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Using Media Resource Control Protocol over SIP  
draft-robinson-mrcp-sip-00

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Abstract

This Draft presents a method for using Media Resource Control Protocol (MRCP) in the body of SIP messages for the purpose of controlling Prompt Players, Text to Speech, and Speech Recognition Engines. Here we present MRCP->SIP as a function of the "Service Controller," identified in the decomposition of Application Server Component Architectures for SIP ([draft-rosenberg-sip-app-components-01](#)). The author's believe that MRCP->SIP brings some powerful synergies to bare; rapid development of reliable media resource control, and the highly available, redundant, SIP infrastructure, capable of intelligent resource location.

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## 1. Introduction

Session Initiation Protocol (SIP) continues to be instrumental in moving the voice network from a monolithic, closed system, architecture to a distributed, open system, component architecture. SIP provides the versatility to allow distributed application server components to provide advanced intelligent services to remote clients. The benefits to the component server architecture include increased scalability, fault tolerance, and load balancing capabilities. However, control of distributed Media Resources remains an open issue. Oftentimes Media Resource control is determined by the composition of a particular network deployment or the specific media needs of an application. Here we present an open, network and application agnostic, standard, Media Resource Control Protocol (MRCP), for controlling distributed Media Resources.

The following example illustrates a distributed server architecture for delivering voice-enabled applications. The components will include the following: VoiceXML browser, Prompt Server and Automatic Speech Recognition (ASR) Server. The VoiceXML browser includes a back-to-back SIP Agent. The Prompt Server and ASR Server include a User Agent Server and are collectively termed Media Resources. The application logic resides on a Web Server and is accessed by the VoiceXML browser. After fetching the VoiceXML script the browser parses the document and begins processing the call. When a resource is needed the appropriate Media Resource must be accessed and controlled to perform the work item. How this interaction is defined and implemented is debatable, here we suggest one manner of achieving the desired end result.

The method for tunneling the MRCP to the servers is the SIP re-INVITE message. The VoiceXML browser will obtain the type of Media Resource needed by performing a standard SIP INVITE / 200 OK, all subsequent call control messages and server events are transported in SIP re-INVITE messages. For example, when the welcome.wav audio prompt needs to be streamed to the user the VoiceXML browser will act as an MRCP client and send an MRCP SPEAK request to the Prompt Server via SIP re-INVITE. When the Prompt server has finished fetching the

audio prompt it responds with an MRCP IN-PROGRESS event to the VoiceXML browser. When the Prompt Server has completed streaming the audio prompt it initiates an MRCP COMPLETE event to the VoiceXML browser.

The following call flow illustrates an advanced, interactive, voice telephone call. The caller, noted by User Agent "A," interacts with a VXML Browser "B," Prompt Player "C," and Speech Recognition Engine "D."

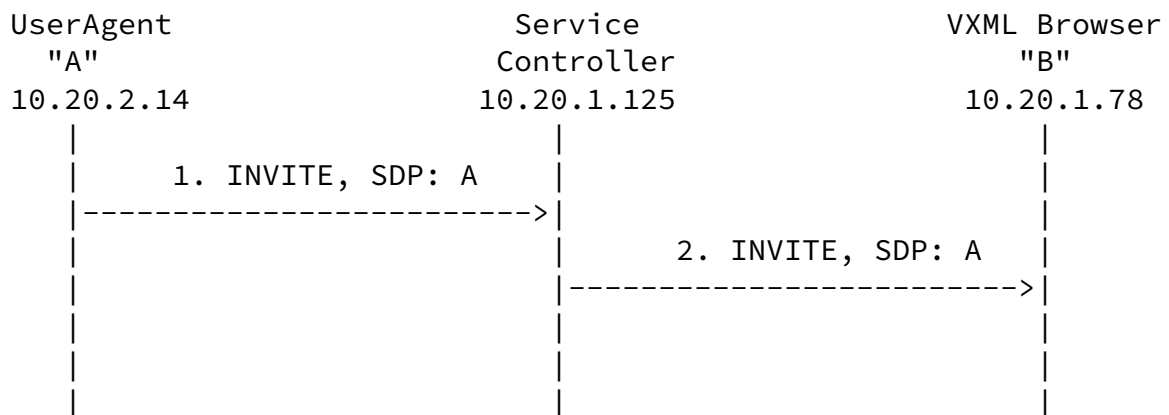
The call flow illustrates a user dialing an information service and interacting with an interactive voice system. In this case the user knows the choices being played by the Prompt Player, hence the user doesn't wait for the completion of the prompts to respond. The user responds, at Step 21, and the Speech Recognition Engine sends an "MRCP: START-OF-SPEECH" message to the Prompt Player to terminate the prompt playing. The speech is recognized and the associated, informational, prompt is played to the user.

NOTE: Following each flow diagram are actual SIP messages that demonstrate the insertion of MRCP message bodies. Identical, sequential ingress and egress SIP messages are combined for brevity.

## [2. Call Flow](#)

### [2.1 INVITE FROM USER AGENT](#)

User Agent "A" sends an INVITE to the VXML Browser requesting the service "myapplication."



\*\*\*\*\*  
\* Step 1 & 2 \*  
\*\*\*\*\*

```

INVITE sip:myapplication@10.20.1.125 SIP/2.0
From: sip:4444@10.20.2.14;tag=1c27508
To: sip:myapplication@10.20.1.125
Call-ID: call-1001631757-5@10.20.2.14
CSeq: 1 INVITE
Contact:sip:4444@10.20.2.14
Content-Type:application/sdp
Content-Length: 193
Accept-Language:en
Supported:sip-cc, sip-cc-01, timer
User-Agent:Pingtel/1.0.6 (VxWorks)
Via: SIP/2.0/UDP 10.20.2.14:5060

```

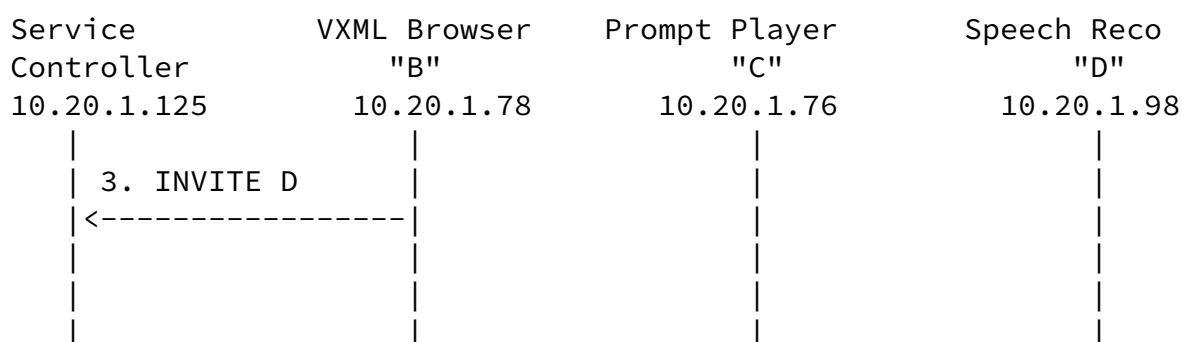
```

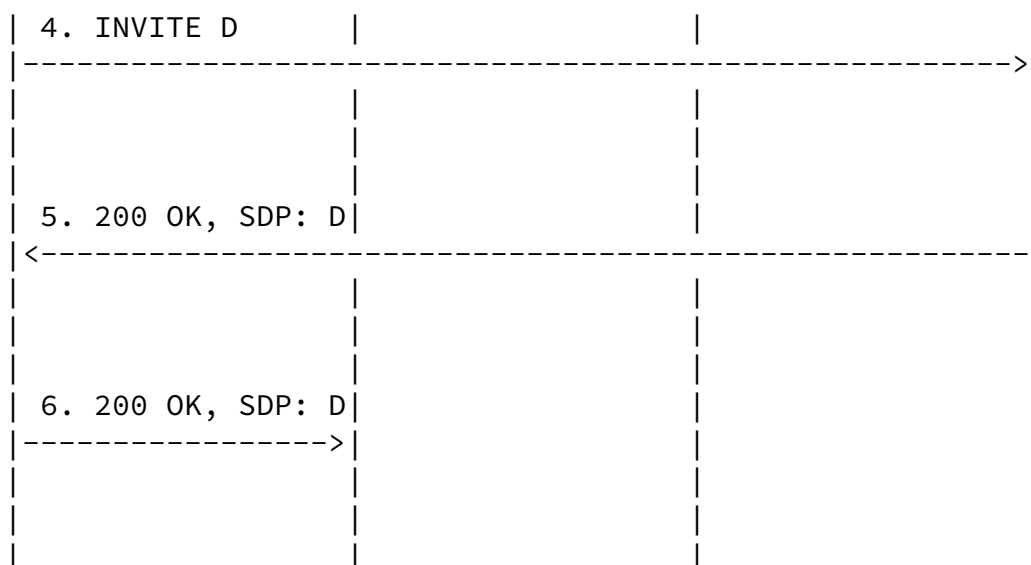
v=0
o=Pingtel 5 5 IN IP4 10.20.2.14
s=phone-call
c=IN IP4 10.20.2.14
t=0 0
m=audio 8766 RTP/AVP 0 96 8
a=rtpmap:0 pcmu/8000/1
a=rtpmap:96 telephone-event/8000/1
a=rtpmap:8 pcma/8000/1

```

## [2.2](#) VXML BROWSER INVITES SPEECH RECOGNITION ENGINE

The VXML Browser host's a VXML script for "myapplication." The script requires the services of Speech Recognition, an INVITE is proxied to the Speech Recognition to ascertain the availability of the resource.





\*\*\*\*\*  
 \* Step 3 \*  
 \*\*\*\*\*

```
INVITE sip:sipproxy@10.20.1.125:5060 SIP/2.0
From: sip:recoclient@10.20.1.78:6106
To: sip:myappreco@10.20.1.125
Contact: sip:recoclient@10.20.1.78:6106
Call-ID: 1001631391281@10.20.1.78
CSeq: 943958389 INVITE
Content-Length: 0
```

\*\*\*\*\*  
 \* Step 4 \*  
 \*\*\*\*\*

```
INVITE sip:sipproxy@10.20.1.98 SIP/2.0
From: sip:recoclient@10.20.1.78:6106
To: sip:myappreco@10.20.1.125
Contact: sip:recoclient@10.20.1.78:6106
Call-ID: 1001631391281@10.20.1.78
CSeq: 943958389 INVITE
Content-Length: 0
Via: SIP/2.0/UDP 10.20.1.125:5060;branch=1_MtrMzjN1TzZJj4HRDKZska99
Via: SIP/2.0/UDP 10.20.1.78:6106
Record-Route: <sip:sipproxy@10.20.1.98:5060;transport=udp;maddr=10.20.1.125>
```

\*\*\*\*\*

\* Step 5 & 6 \*

\*\*\*\*\*

SIP/2.0 200 Ok

Via: SIP/2.0/UDP 10.20.1.78:6106

From: sip:recoclient@10.20.1.78:6106

To: sip:myappreco@10.20.1.125;tag=ds071ee

Call-ID: 1001631391281@10.20.1.78

CSeq: 943958389 INVITE

Record-Route:<sip:sipproxy@10.20.1.98:5060;transport=udp;maddr=10.20.1.125>

Content-Length: 171

Content-Type:application/sdp

Contact:<sip:10.20.1.98:6105;transport=udp>

v=0

o=sandcherry 1001623233343 1001623233343 IN IP4 10.20.1.98

s=sales@sandcherry.com

e=sales@sandcherry.com

c=IN IP4 10.20.1.98

b=0

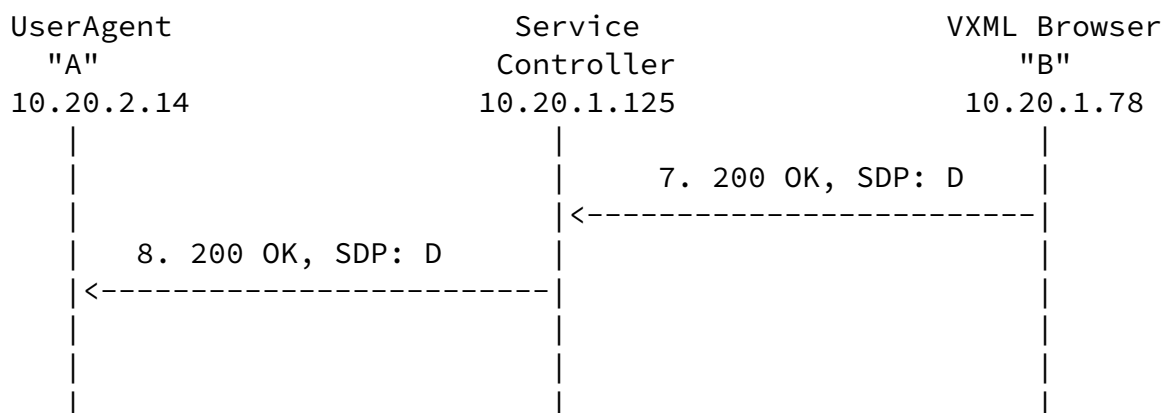
t=0 0

m=audio 17560 RTP/AVP 0

### [2.3](#) 200 OK PROXIED TO USER AGENT

When the VXML Browser receives the 200 OK from the Speech

Recognition Engine the call setup proceeds. The 200 OK is proxied to User Agent "A" with Speech Recognition SDP information.



```
*****  
* Step 7 & 8 *  
*****
```

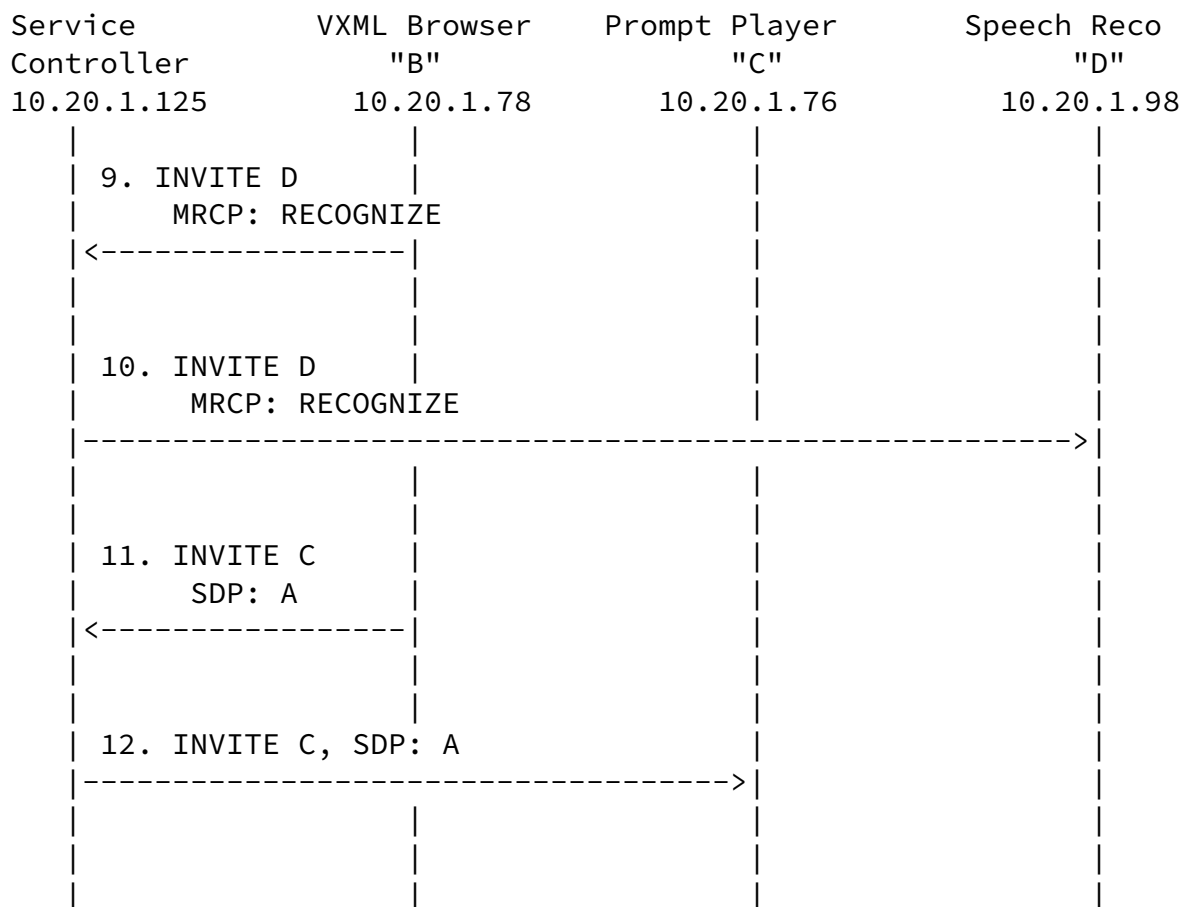
```
SIP/2.0 200 Ok  
Via: SIP/2.0/UDP 10.20.2.14:5060  
From: sip:4444@10.20.2.14;tag=1c27508  
To: sip:myapplication@10.20.1.125;tag=ds05569  
Call-ID: call-1001631757-5@10.20.2.14  
CSeq: 1 INVITE  
Record-Route:<sip:myapplication@10.20.1.78:5060;transport=udp;maddr=10.20.1.1.78>  
Content-Length: 171  
Content-Type:application/sdp  
Contact:<sip:10.20.1.78:6106;transport=udp>
```

```
v=0  
o=sandcherry 1001623233343 1001623233343 IN IP4 10.20.1.98  
s=sales@sandcherry.com  
e=sales@sandcherry.com  
c=IN IP4 10.20.1.98  
b=0  
t=0 0  
m=audio 17560 RTP/AVP 0
```

## 2.4 MRCP: RECOGNIZE PROXIED TO SPEECH RECO, PROMPT PLAYER INVITED

The VXML Browser sends a re-INVITE to the Speech Recognition Engine with "MRCP: RECOGNIZE" in the the message body. This instruction tells the Speech Recognition Engine to begin listening for speech. The MRCP message body also contains the "MY APPLICATION GRAMMAR" instruction that tells the Speech Recognition Engine which grammars, or sets of words, to listen for.

Following the re-INVITE to the Speech Recognition Engine the VXML Browser, per the VXML script, INVITES the Prompt Player with SDP of User Agent "A."



\*\*\*\*\*  
 \* Step 9 & 10 \*  
 \*\*\*\*\*

```
INVITE sip:sipproxy@10.20.1.98 SIP/2.0
From: sip:recoclient@10.20.1.78:6106
To: sip:myappreco@10.20.1.125;tag=ds071ee
Call-ID: 1001631391281@10.20.1.78
```

CSeq: 943958390 INVITE

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Content-Length: 178  
Content-Type: application/mrcp  
Route: <sip:10.20.1.98:6105;transport=udp>  
Contact: <sip:10.20.1.78:6106;transport=udp>  
Via: SIP/2.0/UDP 10.20.1.78:6106

RECOGNIZE 0 MRCP/1.0  
N-Best-List-Length:2  
Content-Type: text/uri-list  
No-Input-Timeout:3000  
Recognition-Timeout:10000  
Recognizer-Start-Timers:false  
Content-Length:5

MY APPLICATION GRAMMAR

\*\*\*\*\*  
\* Step 11 \*  
\*\*\*\*\*

INVITE sip:sipproxy@10.20.1.125:5060 SIP/2.0  
From: sip:promptclient@10.20.1.78:6106  
To: sip:myappprompt@10.20.1.125  
Contact: sip:promptclient@10.20.1.78:6106  
Call-ID: 1001631393109@10.20.1.78  
CSeq: 1601052353 INVITE  
Content-Length: 193  
Content-Type: application/sdp

v=0  
o=Pingtel 5 5 IN IP4 10.20.2.14  
s=phone-call  
c=IN IP4 10.20.2.14  
t=0 0  
m=audio 8766 RTP/AVP 0 96 8  
a=rtpmap:0 pcmu/8000/1  
a=rtpmap:96 telephone-event/8000/1  
a=rtpmap:8 pcma/8000/1

\*\*\*\*\*

\* Step 12 \*  
\*\*\*\*\*

INVITE sip:sipproxy@10.20.1.76 SIP/2.0  
From: sip:promptclient@10.20.1.78:6106  
To: sip:myappprompt@10.20.1.125  
Contact: sip:promptclient@10.20.1.78:6106  
Call-ID: 1001631393109@10.20.1.78

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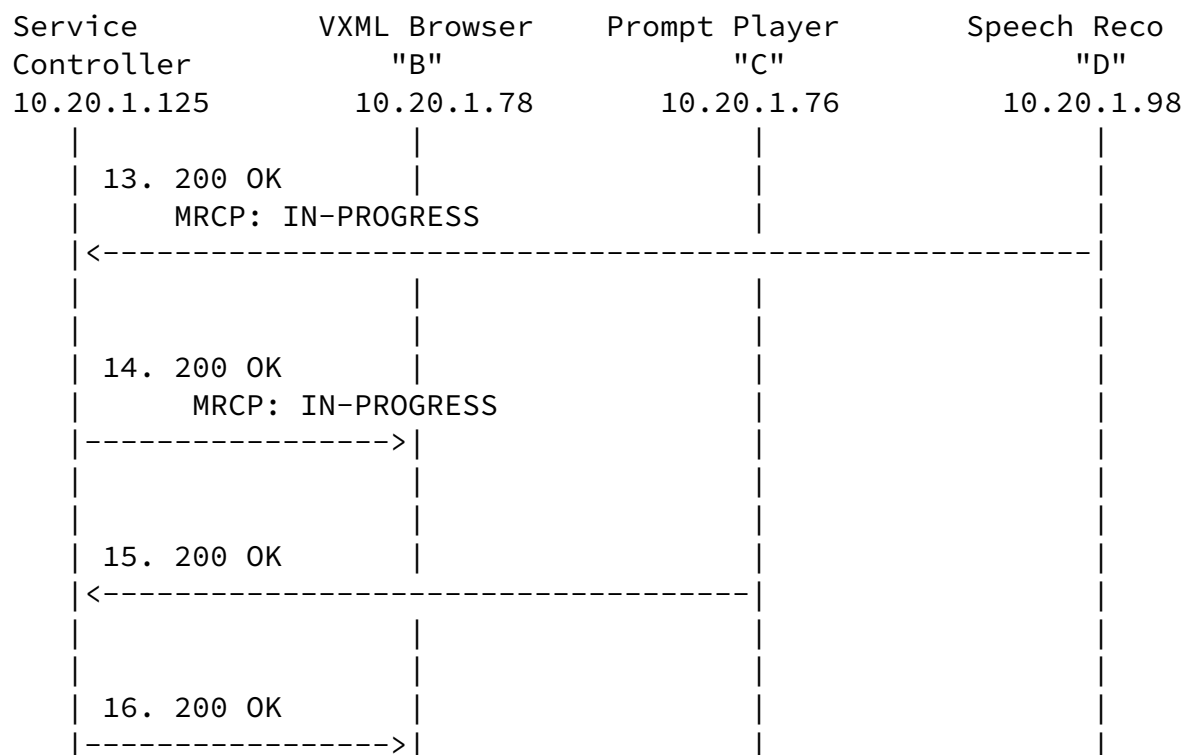
CSeq: 1601052353 INVITE  
Content-Length: 193  
Content-Type:application/sdp  
Via: SIP/2.0/UDP 10.20.1.125:5060;branch=1\_qrF28qA691vuJeW3TTgHBwQ99  
Via: SIP/2.0/UDP 10.20.1.78:6106  
Record-Route: <sip:sipproxy@10.20.1.76:5060;transport=udp;maddr=10.20.1.125>

v=0

o=Pingtel 5 5 IN IP4 10.20.2.14  
s=phone-call  
c=IN IP4 10.20.2.14  
t=0 0  
m=audio 8766 RTP/AVP 0 96 8  
a=rtpmap:0 pcmu/8000/1  
a=rtpmap:96 telephone-event/8000/1  
a=rtpmap:8 pcma/8000/1

## [2.5](#) 200 OK'S FROM SPEECH RECO AND PROMPT PLAYER

The Speech Recognition returns a 200 OK with "MRCP: IN-PROGRESS" message body, and Prompt Player returns a 200 OK.



\*\*\*\*\*  
\* Step 13 & 14 \*  
\*\*\*\*\*

SIP/2.0 200 Ok  
Via: SIP/2.0/UDP 10.20.1.78:6106  
From: sip:recoclient@10.20.1.78:6106  
To: sip:myappreco@10.20.1.125;tag=ds071ee  
Call-ID: 1001631391281@10.20.1.78  
CSeq: 943958390 INVITE  
Record-Route:<sip:sipproxy@10.20.1.98:5060;transport=udp;maddr=10.20.1.125>  
Content-Length: 30  
Content-Type:application/mrcp  
Contact:<sip:10.20.1.98:6105;transport=udp>

MRCP/1.0 0 200 IN-PROGRESS

\*\*\*\*\*

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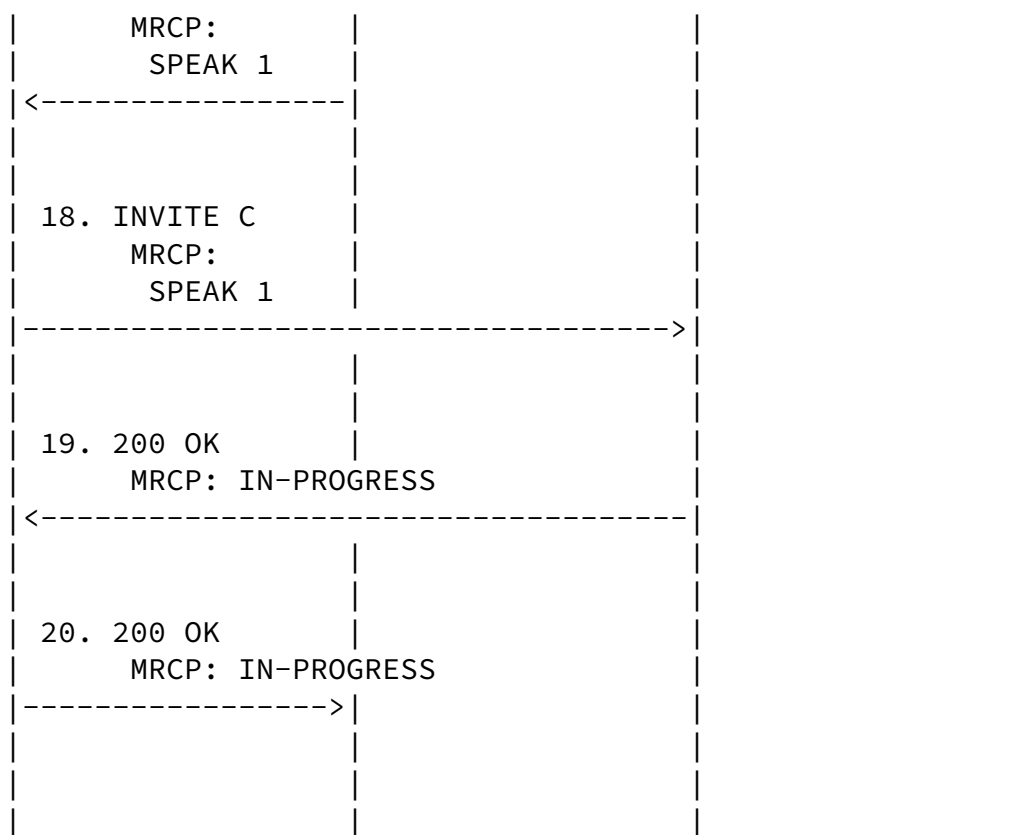
\* Step 15 & 16 \*  
\*\*\*\*\*

SIP/2.0 200 Ok  
Via: SIP/2.0/UDP 10.20.1.78:6106  
From: sip:promptclient@10.20.1.78:6106  
To: sip:myappprompt@10.20.1.125;tag=ds0f262  
Call-ID: 1001631393109@10.20.1.78  
CSeq: 1601052353 INVITE  
Record-Route:<sip:sipproxy@10.20.1.76:5060;transport=udp;maddr=10.20.1.125>  
Content-Length: 0  
Contact:<sip:10.20.1.76:6101;transport=udp>

## [2.6](#) MRCP: SPEAK 1 PROXIED TO PROMPT PLAYER, MRCP: IN-PROGRESS RETURNED

The VXML Browser sends a re-INVITE with "MRCP: SPEAK 1" message body. "SPEAK 1" tells the Prompt Player to play "1" prompts. 200 OK with "MRCP: IN-PROGRESS" message body is returned from Prompt Player.

Service Controller	VXML Browser "B"	Prompt Player "C"	Speech Reco "D"
10.20.1.125	10.20.1.78	10.20.1.76	10.20.1.98
17. INVITE C			



\*\*\*\*\*  
 \* Step 17 \*  
 \*\*\*\*\*

```

INVITE sip:sipproxy@10.20.1.76 SIP/2.0
From: sip:promptclient@10.20.1.78:6106
To: sip:myappprompt@10.20.1.125;tag=ds0f262
Call-ID: 1001631393109@10.20.1.78
CSeq: 1601052354 INVITE
Content-Length: 108
Content-Type:application/mrcp
Route: <sip:10.20.1.76:6101;transport=udp>
Contact:<sip:10.20.1.78:6106;transport=udp>
  
```

Via: SIP/2.0/UDP 10.20.1.78:6106

```

SPEAK 1 MRCP/1.0
Content-Type:text/uri-list
Content-Length:41
  
```

\*\*\*\*\*  
\* Step 18 \*  
\*\*\*\*\*

INVITE sip:10.20.1.76:6101;transport=udp SIP/2.0  
From: sip:promptclient@10.20.1.78:6106  
To: sip:myappprompt@10.20.1.125;tag=ds0f262  
Call-ID: 1001631393109@10.20.1.78  
CSeq: 1601052354 INVITE  
Content-Length: 108  
Content-Type:application/mrcp  
Contact: <sip:10.20.1.78:6106;transport=udp>  
Via: SIP/2.0/UDP 10.20.1.125:5060;branch=1\_z6Y1Q7rzmpD2qNxn54enPA99  
Via: SIP/2.0/UDP 10.20.1.78:6106  
Record-Route:<sip:sipproxy@10.20.1.76:5060;transport=udp;maddr=10.20.1.125>

SPEAK 1 MRCP/1.0  
Content-Type:text/uri-list  
Content-Length:41

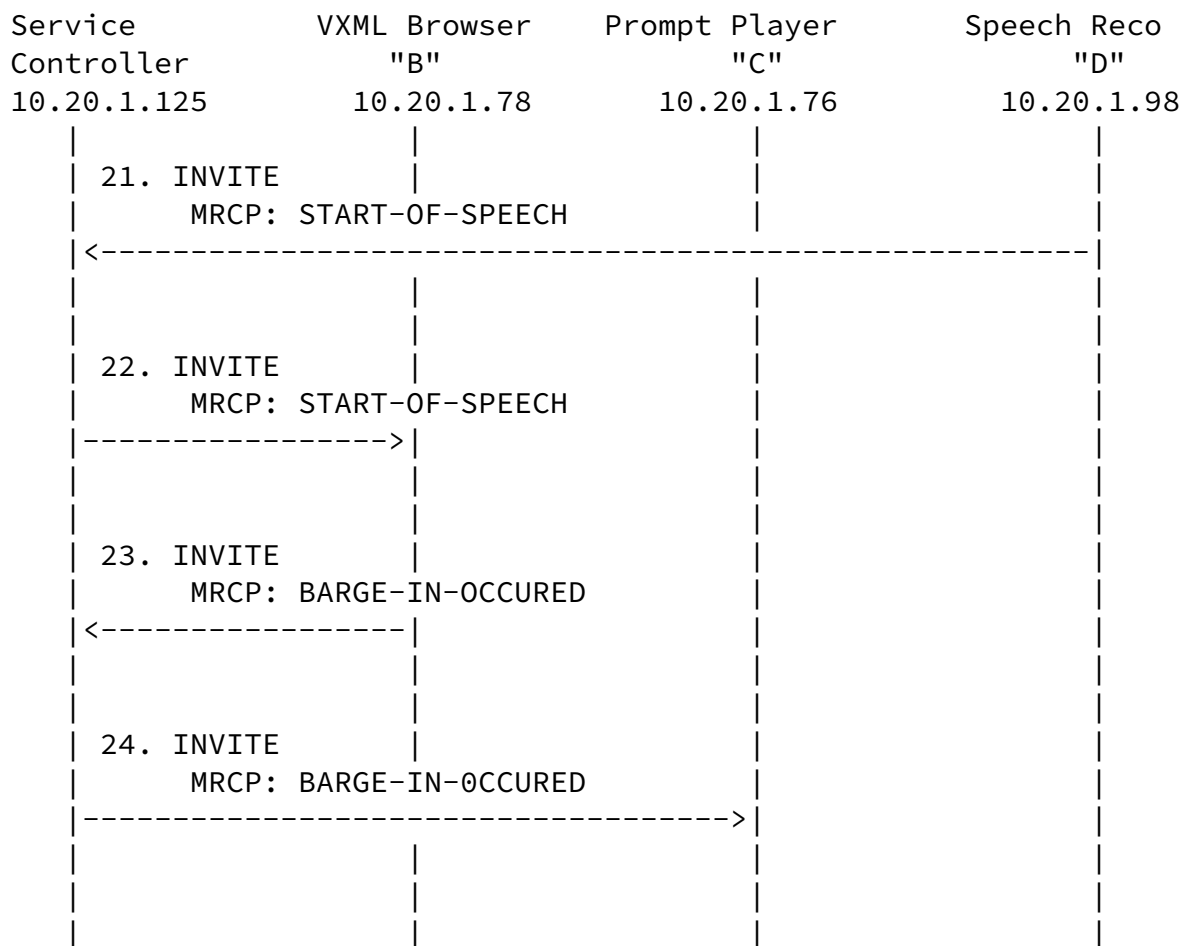
\*\*\*\*\*  
\* Step 19 & 20 \*  
\*\*\*\*\*

SIP/2.0 200 Ok  
Via: SIP/2.0/UDP 10.20.1.78:6106  
From: sip:promptclient@10.20.1.78:6106  
To: sip:myappprompt@10.20.1.125;tag=ds0f262  
Call-ID: 1001631393109@10.20.1.78  
CSeq: 1601052354 INVITE  
Record-Route:<sip:sipproxy@10.20.1.76:5060;transport=udp;maddr=10.20.1.125>  
Content-Length: 30  
Content-Type:application/mrcp  
Contact:<sip:10.20.1.76:6101;transport=udp>

MRCP/1.0 1 200 IN-PROGRESS

## 2.7 MRCP: START-OF-SPEECH AND MRCP: BARGE-IN-OCCURED

The Speech Recognition Engine detects speech and immediately sends an INVITE, with "MRCP: START-OF-SPEECH" message body, to the VXML Browser notifying the VXML Browser that User Agent "A" is speaking. The VXML Browser must send a termination instruction to the Prompt Player to inform Prompt Player to stop playing prompt. The VXML Browser uses a re-INVITE with "MRCP: BARGE-IN-OCCURED" to terminate prompt playing.



\*\*\*\*\*  
\* Step 21 & 22 \*  
\*\*\*\*\*

```
INVITE sip:sipproxy@10.20.1.98 SIP/2.0
From: sip:myappreco@10.20.1.125;tag=ds071ee
To: sip:recoclient@10.20.1.78:6106
Call-ID: 1001631391281@10.20.1.78
CSeq: 903953173 INVITE
Content-Length: 31
Content-Type:application/mrcp
```

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Route: <sip:10.20.1.78:6106;transport=udp>  
Contact:<sip:10.20.1.98:6105;transport=udp>  
Via: SIP/2.0/UDP 10.20.1.98:6105

START-OF-SPEECH 0 MRCP/1.0

\*\*\*\*\*  
\* Step 23 \*  
\*\*\*\*\*

INVITE sip:sipproxy@10.20.1.76 SIP/2.0  
From: sip:promptclient@10.20.1.78:6106  
To: sip:myappprompt@10.20.1.125;tag=ds0f262  
Call-ID: 1001631393109@10.20.1.78  
CSeq: 1601052355 INVITE  
Content-Length: 31  
Content-Type:application/mrcp  
Route: <sip:10.20.1.76:6101;transport=udp>  
Contact:<sip:10.20.1.78:6106;transport=udp>  
Via: SIP/2.0/UDP 10.20.1.78:6106

BARGE\_IN\_OCCURED 2 MRCP/1.0

\*\*\*\*\*  
\* Step 24 \*  
\*\*\*\*\*

INVITE sip:10.20.1.76:6101;transport=udp SIP/2.0  
From: sip:promptclient@10.20.1.78:6106  
To: sip:myappprompt@10.20.1.125;tag=ds0f262  
Call-ID: 1001631393109@10.20.1.78  
CSeq: 1601052355 INVITE  
Content-Length: 31  
Content-Type:application/mrcp  
Contact: <sip:10.20.1.78:6106;transport=udp>  
Via: SIP/2.0/UDP 10.20.1.125:5060;branch=1\_z6Y1Q7rzmpD2qNxn54enPA99  
Via: SIP/2.0/UDP 10.20.1.78:6106  
Record-Route:<sip:sipproxy@10.20.1.76:5060;transport=udp;maddr=10.20.1.125>

BARGE\_IN\_OCCURED 2 MRCP/1.0

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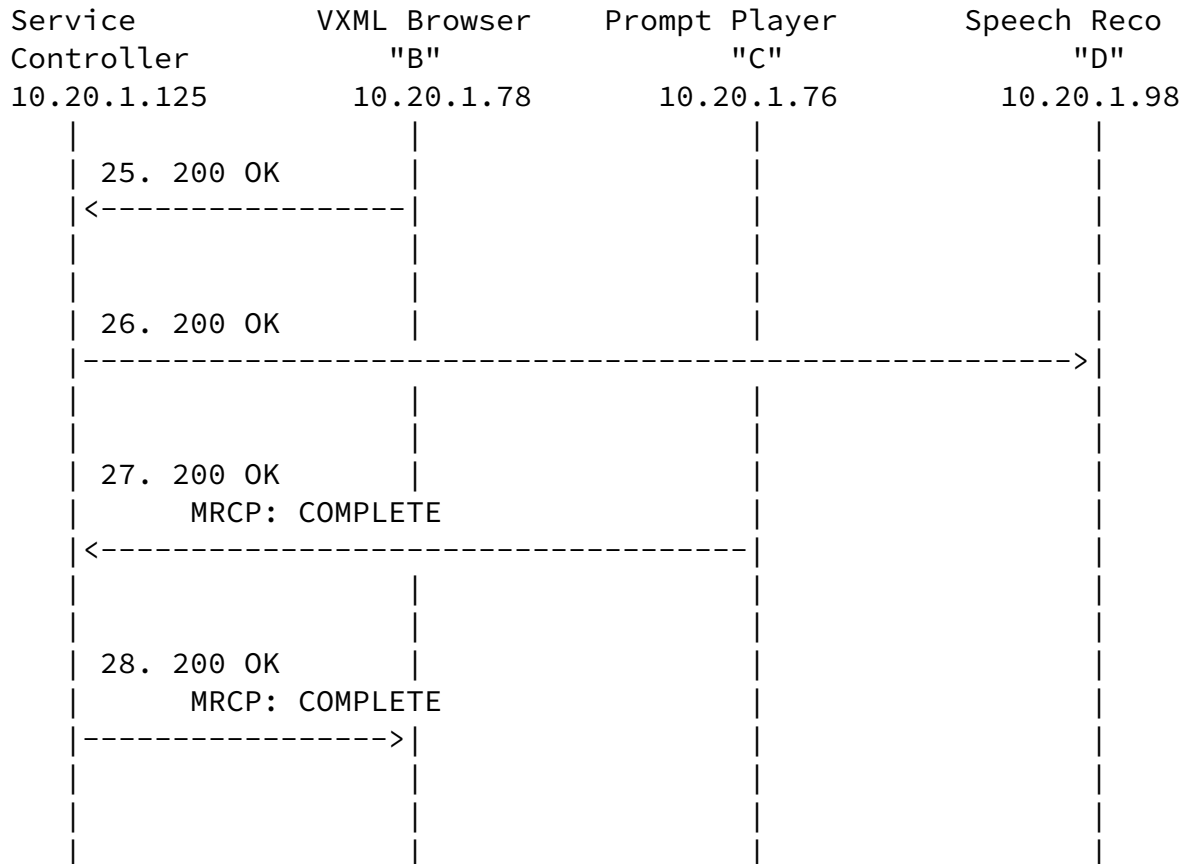
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### [2.8](#) 200 OK FROM SPEECH RECO, PROMPT PLAYER RETURNS MRCP: COMPLETE

The VXML Browser acknowledges the INVITE with "MRCP: START-OF-SPEECH" from the Speech recognition Engine.

The Prompt Player responds to the "MRCP: BARGE-IN-OCCURED" with a 200 OK with "MRCP: COMPLETE" message body. "MRCP: COMPLETE" confirms the Prompt Player terminated prompt playing.



\*\*\*\*\*

\* Step 25 & 26 \*

\*\*\*\*\*

SIP/2.0 200 Ok  
Via: SIP/2.0/UDP 10.20.1.98:6105  
From: sip:myappreco@10.20.1.125;tag=ds071ee  
To: sip:recoclient@10.20.1.78:6106  
Call-ID: 1001631391281@10.20.1.78  
CSeq: 903953173 INVITE  
Record-Route:<sip:sipproxy@10.20.1.98:5060;transport=udp;maddr=10.20.1.125>  
Content-Length: 0  
Contact:<sip:10.20.1.78:6106;transport=udp>

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\*\*\*\*\*

\* Step 27 & 28 \*

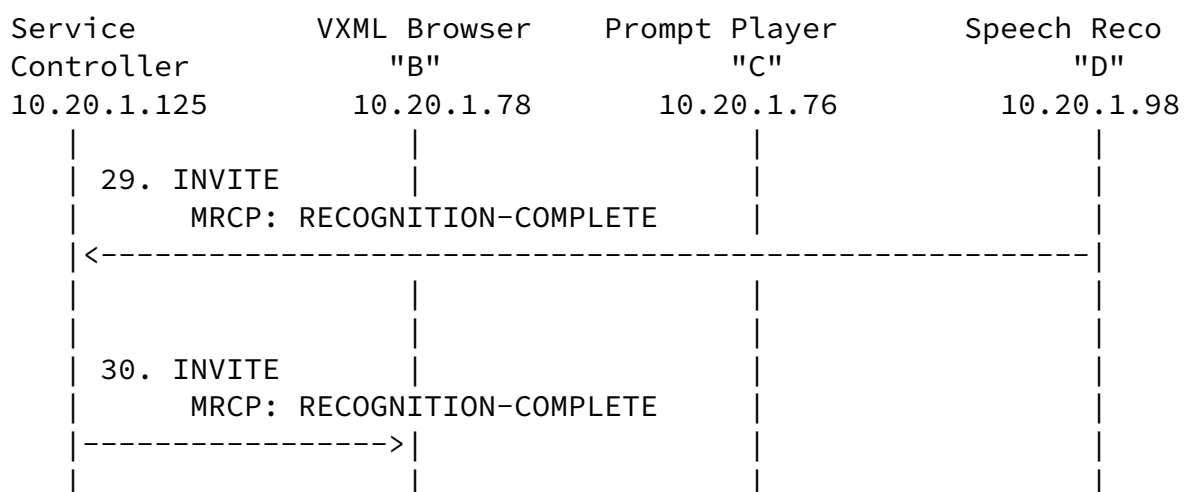
\*\*\*\*\*

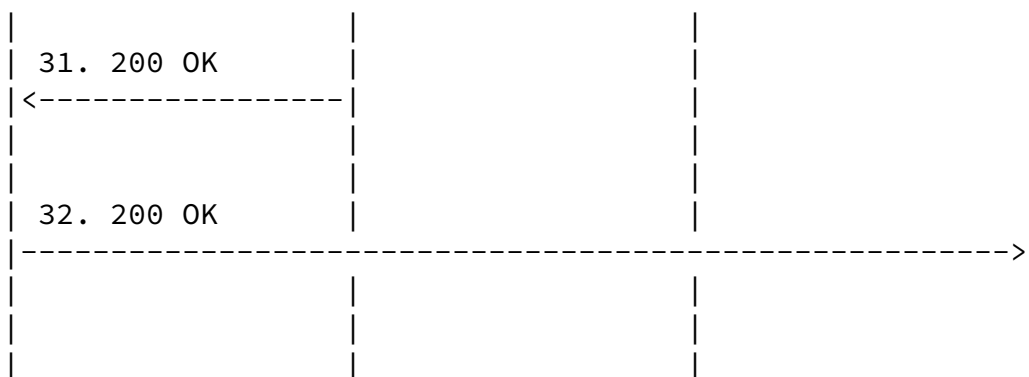
SIP/2.0 200 Ok  
Via: SIP/2.0/UDP 10.20.1.78:6106  
From: sip:promptclient@10.20.1.78:6106  
To: sip:myappprompt@10.20.1.125;tag=ds0f262  
Call-ID: 1001631393109@10.20.1.78  
CSeq: 1601052355 INVITE  
Record-Route:<sip:sipproxy@10.20.1.76:5060;transport=udp;maddr=10.20.1.125>  
Content-Length: 27  
Content-Type:application/mrcp  
Contact:<sip:10.20.1.76:6101;transport=udp>

MRCP/1.0 2 200 COMPLETE

## [2.9](#) MRCP: RECOGNITION-COMPLETE

The Speech Recognition Engine recognizes the speech and sends a re-INVITE with "MRCP: RECOGNITION-COMPLETE." In the "MRCP: RECOGNITION-COMPLETE" message today the recognized words are inserted, "hello world."





\*\*\*\*\*  
 \* Step 29 & 30 \*  
 \*\*\*\*\*

INVITE sip:icm@10.20.1.98 SIP/2.0  
 From: sip:busreco@10.20.1.125;tag=ds071ee  
 To: sip:recoclient@10.20.1.78:6106  
 Call-ID: 1001631391281@10.20.1.78  
 CSeq: 903953174 INVITE  
 Content-Length: 156  
 Content-Type:application/mrcp  
 Route: <sip:10.20.1.78:6106;transport=udp>  
 Contact:<sip:10.20.1.98:6105;transport=udp>  
 Via: SIP/2.0/UDP 10.20.1.98:6105

RECOGNITION-COMplete 0 COMPLETE MRCP/1.0

Completion-Cause:0 success  
 Content-Length:65

SWI\_meaning=hello world  
 RESULT=hello world  
 SWI\_literal=hello world  
 SWI\_grammarName=MY APPLICATION grammar

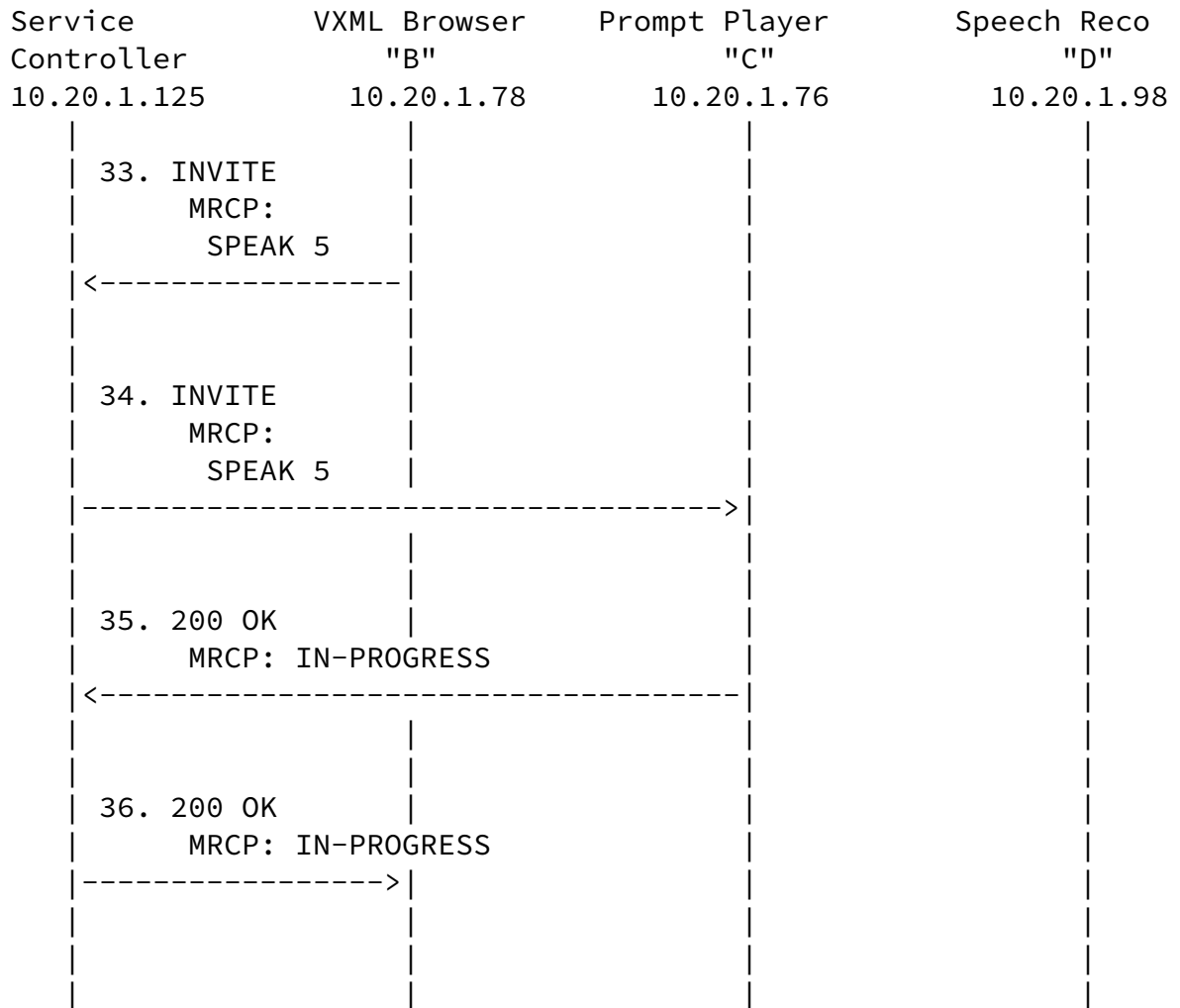
\*\*\*\*\*  
 \* Step 31 & 32 \*  
 \*\*\*\*\*

SIP/2.0 200 Ok  
 Via: SIP/2.0/UDP 10.20.1.98:6105

From: sip:myappreco@10.20.1.125;tag=ds071ee  
To: sip:recoclient@10.20.1.78:6106  
Call-ID: 1001631391281@10.20.1.78  
CSeq: 903953174 INVITE  
Record-Route:<sip:sipproxy@10.20.1.98:5060;transport=udp;maddr=10.20.1.125>  
Content-Length: 0  
Contact:<sip:10.20.1.78:6106;transport=udp>

#### [2.10](#) MRCP: SPEAK 5 PROXIED TO PROMPT PLAYER, MRCP: IN-PROGRESS RETURNED

The VXML Browser receives "hello world" in the "MRCP: RECOGNITION-COMplete" message body. From the executing VXML script the VXML Browser determines that "hello world" corresponds to "SPEAK 5," and sends a re-INVITE to the Prompt Player with "MRCP: SPEAK 5." 200 OK with "MRCP: IN-PROGRESS" is returned, prompt "5" is being played.



\*\*\*\*\*  
 \* Step 33 \*  
 \*\*\*\*\*

```
INVITE sip:sipproxy@10.20.1.76 SIP/2.0
From: sip:promptclient@10.20.1.78:6106
To: sip:myappprompt@10.20.1.125;tag=ds0f262
Call-ID: 1001631393109@10.20.1.78
CSeq: 1601052356 INVITE
Content-Length: 106
Content-Type:application/mrcp
```

Route: <sip:10.20.1.76:6101;transport=udp>  
Contact:<sip:10.20.1.78:6106;transport=udp>  
Via: SIP/2.0/UDP 10.20.1.78:6106

SPEAK 5 MRCP/1.0  
Content-Type:text/uri-list  
Content-Length:39

\*\*\*\*\*  
\* Step 34 \*  
\*\*\*\*\*

INVITE sip:10.20.1.76:6101;transport=udp SIP/2.0  
From: sip:promptclient@10.20.1.78:6106  
To: sip:myappprompt@10.20.1.125;tag=ds0f262  
Call-ID: 1001631393109@10.20.1.78  
CSeq: 1601052356 INVITE  
Content-Length: 106  
Content-Type:application/mrcp  
Contact: <sip:10.20.1.78:6106;transport=udp>  
Via: SIP/2.0/UDP 10.20.1.125:5060;branch=1\_z6Y1Q7rzmpD2qNxn54enPA99  
Via: SIP/2.0/UDP 10.20.1.78:6106  
Record-Route:<sip:sipproxy@10.20.1.76:5060;transport=udp;maddr=10.20.1.125>

SPEAK 5 MRCP/1.0  
Content-Type:text/uri-list  
Content-Length:39

\*\*\*\*\*  
\* Step 35 & 36 \*  
\*\*\*\*\*

SIP/2.0 200 Ok  
Via: SIP/2.0/UDP 10.20.1.78:6106  
From: sip:promptclient@10.20.1.78:6106  
To: sip:myappprompt@10.20.1.125;tag=ds0f262  
Call-ID: 1001631393109@10.20.1.78  
CSeq: 1601052356 INVITE  
Record-Route:<sip:sipproxy@10.20.1.76:5060;transport=udp;maddr=10.20.1.125>  
Content-Length: 30  
Content-Type:application/mrcp  
Contact:<sip:10.20.1.76:6101;transport=udp>

MRCP/1.0 5 200 IN-PROGRESS

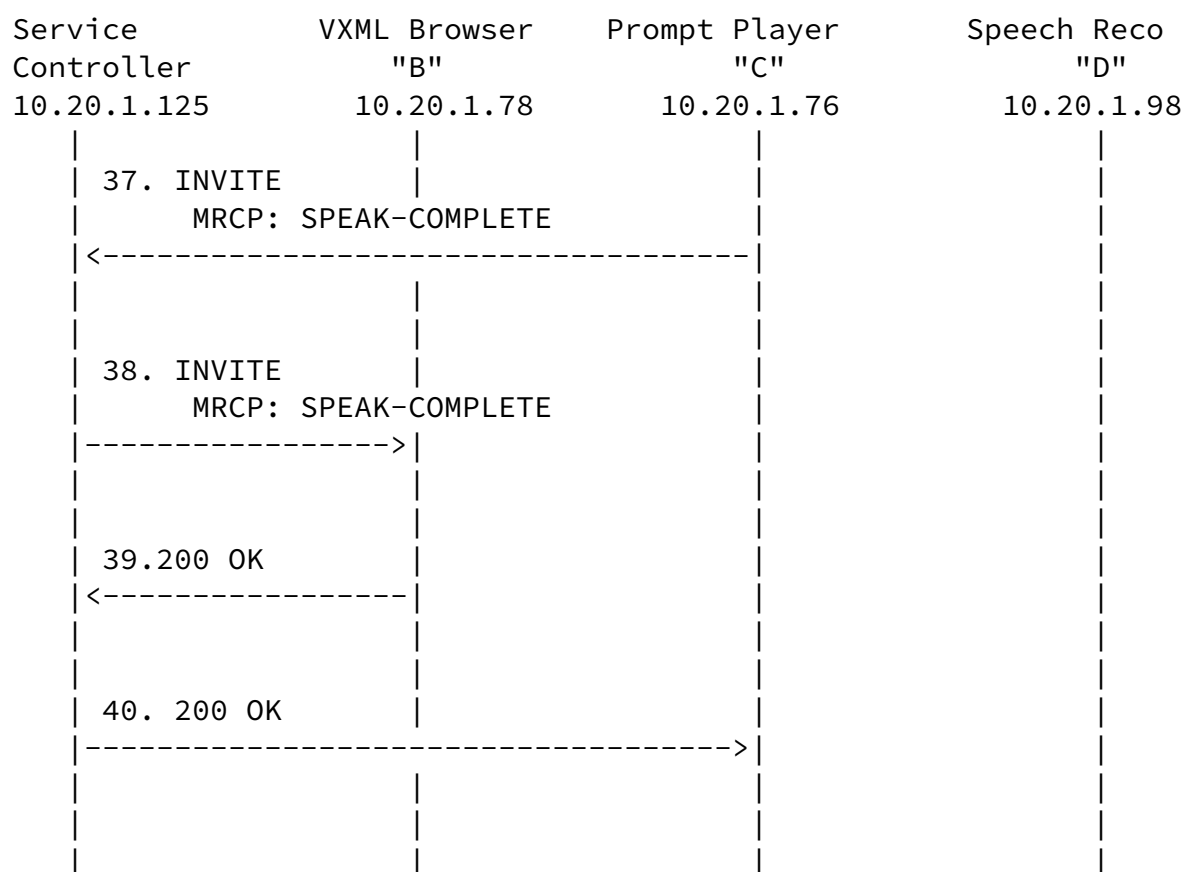
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[2.11](#) MRCP: SPEAK-COMPLETE RETURNED FROM PROMPT PLAYER

When prompt "5" finishes playing the Prompt Player sends an INVITE with "MRCP: SPEAK-COMPLETE" message body to notify the VXML Browser prompt "5" has finished. The VXML Browser responds to the "MRCP: SPEAK-COMPLETE" with a 200 OK.



\*\*\*\*\*  
 \* Step 37 & 38 \*  
 \*\*\*\*\*

```

INVITE sip:sipproxy@10.20.1.76 SIP/2.0
From: sip:myappprompt@10.20.1.125;tag=ds0f262
To: sip:promptclient@10.20.1.78:6106
Call-ID: 1001631393109@10.20.1.78
CSeq: 904379283 INVITE
Content-Length: 66
Content-Type:application/mrcp
  
```

Route: <sip:10.20.1.78:6106;transport=udp>  
Contact:<sip:10.20.1.76:6101;transport=udp>  
Via: SIP/2.0/UDP 10.20.1.76:6101

SPEAK-COMPLETED 5 COMPLETE MRCP/1.0

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Completion-Cause:0 normal

\*\*\*\*\*  
\* Step 39 & 40 \*  
\*\*\*\*\*

SIP/2.0 200 Ok  
Via: SIP/2.0/UDP 10.20.1.76:6101  
From: sip:myappprompt@10.20.1.125;tag=ds0f262  
To: sip:promptclient@10.20.1.78:6106  
Call-ID: 1001631393109@10.20.1.78  
CSeq: 904379283 INVITE  
Record-Route:<sip:sipproxy@10.20.1.76:5060;transport=udp;maddr=10.20.1.125>  
Content-Length: 0  
Contact:<sip:10.20.1.78:6106;transport=udp>

### [3.](#) Summary

The SIP INFO Method was explored as a possible alternative to the re-INVITE method demonstrated here. However, due to the stateless nature of the INFO Method it was determined that the INFO Method did not lend itself to the stateful MRCP message structure. Like SIP, MRCP is comprised of Initial, Informational, and Final Response messages. Due to the complexity and depth of interaction involved in multi-component interaction, debugging communication failures among the components is greatly simplified by mapping SIP message state to MRCP message state.

Also note that the call flow illustrated in this draft does not use Informational Response Messages, ie., 1xx messages. Currently, the application(s) supported are basic and do not use the full range of MRCP messages, hence many MRCP Informational Messages are not implemented and those that are are being carried in re-INVITE messages. Our expectation is that as applications mature it will become increasingly necessary to incorporate the complete MRCP message set, and as a matter of course it will become a natural evolution to strictly map all MRCP Informational Response Messages to SIP Informational Responses Messages.

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## [Appendix A](#). Acknowledgements

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