3GPP TSG SA WG3 aSIP ad hoc - joint meeting with SA2 **Tdoc S3z010055**
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3GPP SA2 #17 **Tdoc S2-010718**

Source: Nortel Networks

Title: Network hiding mechanism updates to TS 23.228

Document for: Approval

Introduction

This contribution is a revised contribution of Tdoc S2-010325 and includes appropriate text to align with the revised hiding mechanism agreed at the joint S2/N1, New Jersey (Tdoc N1-010261).

The contribution N1-010261proposes modification to the original concept captured in N1-010089 to address the hiding requirement:

- It defines a token concept.
- It updates the usage of the Path header, which will be inserted in the Register message by the Proxy CSCF (instead of the I-CSCF as proposed earlier). Proxy CSCF will add its own contact point name to this header and based on the requirements for network hiding of the operator, the I-CSCF may or may not add its or another suitable I-CSCF contact point name to the Path header.
- S-CSCF will store the Call path information from the Path header and will use it to route the subsequent terminating requests successfully to the Proxy CSCF. This makes unnecessary for the proxy to modify the contact header in register messages.

It is proposed to introduce a new SIP header for conveying serving network information to the P-CSCF during registration phase. The P-CSCF shall then use this serving network information when routing the originating session initiation requests to S-CSCF.

The S-CSCF shall store the path information from the Path header and use when routing the terminating requests to the P-CSCF.

Furthermore, it is proposed to use a flexible token concept, which only has significance to the home network that supplies the token. The token may be used to transport an encrypted S-CSCF name, another representation of the S-CSCF name, or simply a pointer to where the S-CSCF name can be found to hide the serving network configuration. To conform to SIP message encoding, this token is a cryptographically random alphanumeric representation.

1. Discussion

According to 3G TS 23.228 it shall be possible for a network operator to hide its serving network configuration, and maintain only a few contact points for outside networks. This possibility is given by optionally having an I-CSCF as the contact point for all incoming requests in the serving network.

During registration the S-CSCF name is to be conveyed to the P-CSCF, at the same time the serving network operator may want to hide the S-CSCF name from the visited network operator. The solution proposed here is to have the I-CSCF of the serving network translate the S-CSCF name into a token, and provide this token along with the I-CSCF name to the P-CSCF. P-CSCF shall then store both of these network element names, and associate it with the subscriber under registration. This information will then be used to route this subscriber's subsequent originating requests successfully to the S-CSCF.

The serving network information (S-CSCF name, and possible I-CSCF name) is proposed to be conveyed in a new SIP header of the REGISTER transaction. This new header is called the Path header (as introduced by Tdoc N1-001243) which is to be filled during the REGISTER request in similar fashion as the Record-Route header of an INVITE. If the serving network configuration is to be hidden, then

a.) the I-CSCF should add its name or the name of a suitable I-CSCF to the Path header of the REGISTER request, and

b.) the S-CSCF name in the Path header of the 200OK response should be translated by the I-CSCF into a token.

The token concept has the following benefits:

- Removes the need to standardise security algorithms and key exchange mechanisms
- Removes the need to perform encryption/decryption at the I-CSCF, which may result in additional call processing delay (depending on the strength of the encryption).
- Allows the option for innovative solutions to meet the hiding requirement.

Proposal

The proposal section contains required updates regarding to the solution adopted in TSG CN1. Following modifications are proposed to 23.228 v1.7.0 and are based on an assumption that S2-010325 was not approved.

5.3.2.5 Registration information flow B: Continuation of registration

The continuation of the registration flows for the S-CSCF is initiated after the reception of information flow 7 in subclause 5.3.2.4.

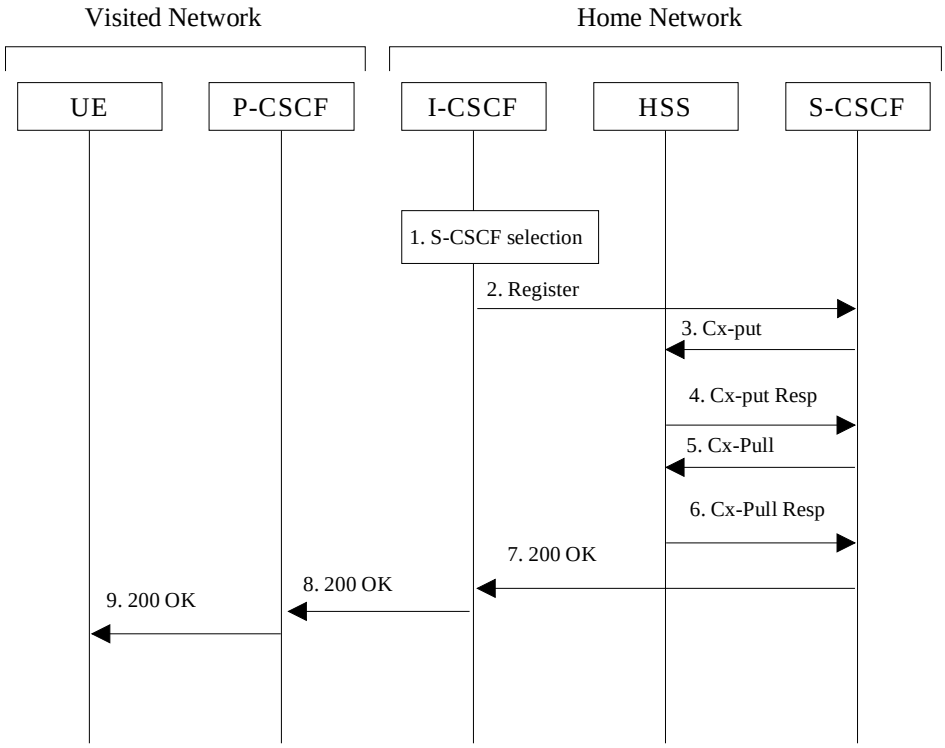

Figure 5-2 Continuation of Registration

1. The I-CSCF, using its role of the S-CSCF selection, shall determine the name of an appropriate S-CSCF.
2. The I-CSCF, using the name of the S-CSCF, shall determine the address of the S-CSCF through a name-address resolution mechanism and then shall send the register information flow (P-CSCFs "name" in the contact header, subscriber identity, visited network contact name~~,~~) to the selected S-CSCF.
3. The S-CSCF shall send Cx-Put (subscriber identity, S-CSCF name) to the HSS. The HSS stores the S-CSCF name for that subscriber.
4. The HSS shall send Cx-Put Resp to the I-CSCF to acknowledge the sending of Cx-Put.

5. On receipt of the Cx-Put Resp information flow, the S-CSCF shall send the Cx-Pull information flow (subscriber identity) to the HSS in order to be able to download the relevant information from the subscriber profile to the S-CSCF. The S-CSCF shall store the P-CSCFs name, as supplied by the visited network. This represents the name that the home network forwards the subsequent terminating session signalling to for the Ue.

6. The HSS shall returns the information flow Cx-Pull Resp (user information) to the S-CSCF. The S-CSCF shall store the it for that indicated user.

7. The S-CSCF shall determine whether the home contact ~~name~~ information is the S-CSCF name or a combination of an ~~n~~ I-CSCF name and token. If an I-CSCF is chosen as the home contact name, it may be distinct from the I-CSCF that appears in this registration flow, but it shall be able to determine the S-CSCF name from the token, if included in the home contact information. The home contact ~~name~~ information will be used by the P-CSCF to forward signalling to the home network. The S-CSCF shall return the 200 OK information flow (serving network contact ~~name~~information, S-CSCF name) to the I-CSCF.

8. The I-CSCF shall send information flow 200 OK (serving network contact information~~name~~) to the P-CSCF. The I-CSCF shall release all registration information after sending information flow 200 OK.

9. The P-CSCF shall store the serving network contact ~~name~~information, and shall send information flow 200 OK to the Ue.