A Control Framework for the Session Initiation Protocol

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SIP Control Framework

• First version released in December 2005 – now on version 05
  – Discussed on MediaCtrl mailing list
• Provides generic framework using SIP to establish a reliable connection between two entities
  – Uses SIP for session initiation and management
  – Uses SDP and COMEDIA for connection negotiation and establishment
  – Defines primitives exchanged over connection
  – Defines Control Package extension mechanism for specific use of the Control Framework (similar to RFC 3265)
Basic Architecture
(single channel)
SIP Message Flow 1/2

Control Client

<table>
<thead>
<tr>
<th>SIP INVITE</th>
</tr>
</thead>
<tbody>
<tr>
<td>SIP 200 OK</td>
</tr>
<tr>
<td>SIP ACK</td>
</tr>
</tbody>
</table>

Control Server

<table>
<thead>
<tr>
<th>CONTROL</th>
</tr>
</thead>
<tbody>
<tr>
<td>200 OK</td>
</tr>
</tbody>
</table>

INVITE sip:External-Server@example.com SIP/2.0
To: <sip:External-Server@example.com>
From: <sip:Client@example.com>;tag=64823746
Require: escs
Control-Packages: <example-package>
Call-ID: 7823987HJHG6
Content-Type: application/sdp

v=0
c=originator 289084526 2890842808 IN IP4 controller.example.com
s=-
c=IN IP4 controller.example.com
m=application 7575 TCP/ESCS
a=setup:active
a=connection:new

<table>
<thead>
<tr>
<th>SIP BYE</th>
</tr>
</thead>
<tbody>
<tr>
<td>SIP 200 OK</td>
</tr>
</tbody>
</table>

Control Channel Established

Control Channel Terminated
SIP Message Flow 2/2

Control Client       Control Server

SIP INVITE

SIP 200 OK

SIP ACK

Control Channel Established

CONTROL

200 OK

SIP BYE

SIP 200 OK

Control Channel Terminated

SIP/2.0 200 OK
To: <sip:External-Server@example.com>;tag=28943879
From: <sip:Client@example.com>;tag=64823746
Call-ID: 7823987HJHG6
Content-Type: application/sdp

v=0
o=originator 2890844526 2890842808 IN IP4 controller.example.com
s=-
c=IN IP4 mserver.example.com
m=application 7563 TCP/ESCS
a=setup:passive
a=connection:new
Control Package Extension Mechanism

• Control packages must follow Section 10 of Framework Document:
  – Control package name (with version)
  – Define message usage with framework primitives
    • CONTROL messages
    • REPORT messages (including event messages)
  – Common XML: indicate whether “conf-id” and/or “connection-id” attribute support is required
Basic IVR Control Package

- Name: msc-ivr-basic/1.0
- Message Usage:
  - CONTROL: dialog requests:
    - `<dialogprepare>`
    - `<dialogstart>`
    - `<dialogterminate>`
  - REPORT:
    - `<response>` (or in 200 response)
    - `<event>` notifications
- Common XML: ‘connection-id’ and ‘conf-id’ must be supported
Conference Control Package

- Name: msc-conf-audio/1.0
- Message Usage:
  - CONTROL: conference requests:
    - `<createconference>`, `<modifyconference>`, `<destroyconference>`
    - `<join>`, `<modifyjoin>`, `<unjoin>`
  - REPORT:
    - `<response>` (or in 200 response)
    - `<event>` notifications
- Common XML: ‘connection-id’ and ‘conf-id’ must be supported
And Finally …

• To do:
  – Fill in transport placeholders (TLS, SCTP)
  – Add appropriate security section
  – Review new keep-alive section
  – …

• PLEASE REVIEW AND PROVIDE FEEDBACK

• ANY QUESTIONS?
How Framework Control Packages can work together

• Simple use case:
  1. IVR dialog to record participant name
  2. Add participant to conference
  3. IVR dialog to announce participant to conference

• Example Flow Simplifications:
  – AS-MS control channel has been established (and SYNCHed) with support for msc-ivr-basic/1.0 and msc-conf-audio/1.0
  – No timing details
  – Conference already created with conf-id ‘conf1’
  – Participant connection-id ‘p1’ is shorthand for “7HDY839~HJKSkyHS”
IVR dialog to record participant name 1/4

AS ------------------------------------------> MS
SCFW transaction1 CONTROL
Control-Package: msc-ivr-basic/1.0
Content-Length: 92

<dialogstart src="basicivr:promptandrecord" connection-id="p1">
  <data>
    <item name="prompts" value="http://ex.com/sayname.wav" />
    <item name="dtmfterm" value="true" />
    <item name="maxtime" value="30s" />
  </data>
</dialogstart>
IVR dialog to record participant name 2/4

AS <--------------------------------------------------------------- MS
SCFW transaction1 202

AS <--------------------------------------------------------------- MS
CFW transaction1 REPORT
Seq: 1
Status: pending

AS ---------------------------------------------------------------> MS
SCFW transaction1 200
Seq: 1
IVR dialog to record participant name 3/4

AS <--------------------------------------------------------------- MS
SCFW transaction1 REPORT
Seq: 2
Status: terminate
Content-Length: 22

<response status="200"/>

AS ---------------------------------------------------------------> MS
SCFW transaction1 200
Seq: 2
IVR dialog to record participant name 4/4

AS <----------------------------------------------- MS
SCFW transaction1 REPORT
Status: Notify
Content-Length: 92

<event name="dialogexit">
  <data>
    <item name="status" value="1"/>
    <item name="result" value="http://ex.com/recording1.wav"/>
  </data>
</event>

AS ------------------------------------------------> MS
SCFW transaction1 200
Add participant to conference 1/1

AS <---------------------------------------------------------> MS
SCFW transaction2 CONTROL
Control-Package: msc-conf-audio/1.0
Content-Length: 42

<join id1="p1" id2="conf1"/>

AS <---------------------------------------------------------> MS
SCFW transaction2 200
Content-Length: 22

<response status="200"/>
IVR dialog to announce participant to conference 1/4

AS --------------------------------------------------------------------------> MS
SCFW transaction3 CONTROL
Control-Package: msc-ivr-basic/1.0
Content-Length: 94

<dialogstart src="basicivr:playannouncement" conf-id="conf1">
  <data>
    <item name="prompts" value="http://ex.com/recording1.wav http://ex.com/hasjoined.wav"/>
  </data>
</dialogstart>
IVR dialog to announce participant to conference 2/4

AS <---------------------------------------------------------------------------------------------- MS
SCFW transaction3 202

AS <---------------------------------------------------------------------------------------------- MS
SCFW transaction3 REPORT
Seq: 1
Status: pending

AS ---------------------------------------------------------------------------------------------- > MS
SCFW transaction3 200
Seq: 1
IVR dialog to announce participant to conference 3/4

AS <-------------------------------------------------------------------------- MS
SCFW transaction3 REPORT
Seq: 2
Status: terminate
Content-Length: 22

<response status="200"/>

AS --------------------------------------------------------------------------> MS
SCFW transaction3 200
Seq: 2
IVR dialog to announce participant to conference 4/4

AS <------------------------------------------------------------------------- MS
SCFW transaction3 REPORT
Status: Notify
Content-Length: 62

<event name="dialogexit">
  <data>
    <item name="status" value="1"/>
  </data>
</event>

AS -------------------------------------------------------------------------> MS
SCFW transaction3 200