

CHANGE REQUEST

⌘ **33.220 CR CRNum** ⌘ rev **-** ⌘ Current version: **6.0.0** ⌘

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Proposed change affects: UICC apps ME Radio Access Network Core Network

Title:	⌘ NAF's public hostname verification		
Source:	⌘ Nokia		
Work item code:	⌘ SSC-GBA	Date:	⌘ 02/05/2004
Category:	⌘ C	Release:	⌘ Rel-6
	Use <u>one</u> 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 <u>one</u> 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) Rel-6 (Release 6)

Reason for change:	⌘ NAF is able to send its public hostname (visible to UE but necessarily for BSF) to BSF so that BSF is able to derive the NAF specific key material Ks_NAF. The change in the Zn interface is NAF is able to send its public hostname to BSF. This is needed for key derivation purposes.
Summary of change:	⌘ BSF needs to have access to NAF's public hostname in order to be able to derive the NAF specific key material.
Consequences if not approved:	⌘ BSF may not able to derive the NAF specific key material, the public address of the NAF is different than the NAF internal address used between NAF and BSF.

Clauses affected:	⌘ 3.2, 4.2.1, 4.3.6, 4.5.3										
Other specs affected:	<table border="1" style="display: inline-table; border-collapse: collapse;"> <tr> <td style="padding: 2px;">Y</td> <td style="padding: 2px;">N</td> </tr> <tr> <td style="padding: 2px;">X</td> <td style="padding: 2px;"></td> </tr> <tr> <td style="padding: 2px;"></td> <td style="padding: 2px;">X</td> </tr> <tr> <td style="padding: 2px;"></td> <td style="padding: 2px;">X</td> </tr> </table>	Y	N	X			X		X	Other core specifications	⌘ Draft TS 29.109
	Y	N									
	X										
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	Test specifications										
	O&M Specifications										
Other comments:	⌘										

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3.2 Abbreviations

For the purposes of the present document, the following abbreviations apply:

AK	Anonymity Key
AKA	Authentication and Key Agreement
BSF	Bootstrapping Server Function
CA	Certificate Authority
<u>FQDN</u>	<u>Fully Qualified Domain Name</u>
GAA	Generic Authentication Architecture
GBA	Generic Bootstrapping Architecture
HSS	Home Subscriber System
IK	Integrity Key
KDF	Key Derivation Function
MNO	Mobile Network Operator
NAF	Network Application Function
PKI	Public Key Infrastructure

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4.2.1 Bootstrapping server function (BSF)

A generic Bootstrapping Server Function (BSF) and the UE shall mutually authenticate using the AKA protocol, and agree on session keys that are afterwards applied between UE and an operator-controlled Network Application Function (NAF). The BSF can restrict the applicability of the key material to a defined set of NAFs by using a suitable key derivation procedure. The generation of key material is specified in section 4.5.2.

Editor's note: Key generation for NAF is ffs. Potential solutions may include:

- *Separate run of HTTP Digest AKA over Ub interface for each request of key material from a NAF*
- *Issues with key lifetime are ffs.*

~~In addition, BSF shall be able to verify that a NAF is authorized to use a hostname, i.e., the FQDN used by UE when it contacts the NAF.~~

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4.3.6 Requirements on Zn interface

The requirements for Zn interface are:

- mutual authentication, confidentiality and integrity shall be provided;

NOTE: This requirement may be fulfilled by physical or proprietary security measures if BSF and NAF are located within the same operator's network.

- The BSF shall verify that the requesting NAF is authorised;
- The NAF shall be able to send a key material request to the BSF, containing NAF's public hostname used by the UE's corresponding request to the BSF; BSF shall be able to verify that a NAF is authorized to use this hostname, i.e., the FQDN used by UE when it contacts the NAF;
- The BSF shall be able to send the requested key material to the NAF;
- The NAF shall be able to get the subscriber profile information needed for security purposes from BSF;
- The BSF shall be able to indicate to the NAF the lifetime of the key material.

Editor's note: Relationship between Transaction Identifier and subscriber identity is ffs. In the case of Presence Ut interface, there are several potential identities that are related to Transaction Identifier, i.e. IMPI and IMPUs. The subscriber may have several Presence accounts related to same IMPI. Transaction Identifier does not carry enough information on which IMPU the end-user is trying to use.

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4.5.3 Procedures using bootstrapped Security Association

After UE is authenticated with the BSF, every time the UE wants to interact with an NAF the following steps are executed as depicted in figure 5.

UE starts communication over Ua interface with the NAF:

- in general, UE and NAF will not yet share the key(s) required to protect Ua interface. If they already do (i.e. if a key Ks_NAF for the corresponding key derivation parameter NAF_Id_n is already available), the UE and the NAF can start to securely communicate right away. If the UE and the NAF do not yet share a key, the UE proceeds as follows:
 - if a key Ks is available in the UE, the UE derives the key Ks_NAF from Ks, as specified in clause 4.5.2;
 - if no key Ks is available in the UE, the UE first agrees on a new key Ks with the BSF over the Ub interface, and then proceeds to derive Ks_NAF;
- if the NAF shares a key with the UE, but an update of that key is needed, e.g. because the key's lifetime has expired, it shall send a suitable key update request to the UE and terminates the protocol used over Ua interface. The form of this indication may depend on the particular protocol used over Ua interface (cf. 4.5.1);
- the UE supplies Transaction Identifier to the NAF, in the form of a Transaction Identifier, to allow the NAF to retrieve specific key material from BSF;
- the UE derives the keys required to protect the protocol used over Ua interface from the key material, as specified in clause 4.3.2;

NOTE: The UE shall adapt the key material Ks_NAF to the specific needs of the Ua interface. This adaptation is outside the scope of this specification.

- when the UE is powered down, or when the UICC is removed, any keys Ks and Ks_NAF shall be deleted from storage;
- when a new Ks is agreed over the Ub interface and a key Ks_NAF, derived from one NAF_Id, is updated, the other keys Ks_NAF, derived from different values NAF_Id, stored on the UE shall not be affected;

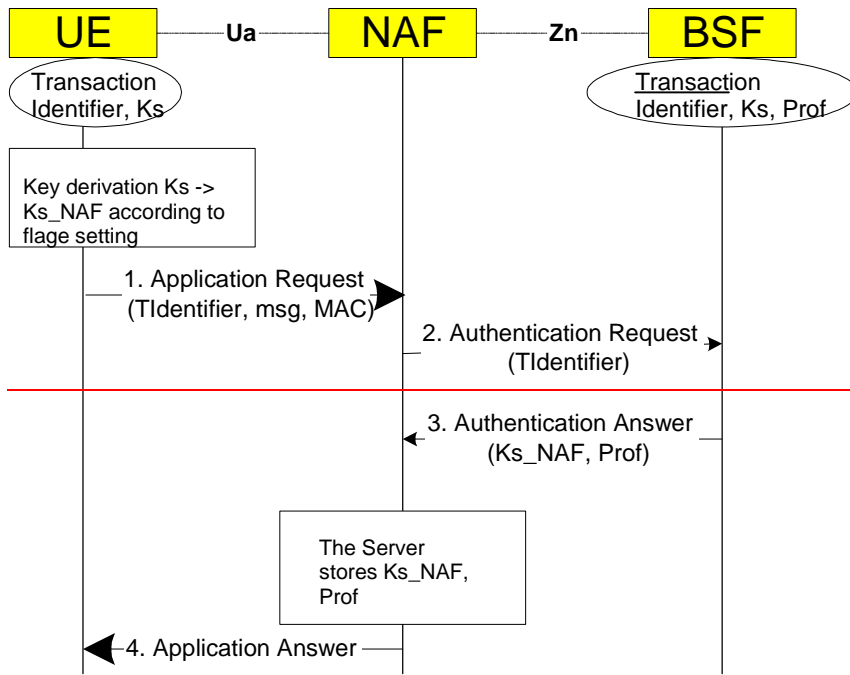
NAF starts communication over Zn interface with BSF

- The NAF requests key material corresponding to Transaction Identifier supplied by the UE to the NAF used over Ua interface;
- With the key material request, the NAF shall supply NAF's public hostname that UE has used to access NAF to BSF, and BSF shall be able verify that NAF is authorized to use that hostname;
- The BSF derives the keys required to protect the protocol used over Ua interface from the key material Ks and the key derivation parameters, as specified in clause 4.5.2, and supplies to NAF the requested key material Ks_NAF, as well as the lifetime time of that key material. If the key identified by the Transaction Identifier supplied by the NAF is not available at the BSF, the BSF shall indicate this in the reply to the NAF. The NAF then indicates a key update request to the UE.

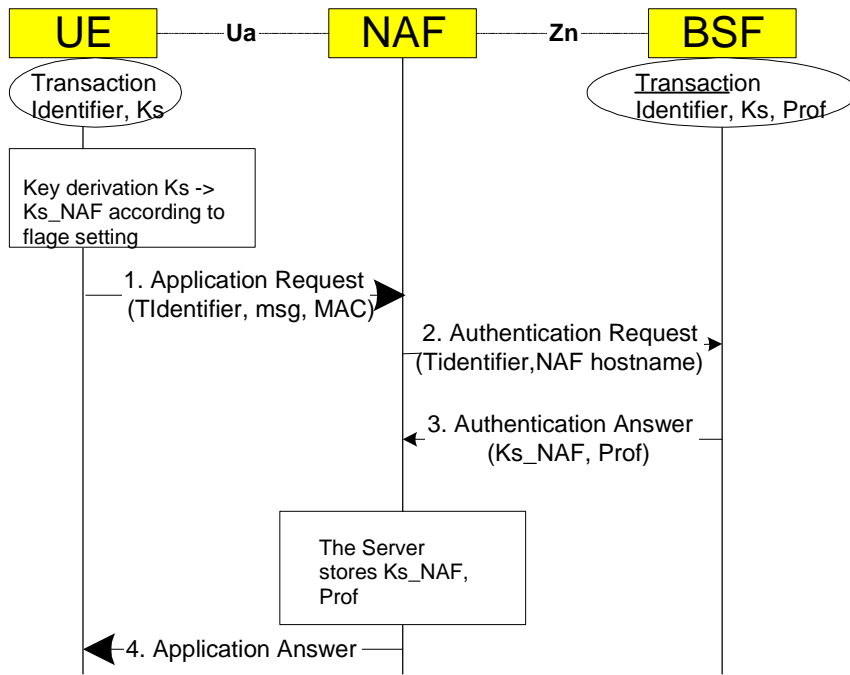
NOTE: The NAF shall adapt the key material Ks_NAF to the specific needs of the Ua interface in the same way as the UE did. This adaptation is outside the scope of this specification.

NAF continues with the protocol used over the Ua interface with the UE.

Once the run of the protocol used over Ua interface is completed the purpose of bootstrapping is fulfilled as it enabled UE and NAF to use Ua interface in a secure way.



msg is appl. specific dataset
Prof is application specific part of user profile



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Figure 5: The bootstrapping usage procedure

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