3GPP TSG-SA3 Meeting #24 **S3-020383**
Helsinki, Finland, 9-12 July 2002

CR-Form-v5.1

CHANGE REQUEST

⌘ **33.203** **CR** **CRNum** ⌘ **rev** **-** ⌘ Current version: **5.2.0** ⌘

*For **HELP** on using this form, see bottom of this page or look at the pop-up text over the ⌘ symbols.*

Proposed change affects: ⌘ (U)SIM ☐ ME/UE **X** Radio Access Network ☐ Core Network **X**

Title:	⌘	Removal of some editor notes in TS33.203
Source:	⌘	Ericsson
Work item code:	⌘	IMS
Date:	⌘	2002-07-01
Category:	⌘	**F**
Release:	⌘	Rel-5

Use one of the following categories:
F *(correction)*
A *(corresponds to a correction in an earlier release)*
B *(addition of feature),*
C *(functional modification of feature)*
D *(editorial modification)*
Detailed explanations of the above categories can be found in 3GPP TR 21.900.

Use one of the following releases:
2 (GSM Phase 2)
R96 (Release 1996)
R97 (Release 1997)
R98 (Release 1998)
R99 (Release 1999)
REL-4 (Release 4)
REL-5 (Release 5)

Reason for change: ⌘ TS33.203 version 5.2.0 still contains a number of editor notes. It is proposed that the following editor notes are removed, with the following reasoning:

Chapter 4 contains an editor note regarding the UE Functionality split. As SA plenary #16 has concluded that no UE Functionality Split will take place in REL-5, we can remove this editor note.

Chapter 6.1.2 contains an editor note stating that chapter 6.1.2 shall handle requirements for network and user authentication failures. As this subsection already covers these requirements this editor note can be removed.

Chapter 6.1.2.2 contains an editor note which states that it is FFS whether the same header i.e. 4xx Auth_Failure shall be used for both UE and network authentication failure. The Editors Note can be removed, since what SIP header shall be used for UE and Network failures is not an issue for 33.203 to solve since it is specified in TS 24.229.

Chapter 6.1.3 contains an editor note stating that this subsection shall deal with requirements for the case when the SQNs in the ISIM and the HSS are not in synch. As this subsection already covers these requirements this editor note can be removed.

Chapter 8 contains an editor note stating that this section is based on the current working assumption in SA1 and SA2. As the ISIM concept and the re-use of R99/REL-4 USIM's for IMS has been agreed at the SA plenary, this chapter is no longer based on working assumptions and therefore this editor note can be removed.

Summary of change: ⌘ TS33.203 version 5.2.0 still contains a number of editor note's. This CR proposes to remove the majority of these note's based on the reasoning above.

Consequences if ⌘ A number of Editors Note will remain in TS33.203, which may lead the reader to

not approved:	incorrectly believe certain issues are still unresolved or based on outdated assumptions.

Clauses affected:	⌘	4, 6.1.2, 6.1.2.2, 6.1.3, 8		
Other specs affected:	⌘	☐ Other core specifications ☐ Test specifications ☐ O&M Specifications	⌘	
Other comments:	⌘			

How to create CRs using this form:
Comprehensive information and tips about how to create CRs can be found at http://www.3gpp.org/specs/CR.htm. Below is a brief summary:

1) Fill out the above form. The symbols above marked ⌘ contain pop-up help information about the field that they are closest to.
2) Obtain the latest version for the release of the specification to which the change is proposed. Use the MS Word "revision marks" feature (also known as "track changes") when making the changes. All 3GPP specifications can be downloaded from the 3GPP server under ftp://ftp.3gpp.org/specs/ For the latest version, look for the directory name with the latest date e.g. 2001-03 contains the specifications resulting from the March 2001 TSG meetings.
3) With "track changes" disabled, paste the entire CR form (use CTRL-A to select it) into the specification just in front of the clause containing the first piece of changed text. Delete those parts of the specification which are not relevant to the change request.

4 Overview of the security architecture

In the PS domain, the service is not provided until a security association is established between the mobile equipment and the network. IMS is essentially an overlay to the PS-Domain and has a low dependency of the PS-domain. Consequently a separate security association is required between the multimedia client and the IMS before access is granted to multimedia services. The IMS Security Architecture is shown in the following figure.

IMS authentication keys and functions at the user side shall be stored on a UICC. It shall be possible for the IMS authentication keys and functions to be logically independent to the keys and functions used for PS domain authentication. However, this does not preclude common authentication keys and functions from being used for IMS and PS domain authentication according to the guidelines given in section 8.

For the purposes of this document the ISIM is a term that indicates the collection of IMS security data and functions on a UICC. Further information on the ISIM is given in section 8.

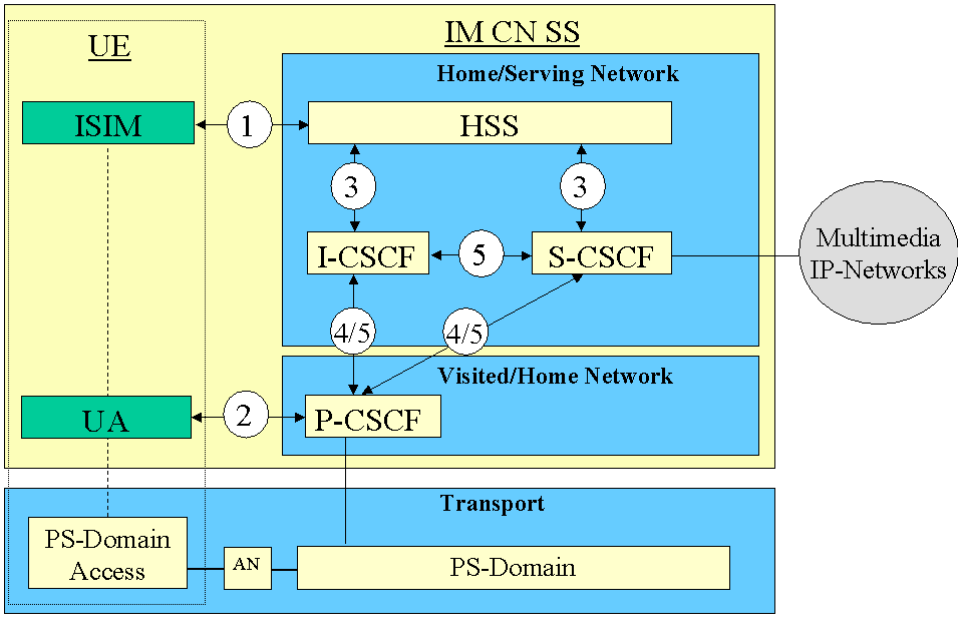


Figure 1: The IMS security architecture

There are five different security associations and different needs for security protection for IMS and they are numbered 1,2, 3, 4 and 5 in figure 1 where:

1. Provides mutual authentication. The HSS delegates the performance of subscriber authentication to the S-CSCF. However the HSS is responsible for generating keys and challenges. The long-term key in the ISIM and the HSS is associated with the IMPI. The subscriber will have one (network internal) user private identity (IMPI) and at least one external user public identity (IMPU).

2. Provides a secure link and a security association between the UE and a P-CSCF for protection of the Gm reference point. Data origin authentication is provided i.e. the corroboration that the source of data received is as claimed. For the definition of the Gm reference point cf. TS23.002 [9].

3. Provides security within the network domain internally for the Cx-interface. This security association is covered by TS 33.210 [5]. For the definition of the Cx-interface cf. TS23.002 [9].

4. Provides security between different networks for SIP capable nodes. This security association is covered by TS 33.210 [5]. This security association is only applicable when the P-CSCF resides in the VN and if the P-CSCF resides in the HN then bullet point number five below applies, cf. also Figure 2 and Figure 3.

5. Provides security within the network internally between SIP capable nodes. This security association is covered by TS 33.210 [5]. Note that this security association also applies when the P-CSCF resides in the HN.

There exist other interfaces and reference points in IMS, which have not been addressed above. Those interfaces and reference points reside within the IMS, either within the same security domain or between different security domains. The protection of all such interfaces and reference points apart from the Gm reference point are protected as specified in TS 33.210 [5].

Mutual authentication is required between the UE and the HN.

The mechanisms specified in this technical specification are independent of the mechanisms defined for the CS- and PS-domain.

An independent IMS security mechanism provides additional protection against security breaches. For example, if the PS-Domain security is breached the IMS would continue to be protected by it's own security mechanism. As indicated in Figure 1 the P-CSCF may be located either in the Visited or the Home Network. The P-CSCF shall be co-located within the same network as the GGSN, which may reside in the VPLMN or HPLMN according to the APN and GGSN selection criteria, cf. TS23060 [10].

P-CSCF in the Visited Network

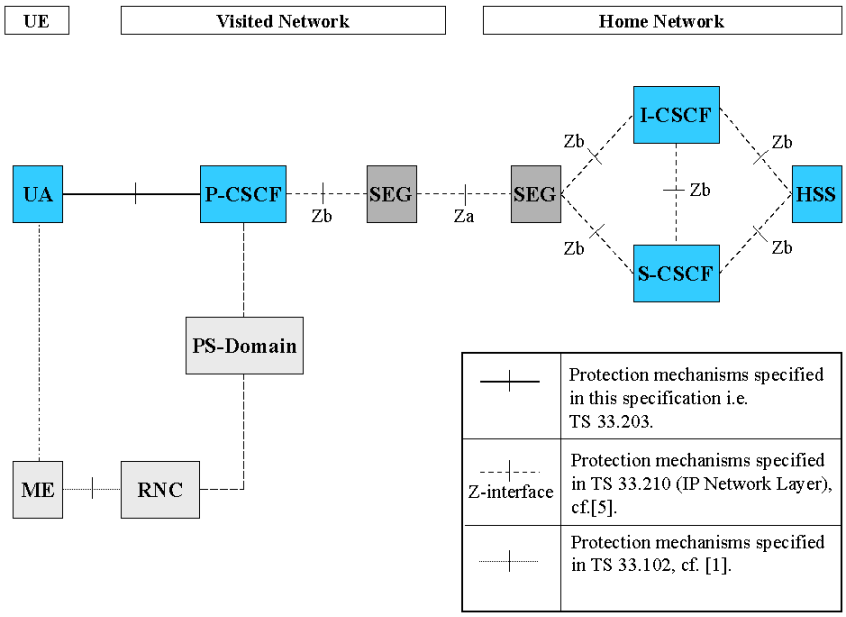


Figure 2: This figure gives an overview of the security architecture for IMS and the relation with Network Domain security, cf. TS 33.210 [5], when the P-CSCF resides in the VN

P-CSCF in the Home Network

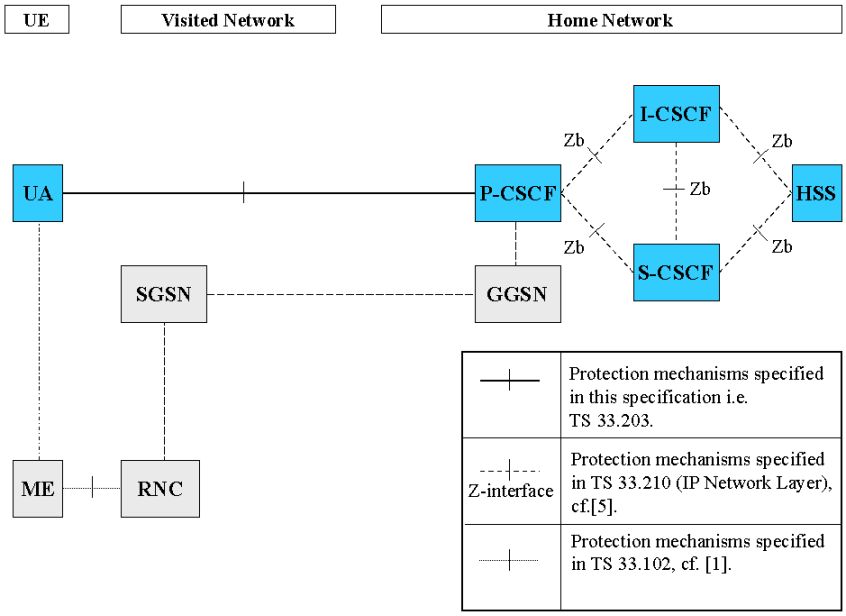


Figure 3: This figure gives an overview of the security architecture for IMS and the relation with Network Domain security, cf. TS 33.210 [5], when the P-CSCF resides in the HN

The confidentiality and integrity protection for SIP-signaling is provided in a hop-by-hop fashion, cf. Figure 2 and Figure 3. The first hop i.e. between the UE and the P-CSCF is specified in this technical specification. The other hops, inter-domain and intra-domain are specified in TS 33.210 [5].

~~[Editors Note: The UE Functional split security architecture is FFS e.g. if a section "security for the local interface between the TE and the MT in UE functional split scenarios" would be added to this specification. In this section, it would be pointed out what security features are required on this local interface. Security mechanisms would not be specified, as they would depend on the particular nature of this interface. The new section would also not attempt to assess security mechanisms available for technologies, which may be used to realise this interface (e.g. Bluetooth, Wireless LAN).]~~

********** NEXT CHANGE **********

6.1.2 Authentication failures

~~[Editor's note: This subsection shall deal with the requirements for network and user authentication failures.]~~

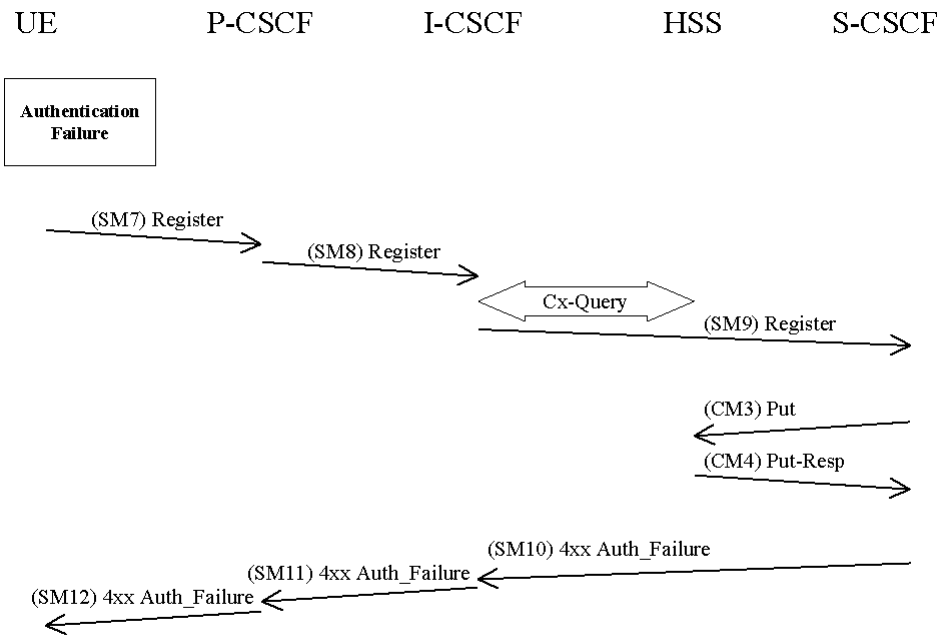
6.1.2.1 User authentication failure

In this case the authentication of the user should fail at the S-CSCF due an incorrect RES (received in SM9). However, in this case when RES is incorrect, the IK used to protect SM7 will be incorrect as well and integrity check at P-CSCF will fail before RES can be verified at S-CSCF.

P-CSCF in this case shall discard SM7 and the registration and authentication procedures shall be then aborted.

6.1.2.2 Network authentication failure

In this section the case when the authentication of the network is not successful is specified. When the check of the MAC in the UE fails the network can not be authenticated and hence registration fails. The flow is identical as for the successful registration in 6.1.1 up to SM6.



The UE shall send a Register message towards the HN including an indication of the cause of failure in SM7. The P-CSCF and the I-CSCF forward this message to the S-CSCF.

SM7:
REGISTER(Failure = *AuthenticationFailure*, IMPI)

Upon receiving SM9, which includes the cause of authentication failure, the S-CSCF sends a Cx-Put in CM3 and receives a Cx-Put-Resp in CM4.

CM3:
Cx-AV-Put(IMPI, Clear S-CSCF name)

The S-CSCF sends a Cx-Put (CM3) to the HSS, which indicates that authentication failed and that, the S-CSCF should be cleared. The HSS responds with a Cx-Put-Resp in CM4.

In SM10 the S-CSCF sends a 4xx Auth_Failure towards the UE indicating that authentication has failed, no security parameters shall be included in this message.

SM10:
SIP/2.0 4xx Auth_Failure

Upon receiving SM10 the I-CSCF shall clear any registration information related to the IMPI.

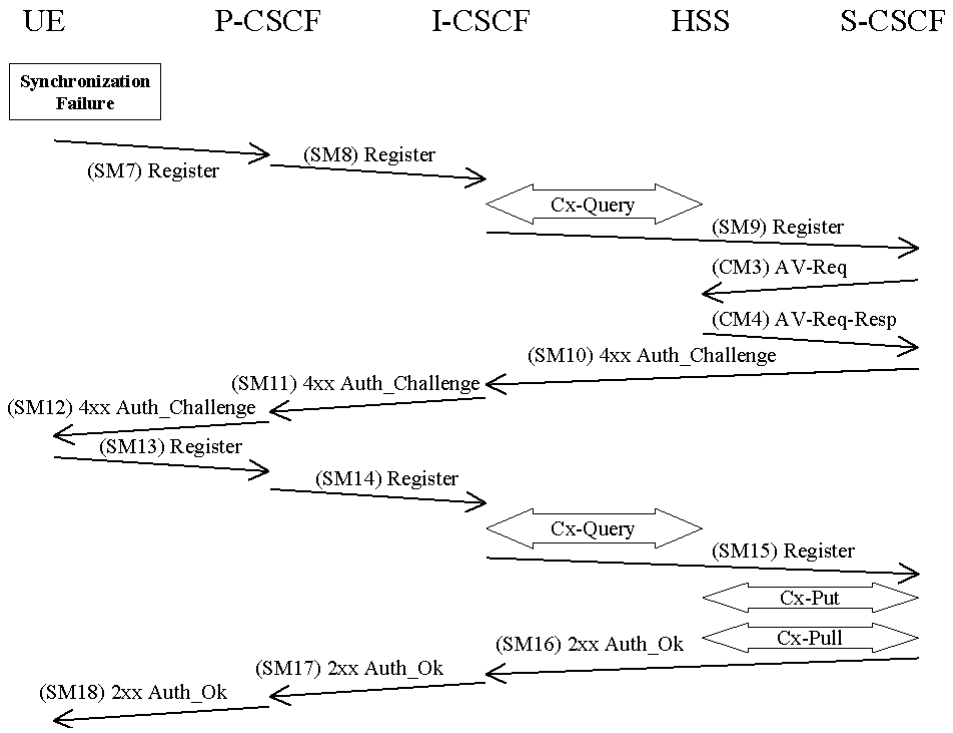
~~[Editor's note: It is FFS if same header i.e. 4xx Auth_Failure shall be used for both UE and network authentication failure.]~~

********** NEXT CHANGE **********

6.1.3 Synchronization failure

~~[Editor's note: This subsection shall deal with the requirements for the case when the SQNs in the ISIM and the HSS are not in synch.]~~

In this section the case of an authenticated registration with synchronization failure is described. After re-synchronization, authentication may be successfully completed, but it may also happen that in subsequent attempts other failure conditions (i.e. user authentication failure, network authentication failure) occur. In below only the case of synchronization failure with subsequent successful authentication is shown. The other cases can be derived by combination with the flows for the other failure conditions.



The flow equals the flow in 6.1.1 up to SM6. When the UE receives SM6 it detects that the SQN is out of range and sends a synchronization failure back to the S-CSCF in SM7. Draft-ietf-sip-digest-aka-01 [17] describes the fields to populate corresponding parameters of synchronization failure.

SM7:
REGISTER(Failure = *Synchronization Failure,* AUTS, IMPI*)*

Upon receiving the *Synchronization Failure* and the AUTS the S-CSCF sends an Av-Req to the HSS in CM3 including the required number of Avs, n.

CM3:
Cx-AV-Req(IMPI, RAND,AUTS, n)

The HSS checks the AUTS as in section 6.3.5 in [1]. If the check is successful and potentially after updating the SQN the HSS creates and sends new AVs to the S-CSCF in CM4.

CM4:
Cx-AV-Req-Resp(IMPI, n,$RAND_1$||$AUTN_1$||$XRES_1$||CK_1||IK_1,….,$RAND_n$||$AUTN_n$||$XRES_n$||CK_n||IK_n)

The rest of the messages i.e. SM10-SM18 including the Cx messages are exactly the same as SM4-SM12 and the corresponding Cx messages in 6.1.1.

********** NEXT CHANGE **********

8 ISIM

~~[Editors note: This section is based on the current working assumption in SA1 and SA2.]~~

For the purposes of this document the ISIM is a term that indicates the collection of IMS security data and functions on a UICC. The following implementation options are permitted:

- Use of a distinct ISIM application on a UICC which does not share security functions with the USIM;
- Use of a distinct ISIM application on a UICC which does share security functions with the USIM;
- Use of a R99/Rel-4 USIM application on a UICC.

NOTE: For later releases other implementations of ISIM are foreseen to be permitted.

There shall only be one ISIM for each IMPI. The IMS subscriber shall not be able to modify or enter the IMPI. The IMS subscriber shall not be able to modify or enter the Home Domain Name.