**3GPP TSG-RAN WG3 #114 bis R3-221081R3-215701**

E-meeting, 16th-27th, Jan, 2022

Agenda Item: 23.2

Source: CMCC (moderator)

Title: Summary of offline discussion on Authorization for SL relay

Document for: Discussion

# Introduction

This contribution provides the summary of the following email discussion,

**CB: # SLRelay1\_Authorization**

**- Whether authorization information is needed for L3 remote UE? Draft LS to RAN2 and other groups, if agreeable.**

**- 5G ProSe authorized IEs are included as individual IEs under a parent IE or as a bitmap?**

**- Reusing existing IEs or defining dedicated IEs for ProSe NR UE-PC5-AMBR and PC5 QoS parameters?**

**- Stage3 details for the above issues over NG, Xn, F1 interface**

**- Capture agreements and open issues, provide CRs/TPs, if agreeable**

(CMCC - moderator)

Summary of offline disc [R3-221081](file:///C:\Users\cmcc\Documents\WeChat%20Files\wxid_4s5z34xevd1w21\FileStorage\File\2022-01\Inbox\R3-221081.zip)

This CB will be organized in two phases,

Phase I: Try to achieve some agreements on the remaining authorization issues

Phase II: Work on the BL CRs/TPs and potential reply LS to RAN2 and SA2

Please provide your views by **23:59 UTC Wednesday, January 19th**, so that they may be taken into account during the online session.

# For the Chairman’s Notes

Propose to capture the following: [TBD]

# Discussion

Authorization for relay UE and remote UE for L2 and L3 UE to network relay has been discussed in last RAN3 meeting. The following agreements had been achieved and some open issues had been left for this meeting:

Define a new IE to indicate whether UE is authorized to use 5G ProSe services. The type of authorization information includes at least one or more items as below:

- 5G ProSe Direct Discovery

- 5G ProSe Direct Communication

- 5G ProSe Layer-2 UE-to-Network Relay

- 5G ProSe Layer-3 UE-to-Network Relay

- 5G ProSe Layer-2 Remote UE

Include 5G ProSe authorized information in the listed NGAP messages.

1. INITIAL CONTEXT SETUP REQUEST
2. UE CONTEXT MODIFICATION REQUEST
3. HANDOVER REQUEST
4. PATH SWITCH REQUEST ACKNOWLEDGE

Include 5G ProSe authorized information in the listed XnAP messages.

1. HANDOVER REQUEST
2. RETRIEVE UE CONTEXT RESPONSE

Support SL relay in split architecture in R17.

Include 5G ProSe authorized information in the listed F1AP messages.

1. UE CONTEXT SETUP REQUEST
2. UE CONTEXT MODIFICATION REQUEST

## Issue 1-L3 remote UE Authorized

Authorization information for L3 remote UE issue had been raised in LS from RAN2 [1]. From RAN2’s perspective, whether authorization information for L3 remote UE is needed for NG-RAN can be decided by RAN3. Companies share their view in contributions [2] [8] [11] [12] [13] [15] [19] for that issue. Some companies think it is not needed to include L3 remote UE authorization. As mentioned in their papers, such similar question has been discussed in LTE D2D relay, the L3 remote UE could be provided with discovery configuration via dedicated signaling, but eNB does not need to perform authorization for the remote UE. However, there are still opposite views.

Here we discuss about whether L3 remote UE authorization is needed. Companies are encouraged to show their views on it.

**Question 1: Do companies agree the authorization of L3 remote UE by NG-RAN is necessary for NR SL relay?**

|  |  |
| --- | --- |
| Company | Comment |
| Qualcomm | Not needed. SA2 already discussed this and don’t have any requirement. So RAN3 need not define any authorization of L3 remote UE by NG-RAN.  Also, it is possible that network can reuse the authorization IE of direct discovery for L3 Remote UE as well. In other words, network can allocate resource for L3 remote UE (provide discovery configuration via dedicated signaling) if **NR ProSe Direct Discovery** IE is set to “authorized” in **NR ProSe authorized information.** |
| ZTE | Not necessary. In the NR SL relay WID, it guides that the Relay and Remote UE authorization shall re-use LTE as baseline. As we know, in legacy LTE D2D relay, the L3 remote UE could be provided with discovery configuration via dedicated signalling, but eNB does not need to perform authorization for the remote UE. When it comes to NR SL relay, the situation of L3 remote UE has no difference from LTE D2D relay, so we can follow the conclusion of authorization of LTE L3 remote UE. |
| Lenovo, Motorola Mobility | No, we can follow LTE principle. |
| CATT | No. network can allocate resource for L3 remote UE based on *NR ProSe Direct Discovery* IE included in NR ProSe authorized information. Also, authorization information for L3 remote UE was not contained in LTE.  We provide a draft reply LS in R3-220239 including “Do not introduce 5G ProSe Layer-3 Remote UE in ProSe authorized information unless RAN2 and SA2 have further requirement.” |
| Nokia | Not needed. |
| China Telecom | Not necessary. The network can provide discovery configuration for L3 remote UE based on *NR ProSe Direct Discovery* IE. In our understanding, authorization of L3 remote UE can be completed by CN. Unless SA2 has further requirement, the SL Relay related authorization information should be introduced according to latest TS 23.304. |
| Samsung | Not needed. |
| Huawei | We believe this is beneficial |
| E/// | No.  SA2 has concluded no clear benefit is seen. Furthermore, the technical argumentation about having L3 Remote UE authorization is not correct. When UE was in CONNECTED mode, it had the dedicated signaling with gNB. However, after it switches to L3 Remote UE, that means no Uu coverage and the UE context is released. In this case, the discovery configuration cannot be provided via dedicated signaling. |

**Question 2: If answer for Q1 is yes, do companies agree include it in the listed NGAP, XnAP and F1AP?**

**NGAP:**

**INITIAL CONTEXT SETUP REQUEST**

**UE CONTEXT MODIFICATION REQUEST**

**HANDOVER REQUEST**

**PATH SWITCH REQUEST ACKNOWLEDGE**

**XnAP:**

**HANDOVER REQUEST**

**RETRIEVE UE CONTEXT RESPONSE**

**F1AP:**

**UE CONTEXT SETUP REQUEST**

**UE CONTEXT MODIFICATION REQUEST**

|  |  |
| --- | --- |
| Company | Comment |
| Huawei | Yes, similar to other 5G ProSe Service Authorized information. |
| E/// | Ok |
|  |  |
|  |  |
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## Issue 2- IE structure of 5G ProSe authorized IEs

In last RAN3 meeting, it was agreed to define a new IE to indicate whether UE is authorized to use 5G ProSe services. The type of authorization information includes at least one or more authorization IEs.

Regarding the IE structure of 5G ProSe authorized IEs, two options on the table,

* Option 1: each item of authorization information is included as individual IEs under a parent IE;
* Option 2: the new 5G ProSe authorized IE is defined in a bit string and each bit represents an authorized service related to 5G ProSe.

Based on the reference papers, majority companies support Option 1.

The moderator proposes to follow the majority views.

**Question 3: Do companies agree to follow the majority view that including authorization IEs as individual IEs under a parent IE?**

|  |  |
| --- | --- |
| Company | Comment |
| Qualcomm | Yes, prefer Option 1.  Although bit string (Option 2) would work, it’s probably easier to use the same format as the Core network and LTE specs, which also use individual IEs for ProSe authorization information (Option 1).  We agree that using a bit string (Option 2) will help in saving bits e.g., 3 bits can be used for 8 authorization Ies. But there is not a lot of saving for the currently agreed 5 authorization Ies (only 2 bits saving). Also, it is not clear whether the UE-to-UE relays in Rel-18 would need new authorization Ies (this is up to SA2 decision), if we are looking to do future proofing. |
| ZTE | Yes, agree to adopt Option 1.  We shall simply follow the IE structure of LTE ProSe/NR V2X authorized IEs. Generally, only the legacy way is not applicable for the new feature or serious issue is foreseen if legacy way is reused, new method would be introduced. However, there is no problem to reuse legacy IE structure for 5G ProSe authorized IE. Therefore, it has no strong reason to break the tradition and introduce a new IE structure. |
| Lenovo, Motorola Mobility | Agree with QC and ZTE, don’t see strong need to adopt option 2. |
| CATT | Option 1. The bit consumption is not a serious issue in interface. We prefer to follow the structure of LTE. |
| Nokia | Option 1.  Better to align with CN, and other specs. |
| China Telecom | Yes, prefer Option 1. |
| Samsung | Option 1, which is more future-proof to add more authorization in the future. |
| Huawei | Yes |
| E/// | Option 2.  First companies agree that both options work. Second, companies also agree that Option 2 can save signaling.  Regarding the future-proof, we would say it is a real future-proof way when more types are required by using a bitstring. Unfortunately, we don’t think Option 1 is future-proof, not as some companies said. In Option 1, the only possible way of extension is adding new optional IEs. If in the future we really need a lot of other authorization info, a very long list will be seen with the name “authorized” in the listed messages in our specifications, i.e., NG, Xn, and F1.  In the specification, following legacy may not be always the optimistic way. So we don’t agree with the argumentation that we have to follow legacy because of no issue. In addition, there is no misalignment with CN or other specs by adopting either Option 1 or 2. |

## Issue 3- ProSe NR UE-PC5-AMBR and PC5 QoS parameters

In last RAN3 meeting, ProSe NR UE-PC5-AMBR and PC5 QoS parameters for ProSe are supported for SL relay. In Rel-16, the NR UE Sidelink Aggregate Maximum Bit Rate and PC5 QoS Parameters were introduced to support V2X services. In contribution [12], it suggested both of them can be reused for Rel-17 ProSe and clarify the NR UE Sidelink Aggregate Maximum Bit Rate and PC5 QoS Parameters are also applicable to 5G ProSe. Contribution [13] indicated that V2X services and 5G ProSe services are two completely different services. It is possible to set different PC5 QoS parameters in the future.

Here we discuss about whether R16 NR UE Sidelink Aggregate Maximum Bit Rate and PC5 QoS Parameters can be reused for ProSe. Companies are encouraged to show their views on it.

**Question 2: Do companies agree that R16 NR UE Sidelink Aggregate Maximum Bit Rate and PC5 QoS Parameters can be reused for ProSe?**

|  |  |
| --- | --- |
| Company | Comment |
| Qualcomm | Prefer dedicated IEs for ProSe.  It might be possible that a UE can use sidelink for both V2X and ProSe at the same time (if not possible now, at least in the future). In such a case, dedicated IEs can help distinguish AMBR/QoS for V2X and ProSe instead of reusing the same IEs.  Also core network specs too distinguish V2X and ProSe subscription data (including AMBR), hence better to allow dedicated IEs for ProSe. |
| ZTE | Yes, we think R16 NR UE-SL-AMBR and PC5 QoS parameters can be reused for ProSe.  In Uu, the UE-AMBR limits the aggregate bit rate that can be expected to be provided across all Non-GBR QoS Flows of a UE. That is, it is applied for all Non-GBR QoS Flows **for all kind of services of a UE over Uu**. Similarly, the UE-SL-AMBR shall be used to limit the aggregate maximum bitrate of the UE’s sidelink communication for all services over PC5 interface including V2X services and ProSe services. On the other hand, if separate UE-SL-AMBR is defined, NG-RAN shall further be able to distinguish V2X services and 5G ProSe services of a UE so as to enable different control for NR V2X services and for ProSe services, which may bring extra specification impact. Therefore, it is suggested that the R16 NR UE-SL-AMBR is reused for ProSe.  The PC5 QoS parameters for ProSe is one kind of subscription data to give the user permission to use 5G ProSe. The R16 PC5 QoS parameters IE is defined to provide information on the PC5 QoS parameters of the UE’s sidelink communication, which can be reused for 5G ProSe by adding a list of PC5 QoS flows for 5G ProSe services in addition to NR V2X services. |
| Lenovo, Motorola Mobility | Maybe not for now, since there is no clear requirement from SA2. |
| CATT | Prefer dedicated IEs for ProSe.  We cannot exclude that a UE support both V2X and ProSe. These are two features in SA2’s specifications. The value configured to UE also can be different for different service. |
| Nokia | Prefer dedicated IEs for ProSe.  As discussed in R3-220829, V2X subscription data and ProSe subscription data are separate in core network and other specs. So it is preferred to align with core network and other specs. |
| China Telecom | Prefer dedicated IEs for ProSe.  We should not exclude that UE supports both v2x and prose services. Also the V2X and ProSe subscription data are separate in SA2’s specifications, it is better to allow dedicated IEs for ProSe. |
| Samsung | Prefer to dedicated IE for ProSe since it is more flexible. |
| Huawei | No, V2X services and 5G ProSe services are two different services that define new dedicated IEs for ProSe, allowing future compatibility. |
| E/// | No strong view. A set of new IEs could be a clean way. |

# Conclusion, Recommendations [if needed]

[TBD]

# References

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| --- | --- | --- |
| [1] | [R3-220137](file:///D:\会议硬盘\TSGR3_114bis-e\Docs\R3-220137.zip) | Reply LS on discovery and relay (re)selection (RAN2) |
| [2] | [R3-220238](file:///D:\会议硬盘\TSGR3_114bis-e\Docs\R3-220238.zip) | Discussion on Authorisation for 5G ProSe Layer-3 Remote UE (CATT) |
| [3] | [R3-220239](file:///D:\会议硬盘\TSGR3_114bis-e\Docs\R3-220239.zip) | Reply LS for authorisation information for 5G ProSe Layer-3 Remote UE (CATT) |
| [4] | [R3-220240](file:///D:\会议硬盘\TSGR3_114bis-e\Docs\R3-220240.zip) | Support of NR ProSe Authorized for F1AP (CATT) |
| [5] | [R3-220241](file:///D:\会议硬盘\TSGR3_114bis-e\Docs\R3-220241.zip) | Support of NR ProSe Authorized for XnAP (CATT) |
| [6] | [R3-220322](file:///D:\会议硬盘\TSGR3_114bis-e\Docs\R3-220322.zip) | Introduction of ProSe authorization information (Huawei) |
| [7] | [R3-220323](file:///D:\会议硬盘\TSGR3_114bis-e\Docs\R3-220323.zip) | (TP for SLrelay BLCR for 38.413, 38.423) Introduction of ProSe authorization information (Huawei) |
| [8] | [R3-220324](file:///D:\会议硬盘\TSGR3_114bis-e\Docs\R3-220324.zip) | [draft] Reply LS on discovery and relay (re)selection (Huawei) |
| [9] | [R3-220340](file:///D:\会议硬盘\TSGR3_114bis-e\Docs\R3-220340.zip) | Introduction of service authorization for SL Relay over NG (Ericsson) |
| [10] | [R3-220341](file:///D:\会议硬盘\TSGR3_114bis-e\Docs\R3-220341.zip) | Introduction of service authorization for SL Relay over Xn (Ericsson) |
| [11] | [R3-220349](file:///D:\会议硬盘\TSGR3_114bis-e\Docs\R3-220349.zip) | Authorization for Relay and Remote UE (Ericsson) |
| [12] | [R3-220374](file:///D:\会议硬盘\TSGR3_114bis-e\Docs\R3-220374.zip) | Discussion on NR ProSe authorization (ZTE) |
| [13] | [R3-220395](file:///D:\会议硬盘\TSGR3_114bis-e\Docs\R3-220395.zip) | Discussion on UE authorization for SL Relay (China Telecommunication) |
| [14] | [R3-220457](file:///D:\会议硬盘\TSGR3_114bis-e\Docs\R3-220457.zip) | Support of NR ProSe Authorized for NGAP (CATT) |
| [15] | [R3-220829](file:///D:\会议硬盘\TSGR3_114bis-e\Docs\R3-220829.zip) | Discussion on Relay and Remote UE authorization (Nokia, Nokia Shanghai Bell) |
| [16] | [R3-220830](file:///D:\会议硬盘\TSGR3_114bis-e\Docs\R3-220830.zip) | (NGAP CR) support for NR Sidelink Relay (Nokia, Nokia Shanghai Bell) |
| [17] | [R3-220831](file:///D:\会议硬盘\TSGR3_114bis-e\Docs\R3-220831.zip) | (XnAP CR) support for NR Sidelink Relay (Nokia, Nokia Shanghai Bell) |
| [18] | [R3-220832](file:///D:\会议硬盘\TSGR3_114bis-e\Docs\R3-220832.zip) | (F1AP CR) support for NR Sidelink Relay (Nokia, Nokia Shanghai Bell) |
| [19] | [R3-220864](file:///D:\会议硬盘\TSGR3_114bis-e\Docs\R3-220864.zip) | Consideration on authorization for SL relay (CMCC) |
| [20] | [R3-220865](file:///D:\会议硬盘\TSGR3_114bis-e\Docs\R3-220865.zip) | Support of 5G ProSe Authorization for NG-AP (CMCC) |
| [21] | [R3-220866](file:///D:\会议硬盘\TSGR3_114bis-e\Docs\R3-220866.zip) | Support of 5G ProSe Authorization for Xn-AP (CMCC) |