Unauthenticated IMS Registration Attempt

**REGISTER**

```text
REGISTER sip:hims.net SIP/2.0, Via: SIP/2.0/UDP
pcscf1.vims.net;branch=0aab1, Via: SIP/2.0/UDP
UE-IP;branch=0abab, Max-Forwards: 19, From:
<sip:name@hims.net>;tag=abbb, To: <sip:name@hims.net>,
Contact: <sip:[UE-IP]>;expires=90000,
CSeq: 25 REGISTER, Content-Length: 0, Authorization: Digest username =
name.private@hims.net integrity protection: no
```

P-CSCF adds a Via header and removes the Route header. The
REGISTER message will be routed to the IP address obtained from the
DNS response. Note that the integrity protection flag is set to
false to signify that the user has not been authenticated.

**User Authorization Request**

name.private@hims.net

**User Authorization Answer**

I-CSCF selects the S-CSCF based on
the S-CSCF capabilities.

**REGISTER**

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

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.

**401 Unauthorized**

```text
WWW-Authenticate: nonce=RAND-AUTHN, ck, ik,
via: pcscf1, pcscf1, ue-ip
```

Pass the message to the P-CSCF.
CK and IK are carried in the
WWW-Authenticate header.

**IPSec Security Association Establishment**

Authenticated IMS Registration

**REGISTER**

```text
Via: pcscf1 UE-IP;UE-Server-Port, Contact: UE-IP ue-server-port,
Authorization Digest username =
name.private@hims.net,
wwwmnaes=RES integrity protection: yes,
RES
```

Pass the REGISTER message to the
I-CSCF. This time the Authorization
header indicates that integrity
protection is enabled.

**User Authorization Request**

name.private@hims.net

**User Authorization Answer**

HSS replies with the S-CSCFs.
The SIP REGISTER message is finally delivered to the S-CSCF.

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

The success is relayed back to the P-CSCF.