3GPP TSG-RAN2#118-e Tdoc R2-22XXXX

Electronic meeting, 2022-05-09 - 2022-05-20

Agenda Item: 6.24.3 Other

Source: Ericsson

Title: Report from [AT118-e][047][NR17] MINT (Ericsson)

Document for: Discussion, Decision

# 1 Introduction

This is a report from the following discussion:

* [AT118-e][047][NR17] MINT (Ericsson)

Scope: Treat [R2-2204510](http://www.3gpp.org/ftp//tsg_ran/WG2_RL2/TSGR2_118-e/Docs//R2-2204510.zip), [R2-2204527](http://www.3gpp.org/ftp//tsg_ran/WG2_RL2/TSGR2_118-e/Docs//R2-2204527.zip), [R2-2204529](http://www.3gpp.org/ftp//tsg_ran/WG2_RL2/TSGR2_118-e/Docs//R2-2204529.zip), [R2-2205869](http://www.3gpp.org/ftp//tsg_ran/WG2_RL2/TSGR2_118-e/Docs//R2-2205869.zip), [R2-2205520](http://www.3gpp.org/ftp//tsg_ran/WG2_RL2/TSGR2_118-e/Docs//R2-2205520.zip), [R2-2205618](http://www.3gpp.org/ftp//tsg_ran/WG2_RL2/TSGR2_118-e/Docs//R2-2205618.zip), [R2-2205867](http://www.3gpp.org/ftp//tsg_ran/WG2_RL2/TSGR2_118-e/Docs//R2-2205867.zip), [R2-2205868](http://www.3gpp.org/ftp//tsg_ran/WG2_RL2/TSGR2_118-e/Docs//R2-2205868.zip), [R2-2205992](http://www.3gpp.org/ftp//tsg_ran/WG2_RL2/TSGR2_118-e/Docs//R2-2205992.zip), [R2-2205993](http://www.3gpp.org/ftp//tsg_ran/WG2_RL2/TSGR2_118-e/Docs//R2-2205993.zip), [R2-2206049](http://www.3gpp.org/ftp//tsg_ran/WG2_RL2/TSGR2_118-e/Docs//R2-2206049.zip), [R2-2206050](http://www.3gpp.org/ftp//tsg_ran/WG2_RL2/TSGR2_118-e/Docs//R2-2206050.zip). Ph1 Determine agreeable parts, Ph2 agree CRs

Intended outcome: Report, Agreed CRs

Deadline: Schedule 1

The following delegates participated in the discussion:

|  |  |
| --- | --- |
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| Ericsson | Mattias Bergström, mattias.a.bergstrom@ericsson.com |
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The following documents were treated:

[R2-2204510](http://www.3gpp.org/ftp//tsg_ran/WG2_RL2/TSGR2_118-e/Docs//R2-2204510.zip) LS on system information extensions for minimization of service interruption (MINT) ([C1-223219](http://www.3gpp.org/ftp//tsg_ct/WG1_mm-cc-sm_ex-CN1/TSGC1_135e/Docs//C1-223219.zip); contact: Ericsson) CT1 LS in Rel-17 MINT To:RAN2 Cc:SA2

[R2-2204527](http://www.3gpp.org/ftp//tsg_ran/WG2_RL2/TSGR2_118-e/Docs//R2-2204527.zip) Reply LS on Reply LS on MINT functionality for Disaster Roaming ([S3-220518](http://www.3gpp.org/ftp//tsg_sa/WG3_Security/TSGS3_106e/Docs//S3-220518.zip); contact: LGE) SA3 LS in Rel-17 MINT To:SA2 Cc:SA5, CT1, CT4, CT6, RAN2, SA, CT, RAN

[R2-2204529](http://www.3gpp.org/ftp//tsg_ran/WG2_RL2/TSGR2_118-e/Docs//R2-2204529.zip) LS on MINT functionality for Disaster Roaming ([S5-222575](http://www.3gpp.org/ftp//tsg_sa/WG5_TM/TSGS5_142e/Docs//S5-222575.zip); contact: Ericsson) SA5 LS in Rel-17 MINT To:SA2 Cc:SA, SA3, CT, CT1, CT4, CT6, RAN, RAN2

[R2-2205869](http://www.3gpp.org/ftp//tsg_ran/WG2_RL2/TSGR2_118-e/Docs//R2-2205869.zip) Remaining issues for MINT Ericsson discussion Rel-17

[R2-2205520](http://www.3gpp.org/ftp//tsg_ran/WG2_RL2/TSGR2_118-e/Docs//R2-2205520.zip) Discussion on supporting case A from CT1 on MINT Huawei, HiSilicon discussion Rel-17 MINT

[R2-2205618](http://www.3gpp.org/ftp//tsg_ran/WG2_RL2/TSGR2_118-e/Docs//R2-2205618.zip) TP to resolve TBD on oneBitApproach for MINT LG Electronics France discussion

[R2-2205867](http://www.3gpp.org/ftp//tsg_ran/WG2_RL2/TSGR2_118-e/Docs//R2-2205867.zip) Introducing single-bit approach for MINT [MINT] Ericsson CR Rel-17 36.331 17.0.0 4810 - B TEI17

[R2-2205868](http://www.3gpp.org/ftp//tsg_ran/WG2_RL2/TSGR2_118-e/Docs//R2-2205868.zip) Introducing single-bit approach for MINT [MINT] Ericsson CR Rel-17 38.331 17.0.0 3122 - B TEI17

[R2-2205992](http://www.3gpp.org/ftp//tsg_ran/WG2_RL2/TSGR2_118-e/Docs//R2-2205992.zip) Support of of case A from CT1 on MINT Huawei, HiSilicon CR Rel-17 38.331 17.0.0 3147 - F MINT

[R2-2205993](http://www.3gpp.org/ftp//tsg_ran/WG2_RL2/TSGR2_118-e/Docs//R2-2205993.zip) Support of of case A from CT1 on MINT Huawei, HiSilicon CR Rel-17 36.331 17.0.0 4815 - F MINT

[R2-2206049](http://www.3gpp.org/ftp//tsg_ran/WG2_RL2/TSGR2_118-e/Docs//R2-2206049.zip) Corrections to MINT specification [MINT] Lenovo draftCR Rel-17 38.331 17.0.0 F TEI17

[R2-2206050](http://www.3gpp.org/ftp//tsg_ran/WG2_RL2/TSGR2_118-e/Docs//R2-2206050.zip) Corrections to MINT specification [MINT] Lenovo draftCR Rel-17 36.331 17.0.0 F TEI17

# 2 Discussion

## 2.1 LSs

RAN2 received these MINT-related LSs to this meeting:

[R2-2204510](http://www.3gpp.org/ftp//tsg_ran/WG2_RL2/TSGR2_118-e/Docs//R2-2204510.zip) LS on system information extensions for minimization of service interruption (MINT) ([C1-223219](http://www.3gpp.org/ftp//tsg_ct/WG1_mm-cc-sm_ex-CN1/TSGC1_135e/Docs//C1-223219.zip); contact: Ericsson) CT1 LS in Rel-17 MINT To:RAN2 Cc:SA2

[R2-2204527](http://www.3gpp.org/ftp//tsg_ran/WG2_RL2/TSGR2_118-e/Docs//R2-2204527.zip) Reply LS on Reply LS on MINT functionality for Disaster Roaming ([S3-220518](http://www.3gpp.org/ftp//tsg_sa/WG3_Security/TSGS3_106e/Docs//S3-220518.zip); contact: LGE) SA3 LS in Rel-17 MINT To:SA2 Cc:SA5, CT1, CT4, CT6, RAN2, SA, CT, RAN

[R2-2204529](http://www.3gpp.org/ftp//tsg_ran/WG2_RL2/TSGR2_118-e/Docs//R2-2204529.zip) LS on MINT functionality for Disaster Roaming ([S5-222575](http://www.3gpp.org/ftp//tsg_sa/WG5_TM/TSGS5_142e/Docs//S5-222575.zip); contact: Ericsson) SA5 LS in Rel-17 MINT To:SA2 Cc:SA, SA3, CT, CT1, CT4, CT6, RAN, RAN2

The first LS relates to the so called "single bit approach" which RAN2 has added a placeholder for in the RRC specifications. There are company contributions proposing how update the RAN2 specifications in response to the first LS, see below.

The second and the third LS require no RAN2 action.

The rapporteur proposes to note these three LSs and consider them in the rest of the discussion.

1. The LSs in [R2-2204510](http://www.3gpp.org/ftp//tsg_ran/WG2_RL2/TSGR2_118-e/Docs//R2-2204510.zip), [R2-2204527](http://www.3gpp.org/ftp//tsg_ran/WG2_RL2/TSGR2_118-e/Docs//R2-2204527.zip), and [R2-2204529](http://www.3gpp.org/ftp//tsg_ran/WG2_RL2/TSGR2_118-e/Docs//R2-2204529.zip) are noted.

## 2.2 Corrections in [R2-2206049](http://www.3gpp.org/ftp//tsg_ran/WG2_RL2/TSGR2_118-e/Docs//R2-2206049.zip) and [R2-2206050](http://www.3gpp.org/ftp//tsg_ran/WG2_RL2/TSGR2_118-e/Docs//R2-2206050.zip)

The following CRs proposes corrections to LTE and NR RRC specifications:

[R2-2206049](http://www.3gpp.org/ftp//tsg_ran/WG2_RL2/TSGR2_118-e/Docs//R2-2206049.zip) Corrections to MINT specification [MINT] Lenovo draftCR Rel-17 38.331 17.0.0 F TEI17

[R2-2206050](http://www.3gpp.org/ftp//tsg_ran/WG2_RL2/TSGR2_118-e/Docs//R2-2206050.zip) Corrections to MINT specification [MINT] Lenovo draftCR Rel-17 36.331 17.0.0 F TEI17

Both CRs add a requirement on the UE to maintain a valid version of the MINT-SIB (SIB30 in LTE and SIB15 in NR). The NR CR also removes the inner optionality bit of uac-BarringInfo-v1700, i.e. remove OPTIONAL from uac-BarringInfoSetList-v1700, and moves the Cond MINT to the outer field and add "Need R" to the "if absent" part of the condition.

**Q1: Do you agree with the intention of these CRs?**

|  |  |  |
| --- | --- | --- |
| **Company** | **Answer** | **Comments** |
| Ericsson | Yes |  |
| Huawei, HiSilicon | Yes |  |
| Lenovo | Yes | Proponent. Furthermore, the changes can be merged with other agreeable changes into single RRC CRs. |
| LGE | Yes |  |
| Samsung | Yes |  |
| vivo | Yes |  |
| Apple | Yes |  |
| Intel | Yes |  |
| Qualcomm | Yes |  |

**Q2: Do you have any detailed suggested changes for the CRs?**

|  |  |
| --- | --- |
| **Company** | **Comments** |
| OPPO | Do we need a need-code for the always-absent case? |
| Intel | Responding to Oppo’s comment – we don’t always require a Need code for absence – only required if the value can change from present to absent and UE should do something when it occurs and the condition for absence is valid – which is a bit of a grey area. For SIBs, it is not essential, but does no harm. |
|  |  |

***Summary****: All agree to the content of these CRs and no changes seem necessary. It was proposed to merge the changes to one MINT CR (per RAT).*

1. The contents of the CRs R2-2206049 and R2-2206050 is agreeable and are to be merged in to a one MINT CR per RAT (one for LTE RRC and one for NR RRC).

## 2.3 Capturing the "one bit approach"

These papers discuss how to capture the one bit approach.

[R2-2205520](http://www.3gpp.org/ftp//tsg_ran/WG2_RL2/TSGR2_118-e/Docs//R2-2205520.zip) Discussion on supporting case A from CT1 on MINT Huawei, HiSilicon discussion Rel-17 MINT

[R2-2205992](http://www.3gpp.org/ftp//tsg_ran/WG2_RL2/TSGR2_118-e/Docs//R2-2205992.zip) Support of of case A from CT1 on MINT Huawei, HiSilicon CR Rel-17 38.331 17.0.0 3147 - F MINT

[R2-2205993](http://www.3gpp.org/ftp//tsg_ran/WG2_RL2/TSGR2_118-e/Docs//R2-2205993.zip) Support of of case A from CT1 on MINT Huawei, HiSilicon CR Rel-17 36.331 17.0.0 4815 - F MINT

[R2-2205869](http://www.3gpp.org/ftp//tsg_ran/WG2_RL2/TSGR2_118-e/Docs//R2-2205869.zip) Remaining issues for MINT Ericsson discussion Rel-17

[R2-2205867](http://www.3gpp.org/ftp//tsg_ran/WG2_RL2/TSGR2_118-e/Docs//R2-2205867.zip) Introducing single-bit approach for MINT [MINT] Ericsson CR Rel-17 36.331 17.0.0 4810 - B TEI17

[R2-2205868](http://www.3gpp.org/ftp//tsg_ran/WG2_RL2/TSGR2_118-e/Docs//R2-2205868.zip) Introducing single-bit approach for MINT [MINT] Ericsson CR Rel-17 38.331 17.0.0 3122 - B TEI17

[R2-2205618](http://www.3gpp.org/ftp//tsg_ran/WG2_RL2/TSGR2_118-e/Docs//R2-2205618.zip) TP to resolve TBD on oneBitApproach for MINT LG Electronics France discussion

The CT specification defined the one bit approach in [C1-223001](http://www.3gpp.org/ftp//tsg_ct/WG1_mm-cc-sm_ex-CN1/TSGC1_135e/Docs//C1-223001.zip) as:

|  |
| --- |
| The disaster related indication indicates that the available PLMN broadcasting this indication is the only PLMN accessible for disaster inbound roamers, that this PLMN accepts disaster inbound roamers from any other PLMN, that a disaster condition applies to all other PLMNs in the location of the broadcast, and that the disaster inbound roamers attempt to determine the MS determined PLMN with disaster condition as per bullet q2) |

From this definition it is clear that only one PLMN can indicate the single bit approach. And this (one) PLMN is the only PLMN that offers disaster roaming and this PLMN further accepts disaster roamers from any other PLMN.

The main difference between the proposals for how to capture is one bit approach is if/how signalling is affected. [R2-2205520](http://www.3gpp.org/ftp//tsg_ran/WG2_RL2/TSGR2_118-e/Docs//R2-2205520.zip) proposes to change the ASN.1 as below. The rapporteur's understanding is that with this signalling approach the network should either indicate the oneBitApproach or provide the PLMNs with disaster conditions for each PLMN sharing the cell. If the oneBitApproach is indicated, the network also indicates an integer that points to the lists in SIB1 containing the PLMNs/NPNs. For example, if the integer is set to 4, it means that the fourth PLMN in the SIB1 list(s) (i.e. PLMN-list + NPN-list) is the "*only PLMN accessible for disaster inbound roamers*".

SIB15-r17 ::= SEQUENCE {

disasterRelatedIndicaiton-r17 ::= CHOICE {

oneBitApproach-r17 INTEGER (1..maxPLMN),

applicableDisasterInfoList-r17 SEQUENCE (SIZE (1..maxPLMN)) OF ApplicableDisasterInfo-r17

}

commonPLMNsWithDisasterCondition-r17 SEQUENCE (SIZE (1..maxPLMN)) OF PLMN-Identity OPTIONAL, -- Need R

lateNonCriticalExtension OCTET STRING OPTIONAL,

...

}

ApplicableDisasterInfo-r17 ::= CHOICE {

noDisasterRoaming-r17 NULL,

commonPLMNs-r17 NULL,

dedicatedPLMNs-r17 SEQUENCE (SIZE (1..maxPLMN)) OF PLMN-Identity

}

**Q3: Should RAN2 change the ASN.1 as proposed in** [**R2-2205520**](http://www.3gpp.org/ftp//tsg_ran/WG2_RL2/TSGR2_118-e/Docs//R2-2205520.zip)**,** [**R2-2205992**](http://www.3gpp.org/ftp//tsg_ran/WG2_RL2/TSGR2_118-e/Docs//R2-2205992.zip)**, and** [**R2-2205993**](http://www.3gpp.org/ftp//tsg_ran/WG2_RL2/TSGR2_118-e/Docs//R2-2205993.zip)**?**

|  |  |
| --- | --- |
| **Company** | **Comments** |
| Ericsson | No, the existing signalling works. The field description for the one-bit approach should instead be clarified such that it is clear that there is only one PLMN that can indicate the single-bit approach.  The CT1-wording for this would be a good starting-point and detailed proposals are found in [R2-2205867](http://www.3gpp.org/ftp//tsg_ran/WG2_RL2/TSGR2_118-e/Docs//R2-2205867.zip)/[R2-2205868](http://www.3gpp.org/ftp//tsg_ran/WG2_RL2/TSGR2_118-e/Docs//R2-2205868.zip) and in [R2-2205618](http://www.3gpp.org/ftp//tsg_ran/WG2_RL2/TSGR2_118-e/Docs//R2-2205618.zip). |
| Huawei, HiSilicon | Yes, proponent.  The existing signalling causes unessary signaling overhead by repeating the PLMN list, if there is only PLMN is allowed for single-bit approach, there is no need to signal the PLMN ID list. We understand previously companies agree to introduce this common and dedicated PLMN list to reduce the signaling overhead, as ASN.1 is not yet frozen, we believe the same principle of saving signaling overhead should be considered. |
| Lenovo | Open and we can discuss whether we want to allow common signaling of the one-bit approach in case of RAN sharing. But in general, we disagree with the statement saying „that only one PLMN can indicate the single bit approach“ since in case of RAN sharing multiple PLMNs can set this flag acc. to current signaling structure. To our understanding CT1 made agreement on the one-bit approach not considering RAN sharing. Let’s assume this example:   1. There are 3 PLMNs deployed in a geographical area where a public PLMN A is not affected by disaster condition and PLMN D1 and PLMN D2 are affected by disaster condition. 2. The RAN of PLMN A is shared with other two PLMNs, e.g. PLMN B is a public PLMN and PLMN C is an SNPN. 3. PLMN A, B and C can set the ApplicableDisasterInfo-r17 as follows:  * (Depending on operator policy) PLMN A may set the one-bit approach. * (Depending on operator policy) PLMN B may set the one-bit approach or may offer disaster roaming service for PLMN D1 but not for PLMN D2. * PLMN C sets the noDisasterRoaming indication.   MINT refers to RAN failure in case of disaster condition. So, if a RAN is not affected by disaster condition, why then can only one PLMN sharing the RAN set the single bit approach? |
| LGE | The proposed signaling structure allows compact signaling in case of oneBitApproach, and it is well in line with CT1 specification (Case A), hence we support this change. |
| Samsung | At least, suggested change is quite aligned wiht the CT1’s LS and this signaling reduces the redundatn signaling overhead. It seems better than the current ASN.1 in terms of signlaing optimization. |
| vivo | We think we should align with CT1 spec and we think the proposed change can achieve this aim. |
| Apple | We think Huawei’s approach can save the signaling. It is better to take the final opportunity to optimize the ASN.1 structure. |
| Vodafone | From the use case perspective, it is foreseen that this bit is broadcasted only by 1 PLMN in a particular area (e.g. in the case other PLMNs in this area are out of service). If so, I am wondering why a particular gNB should still broadcast a list of PLMNs which are out of service and why we should refer to oneBitApproach-r17 INTEGER (1..maxPLMN) and not just have 1 bit and on top of that It feels like if 10 out of 12 PLMNs in the area are out of service, the other 2 working should still be able to indicate that they are both accesable for all other users which have other PLMNs.  I am wondering if we should ask CT1 what is the reason only one PLMN which is in service is allowed to broadcast such a bit… |
| OPPO | After checking with our CT1 colleagues, we believe this propoed change is more aligned with CT1 intention. |
| Intel | Yes. It is more compact, better aligns with CT1 and easier to read. As ASN.1 is not frozen, it is good to udpate. |
| Qualcomm | Assuming only PLMN can indicate this even in RAN sharing, this seems to be most compact option. Since this is a separate SIB, we are not too worried about the SIB size though. |

***Summary****: See summary after Q4.*

Moderator added this red part in the middle of phase 1 of this discussion:

Lenovo suggests (above) that in case of RAN sharing where e.g. PLMN A share a cell with PLMN B. PLMN A can indicate the "one bit approach" while PLMN B can offer disaster roaming to some selected set of PLMNs with disaster conditions. CT1's wording is:

|  |
| --- |
| The disaster related indication indicates that the available PLMN broadcasting this indication is the only PLMN accessible for disaster inbound roamers, that this PLMN accepts disaster inbound roamers from any other PLMN, that a disaster condition applies to all other PLMNs in the location of the broadcast, and that the disaster inbound roamers attempt to determine the MS determined PLMN with disaster condition as per bullet q2) |

To reach clarity in this, the moderator thinks RAN2 needs to reach a common understanding of this, hence proposes to discuss these two different understandings:

**Understanding A - Single-bit approach applies only for non-sharing PLMNs:**

PLMN A and PLMN B does RAN sharing. PLMN A indicates the "single bit approach", while PLMN B uses the list of PLMNs to say (for example) that PLMN B is offering disaster roaming for UEs of PLMN C and PLMN D (but not "all" other PLMNs).

**Understanding B - Single bit approach applies also within the shared network:**

PLMN A and PLMN B does RAN sharing. If PLMN A indicates the "single bit approach", it means that PLMN B is experiencing disaster conditions (as well as **all** other PLMNs).

**Q3\*: Which understanding should be assumed?**

|  |  |  |
| --- | --- | --- |
| **Company** | **A or B** | **Comments** |
| Vodafone | B | If we are looking for a NW sharing case where 1 gNB broadcast a list of PLMN for NW sharing, then according to CT1 the one bit approach would only be applicable for 1 PLMN providing services in this geograthical area which should lead to the situation that no other PLMNs are broadcastet in this time within this geograthincal area for NW sharing. It should not be a very common case, but I guess in case of a disaster, there should also not be a broadcast of the PLMNs which are under disaster, but 1 bit approach under PLMNs which can provide services. |
| Ericsson | - | Vodafone raises (for Q3 and Q3\*) a very important aspect.  If PLMN A and PLMN B share a cell and PLMN B experiences a disaster condition, then PLMN B must be removed from SIB1. Meaning that whenever the single-bit approach is used, there must be **one** PLMN in SIB1.  The reason is that a UE from PLMN B which does **not** support MINT would not read SIB15. This UEs would just look at SIB 1 and find its PLMN and try to connect to the cell, but would fail as PLMN B is experiencing a disaster.  Therefore I think we cannot adopt the ASN.1 in R2-2205520, R2-2205992, and R2-2205993.  Instead, RAN2 should assume:  Understanding C: whenever the single bit approach is used, there is a single PLMN in SIB1.  SIB15 can then indicate just the single bit (without an INTEGER refering to an entry in the SIB1-list) and this single bit means that the (single) PLMN in SIB1 is accepting disaster roamers from any other PLMN.  One can of course question the motivation why the single bit needs to mean that this PLMN is "the only PLMN accessible for disaster inbound roamers". That information seem irrelevant. The only information which is needed for the UE to know is that if the single bit is broadcasted the (single) PLMN of this cell accepts UEs from any other PLMN.  With all of the above: The current ASN.1 does not result in any significantly larger overhead:   * with the current ASN.1 SIB15 would have a single entry in "applicableDisasterInfoList" and this single entry would be set to "oneBitApproach". * with the ASN.1 in R2-2205520, R2-2205992, and R2-2205993, there would be the (new) top-level CHOICE set to "oneBitApproach".   We are open to change the ASN.1 for clarity, but from an overhead point of view, there is no meaningful difference. |
| Apple | See comments | According to our CT1 colleague, CT1 has not discussed network sharing case in last meeting. And it is not sure if it will be discussed in upcoming meetings.  Based on that, my interpretation is the 1 bit approach was only for non-sharing PLMN(s). But I guess we should better ask CT1 for clarifications. |
| Intel | See comments | The logic and explanation provided by Ericsson seems reasonable. But we can get confirmation from CT1 if it is needed. |
| Qualcomm |  | Also prefer to confirm with CT1 before proceeding. I have been assuming B but not necessarily that all other PLMNs are experiencing disaster condition; it is just that there is a single PLMN which is accepting. |
|  |  |  |

***Summary****: See summary after Q4.*

If the ASN.1 is changed as above, the following field descriptions are proposed in [R2-2205520](http://www.3gpp.org/ftp//tsg_ran/WG2_RL2/TSGR2_118-e/Docs//R2-2205520.zip), [R2-2205992](http://www.3gpp.org/ftp//tsg_ran/WG2_RL2/TSGR2_118-e/Docs//R2-2205992.zip), and [R2-2205993](http://www.3gpp.org/ftp//tsg_ran/WG2_RL2/TSGR2_118-e/Docs//R2-2205993.zip):

| *SIB15* field descriptions |
| --- |
| ***applicableDisasterInfoList***  A list indicating the applicable disaster information for the networks indicated in *plmn-IdentityList* and *npn-IdentityList-r16*. The network indicates in this list one entry for each entry of *plmn-IdentityList*, followed by one entry for each entry of *npn-IdentifyList-r16*, meaning that this list will have as many entries as the number of entries of the combination of *plmn-IdentityList* and *npn-IdentifyList-r16*. The first entry in this list indicates the disaster information applicable for the network(s) in the first entry of *plmn-IdentityList*/*npn-IdentityList-r16*, the second entry in this list indicates the disaster information applicable for the network(s) in the second entry of *plmn-IdentityList*/*npn-IdentityList-r16*, and so on. Each entry in this list can either be having the value *noDisasterRoaming*, *commonPLMNs*, or *dedicatedPLMNs*. If an entry in this list takes the value *noDisasterRoaming*, disaster roaming is not allowed for this network(s). If an entry in this list takes the value *commonPLMNs*, the PLMN(s) with disaster conditions indicated in the field *commonPLMNsWithDisasterCondition* apply for this entry. If an entry in this list contains the value *dedicatedPLMNs*, the listed PLMN(s) are the PLMN(s) with disaster conditions that apply to the network(s) corresponding to this entry. For SNPNs, the network indicates the value *noDisasterRoaming*. |
| ***commonPLMNsWithDisasterCondition***  A list of PLMN(s) with disaster conditions which can be commonly applicable to the PLMNs sharing the cell. |
| ***disasterRelatedIndicaiton***  Disaster related indication information. *oneBitApproach-17* and *applicableDisasterInfoList-r17* are for case A) and case B) respectively described in [xx]. |
| ***OneBitApproach***  Indicate a PLMN, which is the only PLMN accessible for disaster inbound roamers, and accepts disaster inbound roamers from any other PLMN, and a disaster condition applies to all other PLMNs in the location of the broadcast, referring to [xx]. |

| Conditional presence | Explanation |
| --- | --- |
| *CaseB* | The field is optional present if *applicableDisasterInfoList-r17* is present. Otherwise the field is not present. |

**Q4: If yes to Q3, do you agree with the associated field descriptions?**

|  |  |
| --- | --- |
| **Company** | **Comments** |
| Huawei, HiSilicon | Yes, proponent. |
| LGE | For conditonal presence, is seems better to be conditioned on the field *commonPLMNs*: This field is mandatory present in case *commonPLMNs* is configured. Otherwise the field is absent. |
| Samsung | Remove Need R in the ASN.1 and add the Need R in the Explanation of Conditional presence of this field. |
| Apple | Agree. |
| Intel | Yes.  Another suggestion for ASN.1: Could be cleaner to define an IE including applicableDisasterInfoList and commonPLMNsWithDisasterCondition and use it in the CHOICE directly to avoid the conditional presence? |

***Summary of Q3, Q3\* and Q4****:*

*The ASN.1 proposed in R2-2205520, R2-2205992, and R2-2205993 seemed initially to be better than the ASN.1 in the current specification. However, it was identified that changing the ASN.1 in this way would change how the oneBitApproach can be used. Specifically: it would disallow a scenario where two PLMNs sharing a cell would both want accept disaster roaming from any other PLMN. CT1's wording (see attachment of R2-2204510) is excluding such a scenario, however some companies think that CT1 had not considered a RAN sharing scenario.*

*The rapporteur thinks that* ***if*** *RAN2 should follow CT1's wording blindly and precisely, that means that when the oneBitApproach is broadcasted for a PLMN, it means "that a disaster condition applies to* ***all*** *other PLMNs in the location of the broadcast". But since "the available PLMN broadcasting this indication is the only PLMN accessible for disaster inbound roamers" it means that in RAN sharing scenario, if PLMN A broadcasts the one bit, it means that disaster roaming applies also to a PLMN B sharing the cell. And hence that disaster conditions apply to PLMN B. And, if disaster conditions apply to PLMN B, and if PLMN B is still broadcasted in SIB1, it means that a UE of PLMN B would attempt connecting to PLMN B, but that would fail since PLMN B is experiencing disaster conditions. Instead, the UE must connect to PLMN A (one could imagine that the NW would do something to address this, e.g. reroute the UE attempting to connect to PLMN B to instead connect to PLMN A, but that seems overly complex and not what CT1 is assuming).*

*Companies seem to have different views on the above. Some think that CT1 has not considered RAN sharing for the oneBitApproach. The rapporteur thinks that the current definition provided by CT1 for the oneBitApproach does not work, or would only work if there is a single PLMN in SIB1. But there seem to be no consensus that RAN2 should assume this limitation.*

*The rapporteur suggests continuing the discussion on how RAN2 should assume the oneBitApproach should use before deciding if/how to update the ASN.1. The phase 1 of this discussion can continue by people giving further input to question Q3, Q3\* and Q4.*

If the ASN.1 is not going to be updated, the field descriptions of applicableDisasterInfoList needs updating to capture the oneBitApproach. Two approaches have been provided.

**Approach A (**[**R2-2205867**](http://www.3gpp.org/ftp//tsg_ran/WG2_RL2/TSGR2_118-e/Docs//R2-2205867.zip) **and** [**R2-2205868**](http://www.3gpp.org/ftp//tsg_ran/WG2_RL2/TSGR2_118-e/Docs//R2-2205868.zip)**)**:

|  |
| --- |
| ***applicableDisasterInfoList***  A list indicating the applicable disaster information for the networks indicated by *plmn-IdentityList-r15* in *CellAccessRelatedInfo-5GC-r15*. The first entry in this list indicates the disaster information applicable for the network(s) in the first entry of *plmn-IdentityList*, the second entry in this list indicates the disaster information applicable for the network(s) in the second entry on *plmn-IdentityList*, and so on. Each entry in this list can either be having the value *noDisasterRoaming*, *oneBitApproach*, *commonPLMNs*, or *dedicatedPLMNs*. If an entry in this list takes the value *noDisasterRoaming*, disaster roaming is not allowed for this network(s). If an entry in this list takes the value *onlyPLMN-ForDisasterRoaming*, disaster conditions apply to all other PLMNs and this is the only network accessible for disaster roamers and this network accepts disaster roamers from any other PLMN. If an entry in this list takes the value *commonPLMNs*, the PLMN(s) with disaster conditions indicated in the field *commonPLMNsWithDisasterCondition* apply for this entry. If an entry in this list contains the value *dedicatedPLMNs*, the listed PLMN(s) are the PLMN(s) with disaster conditions that apply to the network(s) corresponding to this entry. |

Approach A applies "globally" in the sense it indicates that **all** other PLMNs experience disaster conditions, i.e. also the PLMNs **not** sharing the cell. It is also captured that this is the **only** network accessible for disaster roaming, and further that this network accepts UEs from **any** other PLMN. Approach A is lacking explicit wording that the network indicates "noDisasterRoaming" for PLMNs other than "the only" PLMN.

**Approach B (**[**R2-2205618**](http://www.3gpp.org/ftp//tsg_ran/WG2_RL2/TSGR2_118-e/Docs//R2-2205618.zip)**):**

|  |
| --- |
| ***applicableDisasterInfoList***  A list indicating the applicable disaster information for the networks indicated in *plmn-IdentityList* and *npn-IdentityList-r16*. The network indicates in this list one entry for each entry of *plmn-IdentityList*, followed by one entry for each entry of *npn-IdentifyList-r16*, meaning that this list will have as many entries as the number of entries of the concatenation of *plmn-IdentityList* and *npn-IdentifyList-r16*. The first entry in this list indicates the disaster information applicable for the network(s) in the first entry of *plmn-IdentityList*/*npn-IdentityList-r16*, the second entry in this list indicates the disaster information applicable for the network(s) in the second entry of *plmn-IdentityList*/*npn-IdentityList-r16*, and so on. Each entry in this list can either be having the value *noDisasterRoaming*, *oneBitApproach*, *commonPLMNs*, or *dedicatedPLMNs*. If an entry in this list takes the value *noDisasterRoaming*, disaster roaming is not allowed for this network(s). If an entry in this list takes the value *oneBitApproach*, a disaster condition applies to all the entries in *plmn-IdentityList* and *npn-IdentifyList-r16* and all other entries in the list shall be set to *noDisasterRoaming*. If an entry in this list takes the value *commonPLMNs*, the PLMN(s) with disaster conditions indicated in the field *commonPLMNsWithDisasterCondition* apply for this entry. If an entry in this list contains the value *dedicatedPLMNs*, the listed PLMN(s) are the PLMN(s) with disaster conditions that apply to the network(s) corresponding to this entry. For SNPNs, the network indicates the value *noDisasterRoaming*. |

Approach B applies "locally" in the sense that it indicates that disaster conditions apply **only to other the PLMNs sharing the cell**. But it is undefined if other PLMNs (not sharing the cell) are affected by disaster conditions. Also, it is undefined which PLMNs' UEs are accepted for disaster roaming.

These two approaches can be compared to CT1's wording:

|  |
| --- |
| The disaster related indication indicates that the available PLMN broadcasting this indication is the only PLMN accessible for disaster inbound roamers, that this PLMN accepts disaster inbound roamers from any other PLMN, that a disaster condition applies to all other PLMNs in the location of the broadcast, and that the disaster inbound roamers attempt to determine the MS determined PLMN with disaster condition as per bullet q2) |

RAN2 needs to reach an understanding of which interpretation is the one that CT1 have in mind.

**Q5: Which approach should be adopted?**

|  |  |  |
| --- | --- | --- |
| **Company** | **A or B** | **Preferred name for the "oneBitApproach"** |
| Ericsson | A\* | B is omitting some important aspects that CT1 indicated.  RAN2 can consider a modified version of A (let's call it "A\*") where it is specified that the network indicates "*noDisasterRoaming*" for all other PLMNs sharing the cell. While strictly not needed (since A already states "*this is the only network accessible for disaster roamers*"), we would be OK to capture this signalling detail. |
| Huawei, HiSilicon | B | We think the description from B is more in line with CT1’s intention. |
| Lenovo | A | On the statement saying „that only one PLMN can indicate the single bit approach“ see our comment to Q3 above.  We are fine basically fine with Approach A but suggest some improvements as shown below:  “... disaster conditions apply to all other PLMNs **in the location of the broadcast** and this is the only network accessible for disaster **inbound** roamers and this network accepts disaster **inbound** roamers from any other PLMN.“ |
| LGE | B | In approach B, there are two points:  - Point A) All the concerned infomation is to assist PLMN selection by NAS. Since CT1 spec already specifies the full meaning of oneBitApproach (highlighte in yellow below), there is no reason and benefit for RRC to repeat the same thing (partial repeating may only cause spec misalignemnt). In this sense, it is better minimize description related to OneBitApproach in RRC.  <23.122 >  A) broadcasts the disaster related indication. The disaster related indication indicates that the available PLMN broadcasting this indication is the only PLMN accessible for disaster inbound roamers, that this PLMN accepts disaster inbound roamers from any other PLMN, that a disaster condition applies to all other PLMNs in the location of the broadcast, and that the disaster inbound roamers attempt to determine the MS determined PLMN with disaster condition as per bullet q2); or  - Point B) Approach B also clarifies how the entries of the field in *applicableDisasterInfoList* shoud be set when one of those is set to *oneBitApproach* |
| Samsung | B | We think the description from B is more in line with CT1’s intention and easy to understand. |
| vivo | B | Agree with Samsung. |
| Apple | No strong view | Either A\* or B is fine. |
| Intel | A or A\* | To us, A is more clear to read than B.  We also note that B includes a “shall” to a network behaviour – something we don’t normally use in RAN2 stage 3 (CT1 does!). If we want to capture network behaviour (either with B or A\*), we should use the normal RAN2 convention and avoid “shall” (e.g., use something like “Network always sets …”) |
| Qualcomm | B | I think CT1’s intention was not that all other PLMNs are experiencing disaster conditions but there is one angel PLMN. In the end, disaster conditions will impact RAN more likely and thus PLMNs sharing the same RAN will have the same condition. |

***Summary****: Pending outcome of Q3, Q3\* and Q4.*

One discussion point is what field name should be used for the field so far called "oneBitApproach". [R2-2205618](http://www.3gpp.org/ftp//tsg_ran/WG2_RL2/TSGR2_118-e/Docs//R2-2205618.zip) proposes to stick to "oneBitApproach". [R2-2205867](http://www.3gpp.org/ftp//tsg_ran/WG2_RL2/TSGR2_118-e/Docs//R2-2205867.zip) and [R2-2205868](http://www.3gpp.org/ftp//tsg_ran/WG2_RL2/TSGR2_118-e/Docs//R2-2205868.zip) proposes "onlyPLMN-ForDisasterRoaming".

**Q6: Which name should be used for the oneBitApproach-field?**

|  |  |
| --- | --- |
| **Company** | **Answer** |
| Ericsson | Something more descriptive than "oneBitApproach" would be good, e.g. "onlyPLMN-ForDisasterRoaming" but we are open to suggestion for improvement. |
| Huawei, HiSilicon | Yes, we think the field name is better to be more precise, maybe *onlyPLMN* is already sufficient, the whole choice structure is for disaster roaming, so no need to have *forDisasterRoaming*. |
| Lenovo | We have a slight preference for „singlePLMN-ForDisasterRoaming“. Using „only“ as prefix in a field name looks strange. |
| LGE | Ericsson suggestion seems good. |
| Samsung | No strong view but changing the current field name is fine. |
| vivo | No strong view |
| Apple | onlyPLMN-ForDisasterRoaming is good. No strong view though. |
| Intel | No strong view. We prefer the Lenovo suggestion. |
| Qualcomm | Something more descriptive is better; Lenovo suggestion is fine. |

***Summary****: The name of this parameter can easily be settled once we have reached a common understanding of how this bit should be used.*

## 2.4 Updating the section "Actions upon reception of SIB15"

The sections describing UE actions upon reception of the MINT-SIB needs updating. Three different approaches are provided:

**Approach A** (from [R2-2205618](http://www.3gpp.org/ftp//tsg_ran/WG2_RL2/TSGR2_118-e/Docs//R2-2205618.zip)) has an if-statement where the UE forwards the applicable PLMNs with disaster condition for each PLMN if the oneBitApproach is not used, otherwise the UE forwards the PLMN that broadcasts the oneBitApproach:

|  |
| --- |
| 5.2.2.4.17 Actions upon reception of *SIB15*  Upon receiving *SIB15*, the UE shall:  1> if no PLMN sharing the cell broadcasts *oneBitApproach,* forward the applicable PLMNs with disaster condition for each PLMN sharing the cell to upper layers;  1> else:  2> forwarding the PLMN broadcasting *oneBitApproach* and an indication that a disaster related indication is broadcast by the PLMN to upper layers. |

**Approach B** (from [R2-2205992](http://www.3gpp.org/ftp//tsg_ran/WG2_RL2/TSGR2_118-e/Docs//R2-2205992.zip) and [R2-2205993](http://www.3gpp.org/ftp//tsg_ran/WG2_RL2/TSGR2_118-e/Docs//R2-2205993.zip)) does not suggest any new wording, instead it removes the editor's note:

|  |
| --- |
| 5.2.2.4.17 Actions upon reception of *SIB15* Upon receiving *SIB15*, the UE shall:  1> forward the applicable PLMNs with disaster condition for each PLMN sharing the cell to upper layers. |

**Approach C** (from [R2-2205867](http://www.3gpp.org/ftp//tsg_ran/WG2_RL2/TSGR2_118-e/Docs//R2-2205867.zip) and [R2-2205868](http://www.3gpp.org/ftp//tsg_ran/WG2_RL2/TSGR2_118-e/Docs//R2-2205868.zip)) changes the wording so the UE forwards "applicable disaster information" rather than the current "applicable PLMNs with disaster condition":

|  |
| --- |
| 5.2.2.38 Actions upon reception of *SystemInformationBlockType30* Upon receiving *SystemInformationBlockType30*, the UE shall:  1> forward the applicable disaster information for each PLMN sharing the cell to upper layers. |

**Q7: Which approach do you prefer to update the sections for UE action upon reception of the MINT SIB?**

|  |  |  |
| --- | --- | --- |
| **Company** | **A, B or C** | **Comments** |
| Ericsson | C | Approach B does not support the one bit approach as NAS will not know that the single-bit approach is indeed sent for a PLMN.  Approach A and Approach C both supports the one bit approach.  Approach C is more succinct as it refers to that RRC forwards "applicable disaster information", which covers any type of disaster roaming information (i.e. "list of PLMNs with disaster conditions", "oneBitApproach" or "no disaster roaming"). |
| Huawei, HiSilicon |  | We think the existing sentence is generic, the oneBitApproach could be a special case that only one PLMN is forwarded. But we understand Alt C may be clearer, so we can go with the majority. |
| Lenovo | C | Approach C looks sufficient to us. On the wording we suggest to add „roaming“, i.e. „...disaster **roaming** information ...“ |
| LGE | A possibly with simplication | C lacks what “applicable iunformation“ precisely means, which we need to avoid.  A is a bit lengthy but it captures the applicbale information exactly, which is in line with CT1 specification. Taking Approach A as baseline, the approach A can be simplifed as follows:  1> forward the applicable PLMNs with disaster condition for each PLMN sharing the cell or the PLMN broadcasting *oneBitApproach*, if any*,* to upper layers. |
| Samsung | C | Apporach C is enough in RRC specification. |
| vivo | C | Approach C is more descriptive by using information insted of condition |
| Apple | C | C can inlcude both one bit approach and list of PLMNs. |
| Intel | C | C seems clearer to us. |
| Qualcomm | C | All the interpreation of the information can be done by upper layers. |

*Summary: All companies except one either prefers or can accept approach C, which is proposed to be adopted with the modification proposed by Lenovo.*

1. Approach C is adopted with modification: "disaster roaming information".

## 2.5 "Combination" or "concatenation" of the PLMN- and NPN-list

[R2-2205618](http://www.3gpp.org/ftp//tsg_ran/WG2_RL2/TSGR2_118-e/Docs//R2-2205618.zip) proposes to use the word "concatenation" instead of "combination" in the field description of the disaster roaming information. It is argued that it is more suitable to say that the entries of the list correspond to those of the "concatenation" of the two lists, rather than "combination". The proposed changed is shown here:

|  |
| --- |
| ***applicableDisasterInfoList***  A list indicating the applicable disaster information for the networks indicated in *plmn-IdentityList* and *npn-IdentityList-r16*. The network indicates in this list one entry for each entry of *plmn-IdentityList*, followed by one entry for each entry of *npn-IdentifyList-r16*, meaning that this list will have as many entries as the number of entries of the concatenation ~~combination~~ of *plmn-IdentityList* and *npn-IdentifyList-r16*. The first entry in this list indicates the disaster information applicable for the network(s) in the first entry of *plmn-IdentityList*/*npn-IdentityList-r16*, the second entry in this list indicates the disaster information applicable for the network(s) in the second entry of *plmn-IdentityList*/*npn-IdentityList-r16*, and so on. Each entry in this list can either be having the value *noDisasterRoaming*, *oneBitApproach*, *commonPLMNs*, or *dedicatedPLMNs*. If an entry in this list takes the value *noDisasterRoaming*, disaster roaming is not allowed for this network(s). If an entry in this list takes the value *oneBitApproach*, [TBD what happens]. If an entry in this list takes the value *commonPLMNs*, the PLMN(s) with disaster conditions indicated in the field *commonPLMNsWithDisasterCondition* apply for this entry. If an entry in this list contains the value *dedicatedPLMNs*, the listed PLMN(s) are the PLMN(s) with disaster conditions that apply to the network(s) corresponding to this entry. For SNPNs, the network indicates the value *noDisasterRoaming*. |

**Q8: Should RAN2 change from " combination" to "concatenation" as proposed in** [**R2-2205618**](http://www.3gpp.org/ftp//tsg_ran/WG2_RL2/TSGR2_118-e/Docs//R2-2205618.zip)**?**

|  |  |
| --- | --- |
| **Company** | **Comments** |
| Ericsson | No strong view. The existing "combination" works and we think it is clear enough. If majority wants to change we are OK to change. Note though that the field description has this wording which should make it clear how the signalling work:  The first entry in this list indicates the disaster information applicable for the network(s) in the first entry of *plmn-IdentityList*/*npn-IdentityList-r16*, the second entry in this list indicates the disaster information applicable for the network(s) in the second entry of *plmn-IdentityList*/*npn-IdentityList-r16*, and so on. |
| Huawei, HiSilicon | We also think combination is already clear, so we see no strong need to change the term. |
| Lenovo | No since „concatenation“ is not the right word here. The plmn-IdentityList and npn-IdentifyList-r16 are separate lists and NW does not concatenate them into a single list. |
| LGE | The exisintg combination somehow works in the sense that other field description clearly specifies how the signaling works, but *concatenation* is considered to be more precise/appropriate term to simply merge the two lists, and hence it is good to make the change.  To Lenovo, the wording *concatenation* is not about NW action but about how UE treats two lists. |
| Samsung | No strong view. |
| vivo | No strong view. |
| Apple | We don’t see too much difference. |
| Intel | Agree with Lenovo. Combination is better but no strong view. |
| Qualcomm | Also prefer „combination“. The word „concatenation“ has a different meaning. |

*Summary: Some companies do not agree that the UE actually concatenates these lists, and it seems current wording is sufficiently clear.*

1. Stick to "combination" rather than "concatenation" for the applicableDisasterInfoList.

# 3 Conclusion

Based on the discussion above we propose:

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