3GPP TSG-RAN2#117-e Tdoc R2-22xxxx

Electronic meeting, 2022-02-21 - 2022-03-03

Agenda Item: 8.24.3 Other

Source: Ericsson

Title: Report [AT117-e][062][NR17] MINT (Ericsson)

Document for: Discussion, Decision

# 1 Introduction

This document summarizes this offline discussion:

* [AT117-e][062][NR17] MINT (Ericsson)

 Scope: Treat [R2-2202176](http://www.3gpp.org/ftp//tsg_ran/WG2_RL2/TSGR2_117-e/Docs//R2-2202176.zip), [R2-2202226](http://www.3gpp.org/ftp//tsg_ran/WG2_RL2/TSGR2_117-e/Docs//R2-2202226.zip), [R2-2202264](http://www.3gpp.org/ftp//tsg_ran/WG2_RL2/TSGR2_117-e/Docs//R2-2202264.zip), [R2-2202256](http://www.3gpp.org/ftp//tsg_ran/WG2_RL2/TSGR2_117-e/Docs//R2-2202256.zip), [R2-2202257](http://www.3gpp.org/ftp//tsg_ran/WG2_RL2/TSGR2_117-e/Docs//R2-2202257.zip), [R2-2202258](http://www.3gpp.org/ftp//tsg_ran/WG2_RL2/TSGR2_117-e/Docs//R2-2202258.zip), [R2-2202259](http://www.3gpp.org/ftp//tsg_ran/WG2_RL2/TSGR2_117-e/Docs//R2-2202259.zip), [R2-2202260](http://www.3gpp.org/ftp//tsg_ran/WG2_RL2/TSGR2_117-e/Docs//R2-2202260.zip), [R2-2202261](http://www.3gpp.org/ftp//tsg_ran/WG2_RL2/TSGR2_117-e/Docs//R2-2202261.zip), [R2-2202262](http://www.3gpp.org/ftp//tsg_ran/WG2_RL2/TSGR2_117-e/Docs//R2-2202262.zip), [R2-2202263](http://www.3gpp.org/ftp//tsg_ran/WG2_RL2/TSGR2_117-e/Docs//R2-2202263.zip). Ph1 Check the CRs, converge on discussion points if any and determine agreeable parts, Ph2 finally agree CRs.

 Intended outcome: Report, Agreed CRs, endorsed NR UE cap CRs (38306, 38331) for Merge.

 Deadline: EOM.

To allow for updating the CRs based on the result of the discussion in Section 2, the **deadline for providing input to the questions in section 2 is Friday W1**.

The following delegates participated in the discussion:

|  |  |
| --- | --- |
| Company | Contact Name, Email |
| Ericsson | Mattias Bergström, mattias.a.bergstrom@ericsson.com |
| Huawei, HiSilicon | zhaoyang@huawei.com |
| Samsung | seungri.jin@samsung.com |
| CATT | xuhao@catt.cn |
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The following documents were treated:

[R2-2202176](http://www.3gpp.org/ftp//tsg_ran/WG2_RL2/TSGR2_117-e/Docs//R2-2202176.zip) Reply LS on LS on MINT functionality for Disaster Roaming ([S3-214342](http://www.3gpp.org/ftp//tsg_sa/WG3_Security/TSGS3_105e/Docs//S3-214342.zip); contact: LGE) SA3 LS in Rel-17 To:SA2 Cc:SA5, CT1, CT4, CT6, RAN2, SA, CT, RAN

[R2-2202226](http://www.3gpp.org/ftp//tsg_ran/WG2_RL2/TSGR2_117-e/Docs//R2-2202226.zip) Further discussion on open issues for MINT Lenovo, Motorola Mobility discussion Rel-17 MINT

[R2-2202264](http://www.3gpp.org/ftp//tsg_ran/WG2_RL2/TSGR2_117-e/Docs//R2-2202264.zip) Remaining issues for MINT Ericsson discussion Rel-17 TEI17

[R2-2202256](http://www.3gpp.org/ftp//tsg_ran/WG2_RL2/TSGR2_117-e/Docs//R2-2202256.zip) Introduction of MINT Ericsson, Lenovo, Motorola Mobility CR Rel-17 36.300 16.7.0 1352 - B TEI17 [R2-2201845](http://www.3gpp.org/ftp//tsg_ran/WG2_RL2/TSGR2_116bis-e/Docs//R2-2201845.zip)

[R2-2202257](http://www.3gpp.org/ftp//tsg_ran/WG2_RL2/TSGR2_117-e/Docs//R2-2202257.zip) Introduction of MINT Ericsson, Lenovo, Motorola Mobility CR Rel-17 36.304 16.6.0 0839 - B TEI17 [R2-2201847](http://www.3gpp.org/ftp//tsg_ran/WG2_RL2/TSGR2_116bis-e/Docs//R2-2201847.zip)

[R2-2202258](http://www.3gpp.org/ftp//tsg_ran/WG2_RL2/TSGR2_117-e/Docs//R2-2202258.zip) Introduction of MINT Ericsson, Lenovo, Motorola Mobility CR Rel-17 36.306 16.7.0 1837 - B TEI17 [R2-2201849](http://www.3gpp.org/ftp//tsg_ran/WG2_RL2/TSGR2_116bis-e/Docs//R2-2201849.zip)

[R2-2202259](http://www.3gpp.org/ftp//tsg_ran/WG2_RL2/TSGR2_117-e/Docs//R2-2202259.zip) Introduction of MINT Ericsson, Lenovo, Motorola Mobility CR Rel-17 36.331 16.7.0 4755 - B TEI17 [R2-2201843](http://www.3gpp.org/ftp//tsg_ran/WG2_RL2/TSGR2_116bis-e/Docs//R2-2201843.zip)

[R2-2202260](http://www.3gpp.org/ftp//tsg_ran/WG2_RL2/TSGR2_117-e/Docs//R2-2202260.zip) Introduction of MINT Ericsson, Lenovo, Motorola Mobility CR Rel-17 38.300 16.8.0 0402 - B TEI17 [R2-2201844](http://www.3gpp.org/ftp//tsg_ran/WG2_RL2/TSGR2_116bis-e/Docs//R2-2201844.zip)

[R2-2202261](http://www.3gpp.org/ftp//tsg_ran/WG2_RL2/TSGR2_117-e/Docs//R2-2202261.zip) Introduction of MINT Ericsson, Lenovo, Motorola Mobility CR Rel-17 38.304 16.7.0 0226 - B TEI17 [R2-2201846](http://www.3gpp.org/ftp//tsg_ran/WG2_RL2/TSGR2_116bis-e/Docs//R2-2201846.zip)

[R2-2202262](http://www.3gpp.org/ftp//tsg_ran/WG2_RL2/TSGR2_117-e/Docs//R2-2202262.zip) Introduction of MINT Ericsson, Lenovo, Motorola Mobility CR Rel-17 38.306 16.7.0 0676 - B TEI17 [R2-2201848](http://www.3gpp.org/ftp//tsg_ran/WG2_RL2/TSGR2_116bis-e/Docs//R2-2201848.zip)

[R2-2202263](http://www.3gpp.org/ftp//tsg_ran/WG2_RL2/TSGR2_117-e/Docs//R2-2202263.zip) Introduction of MINT Ericsson, Lenovo, Motorola Mobility CR Rel-17 38.331 16.7.0 2883 - B TEI17 [R2-2201842](http://www.3gpp.org/ftp//tsg_ran/WG2_RL2/TSGR2_116bis-e/Docs//R2-2201842.zip)

# 2 Discussion

## 2.1 Comments on current CRs

RAN2 endorsed these running CRs in the last meeting:

[R2-2202256](http://www.3gpp.org/ftp//tsg_ran/WG2_RL2/TSGR2_117-e/Docs//R2-2202256.zip) Introduction of MINT Ericsson, Lenovo, Motorola Mobility CR Rel-17 36.300 16.7.0 1352 - B TEI17 [R2-2201845](http://www.3gpp.org/ftp//tsg_ran/WG2_RL2/TSGR2_116bis-e/Docs//R2-2201845.zip)

[R2-2202257](http://www.3gpp.org/ftp//tsg_ran/WG2_RL2/TSGR2_117-e/Docs//R2-2202257.zip) Introduction of MINT Ericsson, Lenovo, Motorola Mobility CR Rel-17 36.304 16.6.0 0839 - B TEI17 [R2-2201847](http://www.3gpp.org/ftp//tsg_ran/WG2_RL2/TSGR2_116bis-e/Docs//R2-2201847.zip)

[R2-2202258](http://www.3gpp.org/ftp//tsg_ran/WG2_RL2/TSGR2_117-e/Docs//R2-2202258.zip) Introduction of MINT Ericsson, Lenovo, Motorola Mobility CR Rel-17 36.306 16.7.0 1837 - B TEI17 [R2-2201849](http://www.3gpp.org/ftp//tsg_ran/WG2_RL2/TSGR2_116bis-e/Docs//R2-2201849.zip)

[R2-2202259](http://www.3gpp.org/ftp//tsg_ran/WG2_RL2/TSGR2_117-e/Docs//R2-2202259.zip) Introduction of MINT Ericsson, Lenovo, Motorola Mobility CR Rel-17 36.331 16.7.0 4755 - B TEI17 [R2-2201843](http://www.3gpp.org/ftp//tsg_ran/WG2_RL2/TSGR2_116bis-e/Docs//R2-2201843.zip)

[R2-2202260](http://www.3gpp.org/ftp//tsg_ran/WG2_RL2/TSGR2_117-e/Docs//R2-2202260.zip) Introduction of MINT Ericsson, Lenovo, Motorola Mobility CR Rel-17 38.300 16.8.0 0402 - B TEI17 [R2-2201844](http://www.3gpp.org/ftp//tsg_ran/WG2_RL2/TSGR2_116bis-e/Docs//R2-2201844.zip)

[R2-2202261](http://www.3gpp.org/ftp//tsg_ran/WG2_RL2/TSGR2_117-e/Docs//R2-2202261.zip) Introduction of MINT Ericsson, Lenovo, Motorola Mobility CR Rel-17 38.304 16.7.0 0226 - B TEI17 [R2-2201846](http://www.3gpp.org/ftp//tsg_ran/WG2_RL2/TSGR2_116bis-e/Docs//R2-2201846.zip)

[R2-2202262](http://www.3gpp.org/ftp//tsg_ran/WG2_RL2/TSGR2_117-e/Docs//R2-2202262.zip) Introduction of MINT Ericsson, Lenovo, Motorola Mobility CR Rel-17 38.306 16.7.0 0676 - B TEI17 [R2-2201848](http://www.3gpp.org/ftp//tsg_ran/WG2_RL2/TSGR2_116bis-e/Docs//R2-2201848.zip)

[R2-2202263](http://www.3gpp.org/ftp//tsg_ran/WG2_RL2/TSGR2_117-e/Docs//R2-2202263.zip) Introduction of MINT Ericsson, Lenovo, Motorola Mobility CR Rel-17 38.331 16.7.0 2883 - B TEI17 [R2-2201842](http://www.3gpp.org/ftp//tsg_ran/WG2_RL2/TSGR2_116bis-e/Docs//R2-2201842.zip)

**Question 1**: Do you have any comments on the CRs in their current form (note they may be updated based on this discussion and based on potential incoming LSs)?

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| **Company** | **Comments** |
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## 2.2 LS from SA3 [R2-2202176](http://www.3gpp.org/ftp//tsg_ran/WG2_RL2/TSGR2_117-e/Docs//R2-2202176.zip)

SA3 wrote in their LS in [R2-2202176](http://www.3gpp.org/ftp//tsg_ran/WG2_RL2/TSGR2_117-e/Docs//R2-2202176.zip):

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| 1 Overall descriptionSA3 would like to thank SA2 for the LS(S3‑213874/[S2-2108172](http://www.3gpp.org/ftp//tsg_sa/WG2_Arch/TSGS2_147E_Electronic_2021-10/Docs//S2-2108172.zip)) on MINT functionality for Disaster Roaming. SA3 would like to inform SA2 that the MINT functionality must ensure that a VPLMN cannot single-handedly trick the HPLMN into considering the VPLMN as providing the disaster roaming. With this in mind, OAM configuration in the HPLMN seems important. SA3 would also like to inform SA2 that SA3 will continue to analyse further security impact caused by Disaster Roaming service indication and will keep SA2 informed when there is progress.2 Actions**To SA2****ACTION:** SA3 kindly asks SA2 to take the above information into account. |

There is no RAN2 action indicated in the LS so perhaps it can be noted in RAN2. But companies are invited to indicate if they think otherwise.

**Question 2**: Do RAN2 need to take any action in response to this LS?

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| **Company** | **Comments** |
| Ericsson | No, can be noted. |
| Huawei, HiSilicon | No impact is seen to RAN2. |
| Samsung | No, can be noted. |
| CATT | No, just noted is enough. |
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## 2.3 Reserved for operator use in LTE

[R2-2202264](http://www.3gpp.org/ftp//tsg_ran/WG2_RL2/TSGR2_117-e/Docs//R2-2202264.zip) argues that we should capture the following UE handling of cells that are reserved for operator use in LTE 36.304:

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| 5.3.1 Cell status and cell reservations[...]When cell status is indicated as "not barred" and "reserved" for operator use for any PLMN,- UEs assigned to Access Class 11 or 15 operating in their HPLMN/EHPLMN shall treat this cell as candidate during the cell selection and reselection procedures if the field *cellReservedForOperatorUse* for that PLMN set to "reserved".- UEs assigned to an Access Class in the range of 0 to 9, 12 to 14 or to Access Identity 3 shall behave as if the cell status is "barred" in case the cell is "reserved for operator use" for the registered PLMN or the selected PLMN.NOTE 3: ACs 11, 15 are only valid for use in the HPLMN/ EHPLMN; ACs 12, 13, 14 are only valid for use in the home country TS 22.011 [4].NOTE X: Access Identity 3 is only valid for PLMNs that indicate to potential Disaster Inbound Roamers that the UEs can access the PLMN as specified in TS 22.261 [x]. |

The intention described in [R2-2202264](http://www.3gpp.org/ftp//tsg_ran/WG2_RL2/TSGR2_117-e/Docs//R2-2202264.zip) is that when the MINT CR for 36.304 gets implemented, and if/when CRs in [R2-2202220](http://www.3gpp.org/ftp//tsg_ran/WG2_RL2/TSGR2_117-e/Docs//R2-2202220.zip) and [R2-2202221](http://www.3gpp.org/ftp//tsg_ran/WG2_RL2/TSGR2_117-e/Docs//R2-2202221.zip) are implemented, the resulting spec text would be the following which is claimed to be the wanted spec:

|  |
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| 5.3.1 Cell status and cell reservations[...]When cell status is indicated as "not barred" and "reserved" for operator use for any PLMN,- UEs assigned to Access Class 11 or 15 (or corresponding Access Identity) operating in their HPLMN/EHPLMN shall treat this cell as candidate during the cell selection and reselection procedures if the field *cellReservedForOperatorUse* for that PLMN set to "reserved".- UEs assigned to an Access Class in the range of 0 to 9 (or corresponding Access Identity 0), 12 to 14 (or corresponding Access Identity) or to Access Identity 1, 2 or 3 shall behave as if the cell status is "barred" in case the cell is "reserved for operator use" for the registered PLMN or the selected PLMN.NOTE 3: ACs 11, 15 (or corresponding Access Identity) are only valid for use in the HPLMN/ EHPLMN; ACs 12, 13, 14 (or corresponding Access Identity) are only valid for use in the home country TS 22.011 [4].NOTE 4: Access Identities 1, 2 are valid in the PLMNs as specified in TS 22.261 [x].NOTE 5: Access Identity 3 is only valid for PLMNs that indicate to potential Disaster Inbound Roamers that the UEs can access the PLMN as specified in TS 22.261 [x]. |

Companies are invited to provide any comments on this approach. And on the technical details, if any.

**Question 3**: Do you agree with the TP?

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| **Company** | **Answer** | **Comments** |
| Ericsson | Yes |  |
| Huawei, HiSilicon | Yes | We think this TP can be directly included in the revised CR 36304. |
| Samsung | Yes |  |
| CATT | Agree |  |
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## 2.4 MTC/NB-IoT

[R2-2202226](http://www.3gpp.org/ftp//tsg_ran/WG2_RL2/TSGR2_117-e/Docs//R2-2202226.zip) asks if MINT should be supported for MTC/NB-IoT connected to 5GC. the contribution lists the impact of supporting MINT for MTC/NB-IoT:

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| If MINT is supported for 5GC-capable eMTC/NB-IoT UEs then the following AS impacts to LTE and NB-IoT in TS 36.331 [5] need to be considered:1. For eMTC:
* Clarification may be needed that SIBX and SIB25 (containing the updated UAC parameters) can be sent on SystemInformation-BR and in the set of narrowbands which are configured in the LTE cell for eMTC UEs.
* SI message size restriction of 936 bits.
1. For NB-IoT:
* The narrowband version of SIBX needs to be specified and added to the SystemInformation-NB message.
* The SIB14-NB containing the access barring parameters for EPC and 5GC needs to be updated with the new UAC barring factor for Access Identity 3.
* SI message size restriction of 680 bits.
 |

**Question 4**: Should RAN2 implement MINT support for MTC/NB-IoT devices?

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| **Company** | **Answer** | **Comments** |
| Huawei, HiSilicon | No | No WG asked to support eMTC and NB-IoT on this, and we also don’t think it is desirable to support so. |
| Samsung | No | We don’t think supporting MINT for MTC/NB-IoT is needed in Rel-17 without request from SA. |
| CATT | No | We can discuss it in the further release. |
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## 2.5 Signalling of PLMNs with disaster condition in SIBX

[R2-2202226](http://www.3gpp.org/ftp//tsg_ran/WG2_RL2/TSGR2_117-e/Docs//R2-2202226.zip) brings up the topic of how PLMNs with disaster conditions are to be signalled and have provided further analysis of signalling overhead for the two approaches discussed last meeting, namely these:

Alternative 1: Merging common and specific PLMNs

Alternative 2: Either common PLMNs or specific PLMNs

At the last RAN2 meeting RAN2 agreed to adopt Alternative 2, which was also implemented in the running CR. However, [R2-2202226](http://www.3gpp.org/ftp//tsg_ran/WG2_RL2/TSGR2_117-e/Docs//R2-2202226.zip) identifies that there are scenarios where signalling overhead can be reduced with Alternative 1. The paper summarizes the analysis as follows (see the paper for further details):

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| **Summary:**1. In scenarios where the number of PLMNs sharing the cell is low and disaster roaming service is provided only for a limited number of PLMNs with disaster condition the signaling overhead for Alt1 and Alt2 is same (see **Example 3**). The same applies if all PLMNs sharing the cell provide disaster roaming service for the same set of PLMNs with disaster condition (see **Example 1**).
2. Signaling overhead reduction can be achieved with Alt1 in scenarios where multiple PLMNs sharing the cell provide disaster roaming service for a common set of PLMNs with disaster condition (see **Example 2**, **Example 4** and **Example 5**).
 |

The proposal is that RAN2 should revisit this topic.

**Question 5**: Do you think RAN2 should revisit the decision on Alternative 2 for signalling of PLMNs with disaster condition in SIBX?

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| **Company** | **Answer** | **Comments** |
| Ericsson | No | There is overhead saving in some scenarios, but Alt 2 seems simpler in our view (and is also what is in the CRs now). We prefer to stick to the current approach. |
| Huawei, HiSilicon | No | This has been discussed before and we think there is no need to repeat. |
| Samsung | No | We prefer to keep the current approach because we think that Alt 1 will not bring the significant signaling reduction.  |
| CATT | No | In principle, if there are clear technical defects, we can revisit them. But for the raised proposals, we treat it as optimization. Hence, we don’t support revisiting the decision made in the last meeting. |
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[R2-2202226](http://www.3gpp.org/ftp//tsg_ran/WG2_RL2/TSGR2_117-e/Docs//R2-2202226.zip) also presents a further optimization for Alternative 1, namely that more than one common list is defined in system information.

**Question 6**: Do you think RAN2 should adopt "Alternative 1 extended" as described in [R2-2202226](http://www.3gpp.org/ftp//tsg_ran/WG2_RL2/TSGR2_117-e/Docs//R2-2202226.zip)?

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| **Company** | **Answer** | **Comments** |
| Ericsson | No | Same argument holds also here, but this alternative is even more complex.  |
| Huawei, HiSilicon | No | This has been discussed before and we think there is no need to repeat. |
| Samsung | No | Same view as Ericsson. |
| CATT | No |  |
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[R2-2202226](http://www.3gpp.org/ftp//tsg_ran/WG2_RL2/TSGR2_117-e/Docs//R2-2202226.zip) further argues that the country-code (MCC) can be omitted from PLMNs with disaster conditions if the MCC is the same as the PLMN sharing the cell.

**Question 7**: Do you think RAN2 should add support for omitting the MCC for PLMNs with disaster conditions in case the MCC is the same as the PLMN sharing the cell?

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| **Company** | **Answer** | **Comments** |
| Ericsson | No | As the paper describes, the spec already allows for omitting the MCC for the second, third, ... PLMNs in a list. And that would be possible to use also in the list of PLMNs with disaster conditions in our understanding. Hence, the additional gain of this proposal seems not significant. |
| Huawei, HiSilicon | No | Same view as Ericsson. |
| Samsung | No | Same view as Ericsson. |
| CATT | No | We share the same view as Ericsson. |
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## 2.6 Remaining open issues

Below companies are encouraged to list remaining open issues. Meaning open issues which are not yet addressed in this discussion. Note, RAN2 is pending input from CT1 on:

* MINT applicability for PNI-NPN
* Semantics for "one bit approach"

**Question 8**: Do you see any other open issue for MINT?

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| **Company** | **Answer** | **Comments** |
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# 3 Conclusion

Based on the discussion above it is proposed:

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