Term P-CSCF Interfaces (Caller and Called are IMS Subscribers)

Calling UE	IMS Network					Called UE	EventStudio System Designer 4.0
Caller User Equipment	Visited IMS 1	Home IMS 1	Home IMS 2			Called User Equipment	
Caller	Orig P-CSCF	Orig S-CSCF	Term I-CSCF	Term S-CSCF	Term P-CSCF	Called	15-Dec-07 08:27 (Page 1)

IMS Routing of Initial SIP INVITE

INVITE

```
INVITE CALLED-IP SIP/2.0,
P-Asserted-Identity:
<caller@hims1.net>,
<tel:+13015556666>,
Via: <Term S-CSCF> <Term I-CSCF>
<Orig S-CSCF> <Orig P-CSCF>
<Calling-UE>,
Route: <Term P-CSCF>,
Record-Route: <Term S-CSCF> <Orig
S-CSCF> <Orig P-CSCF>,
Contact: <Calling UE IP> :Port,
SDP: <Caller Supported Codec List>
```

The public URI in the SIP INVITE is replaced with the called subscriber's registered IP address and port number. The message is routed to the P-CSCF IP address that was recorded at the time of registration. The Via and Record-Route headers are updated.

Obtain a media authorization token from the PDF

The terminating P-CSCF requests the Policy Decision Function (PDF) to generate a media authorization token. The token will be included in the INVITE sent to the terminating UE.

INVITE

```
INVITE CALLED-IP SIP/2.0,
P-Asserted-Identity:
<caller@hims1.net>,
<tel:+13015556666>,
Via: <Term P-CSCF>;port <Term
S-CSCF> <Term I-CSCF> <Orig
S-CSCF> <Orig P-CSCF>
<Calling-UE>,
Route: <Term P-CSCF>;port,
Record-Route: <Term S-CSCF> <Orig
S-CSCF> <Orig P-CSCF>,
Contact: <Called UE IP> :Port,
SDP: <Caller Supported Codec
List>,
P-Media-Authorization
```

The P-CSCF updates the Via and Route-Record headers and forwards the request to the Called UE. Note that the secure port is included in the Via address specification. The message also includes the media authorization token. This token will have to be passed to the GGSN in the PDP context activation request.

100 Trying

IMS Routing of First Response to the SIP Invite

183 Session Progress

```
Via: <Term P-CSCF>;port <Term
S-CSCF> <Term I-CSCF> <Orig
S-CSCF> <Orig P-CSCF>
<Calling-UE>,
Record-Route: <Term S-CSCF>;port
<Orig S-CSCF> <Orig P-CSCF>,
Contact: <Calling UE IP> :Port,
SDP: <Codecs supported by Caller
and Called>
```

The UE replies indicating that the session is in progress. The contact address is set its own IP address. The Via and the Record-Route headers are copied from the received INVITE.

183 Session Progress

```
Via: <Term S-CSCF> <Term I-CSCF>
<Orig S-CSCF> <Orig P-CSCF>
<Calling-UE>,
Record-Route: <Term S-CSCF> <Orig
S-CSCF> <Orig P-CSCF>,
Contact: <Calling UE IP> :Port,
SDP: <Codecs supported by Caller
and Called>
```

The P-CSCF removes its own Via header entry and addresses the message to the top via header (Term S-CSCF in this case). The P-CSCF also removes the secure port from the Record-Route.

PDP Context Activation and Audio/Video Path Setup

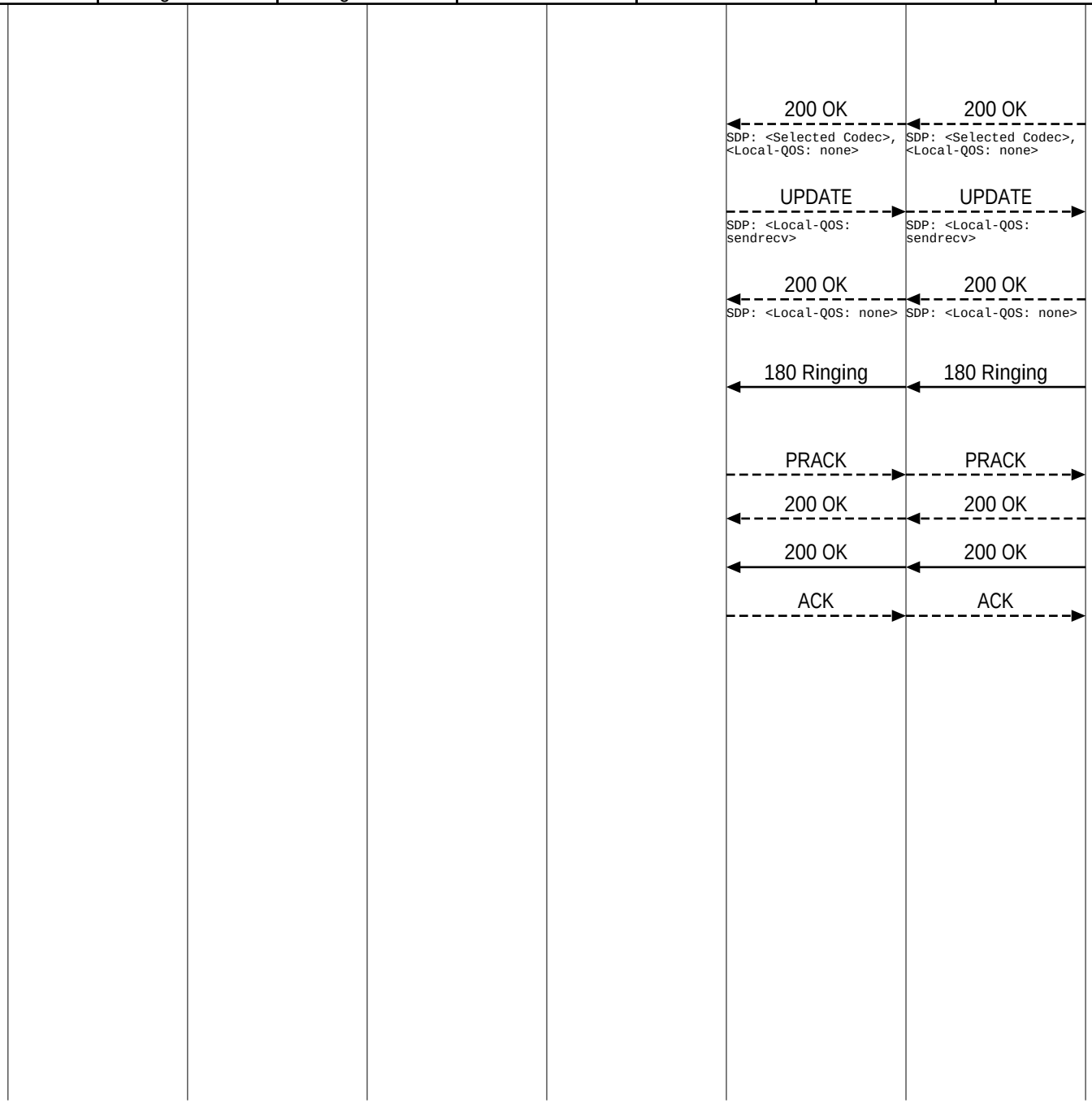
PRACK

```
SDP: <Selected Codec>,
```

PRACK

```
SDP: <Selected Codec>,
```

The Caller now sends a PRACK to inform the called subscriber about the selected Codec.



The message also indicates that currently the resources needed for meeting the quality of service requiements of the session are not available.

The called subscriber acknowledges the PRACK. The message also indicates that quality of service for the session is not met for the called subscriber.

Since the caller PDP context has been activated, notify the called end that the caller can now meet the quality of service in the send and receive direction.

The caller replies back to the called user. Note that the Local QoS is still set to none as the called PDP context activation has not been completed.

Inform the caller that the called subscriber is being rung. This serves as an implicit indication to the caller that the QoS at the called side has also been met.

The caller acknowledges the ringing message.

The called subscriber acknowledges the PRACK.

Notify the caller that that the call has been answered.

The caller acknowledges the "200 OK" message. The call is now ready to enter conversation mode.