**3GPP TSG-WG SA2 Meeting #153E e-meeting *S2-220xxxx***

**Elbonia, October 10 – 14, 2022 (revision of S2-220xxxx)**

**Source: Huawei, HiSilicon**

**Title: Evaluation and conclusion for KI#5: Improved support of RAs including TAs supporting Rejected S-NSSAIs**

**Document for: Approval**

**Agenda Item: 9.14**

**Work Item / Release: FS\_eNS\_Ph3 / Rel-18**

*Abstract: This contribution proposes the evaluation and conclusion of KI#5 Improved support of RAs including TAs supporting Rejected S-NSSAIs.*

# 1. Introduction/Discussion

KI#5 studies whether and how to allow the UE to initiate a registration for an S-NSSAI which was rejected for the RA when the UE enters a TA that is part of the RA and the TA supports this S-NSSAI.

Currently, 9 solutions are proposed for this key issue mainly in the following two categories:

1. **Based on allowed S-NSSAI**, where AMF provides conditional allowed S-NSSAI with its support TA to UE (solution 11, 23, 25, 26)
2. **Based on rejected S-NSSAI**, where AMF provides rejected S-NSSAI with its reject/support TA or new cause to UE (solution 25, 27, 28, 29, 30, 31)

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| --- | --- | --- |
|   | **Category 1:** | **Category 2:** |
| Pros | 1. Does not require UE to perform registration update for using a requested S-NSSAI not supported in the previous TA
 | 1. Reuse most of the current procedures. (only Registration procedure is impacted)
2. Aligned with the current slice management features, where the network determines and updates UE on the Allowed NSSAI, rejected S-NSSAIs, target NSSAI and so on.

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| Cons | 1. Features related to slice management such as NSAC, Target NSSAI and NSSRG will be impacted. (e.g. Cannot be used together)
2. Procedures related to PDU Session management will be impacted and the details are not fully discussed.
3. Have impact on Homogenized slice support in RA. AMF will allow the UE to access an S-NSSAI which is only supported in part of the TAs. May cause non-backward compatibility

  | 1. require UE to perform registration update for using a requested S-NSSAI not supported in the previous TA

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Therefore, it is proposed to take Category 2 solution as the baseline for KI#5.

# 2. Text Proposal

It is proposed to capture the following changes vs. TR 23.700-41.

\* \* \* \* First change (all new) \* \* \* \*

# 7 Overall Evaluation

Editor's note: This clause will provide evaluation of different solutions.

## 7.5 Evaluation for KI#5

The related solutions are #11, 23, 25, 26, 27, 28, 29, 30, 31.

Category 1 is **based on** **allowed S-NSSAI**, where AMF provides conditional allowed S-NSSAI with its support TA to UE (solution 11, 23, 25, 26, 29).

Category 2 is **based on rejected S-NSSAI**, where AMF provides rejected S-NSSAI with its reject/support TA or new cause to UE (solution 25, 27, 28, 29, 30, 31)

Table 7.X-1: Evaluation of KI#5 related principles

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| --- | --- | --- |
|   | **Category 1:** | **Category 2:** |
| Pros | 1. Does not require UE to perform registration update for using a requested S-NSSAI not supported in the previous TA
2. PDU sessions need not be re-established and disconnected (see solution 29)
 | 1. Reuse most of the current procedures. (only Registration procedure is impacted)
2. Aligned with the current slice management features, where the network determines and updates UE on the Allowed NSSAI, rejected S-NSSAIs, target NSSAI and so on.

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| Cons | 1. Features related to slice management such as NSAC, Target NSSAI and NSSRG will be impacted. (e.g. Cannot be used together)
2. Procedures related to PDU Session management will be impacted and the details are not fully discussed.
3. Have impact on Homogenous slice support in RA. AMF will allow the UE to access an S-NSSAI which is only supported in part of the TAs. May cause non-backward compatibility.
4. The AMF in connected mode can detect when the connectivity of a slice is available or not, but in idle mode the MT services cannot assume where in the RA the UE is so the AMF would page anyhow. In MO case the UE can avoid causing MO access attempts for the slices that are not working in current TA.

  | 1. require UE to perform registration update for using a requested S-NSSAI not supported in the previous TA. This may be heavy if the NSSAA applies.
2. requires to release and re-establish sessions at mobility in an out the areas where the slice is supported. this may be heavy if secondary DN authentication is needed.
3. when entering the area of support of S-NSSAI, the RA size may need to be reduced.

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\* \* \* \* Second change (all new) \* \* \* \*

# 8 Conclusions

Editor's note: This clause will list conclusions that have been agreed during the course of the study item activities.

## 8.X Conclusions for Key Issue #5

The following principle is proposed to be the conclusion for normative work:

For **Category 2**

- AMF provides information related to the supported or not supported TA(s) regarding a rejected S-NSSAI in the RA to UE in the registration procedure and UE configuration procedure if the UE indicates it supports this feature . The UE shall be able to request a rejected S-NSSAI in a supported TA based on the supported/not supported TA information. A UE receiving this information shall trigger registration update when it requests a rejected S-NSSAI in a supported TA.

 The current concept of allowed NSSAI and uniform support of it in UE’s RA is not impacted by this feature based on indication of where in RA certain rejected S-NSSAIs are supported/not supported.

For Category 1:

- if NSAC does not apply, or if the operator is happy to use this feature despite NSAC includes UEs or sessions for UEs that are outside the area where a certain S-NSSAI is supported while still in the RA (so maybe NSAC can be inaccurate), it should be possible for the AMF (for supporting UEs) to indicate to the UE that some S-NSSAIs are partially allowed in the RA by indicating the TAs where these are supported or not supported. If so, the UE assumes it can use the connectivity for the slices in the TAs where it is indicated to be supported. The connected mode behaviour can be based on sol.29 principle. Whether the partially allowed NSSAI can be used for redirection or Handover of the UE is to be based on RAN feedback. In this feature, the Allowed NSSAI is still uniformly supported in the RA but the Partially allowed S-NSSAI is not uniformly supported.

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\* \* \* \* End of changes \* \* \* \*