2021-04-28

Minutes of the third teleconference for AMF re-allocation

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Active participants: Bell Canada, China Mobile, Huawei, Lenovo, Motorola Mobility, Nokia, Qualcomm, Samsung, ZTE, Ericsson (organizer).

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Agenda for this teleconference

a. Discuss input documents with respect to solutions, solution evaluations, conclusions. Please disseminate any input documents at least 1 day earlier.

i) Input document from Ericsson revision 2: S3-21ABCD\_AMF\_re-allocation\_solution\_analysis-Ericsson-r2.doc (3gpp.org). We will go through the solutions 6-9.

ii) Input document from ZTE, revision 1 of their proposal for a new solution: TR 33.864 S3-21XXXX New solution for AMF re-allocation-r1-ZTE.doc (3gpp.org)

iii) Input document from Ericsson: S3-21XXXX\_AMF reallocation\_UL NAS COUNT of RR.doc

iv) Samsung input documents (3)

All documents are in https://www.3gpp.org/ftp/Email\_Discussions/SA3/TSGS3\_103e/FS\_AMFREAL\_SEC

b. Proposals for discussion topics by participants for the progress of the study. Examples are discussions of solutions, evaluations or conclusions without the need for input documents.

- No more discussion topics were proposed.

c. AoB

- No other business was discussed.

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Agenda item (a)

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**i) Input document from Ericsson revision 2: S3-21ABCD\_AMF\_re-allocation\_solution\_analysis-Ericsson-r2.doc**

The group discussed the document and specifically solutions 6-9. The results of the discussions are captured in revision r3 in https://www.3gpp.org/ftp/Email\_Discussions/SA3/TSGS3\_103e/FS\_AMFREAL\_SEC

**ii) Input document from ZTE, revision 1 of their proposal for a new solution: TR 33.864 S3-21XXXX New solution for AMF re-allocation-r1-ZTE.doc**

[ZTE] presented the revised solution document

[Huawei] This solution does not have a via RAN forwarding of the RR so it does not solve the issue targeted by this study.

With respect to Step 16 in the solution there were the following comments

[Lenovo] How does the solution work for the different connectivity scenarios? There may be UE impact for some scenarios. Different UE ID are used for different types of registrations. What is the UE ID used in this solution?

[ZTE] The UE ID used in the initial RR in Step 19 may be different from the one used in step 1.

[Huawei] if SUCI is used in the INITIAL MESSAGE the solution might not work.

[ZTE] the RRC connection is not released

[Huawei] if NAS signalling connection is released the RRC connections is also released. The UE ID used in NAS and RRC layers are different.

[ZTE] will check

With respect to evaluation clause there was the following comment

[Lenovo] the procedure does not completely comply to the SA2 procedures. Figure shows step 9 as mandatory. Request to remove the evaluation statement that it complies to SA2 procedures.

**iii) Input document from Ericsson: S3-21XXXX\_AMF reallocation\_UL NAS COUNT of RR.doc**

[Ericsson] presented the discussion paper.

The discussion revolved around clause 4.3 of the discussion paper. Some company comments are captured below.

*4.3 Way forward*

*In option (A) it has been identified that two consecutive horizontal Kamf derivations could be initiated by the old AMF and the initial AMF in the Registration procedure in Rel-15/Rel-16 according to current requirements in TS 23.502 and TS 33.501. But some requirements may be missing, in order for this to work between the UE and the network. The following requirements should be added:*

*- The UE and the initial AMF need to store the UL NAS COUNT value corresponding to the Registration Request message even after the first horizontal Kamf derivation has taken place in the old AMF. For how long the UL NAS COUNT value needs to be stored, needs to be discussed (e.g. until the UE receives Registration Accept).*

*- The initial AMF needs to forward the UL NAS COUNT corresponding to the Registration Request message from the initial AMF to the target AMF at direct NAS reroute via N14 interface.*

[Huawei] We have discussed this when 6.9.6 was drafted. We don't need to perform multiple horizontal key derivations. If the iAMF has detected that the oAMF has done horizontal key derivation (HKD) the Initial AMF will not perform an additional one. iAMF and oAMF communicate directly which means there is no slice isolation, the HKD is not that critical. For the re-allocation via RAN this is not clear.

[Qualcomm] Similar opinion as Huawei. Whether there is one or more HKDs (this could be a CR to clarify this) is different from the point that the UL NAS COUNT is transferred from iAMF to tAMF.

**iv) Samsung input documents (3 in number)**

Samsung submitted three documents which covered different changes to solution #5.

(1) S3-211xxx\_Removal\_of\_EN-Samsung-v1.doc.

[Samsung] presented the changes in the solution. The following discussion was captured for the new clause 6.5.2.2 Handling of the GUTI collision

[Huawei] the possibility of GUTI collision introduced in this clause is even higher than the original. Multiple Initial AMF may assign the same GUTI

[Samsung] The lifetime of the GUTI is very short so the probability of multiple UEs to be assigned the same GUTI is small.

[Ericsson] Impact on the NRF?

[Samsung] This (reserving a range of AMF addresses for this solution purposes) will be part of the NF profile

[BellCanada] Network failure and massive registrations? Is this considered ?

[Samsung] Assume that the AMF handling multiple registrations fails?

[BellCanada] RAN temporary failure ?

[Samsung] will check if there is any impact.

(3) S3-211xxx\_Updates\_to\_Evaluation-Samsung-v1.doc

[Samsung] presented the changes in the solution. The following discussion was captured in the Rationale part of the paper under clause 2, bullet point #4.

[lenovo] We have not discussed that we are going to redo SA2 work. This solution does not solve the issue. We have to use the SA2 agreed procedure as the base in order to solve the issue. SA3 should not remove the TS 23.502, 4.2.2.2.3, option 7(B)

[Samsung] This solution fixes an SA2 issue, i.e. registration failure. We disagree, we are trying to solve the issue.

[Huawei] Agree with Lenovo, NAS reroute via RAN existed before 5G. Is there any strong reason for SA3 to delete this SA2 option ?

[Samsung] Agree that the via-RAN procedure existed before 5G, GSM days. We are aware of the registration failure for the via RAN option only in 5G. Why failure happens only in 5G needs to be checked.

[Huawei] Why do we need to delete the SA2 option (TS 23.502, 4.2.2.2.3, option 7(B))? We have solutions that work without deleting the SA2 option.

(3) S3-211xxx\_Updates\_6.5.2.1-Samsung-v1.doc

[Samsung] presented the changes to the solution.

No comments were received for this document.