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Title:	Evaluation of the impact on positive authentication reporting on network performance
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Introduction

At the recent SA3 meeting in Stockholm there was a joint session between SA3 and TIA TR45 AHAG on harmonization of 3GPP and 3GPP2 security standards. In particular, the two groups discussed how to make 3GPP AKA the common international Authentication and Key Agreement standard for 3G.

During the meeting a few features was identified that TIA TR45 AHAG would want SA3 to consider for inclusion in the UMTS security architecture. One of these features is the possibility of having a positive acknowledge of the use of the Authentication Vectors.

SA3 therefore kindly requests CN4 for advice on what impact such mechanism might have on network performance and if CN4 foresees any problems in implementing such mechanism within 3GPP networks.

Authentication Status Reporting

The UMTS Security Architecture already contains the feature "Authentication Failure Report" which provides a mechanism for the VLR/SGSN to report authentication failures back to the HLR.

However, this is not sufficient for TIA TR45 AHAG since they also have a requirement that the VLR/SGSN should be able to report successful authentications. So to facilitate roaming between 3GPP and 3GPP2 systems it may become a requirement that a 3GPP SN should be able to report successful authentication.

Taking this as a starting point, what seems to be required is that the current 3GPP Authentication Failure Report mechanism be extended to also be able to report successful authentication.

The shaded section below is a rewritten version of chapter 6.3.6 from TS 33.102 (v3.4.0) that should provide CN4 with a rough idea of what the generic authentication reporting mechanism might look like.

6.3.6 Reporting authentication failures results from the SGSN/VLR to the HLR

The purpose of this procedure is to provide a mechanism for reporting authentication <u>failures-results</u> from the serving environment back to the home environment.

The procedure is shown in Figure 13.



HLR

Authentication failure status report (IMUI and <u>StatusFailureCodeCause</u>) <u>or</u> (IMUI, Status Code and SQN)

Figure 13: Reporting authentication failure results from VLR/SGSN to HLR

The procedure is invoked by the serving network VLR/SGSN when the authentication procedure fails<u>or if</u> the subscriber profile requires authentication status reporting. The *authentication failure-status* report shall contain the subscriber identity and a failure causestatus code. The possible failure causes are either that the network signature was wrong or that the user response was wrong.

When reporting successful authentication the report shall contain the the sequence number SQN such that the HE can uniquely determine which AV was used. The report shall only be sent when the AV has been used be the SGSN/VLR.

The HE may decide to cancel the location of the user after receiving an *authentication failure-<u>status</u>* report indicating that the authentication failed.

At this point in time SA3 has not decided whether or not we will recommend this change to the existing mechanism.

One concern that has been voiced is that reporting successful authentication may be difficult to implement at that the mechanism may be expensive to operate in terms of network performance. We appreciate that it may be difficult to estimate the network performance impact of the mechanism since it will depend on how many subscribers that will need it and that it also depends on frequency of AV use in general.

Nevertheless, SA3 would be grateful for some advice from CN4 on the proposed mechanism and we would in particular be grateful to receive comments on how to specify such mechanism to avoid unnecessary network load.

SA3 therefore kindly requests CN4 for advice on what impact such mechanism might have on network performance and if CN4 foresees any problems in implementing such mechanism within 3GPP networks.