**3GPP TSG-RAN WG3 #113-e R3-214160**

Electronic meeting, 16th - 26th August, 2021

**Agenda item: 9.3.4.1**

**Source: NTT DOCOMO, INC. (moderator)**

**Title: Summary of discussions on slice correction**

**Document for: Approval**

# 1 Introduction

This paper provides summary of discussions at RAN3#113-e on:

**CB: # 26\_SliceCorrections**

**- When deploying a S-NSSAI with associated SD, should the SD value be explicitly included in S-NSSAI IE? ZTE**

**- Text description for Slice Available Capacity IE aligned to the content of the IE? E///**

**- Correct the maxnoofExtSliceItems from 65535 to 65536 over NG interface? NTTDocomo**

(NTT Docomo - moderator)

Summary of offline disc in [R3-214160](https://ericsson-my.sharepoint.com/personal/angelo_centonza_ericsson_com/Documents/Local%20Documents/3GPP_ETSI/RAN3/RAN3-113/EmailDiscussions/CB%20%23%2026_SliceCorrections/Inbox/R3-214160.zip)

# 2 For the Chairman’s Notes

TBD

# 3 Discussion

## 3.1 Issue#1

In [1], an issue is found that for S-NSSAI which is comprised of SST and SD, the current spec does not require SD value shall be carried in S-NSSAI even when SD value is actually associated with the SST. This could affect the handover continuity of UEs with the following example:

“For example, in the XN interface, RAN node A supports S-NSSAI 1 (SST = 1, SD=FFFFFA) and S-NSSAI 2 (SST=1, SD = FFFFFB), and RAN node B supports S-NSSAI 3 (SST =1, SD =FFFFFA) and S-NSSAI 4 (SST = 1, SD= FFFFFC). When the Xn interface is established, RAN node B transmits only the SST of S-NSSAI 3&4 to RAN node A according to the current protocol. When a UE's PDU session serves S-NSSAI 1 of RAN node A and needs to be hand over to RAN node B, RAN node A cannot determine whether RAN Node B provides the same slices as RAN Node A ‘s S-NSSAI 1 only according to the SST information provided by RAN Node B. In this case, UE continuity may not be guaranteed.”

Based on the analysis above, paper [1] propose the following:

**Observation: The node does not provide associated SD value, although allowed by current specification, is sub optimal for many functions in RAN and Core network.**

**Proposal 1: In order to limit the impact of such sub-optimal behavior, it is propose to require a node, when deploy a S-NSSAI with associated SD, should explicitly include the SD value in S-NSSAI IE.**

**Q1: Do companies acknowledge the issue described above?**

|  |  |  |
| --- | --- | --- |
| **Company** | **Y/N** | **Comments** |
| **Ericsson** | **N** | An S-NSSAI is made of an SST and an SD. A RAN node is configured with at least one SST per S-NSSAI. A RAN node that has been configured with a supported S-NSSAI comprising SST and SD shall not signal only the SST for that S-NSSAI. If that node signals only the SST, we should consider it as badly implemented. Hence, so long as a RAN node signals over the interfaces the SST and SD that have been configured for the S-NSSAI in question, there is no problem. |
| Huawei | N | Not needed. This was discussed before. A CR was agreed in R3-196188 added a reference to 23.003. 23.003 clearly states: "In certain protocols, the SD field is not included to indicate that no SD value is associated with the SST" |
| **CATT** | **N** | Agree with E///. If one S-NSSAI has the SD, it should be carried. What the reason for not carrying the already included SD in S-NSSAI? |
| **ZTE** | **N** | OK with Huawei’s clarification, acknowledge the Issue can be solved by description in TS 23.003. |
| Deutsche Telekom | N | Agree with E///’s and Huawei’s comments. |
| LGE | N | Agree with E///’s and Huawei’s comments |
| **Nokia** | **N** | Agree with E///’s and Huawei’s comments and by the way, we made the CR mentioned by Huawei in R3-196188 exactly to try avoiding this kind of bad implementations mentioned by Ericsson. |

**Q2: Do companies agree with Proposal1 above?**

|  |  |  |
| --- | --- | --- |
| **Company** | **Y/N** | **Comments** |
| **Ericsson** | **N** | Forcing the inclusion of an SD would alter the S-NSSAI value. Some S-NSSAIs are deliberately configured without an SD, hence representing these S-NSSAI with the inclusion of an SD is erroneous and may cause misinterpretations/errors |
| Huawei | N | Not needed – see above |
| **CATT** | **N** | Keep it as-is can work well |
| Deutsche Telekom | N | See answers to Q1 and E///’s comment to Q2. |
| LGE | N | Not needed |
| **Nokia** | **N** |  |
|  |  |  |

**Q3: Do companies think the CR [2][3][4][5] are agreeable?**

|  |  |  |
| --- | --- | --- |
| **Company** | **Y/N** | **Comments** |
| **Ericsson** | **N** | As explained above, we do not see the need of the corrections and in fact we think the corrections could generate errors. |
| Huawei | N | Not needed – see above |
| **CATT** | **N** | See above |
| Deutsche Telekom | N | See answers to Q1 and Q2 |
| LGE | N |  |
| **Nokia** | **N** |  |
|  |  |  |

## 3.2 Issue#2

In [6][7], it found that the text description for Slice Available Capacity is not aligned with IE content, thus the following change is proposed for description alignment.

//////////////////////////////////////// Change Start ////////////////////////////////////////////////

#### 9.2.2.55 Slice Available Capacity

The *Slice Available Capacity* IE indicates the amount of resources per network slice that are available per cell relative to the total NG-RAN resources per cell. The *Slice Available Capacity Value* *Downlink* IE and the *Slice Available Capacity Value Uplink* IE can be weighted according to the ratio of the corresponding cell capacity class values contained in the *Composite Available Capacity Group* IE, if available.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| IE/Group Name | Presence | Range | IE type and reference | Semantics description |
| **Slice Available Capacity** |  | *1..<* maxnoofBPLMNs *>* |  |  |
| >PLMN Identity | M |  | 9.2.2.4 | Broadcast PLMN |
| **>S-NSSAI Available Capacity List** |  | *1* |  |  |
| **>>S-NSSAI Available Capacity Item** | M | *1 .. < maxnoofSliceItems>* |  |  |
| >>>S-NSSAI |  |  | 9.2.3.21 |  |
| >>>Slice Available Capacity Value Downlink | O |  | INTEGER (0..100) | Value 0 indicates no available capacity, and 100 indicates maximum available capacity . Slice Available Capacity Value Downlink should be measured on a linear scale. |
| >>>Slice Available Capacity Value Uplink | O |  | INTEGER (0..100) | Value 0 indicates no available capacity, and 100 indicates maximum available capacity. Slice Available Capacity Value Uplink should be measured on a linear scale. |

|  |  |
| --- | --- |
| Range bound | Explanation |
| maxnoofSliceItems | Maximum no. of signalled slice support items. Value is 1024. |
| maxnoofBPLMNs | Maximum no. of PLMN Ids.broadcast in a cell. Value is 12. |

//////////////////////////////////////// Change End ////////////////////////////////////////////////

**Q4: Do companies think the CR [6[[7] are agreeable?**

|  |  |  |
| --- | --- | --- |
| **Company** | **Y/N** | **Comments** |
| **Ericsson** | **Y** |  |
| Huawei | ? | Change makes sense. Only comment is that this could be considered editorial. No strong view but we should have similar threshold for editorial as we have for other papers. |
| **CATT** | **Y** |  |
| **ZTE** |  | Share the view as Huawei, it seems a Type D CR and in general need to report to the rapporteur of specification. |
| Deutsche Telekom | Y | But we are also ok to trigger it as editorial change via the rapporteur. |
| LGE | Y |  |
| Nokia | N | This kind of changes should be handled by rapporteur. |

## 3.3 Issue#3

In [8], an issue is found that for the maxnoofExtSliceItems value, it should be 16 bits (65536), while the current maxnoofExtSliceItems is 65535. As the number of slices concerns the number of customers for operators to provide E2E network slicing service, it is proposed that the maximum number of slice support items should be corrected to 65536 as shown below.

//////////////////////////////////////// Change Start ////////////////////////////////////////////////

#### 9.3.1.191 Extended Slice Support List

This IE indicates a list of supported slices.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| IE/Group Name | Presence | Range | IE type and reference | Semantics description |
| Slice Support Item |  | *1..<maxnoofExtSliceItems>* |  |  |
| >S-NSSAI | M |  | 9.3.1.24 |  |

|  |  |
| --- | --- |
| Range bound | Explanation |
| maxnoofExtSliceItems | Maximum no. of signalled slice support items. Value is 65536. |

//////////////////////////////////////// Change End ////////////////////////////////////////////////

**Q5: Do companies think the CR [8] is agreeable?**

|  |  |  |
| --- | --- | --- |
| **Company** | **Y/N** | **Comments** |
| **Ericsson** | **N** | We understand the problem, but we also realise that the change is non backwards compatible. We believe that there is no impact to the overall functionality if the maximum number of signalled slices is reduced from 65536 to 65535, hence we do not think this is sufficient to motivate a non backwards compatible change |
| Huawei | N | While this is makes sense from technical pov, the impact is large since this may create compatibility problems.  As you can see, this is already an extension to the slice support, and we added it as a separate IE to make sure it is backward compatible, instead of changing the range.  The benefit is rather small (only adds one more to an already large range). We would prefer to be on the safe side and **not** agree this change |
| CATT | Y?/N? | It is real problem. But as E/// said, the changes is NBC. |
| ZTE | N | Technically the CR is right, but consider many other IE used in current specification, the NBC issue may not negligibly . |
| Deutsche Telekom | N | Even if we acknowledge the issue triggered by DCM, we should avoid a NBC change. |
| LGE | N | Same view with Ericsson and Nokia |
| Nokia | N | Technically the problem is right but it is very minor issue because we just lose one slice value among 65536, and therefore as commented by other companies we should not have a non backwards compatible change for this. |

# 4 Conclusion

TBD

# 5 References

1. R3-213797 S-NSSAI without SD, ZTE,Lenovo, Motorola Mobility,China Unicom,China Telecom, discussion, August, 2021, RAN3#113-e
2. R3-213798 Correction on SD value for NGAP, ZTE, Lenovo, Motorola Mobility,China Unicom,China Telecom, CR0643r, TS 38.413 v16.6.0, Rel-16, Cat. F, August, 2021, RAN3#113-e
3. R3-213799 Correction on SD value for XnAP, ZTE, Lenovo, Motorola Mobility,China Unicom,China Telecom, CR0650r, TS 38.423 v16.6.0, Rel-16, Cat. F, August, 2021, RAN3#113-e
4. R3-213800 Correction on SD value for F1AP, ZTE,Lenovo, Motorola Mobility,China Unicom,China Telecom, CR0794r, TS 38.473 v16.6.0, Rel-16, Cat. F, August, 2021, RAN3#113-e
5. R3-213801 Correction on SD value for E1AP, ZTE,Lenovo, Motorola Mobility,China Unicom,China Telecom, CR0625r, TS 38.463 v16.6.0, Rel-16, Cat. F, August, 2021, RAN3#113-e
6. R3-214252 XnAP Slicing available capacity description alignment, Ericsson, China Unicom, Deutsche Telekom, CMCC, Verizon Wireless, CR0640r, TS 38.423 v16.6.0, Rel-16, Cat. F, August, 2021, RAN3#113-e
7. R3-214253 F1AP Slicing available capacity description alignment, Ericsson, China Unicom, Deutsche Telekom, CMCC, Verizon Wireless, CR0782r, TS 38.473 v16.6.0, Rel-16, Cat. F, August, 2021, RAN3#113-e
8. R3-214240 Correction of maximum extended slice support items, NTT DOCOMO INC., CR0606r1, TS 38.413 v16.6.0, Rel-16, Cat. F, August, 2021, RAN3#113-e