the point by rapp that why a time-window is needed, w/o the said time window, the UAI reporting works well in Uu interface;   And actually opponent of the REQ based approach needs to answer how for Rx-UE to be sure this new signaling (i.e., the assistance information) is supported by Tx-UE (e.g., what if the Tx-UE is a R16 UE or a R17 UE but does not support the DRX feature) |
| Lenovo, MotM | Yes | Rx UE can transmit assistance information when it needs DRX (re)configuration from Tx UE or some other defined trigger conditions are satisfied, no need to define the assistance REQ from Tx UE to Rx UE since Rx UE is the one to request DRX configuration and it should the initiate the procedure. |
| Nokia | No | We share OPPO’s view and think the request sent by the TX-UE is beneficial especially for the alignment of Uu and SL-DRX patterns. |
| Samsung | See comments | As the result of PC5-RRC UE capability signaling, if TX UE can only know both sides’ capability information, it seems SL DRX assistance information REQ makes a sense. On the other hand, if RX UE can also know both sides’ capability information and RX UE keeps TX UE updated when the assistance information is changed, we may not need SL DRX assistance information REQ. |
| ZTE | Yes | If UE assistant information is changed, we think the RX UE will send the updated assistant information to the TX UE. If the UE assistant information is not changed, we donnot know why TX UE need the RX UE to send the same assistant information again. |
| vivo | Yes | Agree with the rapporteur’s analysis. RX UE may send assistance information based on its necessity. |
| MediaTek | Yes | It seems there is no need to specify explicit signaling to request assistance information. Rx UE could rely on other trigger conditions to determine whether to (re)transmit the assistance information, assuming that Rx UE knows that Tx UE supports SL DRX. |
| CATT | Yes | SL DRX assistance information REQ is belongs to optimization. |

**Rapporteur summary**: According to the comments received by the companies, companies’ comments are summarized in the below.

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Rapporteur would like to try to reach at least a consensus about the above highlighted points and thus would like to suggest:

1. .

## Q4 - what information is included in the assistance information

Regarding assistance information provided by RX UE, RAN2 needs to further discuss the content of the assistance information. A RX UE may include at least one of the following as assistance information

* Desired SL DRX configuration for the concerned link
* RX UE’s Uu DRX configuration if RX UE is in RRC\_CONNECTED
* RX UE’s QoS parameters (e.g., PQI) of other SL links
* RX UE’s SL DRX configuration of other SL links

Therefore, rapporteur would like to raise the following question to collect companies’ views.

*Note: discussion for this issue is relevant to unicast in both RRC CONNECTED, RRC\_IDLE/RRC\_INACTIVE and OOC.*

**Q3-1: do companies agree that A RX UE may include at least one of the following as assistance information**

1. **Desired SL DRX configuration for the concerned link**
2. **RX UE’s QoS parameters (e.g., PQI) of other SL links**
3. **RX UE’s SL DRX configuration of other SL links**
4. **RX UE’s Uu DRX configuration if RX UE is in RRC\_CONNECTED**
5. **activated configured SL/UL grant resource allocation, e.g. period and start offset**
6. **Other if any?**

|  |  |  |
| --- | --- | --- |
| Company | Options | Comments |
| Xiaomi | C, d, e | Regarding a, TX UE are not aware how RX UE derives the desired SL DRX configuration. In case TX UE is not able to follow RX UE’s preference, TX UE is not able to do appropriate compromise. So we prefer RX UE to provide the factors related to SL DRX.  Regarding b and c, the SL DRX for unicast can’t be derived from QoS parameters. So, we prefer c.  Regarding d, it’s useful to achieve alignment between SL and Uu DRX.  Regarding e, our understanding is that sidelink operates in half-duplex mode. If sidelink DRX active time overlaps with SL transmission or UL transmission in case of sidelink shares UL resources, RX UE can’t monitor PSCCH reception. But TX UE is not aware of the SL/UL resource scheduling at RX UE. Therefore, the sidelink transmission within the overlapping period would be lost. The dynamic scheduling is up to gNB’s implementation and unpredictable. But the resources for configured UL/SL grant is predictable. To avoid the conflict between sidelink DRX and configured UL/SL grant, RX UE could provide the activated UL/SL grant resource allocation, e.g. period and starting offset, to TX UE. TX UE could determine the SL DRX to avoid the conflict as much as possible. |
| InterDigital | a, c, d | We think b is not relevant because there may be multiple acceptable DRX configurations for a given QoS profile, and the TX UE cannot know which DRX configuration is active at the RX UE from just the QoS. In that case it would be better to send c and d.  We think e is not relevant because the TX UE can always assume the RX UE is active at the time of the configured grants.  In that case, RAN2 should select among a, c, and d. |
| Apple | A, c | a is always needed because this is the most straight-forward way to have a desrirable configuration in case TX UE has no preference at all.  d is not needed because the SL and UL reception are sort of independent by using different RX chains.  e is not needed because we think half-duplex issue is to be solved by RAN1 via inter-UE coordination, and we do not need additional over-the-top solutions for this. |
| OPPO | a | For a), we believe the UAI message used for Uu interface can be used as baseline scheme, where the DRX info can be included.  Considering the only thing Tx UE should know is what SL DRX configuration is desired from Rx UE for power saving, it is straight forward to include the desired SL DRX configuration directly in the assistance information.  For b), c), d) and e), we understand that is the input for Rx-UE to derive a), so not sure the motivation to include them as well if a) is already included, and how should the Tx-UE behave by getting of the information of b), c), d) and e). |
| Lenovo, MotM | a) | This is simple from the Tx perspective; only the start offset needs to be negotiated – other DRX parameters can be derived by the transmitter. |
| Nokia | a | We think only the desired SL-DRX configuration should be conveyed from the RX-UE to the TX-UE. The information b,c,d,e is available at the RX-UE side and is sufficient to derive information a) by the RX-UE – hence only a) should be sent by the RX-UE to the TX-UE. |
| Samsung | c, d | We think in general there are two options.  Option1: a  Option2: c and d  With a, we think c and d aspects are already taken into account. However, with a, since RX UE cannot know all aspects to determine the best SL DRX configuration in TX UE side, e.g. the actual traffic pattern, congestion level, etc., RX UE may need to signal suggested SL DRX configurations for all possible cases, e.g. when traffic periodicity is 10ms, 20ms, 40ms, etc., when on-duration timer is 10ms, 20ms, 40ms, etc. Thus we think c and d is simpler and more straightforward. |
| ZTE | a, c, d | a is a straight suggestion for SL DRX which shall be considered as the highest priority when configuring SL DRX. However, if the TX UE cannot obey this suggestion, it shall take c and d into consideration. |
| vivo | a | We think only a) is indeed necessary from the listed items since other items can be considered to derive a). E.g. RX UE can base on d) to adjust its preferred SL DRX configuration. |
| MediaTek | a | We also think only a) is necessary. Even if TX UE has information for b), c), d), and e), the TX UE may not come up with a Rx UE satisfied SL DRX configuration. Then we think b), c), d) and e) are unnecessary information to the Tx UE and may expose too much information to the Tx UE. |
| CATT | a | That would be perfect if Rx UE can offer simple and useful assistance information to Tx UE, so a) is preferred. |

**Rapporteur summary**: According to the comments received by the companies, companies’ comments are summarized in the below.

Rapporteur would like to try to reach at least a consensus about the above highlighted points and thus would like to suggest:

1. .

## Q5 - when RX UE sends SL DRX assistance information to TX UE

In RAN2#114e, RAN2 has made the following agreements regarding how to configure SL DRX.

* *For* ***SL unicast****, TX-UE centric DRX configuration based on the assistance information from RX-UE is agreed as baseline.*
* *In* ***SL unicast****, for DRX configuration of each direction where one UE as Tx-UE and the other as Rx-UE, signaling-1 (Rx->Tx) is carried via a new PC5-RRC message, from Rx-UE to Tx-UE.*
* *In* ***SL unicast****, for DRX configuration of the direction where one UE as Tx-UE and the other as Rx-UE, signaling-2 (Tx->Rx) is carried via RRCReconfigurationSidelink, to deliver DRX configuration from Tx-UE to Rx-UE.*

The RX UE shall be able to send the assistance information to TX UE at least before the TX UE sets up the link/DRBs (i.e., TX UE sends *RRCReconfigurationSidelink* to the RX UE), so that the TX UE is able to take the assistance information into consideration when sending *RRCReconfigurationSidelink* to the RX UE, which may contain DRX configuration to be applied by the RX UE.

From Rapporteur’s perspecitve, for unicast, RX UE sends the assistance information to TX UE at least before TX UE sends DRX configuration to RX UE via *RRCReconfigurationSidelink.* Neverthless it is beneficial to check companies’s views.

*Note: discussion for this issue is relevant to unicast in both RRC CONNECTED, RRC\_IDLE/RRC\_INACTIVE and OOC.*

**Q4-1: do companies agree RX UE sends the assistance information to TX UE at the following time**

1. **before TX UE sends DRX configuration to RX UE via RRCReconfigurationSidelink**
2. **after TX UE has sent DRX configuration to RX UE via RRCReconfigurationSidelink?**
3. **After receiving a TX UE’s explicit request for SL-DRX assistance information.**
4. **Upon on REQ from Tx-UE and upon change of interest on the SL-DRX configuration**

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| --- | --- | --- |
| Company | Yes/No | Comments |
| Xiaomi | Yes | We support both options. Option b could be useful, in case the assistance information is changed, i.e. information listed in Q3-1 may change. |
| InterDigital | Yes | Both should be supported, since the assistance information may change due to changes on other links or on Uu. |
| Apple | a b, c | Agree with Xiaomi and interdigital that this information may be time-varying so assistance information needs to be updated for a push-based approach.  On the other hand, the RX UE can also respond to a REQ signaling. |
| OPPO | d | a), b) and c) can all be implemented by d) like we did for UAI, so that Tx-UE can initiate the request of the assistance-information reporting by Rx-UE before the DRX configuration, and Rx-UE may report if any change on the preference, which can happen after the DRX configuration acquisition, to trigger an updated configuration.  For the difference between c) and d), d) has one more condition that "upon change of interest on the SL-DRX configuration". And we are also fine with c) but just think there should be an additional part of REQ. |
| Lenovo, MotM | Both a) and b) | For option(a), before Tx UE sends DRX configuration, Rx UE can send assistance information. A Tx UE does not need to wait for the assistance, if it is there (sent already by the Rx UE) it will be taken into account by the Rx UE.  For option(b), after receiving the DRX configuration from Tx UE, Rx UE can send assistance information if the received DRX configuration should be adjust or update. |
| Nokia | c | We fail to see a difference between option c and d. Anyway the RX-UE may send the SL-DRX assistance information at any time (see Question 1.1) and explicitly after the TX-UE has sent a SL-DRX assistance information request to the RX-UE. |
| Samsung | a, b | We agree with Xiaomi. |
| ZTE | a,b | The RX UE can send the assistant information at any time if the assistant information is changed or it wants to change the SL DRX configruation such as the power saving requirement is changed. |
| vivo | a,b | It is workable to send assistance information before/after TX UE sends DRX configuration to RX UE. The signaling can be as following figure (marked in read)  cid:image001.png@01D794E7.C0A87260  Besides the question itself, we should it needs to be further confirmed that Whether the assistant information should be after UE capabilityEnquirySidelink message? (our understanding is yes) |
| MediaTek | a, b | a) is agreed in previous meeting. b) is useful when Rx UE has changed SL DRX preference. |
| CATT | a,b | Same view as MTK. |

Regardless whether RX UE is mandatory or optional to provide SL DRX assistance information, another related question is whether trigger conditions for RX UE to provide assistance information need to be defined. In rapporteur’s understanding, trigger conditions are needed to be defined. Therefore, rapporteur would like to raise the following question to collect companies’ views. Some exemplary trigger conditions may include the following

* upon change of interest (e.g., whether or not to use SL DRX),
* upon changing QoS profiles,
* upon receiving configuration/reconfiguration on SL DRX from the gNB

**Q4-2: do companies think what trigger conditions/events shall be defined for RX UE to provide SL DRX assistance information to TX UE? E.g.,**

1. **upon change of interest** (**e.g., whether or not to use SL DRX**)**,**
2. **upon changing QoS profiles,**
3. **upon receiving configuration/reconfiguration on SL DRX from the gNB.**
4. Transmitted assistance information has changed
5. **Upon on REQ from Tx-UE and upon change of interest on the SL-DRX configuration**
6. **to align with other SL communication links**

|  |  |  |
| --- | --- | --- |
| Company | Trigger conditions | Comments |
| Xiaomi | d | We could further discuss the detail event after content of assistance information is agreed. |
| InterDigital | d | There are some conditions missing in the list (e.g. upon change in Uu DRX from the gNB), so it would be best to agree to d for now. |
| Apple | a,c,d,e | Although I think “a” is also part of “assistance information” covered by “d”, but I am not sure if rapporteur has the same understandling, so I explicitly list “a” as the option to support.  For c, this can be some new suggestions of DRX configuration triggered after RX UE rejects the TX UE’s proposed DRX configuration. It may be covered by d, but not clear from the question.  For e, the triggering condition can also be an explicit signaling from TX UE. |
| OPPO | ~~f~~e(Upon on REQ from Tx-UE and upon change of interest on the SL-DRX configuration) | As replied to Q4-1  For b) and c), they do not necessarily lead to a change of interest, so that ~~f)~~ e) is better to cover all the cases already and avoid unnecessary signaling. |
| Lenovo, MotM | a) c) and f) | We support (a)(c)(d) assuming the content of assistance information has changed. |
| Nokia | Yes | In general, defining a trigger when the RX-UE should send SL-DRX assistance information may be beneficial. However, we think it needs further discussion on the accurate specification/formulation of the trigger conditions as the wording “change” is not specific. At the moment we fail to see a difference between a) b) c) d) |
| Samsung | d | We agree with Xiaomi and InterDigital. |
| ZTE | d | Whether a,b,c can be the trigger conditions/events of sending UE assistant information depends on whether it will make UE assistant information change. We think d is the simplest conditions and it covers above cases. |
| vivo | d | Item a) is included in item d).  For b), TX UE is aware of QoS profiles changing, e.g. via higher layer interaction, and no assistance information is needed.  For c), if RX UE is a Connected UE, it should report SL DRX configuration to its serving gNB for alignment between SL DRX and Uu DRX. Hence c) is not needed. |
| MediaTek | d | Rx UE provide assistance information only when Rx UE wants to update the assistance information. a), b), c), e) could be the reasons to cause assistance information change (d). Which of a), b), c), e) would cause assistance information also depends on the content of the assistance information, i.e. related to Q3-1. |

**Rapporteur summary**: According to the comments received by the companies, companies’ comments are summarized in the below.

Rapporteur would like to try to reach at least a consensus about the above highlighted points and thus would like to suggest:

1. .

## Q6 - Is RX UE’s SL DRX configuration failure/reject to TX UE’s SL DRX configuration needed

In addition, a RX UE is allowed to accept or reject a recommended DRX configuration by a TX UE. In this way, the drawback of TX UE centric option, i.e., RX UE may lose its power saving by compulsorily following instructions from TX UEs can be mitigated.

From Rapporteur’s perspective, RX UE can simply indicate the decision (i.e., acceptance or rejection) after reception of a suggested SL DRX configuration. The process shall be based on RRC reconfiguration procedure as defined in Rel-16. In details, TX UE sends *RRCReconfigurationSidelink* containing DRX configuration to be applied by the RX UE, upon reception of the signaling, RX UE replies with *RRCReconfigurationCompleteSidelink* indicating acceptance of the DRX configuration, or *RRCReconfigurationFailureSidelink* indicating rejection of the DRX configuration.

Therefore, rapporteur would like to check companies’ views.

**Q5-1: do companies agree that** **a two-step process (i.e., RX UE simply accepts or rejects TX UE’s suggestion) should be adopted as the baseline, i.e.,**

**Step 1: TX UE sends RRCReconfigurationSidelink containing DRX configuration to be applied by the RX UE**

**Step 2: RX UE replies with RRCReconfigurationCompleteSidelink if the DRX configuration is accepted or RRCReconfigurationFailureSidelink if the DRX configuration is rejected?**

|  |  |  |
| --- | --- | --- |
| Company | Yes/No | Comments |
| Xiaomi | No for step 2 | RRCReconfigurationFailureSidelink is used to inform reconfiguration failure in R16. RRCReoconfigurationSidelink may contain both SL DRX configuration and other sidelink configuration. TX UE is not able to know whether the RRCReconfigurationFailureSidelink is caused by RX UE reject the DRX configuration or there is configuration failure, if RRCReconfigurationFailureSidelink is reused. So, we prefer RX UE to indicate the SL DRX reject or accept in **RRCReconfigurationCompleteSidelink.** TX UE could tell the different causes by different messages. |
| InterDigital | Yes | This is aligned with Rel16 configuration of SLRB, and we should keep the same approach. |
| Apple | Yes with comments | We agree with Xiaomi that the RRCReconfigurationFailureSidelink message needs to be enhanced. |
| OPPO | See comments | We are fine with step 1, but for step 2, we agree with Xiaomi and Apple. We prefer RX UE replies with RRCReconfigurationCompleteSidelink for both cases, i.e. no matter DRX configuration is accepted or reject, and add an indication in RRCReconfigurationCompleteSidelink to say whether the DRX configuration is accepted or rejected. The concern for using RRCReconfigurationFailureSidelink is that not only the DRX configuration but also other SL configurations are included in the RRCReconfigurationSidelink, if the Rx UE reply RRCReconfigurationFailureSidelink means it reject all the other configurations as well. |
| Lenovo, MotM | Yes | We support the two-step process should be adapted as baseline. And in step2, if DRX configuration is rejected but other AS configuration in *RRCReconfiguration*Sidelink is accepted, Rx UE replies *RRCReconfigurationFailuresidelink with* DRX configuration failure indication since Tx may need to initiate DRX reconfiguration based on the assistance information from Rx UE considering two-way signaling is agreed for Rx UE DRX configuration. |
| Nokia | comments | We agree with the intention of the 2 step approach that the RX-UE sends an accept or reject message wrt to SL-DRX config to the TX-UE. As stated by Xiaomi, InterDigital, Apple and Oppo the RRCReconfigurationFailure message need to be enhanced to tell the cause for the rejection (in the case non-complaint SL-DRX setting for the RX-UE configured by the TX-UE) |
| Samsung | Yes |  |
| ZTE | Yes with comments | agree with Xiaomi |
| vivo | Yes with comments | We prefer to align with R16 configuration procedure in principle, and whether *RRCReconfigurationCompleteSidelink* or *RRCReconfigurationCompleteSidelink* should be used for the rejection case, we think both can work and details can be further discussed.  Furthermore, after RX UE rejects the DRX configuration, it can immediately perform an assistance information procedure for new DRX configuration. It is not necessary to interleave these two procedures. |
| MediaTek | Yes with comments | Agree with Xiaomi |
| CATT | Yes in principle | Some enhancement should be involved in. |

**Rapporteur summary**: According to the comments received by the companies, companies’ comments are summarized in the below.

Rapporteur would like to suggest

1. .

# Conclusion

We have the following proposal:

[Proposal 1 .](#_Toc80046547)

[Proposal 2 .](#_Toc80046548)

[Proposal 3 .](#_Toc80046549)

[Proposal 4 .](#_Toc80046550)

[Proposal 5 .](#_Toc80046551)

3.1 For chair notes (proposal in priority order)

**Easy Proposals for Block Approval**

**Proposals for Online discussion**

**Proposals of Low priority**

# Reference

[1] R2-2107268 Summary of [POST114-e][706][V2X/SL] Discussion on remaining FFSs/open issues in SL DRX timer maintenance (InterDigital) InterDigital

# Appendix