**S-CSCF Interfaces (IMS Registration for an Unauthenticated User)**

<table>
<thead>
<tr>
<th>Visited Network</th>
<th>Internet</th>
<th>Home Network</th>
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<tbody>
<tr>
<td>User Equipment</td>
<td>Visited CN</td>
<td>Visited IMS</td>
</tr>
<tr>
<td>Subscriber</td>
<td>SGSN</td>
<td>P-CSCF</td>
</tr>
<tr>
<td>GPRS Attach</td>
<td>GGSN</td>
<td>DNS Server</td>
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<td>I-CSCF</td>
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<td>S-CSCF</td>
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<td>HSS</td>
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**GPRS Attach**

**PDP Context Activation**

**Unauthenticated IMS Registration Attempt**

```
REGISTER sip:hims.net SIP/2.0,
Via: SIP/2.0/UDP icscf1.hims.net;branch=0aab2,
Via: SIP/2.0/UDP pcscf1.vims.net;branch=0aab1,
Via: SIP/2.0/UDP UE-IP;branch=0abab,
Route: sip:scscf1.hims.net, 
Max-Forwards: 18,
From: <sip:name@hims.net>;tag=abbb,
To: <sip:name@hims.net>,
Contact: <sip:[UE-IP]>;expires=90000,
Call-ID: ababab,
CSeq: 25 REGISTER,
Content-Length: 0,
Authorization: Digest username = name.private@hims.net integrity
protection: no
```

The I-CSCF forwards the REGISTER message to the selected S-CSCF.

**Multimedia Authentication Request**

**Multimedia Authentication Answer**

```
HSS passes the Random number (RAND), Authentication token (AUTN), signed result (XRES), Cipher key (CK) and Integrity Key (IK).
```

```
Select Authentication vectors
Save the selected authentication vector
```

```
401 Unauthorized
WWW-Authenticate: nonce=RAND-AUTN, ck, ik,
Via: icscf1, pcscf1, ue-ip
```

The user is currently not authenticated, so the registration request is rejected. The terminal is challenged to authenticate the user. RAND, AUTN, CK and IK are passed in the WWW-Authenticate header.

**IPSec Security Association Establishment**

**Authenticated IMS Registration**

```
REGISTER sip:scscf1@hims.net SIP/2.0,
Via: SIP/2.0/UDP icscf1.hims.net;branch=0aab2,
Via: SIP/2.0/UDP pcscf1.vims.net;branch=0aab1,
Via: SIP/2.0/UDP UE-IP;branch=0abab,
Route: sip:scscf1.hims.net, 
Max-Forwards: 18,
From: <sip:name@hims.net>;tag=abbb,
To: <sip:name@hims.net>,
Contact: <sip:pcscf1.vims.net>,
Call-ID: ababab,
CSeq: 25 REGISTER,
Content-Length: 0,
Authorization: Digest username = name.private@hims.net integrity
protection: yes,
```

The SIP REGISTER message is finally delivered to the S-CSCF.

```
Server Assignment Request
Request subscriber related information from the HSS.
```

```
Server Assignment Answer
Received subscriber related information.
```

```
200 OK
Via: icscf1, pcscf1,
Tek-IP/UE-Server-Port
```

Compare RES and XRES

```
The RES and the XRES matched, so the S-CSCF replies with success.
```

```
``