3GPP TSG-RAN WG2 Meeting #115 Electronic R2-21xxxx

Online, 16 – 27 August 2021

**Agenda item: 8.22**

**Source: Nokia**

**Title: Report of email discussion [AT115-e][031][NR17] MINT**

**WID/SID: FS\_MINT-CT - Release 17**

**Document for: Discussion and Decision**

# 1 Introduction

This is to provide an overview of TDocs [1-13] submitted under AI 8.22 for the CT1 LS on UAC enhancements for minimization of service interruption when disaster condition applies in [1].

# 2 Summary

## 2.1 Agreeable points

Based on the received CT1 LS in [1], CT1 has been performing stage 2 study (see 3GPP TR 24.811 for further details) and inform RAN2 that among the solutions that CT1 has not excluded to progress during the normative phase, there are two solutions impacting UAC after a disaster inbound roamer selects a PLMN without disaster condition: Solutions #38 and #40. These solutions require changes in the barring configuration in addition to introducing Access Identity 3 (see 3GPP TS 22.261), which are in the remit of RAN2.

The CT1 studies have been further consulted with SA3 from security perspective. SA3 guides in [2] that:

* broadcasting MINT related information from other PLMN in case of Disaster Condition risks because the broadcast information is not protected
* it must be ensured that the MINT feature is applicable only when UE is out of coverage of or cannot access any allowed PLMNs.
* it must be ensured that, except for emergency calls, unauthenticated network access (i.e. without primary authentication and NAS/AS SMC with null integrity algorithm) to the PLMN offering disaster roaming is not allowed

To address the potential impacts to RAN2, the input documents are providing converging conclusion on feasibility of the two solutions. Companies are invited to provide their views whether they agree with the proposed conclusion that both solutions seem feasible and that can be replied to CT1:

**Q1: Do you agree that RAN2 is ready to answer to CT1 that both solutions: Solution#38 and Solution#40 are feasible?**

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| **Company** | **Preference (Y/N)** | **Detailed Comments** |
| Lenovo | Yes but | We think the answer is valid under the assumption that only Access Identity 3 is valid for disaster inbound roamers. |
| OPPO | Yes | Feasibility-wise, we agree. |
| vivo | Yes |  |
| Samsung | Yes |  |
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When it comes to technical realization, the following observations are made in [3][5][6] [7][9][11][13] :

[Observation 1 [3]:Solution#38 is to reuse the existing UAC framework by taking one additional AI value (3).](file:///C:\Users\wro02711\AppData\Local\Temp\7zO0092F396\R2-2107184%20-%20Discussion%20on%20UAC%20for%20service%20interruption%20minimization%20during%20disaster.docx#_Toc77251719)

[Observation 2 [3]: Solution#40 is based on a framework which is different from legacy UAC procedure, by using an **offset** value on top of the existing barring factor.](file:///C:\Users\wro02711\AppData\Local\Temp\7zO0092F396\R2-2107184%20-%20Discussion%20on%20UAC%20for%20service%20interruption%20minimization%20during%20disaster.docx#_Toc77251720)

Observation 1 [5]: To support Solution #38, a new UAC-BarringInfoSetList for MINT is needed for Access Identity 3.

Observation 2 [5]: To support Solution #40, an extension to current UAC-BarringInfoSetList is required, to carry the uac-Disaster**Offset**ToBarringFactor and uac-BarringForAccessIdentity3.

Observation 1 [6,7] With just some NAS enhancement, Solution#38 would require a new Access Identity to work without any additional RRC enhancement and mostly can follow existing mechanisms.

Observation 2 [6,7] Besides NAS enhancement, Solution#40 would also require a new Access Identity and an **offset** which may require some significant RRC protocol enchantment to work.

Observation 1 [9]: Introducing the new UAC barring factor for Access Identity 3 is feasible in terms of signaling.

Observation 2 [9]: Introducing the new UAC barring offset value and “disaster loaming active” indicator from the forbidden PLMN is feasible in terms of signaling.

Observation 1 [11]: Solution #38: Introduce barring factor and timer for Access identity 3

Observation 2 [11]: Solution #40 Introduce offset to adjust the barring factor for Access Identity 3

Observation 1 [13]: Solution#38 requires an extension SIB1 with UAC parameters for Access Identity 3.

Observation 2 [13]: Solution#40 requires an extension SIB1 with the new uac-DisasterOffsetToBarringFactor per PLMN and additional UE procedure to calculate uac-BarrignFactor..

Companies are invited to provide their views whether they agree with the proposals.

**Q2: Do you agree the observations made in [3][5][6][7][9][11][13]** **conclude that:**

**Solution#38 requires extension of the existing UAC for Access Identity 3?**

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| **Company** | **Preference (Y/N)** | **Detailed Comments** |
| Lenovo | Yes | Only new barring factor for Access Identity 3 needs to be introduced which is independent from the existing barring factor for Access Identity 0. The existing barring time can be reused for Access Identity 3. |
| OPPO | Yes with comment | Sol#38 does not touch the existing UAC framework  The extension is on the signalling part, since the current signalling does not support AI3. |
| vivo | Yes | Solution#38 has to just comply with SA1 requirement configuration for AI =3 to work |
| Samsung | Yes | Solution#38 only requires the new barring factor for Access Identity 3 on top of the current UAC mechanism. |
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Companies are invited to provide their views whether they agree with the proposals.

**Q3: Do you agree with the observations made in [3][5][6][7][9][11][13]** **that conclude:**

**Solution#40 requires extending of the existing UAC for handling of “offset” parameter?**

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| **Company** | **Preference (Y/N)** | **Detailed Comments** |
| Lenovo | Yes | The new offset parameter is tied to the existing barring factor for Access Identity 0. |
| OPPO | Yes with comment | The offset based method does not exist in the existing UAC framework.  So we see the extension of sol#40 is from both framework perspective and signalling perspective. |
| vivo | Yes | The offset would require some significant RRC protocol enchantment to work |
| Samsung | Yes | The new UAC mechanism introducing offset of barring factor could be possible even though it requires some RRC signalling handling. |
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The observations made in [6][7][8][10] differ when it comes in understanding on extension of the UAC framework for Solution#40. It is not clear whether Access Identity 3 is required for Solution#40.

**Q4: Do you share the understanding that:**

**Solution#40 requires Access Identity 3?**

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| **Company** | **Preference (Y/N/ask CT1)** | **Detailed Comments** |
| Lenovo | Yes | It is our understanding that the proposed offset parameter shall be applied only for Access Identity 3. |
| OPPO | No | Our understanding was solution#40 does not include the extension of AI#3. Yet we are open to double check on this point in some way/ |
| vivo | Yes | Solution#40 would also require an offset which may require some significant RRC protocol enchantment to work. |
| Samsung | Yes | Same view with Lenovo. |
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The Tdoc in [4][5][8][10] make further evaluation of the two solutions and proposes a reply to CT1 that there is one preferable solution.

[5][8] state:

-  **Solution #40 costs slightly less signaling overhead** than Solution #38, while [10] states the opposite:

- the **overhead of Solution #38 is slightly less** (the difference of final consuming bits depends on how many PLMNs configure specific barring factors), assuming the consuming bits of solution #40 could be further reduced. if overhead is seen as one key point.

As a compromised conclusion, it is proposed to confirm that RAN2 assumes only one of the two solutions is needed [8]:

**Q5: Do you agree it isn’t clear at this point which of the Solutions costs less signalling overhead?**

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| --- | --- | --- |
| **Company** | **Preference (Y/N)** | **Detailed Comments** |
| Lenovo | Yes | Companies seem to have different views on how barring for Access Identity 3 can be introduced in UAC. |
| OPPO | Yes |  |
| vivo | Yes | Agree with Lenovo |
| Samsung | Yes |  |

The signaling overhead would depend on undertaken technical realization, which discussed in [4][5][7][13] led to several drawbacks observed for Solution#40

**Q6: Do you agree RAN2 should send a reply LS recommending Solution#38?**

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| **Company** | **Preference (Y/N)** | **Detailed Comments** |
| Lenovo | Yes | We prefer solution #38 as it allows an independent and flexible barring for Access Identity 3. |
| OPPO | Yes | Same view as Lenovo.  See our response to Q10 in a more detailed level. |
| vivo | Yes | Solution#38 would just require a new Access Identity to work without any additional RRC enhancement and mostly can follow existing mechanisms |
| Samsung | Yes, but | We also think that Solution#38 seems better approach from RAN2 point of view. RAN2 may give some analysis on both solutions without the recommended solution because RAN4 just asked the feasibility of both solutions. |

On the other hand [8][10] analyse that:

* Solution #: 38 add new dimension in signaling handling, due to the need to provide multiple barring factors for Access Identity 3 (to allow to differentiate e.g. disaster UEs using emergency services from disaster UEs that are browsing, there must be a barring factor per Access Category for Access Identity 3).
* solution#38 does not help to minimize the potential congestion, thus the original motivation of preventing these UEs as many as possible may not be fulfilled

**Q7: Do you agree RAN2 should send a reply LS recommending Solution#40?**

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| **Company** | **Preference (Y/N)** | **Detailed Comments** |
| Lenovo | No | Solution #40 has some minor drawbacks (less flexibility compared to solution #38, tied to barring for Access Identity 0) compared to solution #38. |
| OPPO | No | We do not think the offset-based extension of UAC framework in solution#40 is sufficiently justified  See our response to Q10 in a more detailed level. |
| vivo | No | Solution#40 would also require a new Access Identity and an offset which may require some significant RRC protocol enchantment to work. |
| Samsung | No, but | See comment on Q6. |

Besides ASN.1 impacts, [4][10] make the observation that Solution#38 means access barring for AI 3 is handled similarly to but independently from AI 0. This implies special procedural handling for the existing special AIs (1, 2, 12 to 14) of disaster roaming UEs, if configured, may be valid in the PLMN that provides disaster roaming service as well. The reason is that acc. to TS 22.261 the AIs 1, 2, 12, 13, 14 are valid in visited PLMNs of the home country. Thus, the barring configuration of the special AIs will override the one for AI 3.

**Q8: Do you agree that RAN2 has to work further on special handling for the existing special AIs (1, 2, 12 to 14) of disaster roaming UEs?**

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| **Company** | **Preference (Y/N)** | **Detailed Comments** |
| Lenovo | See comments | Clarification on the applicability of the special AIs (1, 2, 12 to 14) for disaster inbound roamers is needed. We should ask SA1 for guidance since they specified the service requirements for the MINT feature and the new Access Identity 3. |
| OPPO |  | We are fine to ask SA1 for the view. |
| vivo | No | The CT1 Ls just ask RAN2 to provide feedback on Solutions #38 and #40 described in 3GPP TR 24.811. We should let CT1 decide on which solution to further proceed and at what extend. |
| Samsung | No | Agree with vivo. We should wait for CT1’s decision. |

[3] makes a suggestion to involve SA1

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| [Proposal 1: RAN2 reply the LS by asking for guidance from SA1 on the two solutions.](file:///C:\Users\wro02711\AppData\Local\Temp\7zO0092F396\R2-2107184%20-%20Discussion%20on%20UAC%20for%20service%20interruption%20minimization%20during%20disaster.docx#_Toc79139736)  [Proposal 2**:** If Proposal 1 is not agreeable, RAN2 reply the LS by selecting solution #38, and ask SA1 to confirm.](file:///C:\Users\wro02711\AppData\Local\Temp\7zO0092F396\R2-2107184%20-%20Discussion%20on%20UAC%20for%20service%20interruption%20minimization%20during%20disaster.docx#_Toc79139737) |

**Q9: Do you see it necessary to involve SA1 and agree with the proposal 1 in [3]?**

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| **Company** | **Preference (Y/N)** | **Detailed Comments** |
| Lenovo | See comments | Yes: We should definitely ask SA1 for clarifying UAC for disaster inbound roamers such as:   * Whether only new Access Identity 3 applies for disaster inbound roamers or special AIs (1, 2, 12 to 14) as well, if configured for disaster inbound roamers. * Whether access barring for Access Identity 3 should be always lower than Access Identity 0 or can be independent from Access Identity 0. * In case a PLMN provides disaster roaming service for multiple PLMNs with disaster condition, whether access barring for the disaster inbound roamers from the concerned PLMNs should be common for all those PLMNs or can be set differently for each PLMN with disaster condition.   No: We don’t need to ask SA1 for guidance on the solutions. This is what RAN2 can do. |
| OPPO | Proponent | SA1 can be consulted since   1. how to do UAC is more of the scope of SA1, 2. there are still unclear detailed issues included in the whole procedure (we tend to agree with the first point by Lenovo, but not for the second/third point which seems out of the scope of the discussion). |
| vivo | See comments | SA1 is already CC-ed in CT1 Ls, if SA1 wants to make any decision, they can do it by themselves. No need to specifically ask them for guidance. |
| Samsung |  | Same view with vivo. |
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## 2.2 Reply LS content

**Q10: Do you agree RAN2 should send a reply LS to CT1 including at least the outcome of the Q1, Q2, Q3, Q4?**

**Q1: Do you agree that RAN2 is ready to answer to CT1 that both solutions: Solution#38 and Solution#40 are feasible?**

**Q2: Do you agree the observations made in [3-13] conclude that Solution#38 requires extension of the existing UAC for Access Identity 3?**

**Q3: Do you agree with the observations made in [3-13]** **conclude that Solution#40 requires extending of the existing UAC for handling of “offset” parameter?**

**Q4: Do you share the understanding that: Solution#40 requires Access Identity 3? (if the outcome isn’t clear, RAN2 will ask for clarification)**

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| **Company** | **Preference (Y/N)** | **Detailed Comments** |
| Lenovo | No | We think a reply with outcome of Q1 to Q4 is not sufficient. We should further indicate a preference for a solution and add issues for clarification which we identified from RAN2 pov. This will help RAN2 later when the stage 3 details need to be specified. For the clarification part we should ask SA1 for guidance. |
| OPPO | See comment | We are Ok to rely on the outcome of Q1/2/3.  And there are seems still missing input for R2 to get a thoughtful down-selection, e.g., Q4 and the other related issue (like Q8), so we are not sure if a clear down-selection/preference expression by R2 is easy.  In light of that, to identify a way-out   1. either to do the downselection in RAN2: Our preference is sol#38, yet it may not be easy considering the unclear aspects above or necessary 2. or leave this to CT1/SA1, i.e., no clear down-selection in RAN2? It seems a more feasible way-out, so we are thinking maybe good to ask for guidance from SA1 is one way out |
| vivo | Yes, with comments | We should also point out that Solution#40 would also requires which may require some significant RRC protocol enchantment to work. |
| Samsung | Yes | We are fine for adding the outcome of Q1/2/3/4.  If needed, some more aspects regarding the analysis on each solution e.g. concerns, observation, etc. could be added as well. |
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# 3 Conclusion

TBD

# References

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2. [R2-2106974](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_115-e/Docs/R2-2106974.zip) *Reply LS to LS on broadcasting from other PLMN in case of Disaster Condition,* SA3
3. [R2-2107184](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_115-e/Docs/R2-2107184.zip) *Discussion on UAC for service interruption minimization during disaster,* OPPO
4. [R2-2107264](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_115-e/Docs/R2-2107264.zip) *Discussion of the MINT solutions #38 and #40* Lenovo, Motorola Mobility
5. [R2-2107590](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_115-e/Docs/R2-2107590.zip) *Discussion on UAC enhancement for MINT*, Apple
6. [R2-2107840](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_115-e/Docs/R2-2107840.zip) *Draft LS reply on UAC enhancements for minimization of service interruption when disaster condition applies,*  vivo
7. [R2-2107841](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_115-e/Docs/R2-2107841.zip) *UAC enhancements for minimization of service interruption when disaster condition applies*, vivo
8. [R2-2108366](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_115-e/Docs/R2-2108366.zip) *RAN2 aspects for MINT,* Ericsson
9. [R2-2108633](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_115-e/Docs/R2-2108633.zip) *Considerations on the UAC enhancements when disaster condition applies,* Samsung
10. [R2-2108639](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_115-e/Docs/R2-2108639.zip) *Discussion on on UAC enhancements for minimization of service interruption when disaster condition applies*, Huawei, HiSilicon
11. [R2-2108762](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_115-e/Docs/R2-2108762.zip) *UAC for minimization of service interruption when disaster condition applies ZTE corporation,* Sanechips
12. [R2-2108763](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_115-e/Docs/R2-2108763.zip) *draft reply LS on UAC enhancements for minimization of service interruption when disaster condition applies,* ZTE corporation, Sanechips
13. [R2-2108818](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_115-e/Docs/R2-2108818.zip) *Draft reply LS to CT1 on UAC extensions for* *MINT* ([R2-2106902](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_115-e/Docs/R2-2106902.zip)/C1-213527), Nokia