Element Specifications for Cisco Unified CVP VXML Server and Cisco Unified Call Studio

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Americas Headquarters
Cisco Systems, Inc.
170 West Tasman Drive
San Jose, CA 95134-1706
USA
http://www.cisco.com
Tel: 408 526-4000
800 553-NETS (6387)
Fax: 408 527-0833

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Preface

Purpose

This document provides specifications for the elements included with VXML Server.

Audience

This document is intended for voice application developers using Call Studio and VXML Server.

Organization

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Related Documentation

Note: Planning your Unified CVP solution is an important part of the process in setting up Unified CVP. Cisco recommends that you read **Cisco Unified Customer Voice Portal Release**

Solution Reference Network Design (SRND) (http://www.cisco.com/en/US/products/sw/custcosw/ps1006/products_implementation_design_guides_list.html) guide *before* configuring your Unified CVP solution. With Unified CVP 8.x, the Planning Guide for Cisco Unified Customer Voice Portal has been incorporated into the SRND guide.

Unified CVP provides the following documentation:

- *Cisco Security Agent Installation/Deployment for Cisco Unified Customer Voice Portal* provides installation instructions and information about Cisco Security Agent for the Unified CVP deployment. **We strongly urge you to read this document in its entirety.**
- **Cisco Unified Customer Voice Portal Release Solution Reference Network Design (SRND)** (http://www.cisco.com/en/US/products/sw/custcosw/ps1006/products_implementation_design_guides_list.html) provides design considerations and guidelines for deploying contact center voice response solutions based on Cisco Unified Customer Voice Portal (CVP) releases.
- **Getting Started with Cisco Unified Customer Voice Portal** (http://www.cisco.com/en/US/products/sw/custcosw/ps1006/products_installation_and_configuration_guides_list.html) provides instructions to create a simplified Unified CVP lab setup and perform basic call flow model exercises.
- **Configuration and Administration Guide for Cisco Unified Customer Voice Portal** (http://www.cisco.com/en/US/products/sw/custcosw/ps1006/products_installation_and_configuration_guides_list.html)describes how to configure, run, and administer the Cisco Unified CVP product, including associated configuration.
- **Element Specifications for Cisco Unified CVP VXML Server and Unified Call Studio** (http://www.cisco.com/en/US/products/sw/custcosw/ps1006/products_programming_reference_guides_list.html) describes the settings, element data, exit states, and configuration options for Elements.
- **Installation and Upgrade Guide for Cisco Unified Customer Voice Portal** (http://www.cisco.com/en/US/products/sw/custcosw/ps1006/tsd_products_support_series_home.html) describes how to install Unified CVP software, perform initial configuration, and upgrade.
- **Operations Console Online Help for Cisco Unified Customer Voice Portal** (http://www.cisco.com/en/US/products/sw/custcosw/ps1006/products_user_guide_list.html) describes how to use the Operations Console to configure Unified CVP solution components.

  Note: There is a printable (PDF) version of the Operations Console online help. Refer to the **Operations Console User Guide for Cisco Unified Customer Voice Portal** (http://www.cisco.com/en/US/products/sw/custcosw/ps1006/products_user_guide_list.html). The user guide also explains how to log into the Operations Console.
- **Port Utilization Guide for Cisco Unified Customer Voice Portal** (http://www.cisco.com/en/US/products/sw/custcosw/ps1006/prod_technical_reference_list.html) describes the ports used in a Unified CVP deployment.
- **User Guide for Cisco Unified CVP VXML Server and Unified Call Studio** (http://www.cisco.com/en/US/products/sw/custcosw/ps1006/products_user_guide_list.html) describes

the functionality of Call Studio including creating projects, using the Call Studio environment, and deploying applications to the Unified CVP VXML Server.

- **Reporting Guide for Cisco Unified Customer Voice Portal** (http://www.cisco.com/en/US/products/sw/custcosw/ps1006/products_installation_and_configuration_guides_list.html) describes the Reporting Server, including how to configure and manage it, and discusses the hosted database.
- **Say It Smart Specifications for Cisco Unified CVP VXML Server and Unified Call Studio** (http://www.cisco.com/en/US/products/sw/custcosw/ps1006/products_user_guide_list.html) describes in detail the functionality and configuration options for all Say It Smart plugins included with the software.
- **Troubleshooting Guide for Cisco Unified Customer Voice Portal** (http://www.cisco.com/en/US/products/sw/custcosw/ps1006/prod_troubleshooting_guides_list.html) describes how to isolate and solve problems in the Unified CVP solution.
- **Troubleshooting Wiki for Cisco Unified Customer Voice Portal** (http://docwiki.cisco.com/wiki/Troubleshooting_Unified_Customer_Voice_Portal) describes how to isolate and solve problems in the Unified CVP solution.

For additional information about Unified ICME, refer to the **Cisco web site listing Unified ICME documentation** (http://www.cisco.com/en/US/products/sw/custcosw/ps1001/tsd_products_support_series_home.html).

Conventions

This manual uses the following conventions:

Convention	Description
boldface font	Boldface font is used to indicate commands, such as user entries, keys, buttons, and folder and submenu names. For example: • Choose **Edit > Find**. • Click **Finish**.
italic font	Italic font is used to indicate the following: • To introduce a new term. Example: A *skill group* is a collection of agents who share similar skills. • For emphasis. Example: *Do not* use the numerical naming convention. • A syntax value that the user must replace. Example: IF (*condition*, *true-value*, *false-value*) • A book title. Example: See the *Cisco CRS Installation Guide*.

Convention	Description
`window font`	Window font, such as Courier, is used for the following: • Text as it appears in code or that the window displays. Example: `<html><title>Cisco Systems,Inc. </title></html>`
`< >`	Angle brackets are used to indicate the following: • For arguments where the context does not allow italic, such as ASCII output. • A character string that the user enters but that does not appear on the window such as a password.

Obtaining Documentation and Submitting a Service Request

For information on obtaining documentation, submitting a service request, and gathering additional information, see the monthly *What's New in Cisco Product Documentation*, which also lists all new and revised Cisco technical documentation, at:

http://www.cisco.com/en/US/docs/general/whatsnew/whatsnew.html

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Documentation Feedback

Chapter 1

Introduction

Every element included with Call Studio and VXML Server must be configured before it can be used. This reference file contains a detailed specification for each of the core Cisco Unified Customer Voice Portal (Unified CVP) elements, listing all the options available in the configuration. The specifications must be followed, or the element may complain with an error message or behave erratically.

Each element specification in this reference file presents information on some or all of the following topics:

- **Overview** – Each specification starts with a brief description of the element's behavior including what it does, how it reacts to various settings and audio groups, and other miscellaneous behavior. This information should help the developer decide whether to use these elements in an application or to rely on custom elements.
- **Settings** – Settings contain information that affects how the element behaves. Each setting has the following attributes:
  - **Type** – The type of data accepted such as a boolean, integer, or enumeration.
  - **Required** – This defines whether the setting is required to have a value *if the setting is active* (available to be configured in Builder for Studio).

    Note: The definition of required in this case is that the setting must have an appropriate value for Builder for Studio to validate the voice element configuration.
  - **Single setting value** – This defines whether the setting can have multiple values. If set to **`true`**, then the setting may have only a single configuration value. Multiple value settings are created in Builder for Studio by right clicking on the setting and choosing the *add setting name* option.
  - **Substitution allowed** – This setting attribute determines if the setting value can include substitution.

  - **Default** – The initial value of an element setting when a new element is dragged to the workspace.

- **Element Data** – Some elements capture data or yield information that may be useful to other elements, or for logging purposes. The variables created by each element are listed here.

- **Exit States** – Each element may have one or more exit states that indicate the dialog status when the element execution has completed. Exit states do not appear in an element configuration and cannot be changed.

- **Audio Groups** – Voice elements define audio groups that define the different places within the element that audio can be played. Application designers configure the contents of audio groups as a list of audio items that are played one after the other. Audio items may be pre-recorded audio files, text-to-speech (TTS) phrases, and Say It Smart types (playback of formatted data such as dates, currency amounts, and so on). Each audio group can be required or optional and can also define multiple counts. Audio groups with multiple counts are used to define different audio to play each time a certain VoiceXML event occurs (often known as tapered prompts).

Chapter 2

Application_Modifier

The **`Application_Modifier`** action element is used to modify context variables and remove session data values at runtime in a voice application. It allows for a developer to change the application's environment anywhere in the callflow. A typical use for the Application_Modifier element would be for multi-language support because it can be used to change the application level **`xml:lang`** and encoding values. Visiting an Application_Modifier element instance will update the application for the current session only.

This chapter contains the following topics:

Settings

Name (Label)	Type	Req'd	Single Setting Value	Substitution Allowed	Default	Notes
maintainer (Maintainer)	string	No	**`true`**	**`true`**	*None*	This setting specifies the e-mail address of the voice application administrator. This value is set in a VoiceXML **`<meta>`** tag.
language (Language)	string	No	**`true`**	**`true`**	*None*	This setting specifies the language identifier to specify in each VoiceXML document's **`xml:lang`** attribute. This value is set in the **`<vxml>`** tag.
encoding (Encoding)	string	No	**`true`**	**`true`**	*None*	This setting specifies the encoding to use when creating VoiceXML documents. This value is set in the **`<xml>`** tag.

default_audio_path (Default Audio Path)	string	No	**true**	**true**	*None*	This setting specifies a partial URI to a path containing the audio content for this voice application.
remove_session_data (Session Data to Remove)	string	No	**false**	**true**	*None*	This setting specifies the names of session data values to remove from this voice application.

Exit States

Name	Notes
done	The application's context variables were modified and session data values were removed.

Folder and Class Information

Studio Element Folder Name	Class Name
Context	com.audium.server.action.context.ApplicationModifier

Chapter 3

Audio

The Audio voice element simply outputs a VoiceXML page with the contents of a single audio group. The Audio element is used for greetings, error messages and any other time audio is to be played in a situation not associated with an input state.

This chapter contains the following topics:

Audio Groups

Audio Playback

Name (Label)	Max1	Req'd	Notes
initial_audio_group (Initial)	Yes	Yes	The audio group containing the audio to play.

Folder and Class Information

Studio Element Folder Name	Class Name
Top Level	com.audium.server.voiceElement.audio.MAudio

Folder and Class Information

Chapter 4

Counter

The **`Counter`** action element is used to keep track of a count stored as element data. The initial value of the count is defined as a configuration setting. In addition, the element may be configured to increment or decrement with a user defined step size. A typical use for the Counter element would be in a loop in the call flow that increments the count until a decision element decides that the loop must end. Revisiting a Counter element instance will automatically update the count.

This chapter contains the following topics:

Settings

Name (Label)	Type	Req'd	Single Setting Value	Substitution Allowed	Default	Notes
initial (Initial Count)	int	Yes	**`true`**	**`true`**	*None*	This setting specifies at which integer value this counter should start.
type (Type)	string enum	Yes	**`true`**	**`true`**	*None*	This setting specifies whether the counter should be incremented or decremented. Possible values are: **`decrement`** | **`increment`**.
step (Step Size)	int	Yes	**`true`**	**`true`**	1	This setting specifies by how much this counter should be incremented or decremented.

Element Data

Name	Type	Notes
count	string	The current count

Exit States

Name	Notes
done	The counter was updated.

Folder and Class Information

Studio Element Folder Name	Class Name
Calculation	com.audium.server.action.counter.CounterAction

Chapter 5

Callback_Add

The **`Callback_Add`** element is used to add a callback object to the database after all the callback information has been collected from the caller. In addition, it can be optionally configured to automatically delete old recorded files at specified intervals. These recorded files are the files produced by the Record element when the user records his/her name if they want a call back in the CallbackEntry application.

This chapter contains the following topics:

Settings

Name (Label)	Type	Req'd	Single Setting Value	Substitution Allowed	Default	Notes
Callback Number	string	Yes	**`true`**	**`true`**	*None*	The phone number the callers specifies to call back.
Recorded Name File	string	Yes	**`true`**	**`true`**	*None*	The URL to the recorded file for playback when the caller is called back.
Recorded Name Path	string	No	**`true`**	**`true`**	*None*	Path to the recorded file. If specified, files starting with *audio* in this folder are deleted automatically based on the file retention time and interval specified in **`Recorded File Retention`** and **`Recorded File Deletion Interval`** settings.

						Note: All files created by the Record element start with *audio*. If this setting is left blank, recorded files are not deleted automatically. The value of this setting may be either the path to a folder or a path to a file. If a path to a file is specified, then the folder in which the file resides is the folder to be managed. The path to the folder must be accessible to the VXMLServer.
Recorded File Retention	Int	No	**`true`**	**`true`**	240	Number of minutes to retain recorded files before they are eligible for automatic deletion. This setting only takes effect if **`Recorded name Path`** is specified.
Recorded File Deletion Interval	Int	No	**`true`**	**`true`**	30	Number of interval minutes for checking when recorded files can be deleted. This setting only takes effect if **`Recorded name Path`** is specified

Element Data

Name	Type	Notes
Result	string	Result of request to add callback object to the database. Valid string values are *valid*, *no_validation* and *invalid_time*. • **valid** – signifies that the request was successful. • **no_validation** – occurs when a callback object cannot be created because **`Callback_Validate`** element was not executed in the script. • **invalid_time** – means that the time selected for the scheduled callback is invalid.

Exit States

Name	Notes
done	The element execution is complete and the value was successfully retrieved.
error	The element failed to retrieve the value.

Folder and Class Information

Studio Element Folder Name	Class Name
Cisco > Callback	com.cisco.cvp.vxml.custelem.callback.AddCallback

Folder and Class Information

Chapter 6

Callback_Disconnect_Caller

The **`Callback_Disconnect_Caller`** element is responsible for disconnecting the caller's leg of the call. The IP leg of the call for Unified CVP is preserved to hold the caller's *place in line* until the callback is made back to the caller.

This chapter contains the following topics:

Settings

Name (Label)	Type	Req'd	Single Setting Value	Substitution Allowed	Default	Notes
Probe Type	string enum	Yes	Yes	No	Disconnect Caller	The probe type can be one of: **`Disconnect Caller`** | **`Intercept Caller Hangup`** | **`No Intercept Caller Hangup`**

Element Data

Name	Type	Notes
Result	string	The call outcome from the attempt to disconnect the caller's leg.

Exit States

Name	Notes
done	The element execution is complete and the value was successfully retrieved.
error	The element failed to retrieve the value.

Folder and Class Information

Studio Element Folder Name	Class Name
Cisco > Callback	com.cisco.cvp.vxml.custelem.callback.DisconnectCaller

Chapter 7

Callback_Enter_Queue

The **`Callback_Enter_Queue`** element is responsible for adding a new caller to queue. This element must be executed for all callers even if the caller may not be offered a callback.

This chapter contains the following topics:

Settings

None.

Element Data

Name	Type	Notes
ewt	int	The calculated estimated wait time for caller in queue.

Exit States

Name	Notes
done	The element execution is complete and the value was successfully retrieved.
error	The element failed to retrieve the value.

Folder and Class Information

Studio Element Folder Name	Class Name
Cisco > Callback	com.cisco.cvp.vxml.custelem.callback.EnterQueue

Chapter 8

Callback_Get_Status

The **`Callback_Get_Status`** element is responsible for retrieving all information about the callback related to the current call (if a callback exists).

This chapter contains the following topics:

Settings

None.

Element Data

Name	Type	Notes
startCallback	boolean	Specifies whether the application should call the caller, given current caller position in queue and rate of de-queue.
ewt	int	Current estimated remaining wait time in seconds for this caller before the callback should be initiated.
qpos	int	Current position in queue.
rec	string	Recording URL that was stored in the callback table. This only needs to be returned if startCallback is true.
DORateA	int	Average number of seconds that it takes for each caller in this queue to leave the queue. This includes both callers leaving queue by going to agents and callers in queue abandoning.

DORateB	int	Average number of seconds that it takes for the #1 caller in this queue to leave the queue.
RORate	int	Average number of seconds that it takes to get the caller back after starting the callback. The rate is the same for all queues. This includes dial time, ring time, and IVR time spent asking the caller if they are ready to take the callback.
cli	string	The Calling Line ID to be used for this callback
rna	int	Ring No Answer timeout for this call
dn	string	Destination number for this outbound call

Exit States

Name	Notes
done	The element execution is complete and the value was successfully retrieved.
error	The element failed to retrieve the value.

Folder and Class Information

Studio Element Folder Name	Class Name
Cisco > Callback	com.cisco.cvp.vxml.custelem.callback.GetStatus

Chapter 9

Callback_Reconnect

The **`Callback_Reconnect`** element is responsible for reconnecting the caller's leg of the call.

This chapter contains the following topics:

Settings

Name (Label)	Type	Req'd	Single Setting Value	Substitution Allowed	Default	Notes
Dialed Number	string	Yes	**`true`**	**`true`**	*None*	Destination for the outbound call.
Calling Line ID	string	Yes	**`true`**	**`true`**	*None*	The calling line ID to be used for the callback.
Ring No Answer Timeout	string	Yes	**`true`**	**`true`**	30	Ring No Answer timeout in seconds, The default is 30, minimum is 0 and maximum is 300 seconds.
User-to-User Information	string	No	**`true`**	**`true`**	*None*	The user-to-user information (UUI) to include in the callback.

Element Data

Name	Type	Notes

result	string	Contains the reconnect exit state.

Exit States

Name	Notes
noanswer	The callback was attempted and not answered.
busy	The callback was attempted and the calling line was busy.
invalid_number	The callback number was not a valid number.
connected	The callback was attempted and connected.
error	The element failed to retrieve the value.

Folder and Class Information

Studio Element Folder Name	Class Name
Cisco > Callback	com.cisco.cvp.vxml.custelem.callback.Reconnect

Chapter 10

Callback_Set_Queue_Defaults

The **`Callback_Set_Queue_Defaults`** element is responsible for updating the DBServlet with the values that should be used for each queue. There is always a *default* queue type. The values are used whenever a queue type is encountered for which there are no explicitly defined values. For example, if an administrator has defined values for a *billing* and *default* queues, but the caller is queued for *mortgages*. In that case, the application uses the values from **`Callback_Set_Queue_Defaults`**.

This chapter contains the following topics:

Settings

Name (Label)	Type	Req'd	Single Setting Value	Substitution Allowed	Default	Notes
Queue Name	string	Yes	**`true`**	**`false`**	*None*	The name of the queue.
Maximum Percentage	integer	No	**`true`**	**`false`**	50	Maximum percentage of callbacks that can exist in the queue. Maximum is 100, minimum is 0.
Maximum Count	integer	No	**`true`**	**`false`**	9999999	Absolute number of callbacks that can exist in a queue.
Refresh Interval	integer	No	**`true`**	**`false`**	30	Number of minutes between DBServlet refreshes of this reference data. Maximum is 1440 minutes, minimum is 1 minute.

Maximum Estimated Wait Time	integer	No	**true**	**false**	900	Callbacks are only offered for this queue when the estimated wait time (ewt) is greater than or equal this number of seconds. If 0, then callbacks are offered regardless of ewt. Maximum is 86400 seconds, minimum is 0.
Timezone	string enum	No	**true**	**false**	*None*	The timezone to apply to this queue. Valid options available from pull-down menu.
Keepalive Interval	integer	No	**true**	**false**	180	Maximum keepalive interval in seconds. Maximum is 300, minimum is 1. 'Ring No Answer Timeout' setting must be less than this value.
Dialed Number	string	No	**true**	**false**	*None*	Dialed Number to which a callback is directed for this queue.
Reconnect Time	integer	No	**true**	**false**	30	Approximate average time in seconds to reconnect caller. Take into account both ringtime and IVR time when determining this value. Maximum is 300, minimum is 1.
Calling Line ID	string	Yes	**true**	**false**	*None*	The CLI to be used on the callback.
Sample	string	No	**true**	**false**	0	Number of minutes in the interval used to calculate average time to leave queue. Maximum is 1440, minimum is 15.
Burst	string	No	**true**	**false**	10:1	X:Y, where X requests to method LeaveQueue in Y seconds. This is used to detect abnormal system failures so that the requests do not get included in the average time to leave queue calculation.
Ring No Answer Timeout	integer	No	**true**	**false**	30	The RNA timeout for the callback. Maximum is 300, minimum is 0. Must be less than the Keepalive Interval.
Sunday Time Range	string	No	**true**	**false**	00:00:00 – 23:59:59	Time range per day when callbacks can occur. Value “none” means no callbacks are allowed on that day. The default is all day if no value is specified. 00:00:00 – 23:59:59 means all day.
Monday Time Range						
Tuesday Time Range						
Wednesday Time Range						
Thursday Time Range						
Friday Time Range						
Saturday Time Range						
Max No Response Count	string	No	**true**	**false**	3;300	
Max Busy Count	string	No	**true**	**false**	4;300	Max attempts to try the callback when this error occurs and the next the interval (in seconds) in which to retry the call.
Max No Answer Count	string	No	**true**	**false**	4;300	
Max Trunks Busy Count	string	No	**true**	**false**	4;300	

Max Error Count	string	No	`true`	`false`	4;300

Element Data

Name	Type	Notes
result	string	Contains the reconnect exit state.

Exit States

Name	Notes
done	The element execution is complete and the value was successfully retrieved.
error	The element failed to retrieve the value.

Folder and Class Information

Studio Element Folder Name	Class Name
Cisco > Callback	com.cisco.cvp.vxml.custelem.callback.SetQueueDefaults

Folder and Class Information

Chapter 11

Callback_Update_Status

The **`Callback_Update_Status`** element is responsible for updating the database after a callback disconnect or reconnect.

This chapter contains the following topics:

Settings

Name (Label)	Type	Req'd	Single Setting Value	Substitution Allowed	Default	Notes
status	enum string	Yes	**`true`**	**`true`**	*None*	Callback status can be one of the following: • PENDING • INPROGRESS • COMPLETED • ADD TO QUEUE • DROP FROM QUEUE
reason	enum string	*	**`true`**	**`true`**	None	Required if status is COMPLETED, one of the following:

						• error • busy • noanswer • noresponse • invalid_number • connected • trunkbusy • caller_cancelled

Element Data

Name	Type	Notes
result	string	Tells the application whether to cancel the existing callback or to retry, can be one of the following: • cancel • retry • done

Exit States

Name	Notes
done	The element execution is complete and the value was successfully retrieved.
error	The element failed to retrieve the value.

Folder and Class Information

Studio Element Folder Name	Class Name
Cisco > Callback	com.cisco.cvp.vxml.custelem.callback.UpdateStatus

Chapter 12

Callback_Validate

The **`Callback_Validate`** element is responsible for verifying whether or not a callback can be offered to the caller during this call. Depending on the outcome of the validation, the Validate element exits with one of four states.

This chapter contains the following topics:

Settings

None.

Element Data

Name	Type	Notes
result	string	Contains the exit state result.
ewt	int	EWT value passed from Unified ICM.
gw	string	Gateway identifier.
loc	string	Gateway location information.
capacity	int	Gateway capacity.

Exit States

Name	Notes
preemptive	This callback is valid.
none	The callback is not allowed.
refresh	The validation could not be performed because the DBServlet needs a reference data refresh. The application must call SetQueueDefaults before validation can occur.
error	The element failed to retrieve the value.

Folder and Class Information

Studio Element Folder Name	Class Name
Cisco > Callback	com.cisco.cvp.vxml.custelem.callback.Validate

Chapter 13

Callback_Wait

The **`Callback_Wait`** element is responsible for *sleeping* the application for X seconds. The application hands control back to cvp_ccb_vxml.tcl with the parameter wait=X.

This chapter contains the following topics:

Settings

Name (Label)	Type	Req'd	Single Setting Value	Substitution Allowed	Default	Notes
Wait Time	integer	Yes	**`true`**	**`false`**	*None*	Amount of time in seconds to wait. Maximum is 60, minimum is 0.

Exit States

Name	Notes
done	The element execution is complete and the value was successfully retrieved.
error	The element failed to retrieve the value.

Folder and Class Information

Studio Element Folder Name	Class Name
Cisco > Callback	com.cisco.cvp.vxml.custelem.callback.Wait

Chapter 14

Currency

The **`Currency`** voice element captures from the caller a currency amount in dollars and cents. The currency amount can be entered using the keypad or spoken. The captured value will be stored in element data as a decimal value (without the $ character).

There are several different formats for speaking a currency amount or entering it through the keypad. Voice browsers may use different grammars and therefore accept different utterances. However, the spoken formats listed below should result in the same behavior for all supported browsers. The tables below list each input and the value that is stored in the element variable as a result. If some data is left out, the system assumes a default value for the missing information.

Utterance	**Stored Value**	**Example**	**Description**
[dollar] "dollar(s)" ("and") [cent] "cent(s)"	D.CC	"thirteen dollars and fifty cents " = 13.50	Dollars are whole numbers >= 0. Cents are from 00 to 99. The word *and* is optional.
[dollar] "dollar(s) "[cent]	D.CC	"thirteen dollars five" = 13.05	Dollars are whole numbers >= 0. Cents are from 00 to 99.
[dollar] "dollar(s)"	D.00	“three hundred fifty” = 350.00	A plain whole number is interpreted as dollars with no cents.
[cent] "cent(s)"	0.CC	"three cents" = 0.03	To specify cents only, the word *cents* to be uttered. Cents are from 00 to 99.

DTMF Entry	**Stored Value**	**Example**	**Description**
[D]*[CC]	D.CC	3*99 = 3.99	The decimal is represented by the * button.

There are other formats that are possible, particularly when entering via DTMF and inputting incomplete amounts. These inputs may yield differing results on various voice browsers. The returned variable will always be a decimal value with the appropriate number of padded zeros if applicable.

This chapter contains the following topics:

Settings

Name (Label)	Type	Req'd	Single Setting Value	Substitution Allowed	Default	Notes
Inputmode (Input Mode)	string enum	Yes	**`true`**	**`false`**	both	The type of entry allowed for input. Possible values are: **`voice`** | **`dtmf`** | **`both`**.
noinput_timeout (Noinput Timeout)	string	Yes	**`true`**	**`true`**	5s	The maximum time length allowed for silence or no keypress before a noinput event is thrown. Possible values are standard time designations including both a non-negative number and a time unit, for example, 3s (for seconds) or 300ms (for milliseconds). Default = 5s
max_noinput_count (Max NoInput Count)	int ≥ 0	Yes	**`true`**	**`true`**	3	The maximum number of noinput events allowed during currency input capture. 0 = infinite noinputs allowed.
max_nomatch_count (Max NoMatch Count)	int ≥ 0	Yes	**`true`**	**`true`**	3	The maximum number of nomatch events allowed during currency input capture. 0 = infinite nomatches allowed.
currency_confidence_level (Currency Confidence Level)	decimal (0.0 to 1.0)	Yes	**`true`**	**`true`**	0.40	The confidence level threshold to use during currency capture.
modal (Disable Hotlinks)	boolean	Yes	**`true`**	**`true`**	false	Whether or not to temporarily disable all hotlink grammars (global or local) and universal grammars. If set to true, only the currency grammars will be enabled for the duration of the element. Otherwise all active grammars will be enabled.
secure_logging (Secure Logging)	boolean	Yes	**`true`**	**`true`**	false	Whether or not to enable logging of potentially sensitive data of the Currency element. If set to true, the following potentially sensitive data of the element will

						not log: utterance, interpretation, value, nbestUtteranceX† and nbestInterpretationX†. Instead, the above will be logged as the field name appended with the suffix *_secureLogging* and with the value "*****", for example **`nbestUtterance1_secureLogging,*****`**.
maxnbest (Maxnbest)	int ≥ 1	Yes	**`true`**	**`true`**	1	The maximum number of speech recognition results that can be generated per voice input.

Note: Refer to the Element Data table below for information about **`nbestUtteranceX`** and **`nbestInterpretationX`**.

Element Data

Name	Type	Notes
Value	string	The currency amount captured. This will always be a decimal number with the appropriate number of padded zeros (up to 2).
value_confidence	float	This is the confidence value of the captured utterance. When n-best recognition is enabled, this stores the confidence score of the top hypothesis in the n-best list.
nbestLength	int ≥ 1	This stores the number of n-best hypotheses generated by the speech engine.
nbestUtterance1 nbestUtterance2 … nbestUtteranceX	string	This set of element data stores the captured n-best utterances. While the maximum number of nbestUtteranceX values is equal to the maxnbest setting value, the actual number of these values available is determined by speech recognition at runtime, where nbestUtterance1 holds the utterance of the top hypothesis in the n-best list and nbestUtteranceX holds the utterance of the last hypothesis.
nbestInterpretation1 nbestInterpretation2 … nbestInterpretationX	string	This set of element data stores the interpretations of captured n-best utterances. While the maximum number of nbestInterpretationX values is equal to the maxnbest setting value, the actual number of these values available is determined by speech recognition at runtime, where nbestInterpretation1 holds the interpretation of the top hypothesis in the n-best list and nbestInterpretationX holds the interpretation of the last hypothesis.
nbestConfidence1 nbestConfidence2 … nbestConfidenceX	float	This set of element data stores the confidence scores of captured n-best utterances. While the maximum number of nbestConfidenceX values is equal to the maxnbest setting value, the actual number of these values available is determined by speech recognition at runtime, where nbestConfidence1 holds the confidence score of the top hypothesis in the n-best list and nbestConfidenceX holds the confidence score of the last hypothesis.

nbestInputmode1 nbestInputmode2 … nbestInputmodeX	string	This set of element data stores the input modes of captured n-best utterances.

Exit States

Name	Notes
max_nomatch	The maximum number of nomatch events has occurred. If the nomatch max count is 0, this exit state will never occur.
max_noinput	The maximum number of noinput events has occurred. If the noinput max count is 0, this exit state will never occur.
done	The currency capture was completed.

Audio Groups

Currency Capture

Name (Label)	Req'd	Max 1	Notes
initial_audio_group (Initial)	Yes	Yes	Played when the voice element first begins.
nomatch_audio_group (NoMatch)	No	No	Played when a nomatch event occurs.
noinput_audio_group (NoInput)	No	No	Played when a noinput event occurs.
help_audio_group (Help)	No	No	Played when the caller asked for help. If not specified, by default help is treated as a nomatch.

End

Name (Label)	Req'd	Max 1	Notes
done_audio_group (Done)	No	Yes	Played when the currency capture is completed and the voice element exits with the *done* exit state.

Folder and Class Information

Studio Element Folder Name	Class Name
Commerce	com.audium.server.voiceElement.currency.MBasicCurrency

Folder and Class Information

Chapter 15

Currency_with_Confirm

The **`Currency_With_Confirm`** voice element captures from the caller a currency amount in dollars and cents, and presents a confirmation menu allowing the caller to either accept their entry or re-enter the currency value. The currency amount can be entered using the keypad or spoken. The captured value will be stored in element data as a decimal value (without the $ character).

There are several different formats for speaking a currency amount or entering it through the keypad. Voice browsers may use different grammars and therefore accept different utterances. However, the spoken formats listed below should result in the same behavior for all supported browsers. The tables below list each input and the value that is stored in element data as a result. If some data is left out, the system assumes a default value for the missing information.

Utterance	**Stored Value**	**Example**	**Description**
[dollar] "dollar(s)" ("and") [cent] "cent(s)"	D.CC	"thirteen dollars and fifty cents " = 13.50	Dollars are whole numbers >= 0. Cents are from 00 to 99. The word *and* is optional.
[dollar] "dollar(s) "[cent]	D.CC	"thirteen dollars five" = 13.05	Dollars are whole numbers >= 0. Cents are from 00 to 99.
[dollar] "dollar(s)"	D.00	“three hundred fifty” = 350.00	A plain whole number is interpreted as dollars with no cents.
[cent] "cent(s)"	0.CC	"three cents" = 0.03	To specify cents only, the word *cents* to be uttered. Cents are from 00 to 99.

DTMF Entry	**Stored Value**	**Example**	**Description**
[D]*[CC]	D.CC	3*99 = 3.99	The decimal is represented by the * button.

There are other formats that are possible, particularly when entering via DTMF and inputting incomplete amounts. These inputs may yield differing results on various voice browsers. The returned variable will always be a decimal value with the appropriate number of padded zeros if applicable.

This chapter contains the following topics:

Settings

Name (Label)	Type	Req'd	Single Setting Value	Substitution Allowed	Default	Notes
Inputmode (Input Mode)	string enum	Yes	**`true`**	**`false`**	**`both`**	The type of entry allowed for input. Possible values are: **`voice`** | **`dtmf`** | **`both`**.
noinput_timeout (Noinput Timeout)	string	Yes	**`true`**	**`true`**	5s	The maximum time length allowed for silence or no keypress before a noinput event is thrown. Possible values are standard time designations including both a non-negative number and a time unit, for example, 3s (for seconds) or 300ms (for milliseconds). Default = 5s.
currency_max_noinput_count (Currency Max NoInput Count)	int ≥ 0	Yes	**`true`**	**`true`**	3	The maximum number of noinput events allowed during currency input capture. 0 = infinite noinputs allowed.
currency_max_nomatch_count (Currency Max NoMatch Count)	int ≥ 0	Yes	**`true`**	**`true`**	3	The maximum number of nomatch events allowed during currency input capture. 0 = infinite nomatches allowed.
confirm_max_noinput_count (Confirm Max NoInput Count)	int ≥ 0	Yes	**`true`**	**`true`**	3	The maximum number of noinput events allowed during currency input confirmation. 0 = infinite noinputs allowed.
confirm_max_nomatch_count (Confirm Max NoMatch Count)	int ≥ 0	Yes	**`true`**	**`true`**	3	The maximum number of nomatch events allowed during currency input confirmation. 0 = infinite nomatches allowed.
max_disconfirmed_count (Max Disconfirmed Count)	int ≥ 0	Yes	**`true`**	**`true`**	3	The maximum number of times a caller is allowed to disconfirm a captured input. 0 = infinite disconfirmations allowed.

currency_confidence_level (Currency Confidence Level)	decimal (0.0 to 1.0)	Yes	**true**	**true**	0.40	The confidence level threshold to use during currency capture.
confirm_confidence_level (Confirm Confidence Level)	Decimal (0.0 to 1.0)	Yes	**true**	**true**	0.50	The confidence level threshold to use during confirmation.
modal (Disable Hotlinks)	boolean	Yes	**true**	**true**	false	Whether or not to temporarily disable all hotlink grammars (global or local) and universal grammars. If set to true, only the grammars of the current Currency_With_Confirm element (the currency and boolean grammars) will be enabled for the duration of the element. Otherwise all active grammars will be enabled.
secure_logging (Secure Logging)	boolean	Yes	**true**	**true**	false	Whether or not to enable logging of potentially sensitive data of the Currency_With_Confirm element. If set to true, the following potentially sensitive data of the element will not log: utterance, interpretation, value, nbestUtteranceX† and nbestInterpretationX†. Instead, the above will be logged as the field name appended with the suffix *_secureLogging* and with the value "*****", for example **nbestUtterance1_secureLogging,*****.
maxnbest (Maxnbest)	int ≥ 1	Yes	**true**	**true**	1	The maximum number of speech recognition results that can be generated per voice input.

Element Data

Name	Type	Notes
Value	string	The currency amount captured. This will always be a decimal number with the appropriate number of padded zeros (up to 2).
value_confidence	float	This is the confidence value of the captured currency utterance. When n-best recognition is enabled, this stores the confidence score of the top hypothesis in the n-best list.
confirm_confidence	float	This is the confidence value of the captured confirm utterance.
nbestLength	int ≥ 1	This stores the number of n-best hypotheses generated by the speech engine.
nbestUtterance1 nbestUtterance2 …	string	This set of element data stores the captured n-best utterances. While the maximum number of nbestUtteranceX values is equal to the maxnbest setting value, the actual number of these values available is determined by speech recognition at runtime, where nbestUtterance1 holds the utterance of the top

nbestUtteranceX		hypothesis in the n-best list and nbestUtteranceX holds the utterance of the last hypothesis.
nbestInterpretation1 nbestInterpretation2 … nbestInterpretationX	string	This set of element data stores the interpretations of captured n-best utterances. While the maximum number of nbestInterpretationX values is equal to the maxnbest setting value, the actual number of these values available is determined by speech recognition at runtime, where nbestInterpretation1 holds the interpretation of the top hypothesis in the n-best list and nbestInterpretationX holds the interpretation of the last hypothesis.
nbestConfidence1 nbestConfidence2 … nbestConfidenceX	float	This set of element data stores the confidence scores of captured n-best utterances. While the maximum number of nbestConfidenceX values is equal to the maxnbest setting value, the actual number of these values available is determined by speech recognition at runtime, where nbestConfidence1 holds the confidence score of the top hypothesis in the n-best list and nbestConfidenceX holds the confidence score of the last hypothesis.
nbestInputmode1 nbestInputmode2 … nbestInputmodeX	string	This set of element data stores the input modes of captured n-best utterances.

Exit States

Name	**Notes**
max_nomatch	The maximum number of nomatch events has occurred. If the nomatch max count is 0, this exit state will never occur.
max_noinput	The maximum number of noinput events has occurred. If the noinput max count is 0, this exit state will never occur.
max_disconfirmed	The maximum number of disconfirmations has occurred. If the max disconfirmed count is set to 0, this exit state will never occur.
done	The currency capture was confirmed.

Audio Groups

Currency Capture

Name (Label)	**Req'd**	**Max 1**	**Notes**
currency_initial_audio_group (Currency Initial)	Yes	Yes	Played when the voice element first begins.

currency_nomatch_audio_group (Currency NoMatch)	No	No	Played when a nomatch event occurs during a currency capture.
currency_noinput_audio_group (Currency NoInput)	No	No	Played when a noinput event occurs during a currency capture.
currency_help_audio_group (Currency Help)	No	No	Played when the caller asked for help during a currency capture. If not specified, by default help is treated as a nomatch.

Currency Confirm

Name (Label)	Req'd	Max 1	Notes
confirm_initial_audio_group (Confirm Initial)	Yes	Yes	Played when confirmation first begins.
confirm_nomatch_audio_group (Confirm NoMatch)	No	No	Played when a nomatch event occurs during confirmation. The nomatch event count corresponds to the audio group count.
confirm_noinput_audio_group (Confirm NoInput)	No	No	Played when a noinput event occurs during confirmation. The noinput event count corresponds to the audio group count.
confirm_help_audio_group (Confirm Help)	No	No	Played when a help event occurs during confirmation. The help event count corresponds to the audio group count. If not specified, by default help throws a nomatch.
disconfirmed_audio_group (Disconfirmed)	No	No	Played after the caller disconfirms a captured currency entry. Upon reaching the **`max_disconfirmed_count`**, the prompt should be about exiting with the **`max_disconfirmed`** exit state.

End

Name (Label)	Req'd	Max 1	Notes
yes_audio_group (Yes)	No	Yes	Played after the caller chooses the **`yes`** option. If not specified, no audio will be played when this option is chosen.

Folder and Class Information

Studio Element Folder Name	Class Name
Commerce	com.audium.server.voiceElement.currency.MBasicCurrencyWithConfirm

Folder and Class Information

Chapter 16

CVP Subdialog Return

For a Cisco Unified CVP Voice application invoked as a subdialog, the **`CVP Subdialog Return`** element must be used to return data back to the calling application. The element should be used in place of Hang Up elements throughout the call flow. Like a Hang Up element, the element has no exit states.

Note: There is one exception to the above description. If the voice application will only ever be called by a Subdialog Invoke element (that is, never by Unified ICM), then the Subdialog Start and Subdialog Return elements may be used instead. Refer to Subdialog Invoke (page 153), Subdialog Return (page 155) and Subdialog Start (page 157) for details.

The settings for this element are used to define what data to pass back to the calling application. The **`Caller Input`** setting must be assigned a value in order for the application to validate, since it is required to have a value. Each element setting corresponds to an ICM ECC external variable name, and therefore the configuration values must conform to requirements associated with ICM ECC variables. Refer to the Unified CVP documentation for further details.

The CVP Subdialog Return element can be used to enable multiple types of transfer in call failure conditions. In case of a Hook Flash (HF) or Two B-Channel Transfer (TBCT) transfer, for example, **`Caller Input`** should be set to the transfer destination number prefixed with *HF* or *TBCT* (as in HF800xxxxxxx or TBCT800xxxxxxx). An HF or TBCT transfer will be invoked after the **`Caller Input`** was passed back from the CVP Subdialog Return element.

This chapter contains the following topics:

Settings

Name (Label)	Type	Req'd	Single Setting Value	Substitution Allowed	Default	Notes

caller_input (Caller Input)	string	Yes	**true**	**true**	*None*	Required return argument that holds a value to be returned to the calling application.
FromExtVXML0 (External VXML 0)	string	No	**true**	**true**	*None*	Optional return argument that is returned to the calling application.
FromExtVXML1 (External VXML 1)	string	No	**true**	**true**	*None*	Optional return argument that is returned to the calling application.
FromExtVXML2 (External VXML 2)	string	No	**true**	**true**	*None*	Optional return argument that is returned to the calling application.
FromExtVXML3 (External VXML 3)	string	No	**true**	**true**	*None*	Optional return argument that is returned to the calling application.

Exit States

Name	Notes
done	The element execution is complete.

Folder and Class Information

Studio Element Folder Name	Class Name
Cisco	com.audium.server.voiceElement.internal.CiscoSubdialogReturnElement

Chapter 17

CVP Subdialog Start

For a Cisco CVP voice application invoked as a subdialog, the **`CVP Subdialog Start`** element must be used, which receives data from a calling application and creates corresponding element data or session data. The element should be placed at the entrance point of the application, immediately after the Start of Call element.

Data can be passed to the VoiceXML application either as HTTP parameters or VoiceXML parameters (using the **`<param>`** tag). In the first case (that is, as HTTP parameters), Cisco Unified CVP VoiceXML Server will automatically create session data using the name of the data received. In the second case (that is, as VoiceXML parameters), the CVP **`Subdialog_Start`** element must be configured appropriately in order for the data to be available as element or session data for the duration of the call session. For each data passed as a VoiceXML parameter, the *Parameter* setting must be configured with the same exact name as the data. The **`Store As`** setting can be configured to store the passed data either as session or element data. The **`Enable Digits Bypass`** setting is used to activate a VoiceXML workaround to ensure expected functionality for a particular TDM or analog phone. When this setting is set to *true*, a new setting named **`Audio Filler URI`** will be enabled in VoiceXML Studio and can be configured to set a reference to a silence wave file to be played in the digits field. For IP phones the **`Enable Digits Bypass`** setting should be set to *false*.

This chapter contains the following topics:

Settings

Name (Label)	Type	Req'd	Single Setting Value	Substitution Allowed	Default	Notes
Parameter (Parameter)	string	No	**`false`**	**`true`**	*None*	Holds the name of a parameter passed as input to the subdialog. It must match the exact value specified in the VoiceXML page that calls the subdialog.

						This is a repeatable setting, so multiple values can be specified.
Where (Store As)	string	No	**true**	**false**	Session Data	Determines whether the parameter passed to the subdialog will be stored as element data or session data. By making it element data, the information will "belong" only to this element, and so there is no chance that these variables will overwrite any other variables.
enable_digits_bypass (Enable Digits Bypass)	boolean	Yes	**true**	**true**	**false**	Determines whether the digits field is used at the beginning of an application. By default this is disabled.
audio_filler_uri (Audio Filler URI)	string	No	**true**	**true**	*None*	Configures a URI for a silence wave file to be played in the above digits field.

Exit States

Name	Notes
done	The element execution is complete.

Folder and Class Information

Studio Element Folder Name	Class Name
Cisco	com.audium.server.voiceElement.internal.CiscoSubdialogStartElement

Chapter 18

Web Service Elements

Along with Action and Decision elements, another way to perform backend interactions and obtain real-time data is via the Web Service element. This element leverages industry standards, such as the Web Service Definition Language (WSDL) for service definitions and SOAP for message encapsulation to provide simple, seamless interaction with remote web services.

Unlike one-off web service implementations using custom code, this element provides an intuitive graphical interface that dynamically adjusts to match each of your web services. It uses WSDL to discover required and optional settings, setting dependencies, and even valid enumerated values. Like other elements in @audiumstudio.field@, it ensures that the values you enter are of the right type, while still allowing the use of Substitution throughout.

Web Service elements provides a dynamic graphical interface for embedding web service interactions into the call flow.

This element is designed to work with the following technologies:

- WSDL 1.1 (using namespace http://schemas.xmlsoap.org/wsdl/)
  - Binding Styles
    - RPC/encoded
    - RPC/literal
    - Document/literal
    - Document/literal (wrapped)
- SOAP 1.1 encoding (using namespace http://schemas.xmlsoap.org/soap/encoding/)
  - Includes built-in support for 1-dimensional SOAP-encoded arrays that do not use href references for array items.
  - To parse n-dimensional SOAP-encoded arrays (where n is greater than 1) or href references in web service response messages, use the "Store Full Response XML" option and process the response with custom code.

- XML schemas (using namespace http://www.w3.org/2001/XMLSchema)
  - Includes built-in support for 1-dimensional arrays (that is, sequences).
  - To parse n-dimensional arrays (where n is greater than 1) in web service response messages, use the "Store Full Response XML" option and process the response with custom code.

This chapter contains the following topics:

Exit States

Name	Description
done	This exit state is followed when the web service was successfully invoked at runtime, and responded within the time specified in the "Connection Timeout" setting.
error	This exit state is followed when the element encounters any error at runtime. Some examples include a web service that cannot be reached, the web service taking too long (more than the value specified in the "Connection Timeout" setting) to respond, or receiving unexpected data from the service. If this exit state is followed, refer to the @audiumcallservices.field@ logs for additional information about the cause.
fault	This exit state is only present when the loaded WSDL specifies a possible fault message for the selected operation. This exit state is followed when the web service is successfully contacted at runtime, but it responds with its fault message.

Element Data

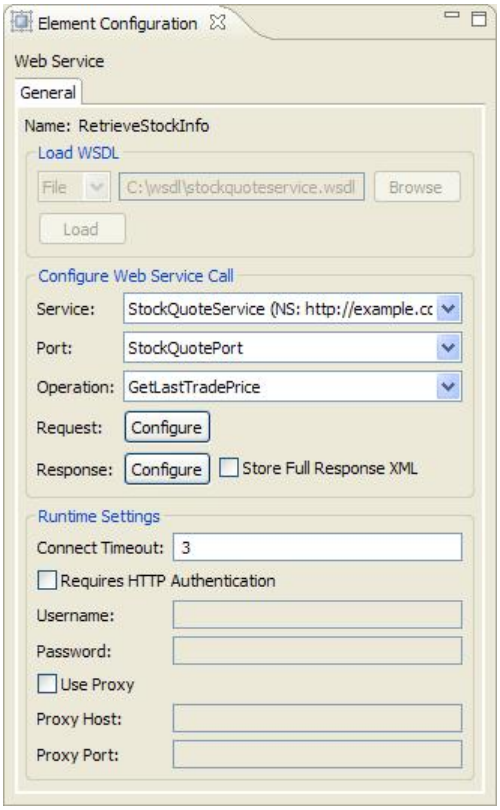
response_xml	Only created if the "Store Full Response XML" checkbox has been checked. Holds the full XML response from the web service at runtime, for later processing by custom code or for debugging purposes.

Note: This element may also create numerous other element or session data variables (with user-specified names), depending on the settings specified in the "Configure Response Parameters" dialog.

Settings

The Web Service element has just one Element Configuration tab, named "General". Refer to the image below and description of each setting for more information.

Figure 1: Element Configuration tab



Group	Name	Description
Load WSDL	WSDL Location	In order for the Web Service element to be configurable, a WSDL file defining the desired web service must first be loaded. First, choose either "URI" or "File" from the drop-down, then either browse for a local file or enter a remote URI where the WSDL can be retrieved. Then, click the "Load" button to initiate @audiumstudio.field@'s download, caching, and parsing of the WSDL. Once WSDL is loaded, the other configuration options become available.
Configure Web Service Call	Service	This drop-down allows you to select which service you would like this element to invoke at runtime.

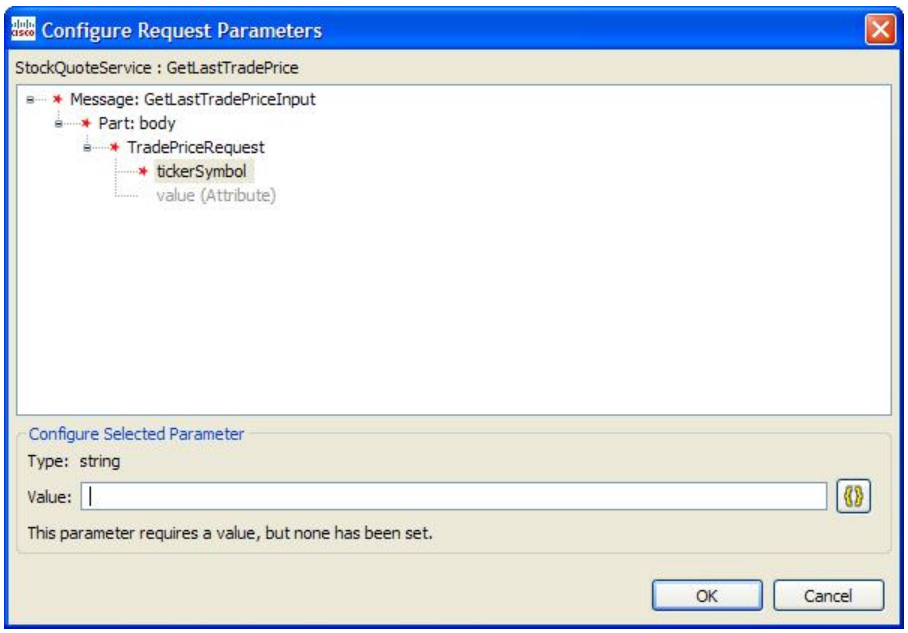
Group	Name	Description
		Generally, WSDL files only define a single service so this list may have just one item. Each service's namespace is listed alongside it in parenthesis.
	Port	This drop-down allows you to specify which port you would like to use to connect to the web service at runtime. Each port has a name, and may define completely different connection properties than other ports. Please refer to your web service's documentation, or the WSDL file, for information about what each port represents. Note that this port list is dependent on which service is selected, and so it will update as the service is changed.
	Operation	This drop-down allows you to specify which operation you would like to execute against the previously-selected service. Note that this operation list is dependent on which port is selected, and so it will update as the port is changed.
	Request	Click the "Configure" button next to the "Request" label to bring up the "Configure Request Parameters" dialog. Using that dialog, you can specify which values to send to the web service as inputs at runtime.
	Response	Click the "Configure" button next to the "Response" label to bring up the "Configure Response Parameters" dialog. Using that dialog, you can specify in which element or session data variable each potential return value from the web service should be stored at runtime.
	Store Full Response XML	Check this box if you would like the full XML response from the web service to be stored in element data at runtime, for later processing by your own custom code, or for debug purposes. Note that checking this box may be memory intensive if the response XML documents are large. Even if this checkbox has been selected, response parameter storage settings

Group	Name	Description
		from the "Configure Response Parameter" dialog will still be used.
Runtime Settings	Connect Timeout	This setting allows you to specify how many seconds @audiumcallservices.field@ should wait for the web service to respond to its request at runtime, before timing-out and following the "error" exit state.
	Requires HTTP Authentication	Check this box if you would like HTTP authentication to be used when accessing the web service at runtime.
	Username	Only available if the "Requires HTTP Authentication" checkbox has been selected. This field allows you to specify the username to use for HTTP authentication when accessing the web service at runtime.
	Password	Only available if the "Requires HTTP Authentication" checkbox has been selected. This field allows you to specify the password to use for HTTP authentication when accessing the web service at runtime.
	Use Proxy	Check this box if you would like a proxy to be used when accessing the web service at runtime.
	Proxy Host	Only available if the "Use Proxy" checkbox has been selected. This field allows you to specify the proxy host to use to access the web service at runtime.
	Proxy Port	Only available if the "Use Proxy" checkbox has been selected. This field allows you to specify the proxy port to use to access the web service at runtime.

Configuring Request Parameters

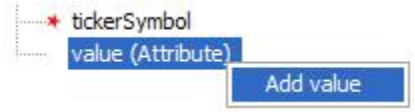
When the "Configure" button for Request Parameters is clicked, the following dialog is displayed:

Figure 2: Configure Request Parameters



Its contents are pre-populated with parameters that the loaded WSDL specifies. These parameters are displayed in a tree format, and use the same symbols for required and repeatable that the settings of other elements use. If a setting is optional it is greyed-out by default (like "value" in the image above), and can be added by right-clicking on it and choosing "Add PARAM_NAME":

Figure 3: Add Parameter



Each parameter has a type, such as string, integer, or float. Some parameters cannot hold a value (they will show "N/A" as their type), because they are intended to either only contain child parameters, or to act as markers. An example of a marker parameter might be "disable_logging"; if it is defined, then no logging will be performed on the service end. Only variables with a type can hold a value. The value you enter will be validated as you type it (a warning message may be displayed below the value field), and also when you validate the entire project before deploying.

If a setting is repeatable it will have its index in the list in brackets, such as the "item" parameter in the following example:

Figure 4: Repeatable Parameters

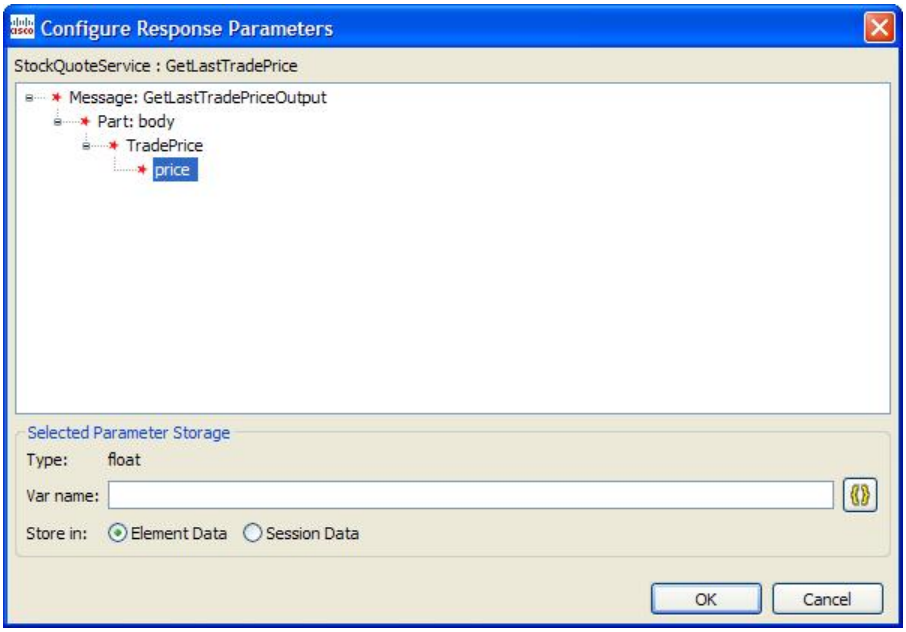
You can add additional parameters to the list by right-clicking on any list item and choosing "Add PARAM_NAME". To remove a parameter from the list, right-click on it and choose "Delete PARAM_NAME". This same functionality can be used to disable (gray-out) an optional parameter, regardless of whether it is repeatable or not.

Similar to element settings, all required parameters must be configured with a value in order for the voice application project to pass validation.

Configuring Response Parameters

Response parameters (data sent back by a web service) are handled in much the same way as request parameters. The "Configure Request Parameters" dialog is also tree-based, and it allows for parameters to be added or deleted as desired.

Figure 5: Configure Response Parameters



However, there are a few differences. First, you must specify whether each parameter should be stored in Element or Session data. Additionally, the text input field is used to specify the variable name to create, rather than a value to pass to the service.

No type-checking is performed in this dialog; the response parameter type is listed only for convenience.

The most significant difference between this dialog and the "Configure Request Parameters" dialog is that parameters marked as required do not need to be configured. Any parameter not configured in this dialog will simply not be stored in element or session data at runtime; if it is present in the web service's response, it will be ignored.

Chapter 19

Database

The **`database`** element provides the ability to execute an SQL command on external databases within a voice application call flow. The element requires JNDI to be configured in the Java application server to handle database connections. Only a single SQL statement can be executed per element. There are four types of commands that can be made:

- **Single** – This is used to run a SQL query that returns only a single row. Element data will be created with the variable names being the names of the columns returned and the value of that column as the element data value (as a string). If no row is returned, no element data will be set.
- **Multiple** – This is used to run a SQL query that returns multiple rows. A Unified CVP-defined Java data structure, the Java class **`ResultSetList`**, stores the full result and is placed in session data. If no rows are returned, the **`ResultSetList`** object in session data will be empty. For detail about the ResultSetList data structure, refer to the javadocs for this class.
- **Inserts** – This is used to run a SQL INSERT command that inserts information into the database.
- **Updates** – This is used to run a SQL UPDATE command that updates information in the database.

The developer can utilize substitution to create dynamic queries. The Database element is ideal for performing simple queries and updates. It may not be sufficient for performing complex database interactions such as multiple dependent queries or stored procedure calls. One would use a custom configurable or generic action element for these tasks. Also note that in order to avoid performance issues creating database connections, implementing database pooling on the application server is highly recommended. Refer to http://docwiki.cisco.com/wiki/Unified_CVP_VXML_Server_JNDI_Resources for additional information on configuring Tomcat JNDI resources.

This chapter contains the following topics:

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Settings

Name (Label)	Type	Req'd	Single Setting Value	Substitution Allowed	Default	Notes
type (Type)	string enum	Yes	**true**	**true**	**single**	The type of query: **single**, **multiple**, **insert** or **update**.
jndiName (JNDI Name)	string	Yes	**true**	**true**	*None*	This JNDI name for the SQL datasource of the database.
key (Session Data Key)	string	Yes	**true**	**true**	*None*	For queries of type multiple, the name of the session variable which the results of the query will be stored.
query (SQL Query)	string	Yes	**true**	**true**	*None*	The SQL query to be executed.

Element Data

Element data is created *only* when the *type* setting is set to *single*. Element data given the names of the return columns are created containing the respective return values. For example, if a query returned the following information:

```
foo bar

123 456
```

The following element data will be created: *foo* with the value *123* and *bar* with the value *456*.

Session Data

Session data is created *only* when the **type** setting is set to *multiple*. In all other cases, no session data is created.

Name	Type	Notes
[value of setting "key"]	ResultSetList	The Java data structure that stores the returned values from a multiple type query. The name of the session data variable is specified by the developer in the **key** setting.

Exit States

Name	Notes
done	The database query was successfully completed.

Folder and Class Information

Studio Element Folder Name	Class Name
Integration	com.audium.server.action.database.DatabaseAction

How to Create a JNDI Database Connection in Tomcat for Use in VXML Applications

Summary

Steps

This section explains how to create a new JNDI database connection in Tomcat. These instructions are useful when you would like to use the built-in Studio Database element, or create some custom code that accesses database functionality through JNDI.

1. In order enable database access on your application server, a compatible JDBC driver must be installed. These drivers, typically packaged as JAR files, should be placed in a directory accessible to the application server classpath (on Tomcat, for example, place in *%CVP_HOME%\VXML\Tomcat\common\lib)*.

   Note: The database must exist for this connection to work. CVP VXML Server will not create the database for you.

2. Add a Tomcat Context for the database connection so that the CVP VXML Server knows how to communicate with your database. **Follow the instructions provided here.**[0]

3. In Audium Builder for CVP Studio, edit the configuration of the Database element in question. Enter the string you entered *below* in <LABEL_YOU_CHOOSE> from the Tomcat Context into the JNDI Name property of the Settings tab of your Database element.

   Note: You should not include the *jdbc/* portion here.

   Here is an example that uses MySQL (edit *context.xml* from *AUDIUM_HOME\Tomcat\conf* folder):

0) http://tomcat.apache.org/tomcat-5.5-doc/jndi-datasource-examples-howto.html

-

```
<Context>
<Resource name="jdbc/<LABEL_YOU_CHOOSE>"
auth="Container"
type="javax.sql.DataSource"
username="USER_NAME"
password="USER_PW"
driverClassName="com.mysql.jdbc.Driver"
url="jdbc:mysql://HOSTNAME_OR_IP:PORT/DB_NAME" />
</Context>
```

The default port number for MySQL is 3306. An example url for the above Context would be *jdbc:mysql://localhost:3306/DB_name*

Note: Alternately, the **<Resource>** can be configured in the *server.xml* file under **<GlobalNamingResources>**, and a **<ResourceLink>** created in *context.xml* under **<Context>**

4. Under heavy load conditions, enable Database Connection Pooling.

A database connection pool creates and manages a pool of connections to a database. Recycling and reusing already existing connections to a database is more efficient than opening a new connection. For further information on Tomcat Database Pooling **please see.**[1]

1) http://tomcat.apache.org/tomcat-5.5-doc/jndi-datasource-examples-howto.html

Chapter 20

Date

The **`Date`** voice element captures a date input from the caller. The date can be entered using DTMF input (in the YYYYMMDD format). It can also be spoken in natural language including a month, day and year. The captured value will be stored in element data as a fixed-length date string in the YYYYMMDD format. If the year is not specified in the input, YYYY is stored as "????". And if the month or the day is not specified, MM and DD will be stored as "??".

This chapter contains the following topics:

Settings

Name (Label)	Type	Req'd	Single Setting Value	Substitution Allowed	Default	Notes
inputmode (Input Mode)	string enum	Yes	**`true`**	**`false`**	both	The type of entry allowed for input. Possible values are: **`voice`** | **`dtmf`** | **`both`**.
Noinput_timeout (Noinput Timeout)	string	Yes	**`true`**	**`true`**	5s	The maximum time length allowed for silence or no keypress before a noinput event is thrown. Possible values are standard time designations including both a non-negative number and a time unit, for example, 3s (for seconds) or 300ms (for milliseconds). Default = 5s.

collect_max_noinput_count (Date Max NoInput Count)	int ≥ 0	Yes	**true**	**true**	3	The maximum number of noinput events. 0 = infinite noinputs allowed.
collect_max_nomatch_count (Date Max NoMatch Count)	int ≥ 0	Yes	**true**	**false**	3	The maximum number of nomatch events allowed. 0 = infinite nomatches allowed.
collect_confidence_level (Date Confidence Level)	decimal (0.0 – 1.0)	Yes	**true**	**true**	0.40	The confidence level threshold to use during date capture.
modal (Disable Hotlinks)	boolean	Yes	**true**	**true**	false	Whether or not to temporarily disable all hotlink grammars (global or local) and universal grammars. If set to true, only the grammars of the current Date element will be enabled for the duration of the element. Otherwise all active grammars will be enabled.
secure_logging (Secure Logging)	boolean	Yes	**true**	**true**	false	Whether or not to enable logging of potentially sensitive data of the Date element. If set to true, the following potentially sensitive data of the element will not log: utterance, interpretation, value, nbestUtteranceX† and nbestInterpretationX†. Instead, the above will be logged as the field name appended with the suffix "_secureLogging" and with the value "*****", for example nbestUtterance1_secureLogging,*****
maxnbest (Maxnbest)	int ≥ 1	Yes	**true**	**true**	1	The maximum number of speech recognition results that can be generated per voice input.

†Refer to the following Element Data table for information about nbestUtteranceX and nbestInterpretationX.

Element Data

Name	Type	Notes
value	string	The date stored in the YYYYMMDD format.
value_confidence	float	This is the confidence value of the captured date utterance. When n-best recognition is enabled, this stores the confidence score of the top hypothesis in the n-best list.
nbestLength	int ≥ 1	This stores the number of n-best hypotheses generated by the speech engine.

nbestUtterance1 nbestUtterance2 … nbestUtteranceX	string	This set of element data stores the captured n-best utterances. While the maximum number of nbestUtteranceX values is equal to the maxnbest setting value, the actual number of these values available is determined by speech recognition at runtime, where nbestUtterance1 holds the utterance of the top hypothesis in the n-best list and nbestUtteranceX holds the utterance of the last hypothesis.
nbestInterpretation1 nbestInterpretation2 … nbestInterpretationX	string	This set of element data stores the interpretations of captured n-best utterances. While the maximum number of nbestInterpretationX values is equal to the maxnbest setting value, the actual number of these values available is determined by speech recognition at runtime, where nbestInterpretation1 holds the interpretation of the top hypothesis in the n-best list and nbestInterpretationX holds the interpretation of the last hypothesis.
nbestConfidence1 nbestConfidence2 … nbestConfidenceX	float	This set of element data stores the confidence scores of captured n-best utterances. While the maximum number of nbestConfidenceX values is equal to the maxnbest setting value, the actual number of these values available is determined by speech recognition at runtime, where nbestConfidence1 holds the confidence score of the top hypothesis in the n-best list and nbestConfidenceX holds the confidence score of the last hypothesis.
nbestInputmode1 nbestInputmode2 … nbestInputmodeX	string	This set of element data stores the input modes of captured n-best utterances.

Exit States

Name	Notes
max_nomatch	The maximum number of nomatch events has occurred. If the max nomatch count is 0, this exit state will never occur.
max_noinput	The maximum number of noinput events has occurred. If the max noinput count is 0, this exit state will never occur.
done	The data capture was completed.

Audio Groups

Date Capture

Name (Label)	Req'd	Max 1	Notes
collect_initial_audio_group	Yes	Yes	Played when the voice element first begins.

(Date Initial)			
collect_noinput_audio_group (Date NoInput)	No	No	Played when a noinput event occurs during date input. The noinput event count corresponds to the audio group count.
collect_nomatch_audio_group (Date NoMatch)	No	No	Played when a nomatch event occurs during date input. The nomatch event count corresponds to the audio group count.
collect_help_audio_group (Date Help)	No	No	Played when a help event occurs during date input. The help event count corresponds to the audio group count. If not specified, a help event is treated as nomatch.

End

Name (Label)	Req'd	Max1	Notes
done_audio_group (Done)	No	Yes	Played after the date capture is completed. If not specified, no audio will be played.

Folder and Class Information

Studio Element Folder Name	Class Name
Date & Time	com.audium.server.voiceElement.date.MBasicDate

Chapter 21

Date_with_Confirm

The **`Date_With_Confirm`** voice element captures a date input from the caller, and presents a confirmation menu allowing the caller to either accept their entry or re-enter the date. The date can be entered using DTMF input (in the YYYYMMDD format). It can also be spoken in natural language including a month, day and year. The captured value will be stored in element data as a fixed-length date string in the YYYYMMDD format. If the year is not specified in the input, YYYY is stored as "????". If the month or the day is not specified, MM and DD will be stored as "??".

This chapter contains the following topics:

Settings

Name (Label)	Type	Req'd	Single Setting Value	Substitution Allowed	Default	Notes
inputmode (Input Mode)	string enum	Yes	**`true`**	**`false`**	**`both`**	The type of entry allowed for input. Possible values are: **`voice`** | **`dtmf`** | **`both`**.
noinput_timeout (Noinput Timeout)	string	Yes	**`true`**	**`true`**	5s	The maximum time length allowed for silence or no keypress before a noinput event is thrown. Possible values are standard time designations including both a non-negative number and a time unit, for example, 3s (for seconds) or 300ms (for milliseconds). Default = 5s.

collect_max_noinput_count (Date Max NoInput Count)	int ≥ 0	Yes	**true**	**true**	3	The maximum number of noinput events allowed during date input capture. 0 = infinite noinputs allowed.
collect_max_nomatch_count (Date Max NoMatch Count)	int ≥ 0	Yes	**true**	**false**	3	The maximum number of nomatch events allowed during date input capture. 0 = infinite nomatches allowed.
confirm_max_noinput_count (Confirm Max NoInput Count)	int ≥ 0	Yes	**true**	**true**	3	The maximum number of noinput events allowed during date input confirmation. 0 = infinite noinputs allowed.
confirm_max_nomatch_count (Confirm Max NoMatch Count)	int ≥ 0	Yes	**true**	**false**	3	The maximum number of nomatch events allowed during date input confirmation. 0 = infinite nomatches allowed.
max_disconfirmed_count (Max Disconfirmed Count)	int ≥ 0	Yes	**true**	**false**	3	The maximum number of times a caller is allowed to disconfirm a captured input. 0 = infinite disconfirmations allowed.
collect_confidence_level (Date Confidence Level)	decimal (0.0 – 1.0)	Yes	**true**	**false**	0.40	The confidence level threshold to use during date capture.
confirm_confidence_level (Confirm Confidence Level)	decimal (0.0 – 1.0)	Yes	**true**	**false**	0.50	The confidence level threshold to use during confirmation.
modal (Disable Hotlinks)	boolean	Yes	**true**	**false**	**false**	Whether or not to temporarily disable all hotlink grammars (global or local) and universal grammars. If set to true, only the grammars of the current Date_With_Confirm element (the built-in date and boolean grammars) will be enabled for the duration of the element. Otherwise all active grammars will be enabled.
secure_logging (Secure Logging)	boolean	Yes	**true**	**false**	**false**	Whether or not to enable logging of potentially sensitive data of the Date_With_Confirm element. If set to true, the following potentially sensitive data of the element will not log: utterance, interpretation, value, nbestUtteranceX† and nbestInterpretationX†. Instead, the above will be logged as the field name appended with the suffix "_secureLogging" and with the value "*****", for example nbestUtterance1_secureLogging,*****.

maxnbest (Maxnbest)	int ≥ 1	Yes	`true`	`false`	1	The maximum number of speech recognition results that can be generated per voice input.

†Refer to the following Element Data table for information about nbestUtteranceX and nbestInterpretationX.

Element Data

Name	Type	Notes
value	string	The date stored in the YYYYMMDD format.
value_confidence	float	This is the confidence value of the captured date utterance. When n-best recognition is enabled, this stores the confidence score of the top hypothesis in the n-best list.
confirm_confidence	float	This is the confidence value of the captured confirm utterance.
nbestLength	int ≥ 1	This stores the number of n-best hypotheses generated by the speech engine.
nbestUtterance1 nbestUtterance2 … nbestUtteranceX	string	This set of element data stores the captured n-best utterances. While the maximum number of nbestUtteranceX values is equal to the maxnbest setting value, the actual number of these values available is determined by speech recognition at runtime, where nbestUtterance1 holds the utterance of the top hypothesis in the n-best list and nbestUtteranceX holds the utterance of the last hypothesis.
nbestInterpretation1 nbestInterpretation2 … nbestInterpretationX	string	This set of element data stores the interpretations of captured n-best utterances. While the maximum number of nbestInterpretationX values is equal to the maxnbest setting value, the actual number of these values available is determined by speech recognition at runtime, where nbestInterpretation1 holds the interpretation of the top hypothesis in the n-best list and nbestInterpretationX holds the interpretation of the last hypothesis.
nbestConfidence1 nbestConfidence2 … nbestConfidenceX	float	This set of element data stores the confidence scores of captured n-best utterances. While the maximum number of nbestConfidenceX values is equal to the maxnbest setting value, the actual number of these values available is determined by speech recognition at runtime, where nbestConfidence1 holds the confidence score of the top hypothesis in the n-best list and nbestConfidenceX holds the confidence score of the last hypothesis.
nbestInputmode1 nbestInputmode2 … nbestInputmodeX	string	This set of element data stores the input modes of captured n-best utterances.

Exit States

Name	Notes
max_nomatch	The maximum number of nomatch events has occurred. If the max nomatch count is 0, this exit state will never occur.
max_noinput	The maximum number of noinput events has occurred. If the max noinput count is 0, this exit state will never occur.
max_disconfirmed	The maximum number of disconfirmations occurred. If the **`max_disconfirmed_count`** is set to 0, this exit state will never occur.
done	The date captured was confirmed.

Audio Groups

Date Capture

Name (Label)	Req'd	Max 1	Notes
collect_initial_audio_group (Date Initial)	Yes	Yes	Played when the voice element first begins.
collect_noinput_audio_group (Date NoInput)	No	No	Played when a noinput event occurs during date input. The noinput event count corresponds to the audio group count.
collect_nomatch_audio_group (Date NoMatch)	No	No	Played when a nomatch event occurs during date input. The nomatch event count corresponds to the audio group count.
collect_help_audio_group (Date Help)	No	No	Played when a help event occurs during date input. The help event count corresponds to the audio group count. If not specified, a help event is treated as nomatch.

Date Confirm

Name (Label)	Req'd	Max 1	Notes
confirm_initial_audio_group (Confirm Initial)	Yes	Yes	Played when the captured date is confirmed.
confirm_noinput_audio_group (Confirm NoInput)	No	No	Played when a noinput event occurs during date confirmation. The noinput event count corresponds to the audio group count.
confirm_nomatch_audio_group	No	No	Played when a nomatch event occurs during date confirmation. The nomatch event count corresponds to the audio group count.

(Confirm NoMatch)			
confirm_help_audio_group (Confirm Help)	No	No	Played when a help event occurs during date confirmation. The help event count corresponds to the audio group count. If not specified, by default help is treated as nomatch.
disconfirmed_audio_group (Disconfirmed)	No	No	Played after the caller disconfirms a date entry.

End

Name (Label)	Req'd	Max 1	Notes
yes_audio_group (Yes)	No	Yes	Played after the caller chooses the *yes* option. If not specified, no audio will be played when this option is chosen.

Folder and Class Information

Studio Element Folder Name	Class Name
Date & Time	com.audium.server.voiceElement.date.MBasicDateWithConfirm

Folder and Class Information

Chapter 22

Digits

The **`Digits`** voice element captures a string of numerical digits. It may be used to collect small or large strings of digits. The digit string can be spoken or entered using the keypad. The captured value will be stored in element data as a string. The string cannot contain any non-numerical characters. Using speech input, the number is spoken one digit at a time (that is, 49678 is spoken *four nine six seven eight*). DTMF input can be terminated by a # keypress if desired (if not used, the entry is considered terminated when the input timeout has been reached).

With the Digits voice element, the application designer has the ability to set length restrictions on the digit string. A minimum and maximum length can be given to narrow the criteria. If a string of a specific length is required, the minimum and maximum lengths should be set to the same value. If fewer digits are entered, a nomatch event will be thrown. A string of digits with length greater than the maximum length cannot be entered.

This chapter contains the following topics:

Settings

Name (Label)	Type	Req'd	Single Setting Value	Substitution Allowed	Default	Notes
inputmode (Input Mode)	string enum	Yes	**`true`**	**`false`**	**`both`**	The type of entry allowed for input. Possible values are: **`voice`** | **`dtmf`** | **`both`**.
noinput_timeout (Noinput Timeout)	string	Yes	**`true`**	**`true`**	5s	The maximum time length allowed for silence or no keypress before a noinput event is thrown. Possible values are

						standard time designations including both a non-negative number and a time unit, for example, 3s (for seconds) or 300ms (for milliseconds). Default = 5s.
max_noinput_count (Digits Max NoInput Count)	int ≥ 0	Yes	**true**	**true**	3	The maximum number of noinput events allowed during digits input capture. 0 = infinite noinputs allowed.
max_nomatch_count (Digits Max NoMatch Count)	int ≥ 0	Yes	**true**	**true**	3	The maximum number of nomatch events allowed during digits input capture. 0 = infinite nomatches allowed.
digits_confidence_level (Digits Confidence Level)	decimal (0.0 to 1.0)	Yes	**true**	**true**	0.40	The confidence level threshold to use during digits capture.
min_digit (Min Digits)	int ≥ 0	Yes	**true**	**true**	*None*	Minimum number of digits allowed.
max_digit (Max Digits)	int ≥ 0	Yes	**true**	**true**	*None*	Maximum number of digits allowed.
modal (Disable Hotlinks)	boolean	Yes	**true**	**true**	false	Whether or not to temporarily disable all hotlink grammars (global or local) and universal grammars. If set to true, only the grammars of the current Digits element will be enabled for the duration of the element. Otherwise all active grammars will be enabled.
secure_logging (Secure Logging)	boolean	Yes	**true**	**true**	false	Whether or not to enable logging of potentially sensitive data of the Digits element. If set to true, the following potentially sensitive data of the element will not log: utterance, interpretation, value, nbestUtteranceX† and nbestInterpretationX†. Instead, the above will be logged as the field name appended with the suffix "_secureLogging" and with the value "*****", for example nbestUtterance1_secureLogging,*****.
maxnbest (Maxnbest)	int ≥ 1	Yes	**true**	**true**	1	The maximum number of speech recognition results that can be generated per voice input.

†Refer to the following Element Data table for information about nbestUtteranceX and nbestInterpretationX

Element Data

Name	Type	Notes
Value	string	The digit string value captured.
value_confidence	float	This is the confidence value of the captured utterance. When n-best recognition is enabled, this stores the confidence score of the top hypothesis in the n-best list.
nbestLength	int ≥ 1	This stores the number of n-best hypotheses generated by the speech engine.
nbestUtterance1 nbestUtterance2 … nbestUtteranceX	string	This set of element data stores the captured n-best utterances. While the maximum number of nbestUtteranceX values is equal to the maxnbest setting value, the actual number of these values available is determined by speech recognition at runtime, where nbestUtterance1 holds the utterance of the top hypothesis in the n-best list and nbestUtteranceX holds the utterance of the last hypothesis.
nbestInterpretation1 nbestInterpretation2 … nbestInterpretationX	string	This set of element data stores the interpretations of captured n-best utterances. While the maximum number of nbestInterpretationX values is equal to the maxnbest setting value, the actual number of these values available is determined by speech recognition at runtime, where nbestInterpretation1 holds the interpretation of the top hypothesis in the n-best list and nbestInterpretationX holds the interpretation of the last hypothesis.
nbestConfidence1 nbestConfidence2 … nbestConfidenceX	float	This set of element data stores the confidence scores of captured n-best utterances. While the maximum number of nbestConfidenceX values is equal to the maxnbest setting value, the actual number of these values available is determined by speech recognition at runtime, where nbestConfidence1 holds the confidence score of the top hypothesis in the n-best list and nbestConfidenceX holds the confidence score of the last hypothesis.
nbestInputmode1 nbestInputmode2 … nbestInputmodeX	string	This set of element data stores the input modes of captured n-best utterances.

Exit States

Name	Notes
max_nomatch	The maximum number of nomatch events has occurred. If the nomatch max count is 0, this exit state will never occur.

max_noinput	The maximum number of noinput events has occurred. If the noinput max count is 0, this exit state will never occur.
done	The digit string capture was completed.

Audio Groups

Digits Capture

Name (Label)	Req'd	Max1	Notes
digits_initial_audio_group (Digits Initial)	Yes	Yes	Played when the voice element first begins.
digits_nomatch_audio_group (Digits NoMatch)	No	No	Played when a nomatch event occurs.
digits_noinput_audio_group (Digits NoInput)	No	No	Played when a noinput event occurs.
digits_help_audio_group (Digits Help)	No	No	Played when the caller asked for help. If not specified, help is treated as a nomatch by default.

End

Name (Label)	Req'd	Max1	Notes
done_audio_group (Done)	No	Yes	Played when the digits capture is completed and the voice element exits with the done exit state.

Folder and Class Information

Studio Element Folder Name	Class Name
Number Capture	com.audium.server.voiceElement.digit.MBasicDigit

Chapter 23

Digits_with_Confirm

The **`Digits_With_Confirm`** voice element captures a string of numerical digits, and presents a confirmation menu allowing the caller to either accept their entry or re-enter the digits. It may be used to collect small or large strings of digits. The digit string can be spoken or entered using the keypad. The captured value will be stored in element data as a string. The string cannot contain non-numerical characters. Using speech input, the number is spoken one digit at a time (i.e. 49678 is spoken "four nine six seven eight"). DTMF input can be terminated by a # keypress if desired (otherwise, the entry is considered terminated when the input timeout is reached).

With the **`Digits_With_Confirm`** voice element, the application designer has the ability to set length restrictions on the digit string. A minimum and maximum length can be given to narrow the criteria. If a string of a specific length is required, the minimum and maximum lengths should be set to the same value. If fewer digits are entered, a nomatch event will be thrown. A string of digits with length greater than the maximum length cannot be entered.

This chapter contains the following topics:

Settings

Name (Label)	Type	Req'd	Single Setting Value	Substitution Allowed	Default	Notes
inputmode (Input Mode)	string enum	Yes	**`true`**	**`false`**	**`both`**	The type of entry allowed for input (during digits capture and confirmation). Possible values are: **`voice`** | **`dtmf`** | **`both`**.

noinput_timeout (Noinput Timeout)	string	Yes	**true**	**true**	5s	The maximum time length allowed for silence or no keypress before a noinput event is thrown. Possible values are standard time designations including both a non-negative number and a time unit, for example, 3s (for seconds) or 300ms (for milliseconds). Default = 5s.
digits_max_noinput_count (Digits Max NoInput Count)	int ≥ 0	Yes	**true**	**true**	3	The maximum number of noinput events allowed during digits input capture. 0 = infinite noinputs allowed.
digits_max_nomatch_count (Digits Max NoMatch Count)	int ≥ 0	Yes	**true**	**true**	3	The maximum number of nomatch events allowed during digits input capture. 0 = infinite nomatches allowed.
confirm_max_noinput_count (Confirm Max NoIput Count)	int ≥ 0	Yes	**true**	**true**	3	The maximum number of noinput events allowed during digits input confirmation. 0 = infinite noinputs allowed.
confirm_max_nomatch_count (Confirm Max NoMatch Count)	int ≥ 0	Yes	**true**	**true**	3	The maximum number of nomatch events allowed during digits input confirmation. 0 = infinite nomatches allowed.
max_disconfirmed_count (Max Disconfirmed Count)	int ≥ 0	Yes	**true**	**true**	3	The maximum number of times a caller is allowed to disconfirm a captured digits input. 0 = infinite disconfirmations allowed.
digits_confidence_level (Digits Confidence Level)	decimal (0.0 to 1.0)	Yes	**true**	**true**	0.40	The confidence level threshold to use during digits capture.
confirm_confidence_level (Confirm Confidence Level)	decimal (0.0 to 1.0)	Yes	**true**	**true**	0.50	The confidence level threshold to use during confirmation.
min_digit (Min Digits)	int > 0	Yes	**true**	**true**	*None*	Minimum number of digits allowed.
max_digit (Max Digits)	int > 0	Yes	**true**	**true**	*None*	Maximum number of digits allowed.
modal (Disable Hotlinks)	boolean	Yes	**true**	**true**	**false**	Whether or not to temporarily disable all hotlink grammars (global or local) and universal grammars. If set to true, only the grammars of the current Digits_With_Confirm element (the builtin digits and boolean grammars) will be enabled for the duration of the

						element. Otherwise all active grammars will be enabled.
secure_logging (Secure Logging)	boolean	Yes	**true**	**true**	**false**	Whether or not to enable logging of potentially sensitive data of the Digits_With_Confirm element. If set to true, the following potentially sensitive data of the element will not log: utterance, interpretation, value, nbestUtteranceX† and nbestInterpretationX†. Instead, the above will be logged as the field name appended with the suffix "_secureLogging" and with the value "*****", for example nbestUtterance1_secureLogging,*****.
maxnbest (Maxnbest)	int ≥ 1	Yes	**true**	**true**	1	The maximum number of speech recognition results that can be generated per voice input.

†Refer to the following Element Data table for information about nbestUtteranceX and nbestInterpretationX

Element Data

Name	Type	Notes
Value	string	The digit string captured.
value_confidence	float	This is the confidence value of the captured digit string utterance. When n-best recognition is enabled, this stores the confidence score of the top hypothesis in the n-best list.
confirm_confidence	float	This is the confidence value of the captured confirm utterance.
nbestLength	int ≥ 1	This stores the number of n-best hypotheses generated by the speech engine.
nbestUtterance1 nbestUtterance2 … nbestUtteranceX	string	This set of element data stores the captured n-best utterances. While the maximum number of nbestUtteranceX values is equal to the maxnbest setting value, the actual number of these values available is determined by speech recognition at runtime, where nbestUtterance1 holds the utterance of the top hypothesis in the n-best list and nbestUtteranceX holds the utterance of the last hypothesis.
nbestInterpretation1 nbestInterpretation2 … nbestInterpretationX	string	This set of element data stores the interpretations of captured n-best utterances. While the maximum number of nbestInterpretationX values is equal to the maxnbest setting value, the actual number of these values available is determined by speech recognition at runtime, where nbestInterpretation1 holds the interpretation of the top hypothesis in the n-best list and nbestInterpretationX holds the interpretation of the last hypothesis.

nbestConfidence1 nbestConfidence2 … nbestConfidenceX	float	This set of element data stores the confidence scores of captured n-best utterances. While the maximum number of nbestConfidenceX values is equal to the maxnbest setting value, the actual number of these values available is determined by speech recognition at runtime, where nbestConfidence1 holds the confidence score of the top hypothesis in the n-best list and nbestConfidenceX holds the confidence score of the last hypothesis.
nbestInputmode1 nbestInputmode2 … nbestInputmodeX	string	This set of element data stores the input modes of captured n-best utterances.

Exit States

Name	Notes
max_nomatch	The maximum number of nomatch events has occurred. If the nomatch max count is 0, this exit state will never occur.
max_noinput	The maximum number of noinput events has occurred. If the noinput max count is 0, this exit state will never occur.
max_disconfirmed	The maximum number of disconfirmations has occurred. If the max disconfirmed count is set to 0, this exit state will never occur.
done	The digit string captured was confirmed.

Audio Groups

Digits Capture

Name (Label)	Req'd	Max1	Notes
digits_initial_audio_group (Digits Initial)	Yes	Yes	Played when the voice element first begins.
digits_nomatch_audio_group (Digits NoMatch)	No	No	Played when a nomatch event occurs during digits capture.
digits_noinput_audio_group (Digits NoInput)	No	No	Played when a noinput event occurs during digits capture.
digits_help_audio_group (Digits Help)	No	No	Played when the caller asks for help during digits capture. If not specified, by default help is treated as a nomatch.

Digits Confirm

Name (Label)	Req'd	Max1	Notes
confirm_initial_audio_group (Confirm Initial)	Yes	Yes	Played when confirmation first begins.
confirm_nomatch_audio_group (Confirm NoMatch)	No	No	Played when a nomatch event occurs during confirmation. The nomatch event count corresponds to the audio group count.
confirm_noinput_audio_group (Confirm NoInput)	No	No	Played when a noinput event occurs during confirmation. The noinput event count corresponds to the audio group count.
confirm_help_audio_group (Confirm Help)	No	No	Played when a help event occurs during confirmation. The help event count corresponds to the audio group count. If not specified, by default help throws a nomatch.
disconfirmed_audio_group (Disconfirmed)	No	No	Played after the caller disconfirms a captured digits entry. Upon reaching the max_disconfirmed_count, the prompt should be about exiting with the max_disconfirmed exit state.

End

Name (Label)	Req'd	Max 1	Notes
yes_audio_group (Yes)	No	Yes	Played after the caller chooses the **yes** option. If not specified, no audio will be played when this option is chosen.

Folder and Class Information

Studio Element Folder Name	Class Name
Number Capture	com.audium.server.voiceElement.digit.MBasicDigitWithConfirm

Folder and Class Information

Chapter 24

Email

The **`Email`** action element sends messages using the Javamail package supplied by the application server to send messages to the provided email address. Additionally the message can include attachments. The application server must be configured to set a JNDI datasource for mail sessions. The **`to`** and **`tolist`** fields are not individually required; however, at least one must be defined. Email addresses are not verified for syntax or validity. Attachments that do not exist will be skipped but the message will still be sent. Repeated email addresses are sent the message multiple times. The **`toList`**, **`ccList`** and **`bccList`** settings must refer to session data variables that holds a **`ResultSetList`** Java class holding a list of email addresses (retrieved from a Database element).

This chapter contains the following topics:

Settings

Name (Label)	Type	Req'd	Single Setting Value	Substitution Allowed	Default	Notes
jndiName (JNDI Name)	string	Yes	**`true`**	**`true`**	*None*	The configured JNDI datasource for mail sessions under the java application server.
to (To)	string	No	**`false`**	**`true`**	*None*	The email address this message will be sent to. This setting is repeatable so that each setting value contains a separate email address.
toList (To List)	string	No	**`true`**	**`true`**	*None*	The name of a session data variable containing a ResultSetList object holding a list of email addresses as retrieved from a Database element.

						The email will be sent to every address in this list.
from (From)	string	Yes	**true**	**true**	*None*	The email address this message will be sent from.
cc (Cc)	string	No	**false**	**true**	*None*	The email address this message will be carbon copied to. This setting is repeatable so that each setting value contains a separate email address.
ccList (Cc List)	string	No	**true**	**true**	*None*	The name of a session data variable containing a ResultSetList object holding a list of email addresses as retrieved from a Database element. The email will be carbon copied to each address in this list.
bcc (Bcc)	string	No	**false**	**true**	*None*	The email address this message will be blind carbon copied to. This setting is repeatable so that each setting value contains a separate email address.
bccList (Bcc List)	string	No	**true**	**true**	*None*	The name of a session data variable containing a ResultSetList object holding a list of email addresses as retrieved from a Database element. The email will be blind carbon copied to each address in this list.
subject (Subject)	string	No	**true**	**true**	*None*	Subject field of the email.
attachment (Attachment)	string	No	**false**	**true**	*None*	Full local path of the file to be attached. This setting is repeatable so that each setting value contains a reference to separate attachments.
messageBody (Message Body)	string	Yes	**true**	**true**	*None*	The message body of the email.

Exit States

Name	Notes
done	The database query successfully completed.

Folder and Class Information

Studio Element Folder Name	Class Name
Notification	com.audium.server.action.email.EmailAction

Configuring Email Element

For the Email Element to start functioning, you need to configure the following settings:

1. Download the JavaMail package from: **java.sun.com/products/javamail/downloads/index.html**.

2. Download **http://java.sun.com/products/javabeans/glasgow/jaf.html** (JavaBeans Activation Framework).

3. Copy JavaMail .jar files and activation.jar to Tomcat\common\lib folder under VXMLServer folder.

4. Add a Mail Session under Tomcat manually by adding this to the \Tomcat\conf\context.xml file within the <Context></Context> tags:

   <Resource name="mail/ChrisMail"

   type="javax.mail.Session"

   mail.smtp.host="xmb-sjc-22d.amer.cisco.com"/>

   Here, the **name** should be "mail/ANY_NAME_YOU_CHOOSE", **type** should be "javax.mail.Session", and mail.smtp.host should be a working SMTP server.

   Note: In Studio, edit the configuration of the Email element in question. Set the JNDI name to the "ANY_NAME_YOU_CHOOSE" portion of what you entered in the Tomcat settings. In the above example, you can enter "ChrisMail" but ensure that you do not include the "mail/" portion here.

Chapter 25

Form

The **`Form`** voice element is used to capture any input from the caller, based on application designer-specified grammars. The valid caller inputs can be specified either directly in the voice element settings (which will create an inline grammar) or with external grammar files. Information returned by the grammar are saved in element data that then can be analyzed by developer-defined components. A Form voice element can be configured to listen for voice input only, DTMF input only, or both voice and DTMF input. In short, the Form element is the most flexible of included Unified CVP elements as it allows almost any custom information to be captured without requiring a separate voice element. If a Unified CVP or third-party voice element does not capture the information desired, one can always use a Form element before embarking on constructing a custom voice element.

The Form element provides support for custom control over the VoiceXML code generation. For example, the developer can decide what name to use for the VoiceXML field, whether or not to include a field-level slot attribute and how to name the slot attribute. The element also supports separate options for activating help prompts and the ability to set modality for Form.

Multiple DTMF and speech external grammars can be referenced within a single Form element, and the application designer has the ability to specify grammar weights for speech grammars and set MIME types for both speech and DTMF grammars. Additionally, the Form element can be used to capture multiple slots, and the developer can specify for which slot(s) they want the recognition values stored as element data. N-best processing can be enabled, and standard n-best results are stored in element data and the activity log.

This chapter contains the following topics:

Settings

Name (Label)	Type	Req'd	Single Setting Value	Sub. Allow	Default	Notes
inputmode (Input Mode)	string enum	Yes	**`true`**	**`false`**	both	The type of entry allowed for input. Possible values are: **`voice`** | **`dtmf`** | **`both`**.
noinput_timeout (Noinput Timeout)	string	Yes	**`true`**	**`true`**	5s	The maximum time length allowed for silence or no keypress before a noinput event is thrown. Possible values are standard time designations including both a non-negative number and a time unit, for example, 3s (for seconds) or 300ms (for milliseconds). Default = 5s.
form_max_noinput_count (Form Max NoInput)	int ≥ 0	Yes	**`true`**	**`true`**	3	0 = infinite noinputs allowed.
form_max_nomatch_count (Form Max NoMatch)	int ≥ 0	Yes	**`true`**	**`true`**	3	0 = infinite nomatches allowed.
confidence_level (Form Confidence Level)	decimal (0.0 – 1.0)	Yes	**`true`**	**`true`**	0.40	The confidence level threshold to use for data capture.
voice_grammar (Voice Grammar)	string	*No	**`false`**	**`true`**	*None*	Defines an external voice grammar for Form, in a string format delimited with semi-colons specifying five values in the following order: 1. The language context in which the current grammar should be used (optional). If omitted the language will be the same as the page-scoped language. 2. The language code to assign to the **`xml:lang`** attribute of the parent **`<grammar>`** tag (optional). If omitted the attribute will not have an xml:lang attribute and the standard scoping rules apply. 3. The grammar weight (optional) 4. The grammar type (optional) 5. URL of the grammar file (required)

						The type can be left blank to use the adapter default or set to **`null`** to not include a type at all. If one of the optional parameters is defined, **four** semi-colons must be used, even if the other parameters are not used. For example: • en-US;en-US;0.6;application/srgs +xml;http://IP:PORT/ mygrammar.grxml • fr-FR;en-US;;application/srgs +xml;http://IP:PORT/ mygrammar.grxml • ;;0.6;;http://IP:PORT/mygrammar.grxml • ;fr-FR;0.6;null;http://IP:PORT/mygrammar.grxml • http://IP:PORT/mygrammar.grxml This setting is repeatable so multiple external grammar sources may be specified. None of the four settings - **`voice_grammar`**, **`dtmf_grammar`**, **`voice_keyword`** and **`dtmf_keypress`** - is required, but at least one must be specified since a form cannot be completed without a grammar.
dtmf_grammar (DTMF Grammar)	URI	*No	**`false`**	**`true`**	*None*	Defines an external DTMF grammar for Form, in a string format delimited with a semi-colon specifying four values in the following order: 1. The language context in which the current grammar should be used (optional). If omitted the language will be the same as the page-scoped language. 2. The language code to assign to the **`xml:lang`** attribute of the parent **`<grammar>`** tag (optional) . If omitted the attribute will not have an xml:lang attribute and the standard scoping rules apply. 3. The grammar type (optional) 4. URL of the grammar file (required) The type can be left blank to use the adapter default or set to *null* to not include a type at all. If one of the optional parameters is defined, **three** semi-colons must be used, even if the other parameters are not used. For example:

						• en-US;en-US;application/srgs +xml;http://IP:PORT/ mygrammar.grxml • ;fr-FR;null;http://IP:PORT/mygrammar.grxml • en-US;;;http://IP:PORT/mygrammar.grxml • http://IP:PORT/mygrammar.grxml This setting is repeatable so multiple external grammar sources may be specified. None of the four settings - **`voice_grammar`**, **`dtmf_grammar`**, **`voice_keyword`** and **`dtmf_keypress`** - is required, but at least one must be specified since a form cannot be completed without a grammar.
voice_keyword (Voice Keyword)	string	*No	**`false`**	**`true`**	*None*	Defines the inline voice grammar for Form, with each configuration of this repeatable setting specifying one option for the grammar. The valid format is a string separated with a semi-colon specifying four values in the following order: 1. The language context in which the current input should be included in the inline grammar (optional). If omitted the language will be the same as the page-scoped language. 2. The language code to assign to the **`xml:lang`** attribute of the **`<item>`** tag inside the inline grammar (optional) . If omitted the attribute will not have an **`xml:lang`** attribute and the standard scoping rules apply. 3. The weight of the grammar item (optional) 4. The grammar item (required) **Note:** The grammar item may either contain the input itself followed by an optional return value, or just the input. If one of the optional parameters is defined, **three** semi-colons must be used, even if the other parameters are not used. Sample configurations values are: • en-US;en-US;0.6;news report [news]

						• ;fr-FR;0.6;news report • news report [news] • news report None of the four settings - **voice_grammar**, **dtmf_grammar**, **voice_keyword** and **dtmf_keypress** - is required, but at least one must be specified since a form cannot be completed without at least one grammar.
dtmf_keypress (DTMF Keypress)	character (0-9, #, *)	*No	**false**	**true**	*None*	Defines the inline DTMF grammar for Form, with each configuration of this repeatable setting specifying one option for the grammar. The valid format is a string separated with a semi-colon specifying three values in the following order: 1. The language context in which the current input should be included in the inline grammar (optional). If omitted the language will be the same as the page-scoped language. 2. The language code to assign to the **xml:lang** attribute of the **<item>** tag inside the inline grammar (optional) . If omitted the attribute will not have an **xml:lang** attribute and the standard scoping rules apply. 3. A character (0-9, #, *) representing the keypress, followed by an optional return value. **Note:** The grammar item may either contain the input itself followed by an optional return value, or just the input. If one of the optional parameters is defined, **two** semi-colons must be used, even if the other parameters are not used. Sample configurations values are: • en-US;en-US;1 [news] • ;fr-FR;1 • 1 [news] • 1

						None of the four settings - **voice_grammar**, **dtmf_grammar**, **voice_keyword** and **dtmf_keypress** - is required, but at least one must be specified since a form cannot be completed without at least one grammar.
help_voice_keyword (Help Voice Keyword)	string	No	**false**	**true**	*None*	Specifies a custom inline voice grammar to activate the help audio group. Each value of this repeatable setting adds another valid utterance. The format is a string specifying just the utterance (for example, *news report*). If this setting is configured, a custom inline voice grammar will be generated, replacing the default help grammar used by a browser, and the custom grammar will be active only within the current Form element.
help_dtmf_keypress (Help DTMF Keypress)	character (0-9, #, *)	No	**false**	**true**	*None*	Specifies a custom inline DTMF grammar to activate the help audio group. Each value of this repeatable setting adds another valid DTMF keypress. The format is a character (0-9, #, *) representing just the keypress. If this setting is configured, a custom inline DTMF grammar will be generated, and it will be active only within the current Form element.
modal (Disable Hotlinks)	boolean	Yes	**true**	**true**	**false**	Whether or not to temporarily disable all hotlink grammars (global or local) and universal grammars. If set to true, only the current Form element grammars will be enabled for the duration of the element. Otherwise all active grammars will be enabled.
field_name (Field Name)	string	Yes	**true**	**true**	found ation _fld	*foundation_fld* - The value to assign to the VXML field name attribute.
slot_name (Field Slot)	string	No	**true**	**true**	*None*	The name to assign to the VXML field slot attribute. If left unspecified, the field will not include a slot attribute.
slot_element_data (Slot Element Data)	string	No	**false**	**true**	*None*	Specifies for which grammar slot the return value should be stored as element data. This is a repeatable setting so multiple slot names can be specified. See notes below for further details.
maxnbest (Maxnbest)	int ≥ 1	Yes	**true**	**true**	1	The maximum number of speech recognition results that can be generated per voice input.
secure_logging (Secure Logging)	boolean	Yes	**true**	**true**	**false**	Whether or not to enable logging of potentially sensitive data of the Form element. If set to true, the following potentially sensitive data of the element will not log: utterance, interpretation,

						value, <SLOT_ELEMENT_DATAX>, nbestUtteranceX, and nbestInterpretationX. Instead, the above will be logged as the field name appended with the suffix "_secureLogging" and with the value "*****", for example nbestUtterance1_secureLogging,*****.

NOTES

- VXML 2.0-compliant browsers typically require top-level slot names in the grammar (inline or external) to match the field-level slot attribute (if it exists) or the field name attribute, in order for the field name variable (and hence the *value* element data) to be defined. For inline grammars, the Form element automatically generates the grammar slot name to match the slot attribute (if available) or the field name. For custom grammars that are referenced from an external source, the application designer needs to set **`Field Name`** and **`Field Slot`** properly based on the slot name returned by the grammar.
- If a grammar returns different slots for different inputs or multiple slots per utterance, there are two ways to configure the Form element to store this data:
  - Leave the **`slot_element_data`** setting empty. The Form element will create element data named "nbestInterpretationX" (where X is from 1 to the length of the n-best list) that contains a string that uses delimiters "+" and ":" to separate the multiple slot names from their values. For example: "+Slot1:value1+Slot2:value2...". A developer would then need to parse this string in a subsequent element to obtain the different slot name and value pairs.
  - Configure the **`slot_element_data`** setting with the names for all the slots that can be returned. The Form element will create a new set of n-best element data to store the recognition results for each slot listed in that setting. The element data will be named as **`<SLOT_ELEMENT_DATAX>`** (where *SLOT_ELEMENT_DATA* is a string identical to the setting value and X is from 1 to the length of the n-best list). For example, if **`slot_element_data`** had two values *city* and *state* and there are three n-best results triggered, then six element data in the names of *city1*, *city2*, *city3*, *state1*, *state2*, and *state3* will be created to store each of the n-best values for the "*city* and *state* slots. Note that if n-best processing is disabled by setting the maxnbest setting to 1, then only one interpretation result will be returned per recognition and thereby only one element data per slot (*city1* and *state1*) will be created.

Element Data

Name	Type	Notes
value	string	This stores the value of the VXML field name variable.
value_confidence	float	This stores the confidence score of the captured Form utterance. When n-best recognition is enabled, this stores the confidence score of the top hypothesis in the n-best list.
<SLOT_ELEMENT_DATA1> <SLOT_ELEMENT_DATA2> …	string	A separate set of element data stores the interpretation values for each filled slot of captured n-best utterances. While the maximum number of **`<SLOT_ELEMENT_DATAX>`** values is equal to the **`maxnbest`** setting value, the actual number of these values available is dependent on speech recognition at runtime, where **`<SLOT_ELEMENT_DATA1>`** holds the slot

<SLOT_ELEMENT_DATAX*>		value of the top hypothesis in the n-best list and **<SLOT_ELEMENT_DATAX>** holds the slot value of the last hypothesis. **Note:** If the **slot_element_data** setting is blank, these sets of element data will not be created.
nbestLength	int ≥ 1	This stores the number of n-best hypotheses generated by the speech engine.
nbestUtterance1 nbestUtterance2 … nbestUtteranceX	string	This set of element data stores the captured n-best utterances. While the maximum number of **nbestUtteranceX** values is equal to the **maxnbest** setting value, the actual number of these values available is determined by speech recognition at runtime, where **nbestUtterance1** holds the utterance of the top hypothesis in the n-best list and **nbestUtteranceX** holds the utterance of the last hypothesis.
nbestInterpretation1 nbestInterpretation2 … nbestInterpretationX	string	This set of element data stores the interpretations of captured n-best utterances. While the maximum number of **nbestInterpretationX** values is equal to the **maxnbest** setting value, the actual number of these values available is determined by speech recognition at runtime, where **nbestInterpretation1** holds the interpretation of the top hypothesis in the n-best list and **nbestInterpretationX** holds the interpretation of the last hypothesis.
nbestConfidence1 nbestConfidence2 … nbestConfidenceX	float	This set of element data stores the confidence scores of captured n-best utterances. While the maximum number of **nbestConfidenceX**values is equal to the **maxnbest** setting value, the actual number of these values available is determined by speech recognition at runtime, where **nbestConfidence1** holds the confidence score of the top hypothesis in the n-best list and **nbestConfidenceX** holds the confidence score of the last hypothesis.
nbestInputmode1 nbestInputmode2 … nbestInputmodeX	string	This set of element data stores the input modes of captured n-best utterances. This stores the number of no input events that the browser returned during the collection phase of the VXML field name variable.
collect_noinput_count	int ≥ 0	This stores the number of no input events that the browser returned during the collection phase of the VXML field name variable.
collect_nomatch_count	int ≥ 0	This stores the number of no match events that the browser returned during the collection phase of the VXML field name variable.

* **SLOT_ELEMENT_DATA** is a string identical to the configuration value of the **slot_element_data** setting, and X is from 1 to the length of the n-best list. If more than one such value is configured, then multiple sets of element data using the same naming convention will be created.

Exit States

Name	Notes
max_nomatch	The maximum number of nomatch events has occurred. If the nomatch max count is 0, this exit state will never occur.
max_noinput	The maximum number of noinput events has occurred. If the noinput max count is 0, this exit state will never occur.
done	The caller input matched the grammar correctly.

Audio Groups

Form Data Capture

Name (Label)	Req'd	Max1	Notes
initial_audio_group (Initial)	Yes	Yes	Played when the voice element first begins.
nomatch_audio_group (NoMatch)	No	No	Played when a nomatch event occurs.
noinput_audio_group (NoInput)	No	No	Played when a noinput event occurs.
help_audio_group (Help)	No	No	Played when the caller asks for help. If not specified, help is treated as a nomatch event by default.

End

Name (Label)	Req'd	Max 1	Notes
done_audio_group (Done)	No	Yes	Played when the form data capture is completed, and the voice element exits with the done exit state.

Folder and Class Information

Studio Element Folder Name	Class Name
Form	com.audium.server.voiceElement.form.MFoundationForm

Folder and Class Information

Chapter 26

Form_with_Confirm

The **Form_With_Confirm** voice element is used to capture and confirm input from the caller, based on application designer-specified grammars. The valid caller inputs can be specified either directly in the voice element settings (which will create an inline grammar) or with external grammar files. Information returned by the grammar are saved in element data that then can be analyzed by developer-defined components. A **Form_With_Confirm** voice element can be configured to listen for voice input only, DTMF input only, or both voice and DTMF input. In short, the **Form_With_Confirm** element is the most flexible of included elements that have confirmation menus as it allows almost any custom information to be captured and confirmed without requiring a separate voice element. If a Unified CVP or third-party voice element does not capture and confirm the information desired, one can always use a **Form_With_Confirm** element before embarking on constructing a custom voice element.

The **Form_With_Confirm** element provides support for custom control over the VoiceXML code generation. For example, the developer can decide what name to use for the VoiceXML field, whether or not to include a field-level slot attribute and how to name the slot attribute. The element also supports separate options for activating help prompts and the ability to set modality for Form.

Multiple DTMF and speech external grammars can be referenced within a single **Form_With_Confirm** element, and the application designer has the ability to specify grammar weights for speech grammars and set MIME types for both speech and DTMF grammars. Additionally, the Form_With_Confirm element can be used to capture multiple slots, and the developer can specify for which slot(s) they want the recognition values stored as element data. N-best processing can be enabled, and standard n-best results are stored in element data and the activity log.

This chapter contains the following topics:

Settings

Name (Label)	Type	Req'd	Single Setting Value	Sub. Allow	Default	Notes
inputmode (Input Mode)	string enum	Yes	**`true`**	**`false`**	**`both`**	The type of entry allowed for input. Possible values are: **`voice`** | **`dtmf`** | **`both`**.
noinput_timeout (Noinput Timeout)	string	Yes	**`true`**	**`true`**	5s	The maximum time length allowed for silence or no keypress before a noinput event is thrown. Possible values are standard time designations including both a non-negative number and a time unit, for example, 3s (for seconds) or 300ms (for milliseconds). Default = 5s.
form_max_noinput_count (Form Max NoInput)	int ≥ 0	Yes	**`true`**	**`true`**	3	The maximum number of noinput events allowed during form input capture. 0 = infinite noinputs allowed.
form_max_nomatch_count (Form Max NoMatch)	int ≥ 0	Yes	**`true`**	**`true`**	3	The maximum number of nomatch events allowed during form input capture. 0 = infinite nomatches allowed.
confirm_max_noinput_count (Confirm Max NoInput)	int ≥ 0	Yes	**`true`**	**`true`**	3	The maximum number of noinput events allowed during form input confirmation. 0 = infinite noinputs allowed.
confirm_max_nomatch_count (Confirm Max NoMatch)	int ≥ 0	Yes	**`true`**	**`true`**	3	The maximum number of nomatch events allowed during form input confirmation. 0 = infinite nomatches allowed.
max_disconfirmed_count (Max Disconfirmed Count)	int ≥ 0	Yes	**`true`**	**`true`**	3	The maximum number of times a caller is allowed to disconfirm a captured input. 0 = infinite disconfirmations allowed.
form_confidence_level (Form Confidence Level)	decimal (0.0 – 1.0)	Yes	**`true`**	**`true`**	0.40	The confidence level threshold to use for capture of the form data.
confirm_confidence_level (Confirm Confidence Level)	decimal (0.0 – 1.0)	Yes	**`true`**	**`true`**	0.50	The confidence level threshold to use for confirmation of the form data.
voice_grammar (Voice Grammar)	string	*No	**`false`**	**`true`**	*None*	Defines an external voice grammar for Form_With_Confirm, in a string format delimited with semi-colons specifying five values in the following order: 1. The language context in which the current grammar should be used (optional). If omitted the language will be the same as the page-scoped language.

						2. The language code to assign to the **`xml:lang`** attribute of the parent **`<grammar>`** tag (optional). If omitted the attribute will not have an **`xml:lang`** attribute and the standard scoping rules apply. 3. The grammar weight (optional) 4. The grammar type (optional) 5. URL of the grammar file (required) The type can be left blank to use the adapter default or set to 'null' to not include a type at all. If one of the optional parameters is defined, **four** semi-colons must be used, even if the other parameters are not used. For example: • en-US;en-US;0.6;application/srgs +xml;http://IP:PORT/mygrammar.grxml • fr-FR;en-US;;application/srgs +xml;http://IP:PORT/mygrammar.grxml • ;;0.6;;http://IP:PORT/mygrammar.grxml • ;fr-FR;0.6;null;http://IP:PORT/ mygrammar.grxml • http://IP:PORT/mygrammar.grxml This setting is repeatable so multiple external grammar sources may be specified. None of the four settings - **`voice_grammar`**, **`dtmf_grammar`**, **`voice_keyword`** and **`dtmf_keypress`** - is required, but at least one must be specified since a form cannot be completed without a grammar.
dtmf_grammar (DTMF Grammar)	URI	*No	**`false`**	**`true`**	*None*	Defines an external DTMF grammar for Form_With_Confirm, in a string format delimited with a semi-colon specifying four values in the following order: 1. The language context in which the current grammar should be used (optional). If omitted the language will be the same as the page-scoped language. 2. The language code to assign to the **`xml:lang`** attribute of the parent **`<grammar>`** tag (optional) . If omitted the

						attribute will not have an **xml:lang** attribute and the standard scoping rules apply. 3. The grammar type (optional) 4. URL of the grammar file (required) The type can be left blank to use the adapter default or set to 'null' to not include a type at all. If one of the optional parameters is defined, **three** semi-colons must be used, even if the other parameters are not used. For example: • en-US;en-US;application/srgs +xml;http://IP:PORT/mygrammar.grxml • ;fr-FR;null;http://IP:PORT/ mygrammar.grxml • en-US;;;http://IP:PORT/mygrammar.grxml • http://IP:PORT/mygrammar.grxml This setting is repeatable so multiple external grammar sources may be specified. None of the four settings - **voice_grammar**, **dtmf_grammar**, **voice_keyword** and **dtmf_keypress** - is required, but at least one must be specified since a form cannot be completed without a grammar.
voice_keyword (Voice Keyword)	string	*No	**false**	**true**	*None*	Defines the inline voice grammar for Form_With_Confirm, with each configuration of this repeatable setting specifying one option for the grammar. The valid format is a string separated with a semi-colon specifying four values in the following order: 1. The language context in which the current input should be included in the inline grammar (optional). If omitted the language will be the same as the page-scoped language. 2. The language code to assign to the **xml:lang** attribute of the **<item>** tag inside the inline grammar (optional) . If omitted the attribute will not have an **xml:lang** attribute and the standard scoping rules apply. 3. The weight of the grammar item (optional)

						4. The grammar item (required) **Note:** The grammar item may either contain the input itself followed by an optional return value, or just the input. If one of the optional parameters is defined, **three** semi-colons must be used, even if the other parameters are not used. Sample configurations values are: • en-US;en-US;0.6;news report [news] • ;fr-FR;0.6;news report • news report [news] • news report None of the four settings - **`voice_grammar`**, **`dtmf_grammar`**, **`voice_keyword`** and **`dtmf_keypress`** - is required, but at least one must be specified since a form cannot be completed without a grammar.
dtmf_keypress (DTMF Keypress)	character (0-9, #, *)	*No	**`false`**	**`true`**	None	Defines the inline DTMF grammar for Form_With_Confirm, with each configuration of this repeatable setting specifying one option for the grammar. The valid format is a string separated with a semi-colon specifying three values in the following order: 1. The language context in which the current input should be included in the inline grammar (optional). If omitted the language will be the same as the page-scoped language. 2. The language code to assign to the **`xml:lang`** attribute of the **`<item>`** tag inside the inline grammar (optional) . If omitted the attribute will not have an **`xml:lang`** attribute and the standard scoping rules apply. 3. A character (0-9, #, *) representing the keypress, followed by an optional return value. **Note:** The grammar item may either contain the input itself followed by an optional return value, or just the input. If one of the optional parameters

						is defined, two semi-colons must be used, even if the other parameters are not used. Sample configurations values are: • en-US;en-US;1 [news] • ;fr-FR;1 • 1 [news] • 1 None of the four settings - **voice_grammar**, **dtmf_grammar**, **voice_keyword** and **dtmf_keypress** - is required, but at least one must be specified since a form cannot be completed without a grammar.
help_voice_keyword (Help Voice Keyword)	string	No	**false**	**true**	*None*	Specifies a custom inline voice grammar to activate the help audio group. Each value of this repeatable setting adds another valid utterance. The format is a string specifying just the utterance (for example, *news report*). If this setting is configured, a custom inline voice grammar will be generated, replacing the default help grammar used by a browser, and the custom grammar will be active only within the current Form_With_Confirm element.
help_dtmf_keypress (Help DTMF Keypress)	character (0-9, #, *)	No	**false**	**true**	*None*	Specifies a custom inline DTMF grammar to activate the help audio group. Each value of this repeatable setting adds another valid DTMF keypress. The format is a character (0-9, #, *) representing just the keypress. If this setting is configured, a custom inline DTMF grammar will be generated, and it will be active only within the current Form_With_Confirm element.
modal (Disable Hotlinks)	boolean	Yes	**true**	**true**	**false**	Whether or not to temporarily disable all hotlink grammars (global or local) and universal grammars. If set to true, only the current Form_With_Confirm element grammars (including the builtin boolean grammar for confirmation) will be enabled for the duration of the element. Otherwise all active grammars will be enabled.
field_name (Field Name)	string	Yes	**true**	**true**	found ation_fld	*foundation_fld* - The value to assign to the VXML field-level name attribute.

slot_name (Field Slot)	string	No	**true**	**true**	*None*	The name to assign to the VXML field-level slot attribute. If left unspecified (i.e. the default value), the field will not have a slot attribute.
slot_element_data (Slot Element Data)	string	No	**false**	**true**	*None*	Specifies for which grammar slot the return value should be stored as element data. This is a repeatable setting so multiple slot names can be specified. See notes below for further details.
maxnbest (Maxnbest)	int ≥ 1	Yes	**true**	**true**	1	The maximum number of speech recognition results that can be generated per voice input.
secure_logging (Secure Logging)	boolean	Yes	**true**	**true**	**false**	Whether or not to enable logging of potentially sensitive data of the Form_With_Confirm element. If set to true, the following potentially sensitive data of the element will not log: utterance, interpretation, value, <SLOT_ELEMENT_DATAX>, nbestUtteranceX, and nbestInterpretationX. Instead, the above will be logged as the field name appended with the suffix "_secureLogging" and with the value "*****", for example nbestUtterance1_secureLogging,*****.

NOTES:

- VXML 2.0-compliant browsers typically require top-level slot names in the grammar (inline or external) to match the field-level slot attribute (if it exists) or the field name attribute, in order for the field name variable (and hence the *value* element data) to be defined. For inline grammars, the **Form_With_Confirm** element automatically generates the grammar slot name to match the slot attribute (if available) or the field name. For custom grammars that are referenced from an external source, the application designer needs to set **Field Name** and **Field Slot** properly based on the slot name returned by the grammar.

- If a grammar returns different slots for different inputs or multiple slots per utterance, there are two ways to configure the **Form_With_Confirm** element to store this data:

  – Leave the **slot_element_data** setting empty. The **Form_With_Confirm** element will create element data named *nbestInterpretationX* (where X is from 1 to the length of the n-best list) that contains a string that uses delimiters "+" and ":" to separate the multiple slot names from their values. For example: "+Slot1:value1+Slot2:value2...". A developer would then need to parse this string in a subsequent element to obtain the different slot name and value pairs.

  – Configure the **slot_element_data** setting with the names for all the slots that can be returned. The **Form_With_Confirm** element will create a new set of n-best element data to store the recognition results for each slot listed in that setting. The element data will be named as **<SLOT_ELEMENT_DATAX>** (where **SLOT_ELEMENT_DATA** is a string identical to the setting value and X is from 1 to the length of the n-best list). For example, if *slot_element_data* had two values *city* and *state* and there are three n-best results triggered, then six element data in the names of *city1*, *city2*, *city3*, *state1*, *state2*, and *state3* will be created to store each of the n-best values for the *city* and *state* slots.

    Note: If n-best processing is disabled by setting the maxnbest setting to 1, then only one interpretation result will be returned per recognition and thereby only one element data per slot (*city1* and *state1*) will be created.

Element Data

Name	Type	Notes
value	string	This stores the value of the VXML field name variable.
value_confidence	float	This stores the confidence score of the captured Form_With_Confirm utterance. When n-best recognition is enabled, this stores the confidence score of the top hypothesis in the n-best list.
<SLOT_ELEMENT_DATA1> <SLOT_ELEMENT_DATA2> … <SLOT_ELEMENT_DATAX*>	string	A separate set of element data stores the interpretation values for each filled slot of captured n-best utterances. While the maximum number of **<SLOT_ELEMENT_DATAX>** values is equal to the **maxnbest** setting value, the actual number of these values available is dependent on speech recognition at runtime, where **<SLOT_ELEMENT_DATA1>** holds the slot value of the top hypothesis in the n-best list and **<SLOT_ELEMENT_DATAX>** holds the slot value of the last hypothesis. **Note:** If the **slot_element_data** setting is blank, these sets of element data will not be created.
nbestLength	int ≥ 1	This stores the number of n-best hypotheses generated by the speech engine.
nbestUtterance1 nbestUtterance2 … nbestUtteranceX	string	This set of element data stores the captured n-best utterances. While the maximum number of **nbestUtteranceX** values is equal to the **maxnbest** setting value, the actual number of these values available is determined by speech recognition at runtime, where **nbestUtterance1** holds the utterance of the top hypothesis in the n-best list and **nbestUtteranceX** holds the utterance of the last hypothesis.
nbestInterpretation1 nbestInterpretation2 … nbestInterpretationX	string	This set of element data stores the interpretations of captured n-best utterances. While the maximum number of **nbestInterpretationX** values is equal to the **maxnbest** setting value, the actual number of these values available is determined by speech recognition at runtime, where **nbestInterpretation1** holds the interpretation of the top hypothesis in the n-best list and **nbestInterpretationX** holds the interpretation of the last hypothesis.
nbestConfidence1 nbestConfidence2 … nbestConfidenceX	float	This set of element data stores the confidence scores of captured n-best utterances. While the maximum number of **nbestConfidenceX** values is equal to the **maxnbest** setting value, the actual number of these values available is determined by speech recognition at runtime, where **nbestConfidence1** holds the confidence score of the top hypothesis in the n-best list and **nbestConfidenceX** holds the confidence score of the last hypothesis.
nbestInputmode1 nbestInputmode2 …	string	This set of element data stores the input modes of captured n-best utterances.

nbestInputmodeX		
collect_noinput_count	int ≥ 0	This stores the number of no input events that the browser returned during the collection phase of the VXML field name variable.
collect_nomatch_count	int ≥ 0	This stores the number of no match events that the browser returned during the collection phase of the VXML field name variable.
confirm_noinput_count	int ≥ 0	This stores the number of no input events that the browser returned during the confirmation phase of the VXML field name variable.
confirm_nomatch_count	int ≥ 0	This stores the number of no match events that the browser returned during the confirmation phase of the VXML field name variable.

* “SLOT_ELEMENT_DATA” is a string identical to the configuration value of the “slot_element_data” setting, and X is from 1 to the length of the n-best list. If more than one such value is configured, then multiple sets of element data using the same naming convention will be created.

Exit States

Name	Notes
max_nomatch	The maximum number of nomatch events has occurred. If the nomatch max count is 0, this exit state will never occur.
max_noinput	The maximum number of noinput events has occurred. If the noinput max count is 0, this exit state will never occur.
max_disconfirmed	The maximum number of disconfirm events has occurred. If the disconfirm max count is 0, this exit state will never occur.
done	The caller input matched the grammar correctly.

Audio Groups

Form Data Capture

Name (Label)	Req'd	Max1	Notes
form_initial_audio_group (Form Initial)	Yes	Yes	Played when the voice element first begins.
form_nomatch_audio_group (Form NoMatch)	No	No	Played when a nomatch event occurs during form data capture.
form_noinput_audio_group (Form NoInput)	No	No	Played when a noinput event occurs during form data capture.
form_help_audio_group (Form Help)	No	No	Played when the caller asks for help during form data capture. If not specified, help is treated as a nomatch event by default.

Form Data Confirm

Name (Label)	Req'd	Max1	Notes
confirm_initial_audio_group (Confirm Initial)	Yes	Yes	Played after the caller enters a value, requesting the caller's confirmation of that value.
confirm_nomatch_audio_group (Confirm NoMatch)	No	No	Played when a nomatch event occurs during confirmation.
confirm_noinput_audio_group (Confirm NoInput)	No	No	Played when a noinput event occurs during confirmation.
confirm_help_audio_group (Confirm Help)	No	No	Played when the caller asks for help during confirmation.
disconfirmed_audio_group (Disconfirmed)	No	No	Played when the caller disconfirms the value.

End

Name (Label)	Req'd	Max 1	Notes
yes_audio_group (Yes)	No	Yes	Played after the caller chooses the *yes* option. If not specified, no audio will be played when this option is chosen.

Folder and Class Information

Studio Element Folder Name	Class Name
Form	com.audium.server.voiceElement.form.MFoundationFormWithConfirm

Chapter 27

Math

The **Math** action element is used to evaluate basic mathematical expressions. The mathematical expression is composed of operators and functions in the form of a string which is passed as a setting to the element, parsed and evaluated at runtime. The result is a double value stored as a string in either element data or session data. All common arithmetic operators are supported. Boolean operators are also fully supported. Boolean expressions are evaluated to be either 1.0 or 0.0 (*true* or *false* respectively).

This chapter contains the following topics:

Examples

Expression: 2 * 4 Result: 8.0	Expression: sqrt(16) Result: 4.0	Expression: {Data.Session.myNumber} == 4 Result: 1.0

Settings

Name (Label)	Type	Req'd	Single Setting Value	Substitution Allowed	Default	Notes

Type (Type)	string enum	Yes	**true**	**false**	**Element**	This setting specifies the type of data that will store the result of the mathematical expression. Possible values are: **Element** | **Session**. Default = **Element**.
Name (Name)	string	Yes	**true**	**true**	*None*	This setting specifies the name to assign to the data that will store the result of the mathematical expression.
Expression (Expression)	string	Yes	**true**	**true**	*None*	This setting specifies the mathematical expression to parse and evaluate. For supported operators and functions see tables below.

Operators and Functions

Operator Name	**Operator**		**Function Name**	**Syntax**
Power	^		Sine	sin(x)
Boolean Not	!		Cosine	cos(x)
Unary Plus, Unary Minus	+x, -x		Tangent	tan(x)
Modulus	%		Arc Sine	asin(x)
Division	/		Arc Cosine	acos(x)
Multiplication	*		Arc Tangent	atan(x)
Addition, Subtraction	+, -		Arc Tangent (with 2 parameters)	atan2(y, x)
Less or Equal, More or Equal	<=, >=		Hyperbolic Sine	sinh(x)
Less Than, Greater Than	<, >		Hyperbolic Cosine	cosh(x)
Not Equal, Equal	!=, ==		Hyperbolic Tangent	tanh(x)
Boolean And	&&		Inverse Hyperbolic Sine	asinh(x)
Boolean Or	||		Inverse Hyperbolic Cosine	acosh(x)
			Inverse Hyperbolic Tangent	atanh(x)
			Natural Logarithm	ln(x)
			Logarithm base 10	log(x)
			Exponential	exp(x)
			Absolute Value / Magnitude	abs()
			Modulus	mod()
			Square Root	sqrt()
			Sum	sum()
			If	if()

Element Data

Element data is created *only* when the **type** setting is set to *Element*. In all other cases, no element data is created.

Name	Type	Notes
[value of setting “name”]	string	The result of the mathematical expression.

Session Data

Session data is created *only* when the **type** setting is set to *Session*. In all other cases, no session data is created.

Name	Type	Notes
[value of setting “name”]	string	The result of the mathematical expression.

Exit States

Name	Notes
done	The mathematical expression was evaluated and the result was stored as either element data or session data.

Folder and Class Information

Studio Element Folder Name	Class Name
Math	com.audium.server.action.math.MathAction

Folder and Class Information

Chapter 28

Menu Support for 2_Option_Menu through 10_Option_Menu

These voice elements define menus that support from 2 to 10 options. The Menu voice elements are similar to the Form voice element, however the number of choices is fixed and all grammars are defined in the voice element itself. Additionally, there is an exit state for each option, therefore the captured value does not have to be analyzed afterwards to determine the next dialog in the call flow. Use Menu elements when the situation defines a fixed number of choices where each choice does something different in the call flow.

Because the number of exit states is fixed for a voice element, there are separate voice elements for Menu voice elements with 2 to10 options. For each additional option, three additional settings are added to handle the spoken keyword, DTMF entry, and interpretation value for each option. The audio groups and element data saved are the same for all Menu voice elements.

Each option must be assigned an interpretation value that the element will return as element data named **`value`** when any of the keywords or DTMF key presses assigned to that option are captured. The element variable (**`value`**) will contain the same value regardless of the input mode (speech or DTMF).

The audio groups are identical to those of the Form voice element. The **`done_audio_group`** group may be used for a message that is to be played regardless of what option is chosen. If an option specific message is desired, it is recommended that the **`done_audio_group`** not be configured and an Audio voice element be used after the particular choice is made.

This chapter contains the following topics:

Settings

Name (Label)	Type	Req'd	Single Setting Value	Substitution Allowed	Default	Notes
noinput_timeout (Noinput Timeout)	string	Yes	**true**	**true**	5s	The maximum time length allowed for silence or no keypress before a noinput event is thrown. Possible values are standard time designations including both a non-negative number and a time unit, for example, 3s (for seconds) or 300ms (for milliseconds). Default = 5s.
max_noinput_count (Max NoInput Count)	int ≥ 0	Yes	**true**	**true**	3	The maximum number of noinput events allowed during input capture. 0 = infinite noinputs allowed.
max_nomatch_count (Max NoMatch Count)	int ≥ 0	Yes	**true**	**true**	3	The maximum number of nomatch events allowed during input capture. 0 = infinite nomatches allowed.
confidence_level (Confidence Level)	decimal (0.0 to 1.0)	Yes	**true**	**true**	0.40	The confidence level threshold to use.
modal (Disable Hotlinks)	boolean	Yes	**true**	**true**	**false**	Whether or not to temporarily disable all hotlink grammars (global or local) and universal grammars. If set to true, only the grammars of the current X_Option_Menu element will be enabled for the duration of the element. Otherwise all active grammars will be enabled.
optionX_dtmf (Option X DTMF)	Character (0-9, #, *)†	No	**true**	**true**	*None*	This setting defines the DTMF grammar that can be used to select the menu **optionX**. The valid format is a string separated with a semi-colon specifying two values in this order: 1. The language context in which the current input should be included in the menu grammar (optional). If omitted the language used will be the same as the page-scoped language. 2. The dtmf keypress or keypresses that is included in the menu DTMF grammar (required)

						Sample configurations values are: • en-US;1 • 1 Additional **optionX_dtmf** settings may be used to define multiple dtmf keypresses corresponding to the same return value. **Note:** • At minimum, one of the two settings: **optionX_dtmf** or **optionX_voice** must be specified. • Keypresses are currently limited to single digits.
optionX_voice (Option X Voice)	string	No	**true**	**true**	*None*	This setting defines the voice grammar that can be used to select the menu **optionX**. Each configuration of this setting specifies an option for the grammar. The valid format is a string separated with semi-colons specifying three values in this order: 1. The language context in which the current input should be included in the menu grammar (optional). If omitted the language used will be the same as the page-scoped language. 2. *exact* or *approximate* (optional) for the accept attribute value, where if *exact*, the spoken utterance must match the expected value exactly; and where if *approximate*, the spoken utterance may match one of several words 3. The voice keyword or keywords (required) that is included in the menu voice grammar. If one of the optional parameters is defined, two semi-colons must be used, even if the other parameter is not used. Sample configuration values are:

						• en-US;exact;news report • ;approximate;news report • fr-FR;;news report • news report Additional **optionX_voice** settings may be used to define multiple matching voice keywords corresponding to the same return value. **Note:** At the minimum, one of the two settings: **optionX_dtmf** or **optionX_voice** *must* be specified.
optionX_value (Option X Value)	string	Yes	**false**	**true**	*None*	The value to be stored in the element data value for this voice element when the caller selects *optionX*. **Note:** Only a single value is allowed for each option.

Where X is 2 – 10 as applicable.

† Some voice browsers may not support menu options using * or #.

Element Data

Name	Type	Notes
value	string	The value associated with the keyword or DTMF keypress inputted by the caller is stored in this variable.
value_confidence	float	This is the confidence value of the matched utterance.

Exit States

Name	Notes
max_nomatch	The maximum number of nomatch events has occurred. If the max_nomatch_count is 0, this exit state will never occur.
max_noinput	The maximum number of noinput events has occurred. If the max_noinput_count is 0, this exit state will never occur.
optionX	The utterance or DTMF entry matched optionX.

Where X is 2 – 10 as applicable.

Note:

- Each option can react on just a spoken keyword, just DTMF keypresses, or both, but at least one method must be specified or an error will be reported.
- All options in the menu must have a consistent input mode. For example, a menu cannot be configured so that option 1 is chosen through both voice and DTMF but option 2 is chosen only through voice.
- There are no menus with more than 10 options. In cases where more are needed, a Form voice element is recommended.

Audio Groups

Menu Option Capture

Name (Label)	Req'd	Max1	Notes
initial_audio_group (Initial)	Yes	Yes	Played when the voice element first begins.
nomatch_audio_group (NoMatch)	No	No	Played when a nomatch event occurs.
noinput_audio_group (NoInput)	No	No	Played when a noinput event occurs.
help_audio_group (Help)	No	No	Played when the caller asked for help. If not specified, by default help is treated as a nomatch.

End

Name (Label)	Req'd	Max 1	Notes
done_audio_group (Done)	No	Yes	Played when the voice element completes any of the option exit states.

Folder and Class Information

Studio Element Folder Name	Class Name
Menu	com.audium.server.voiceElement.menu.MFoundationXOptionMenu

Folder and Class Information

Chapter 29

Number

The **`Number`** voice element captures a number input from the caller. The number can be spoken or entered using the keypad. The resulting value will be stored in element data as a decimal value. The number can be negative or positive and can contain a decimal point. Using DTMF entry, however, the number is restricted to being positive and the decimal point is entered by pressing the * key. Using speech input, the number may be spoken naturally.

This chapter contains the following topics:

Settings

Name (Label)	Type	Req'd	Single Setting Value	Substitution Allowed	Default	Notes
inputmode (Input Mode)	string enum	Yes	**`true`**	**`false`**	both	The type of entry allowed for input. Possible values are: **`voice`** | **`dtmf`** | **`both`**.
noinput_timeout (Noinput Timeout)	string	Yes	**`true`**	**`true`**	5e	The maximum time length allowed for silence or no keypress before a noinput event is thrown. Possible values are standard time designations including both a non-negative number and a time unit, for example, 3s (for seconds) or 300ms (for milliseconds). Default = 5s.

max_noinput_count (Number Max NoInput Count)	int ≥ 0	Yes	**true**	**true**	3	The maximum number of noinput events allowed during number input capture. 0 = infinite noinputs allowed.
max_nomatch_count (Number Max NoMatch Count)	int ≥ 0	Yes	**true**	**true**	3	The maximum number of nomatch events allowed during number input capture. 0 = infinite nomatches allowed.
number_confidence_level (Number Confidence Level)	decimal (0.0 – 1.0)	Yes	**true**	**true**	0.40	The confidence level threshold to use during number capture.
modal (Disable Hotlinks)	boolean	Yes	**true**	**true**	**false**	Whether or not to temporarily disable all hotlink grammars (global or local) and universal grammars. If set to true, only the grammars of the current Number element will be enabled for the duration of the element. Otherwise all active grammars will be enabled.
secure_logging (Secure Logging)	boolean	Yes	**true**	**true**	**false**	Whether or not to enable logging of potentially sensitive data of the Number element. If set to true, the following potentially sensitive data of the element will not log: utterance, interpretation, value, nbestUtteranceX† and nbestInterpretationX†. Instead, the above will be logged as the field name appended with the suffix "_secureLogging" and with the value "*****", for example nbestUtterance1_secureLogging,*****.
maxnbest (Maxnbest)	int ≥ 1	Yes	**true**	**true**	1	The maximum number of speech recognition results that can be generated per voice input.

†Refer to the Element Data table for information about nbestUtteranceX and nbestInterpretationX

Element Data

Name	Type	Notes
Value	string	The number captured and stored as a whole or decimal number with an optional minus sign.
value_confidence	float	This is the confidence value of the captured utterance. When n-best recognition is enabled, this stores the confidence score of the top hypothesis in the n-best list.
nbestLength	int ≥ 1	This stores the number of n-best hypotheses generated by the speech engine.

nbestUtterance1 nbestUtterance2 … nbestUtteranceX	string	This set of element data stores the captured n-best utterances. While the maximum number of **nbestUtteranceX** values is equal to the **maxnbest** setting value, the actual number of these values available is determined by speech recognition at runtime, where **nbestUtterance1** holds the utterance of the top hypothesis in the n-best list and **nbestUtteranceX** holds the utterance of the last hypothesis.
nbestInterpretation1 nbestInterpretation2 … nbestInterpretationX	string	This set of element data stores the interpretations of captured n-best utterances. While the maximum number of **nbestInterpretationX** values is equal to the **maxnbest** setting value, the actual number of these values available is determined by speech recognition at runtime, where **nbestInterpretation1** holds the interpretation of the top hypothesis in the n-best list and **nbestInterpretationX** holds the interpretation of the last hypothesis.
nbestConfidence1 nbestConfidence2 … nbestConfidenceX	float	This set of element data stores the confidence scores of captured n-best utterances. While the maximum number of **nbestConfidenceX** values is equal to the **maxnbest** setting value, the actual number of these values available is determined by speech recognition at runtime, where **nbestConfidence1** holds the confidence score of the top hypothesis in the n-best list and **nbestConfidenceX** holds the confidence score of the last hypothesis.
nbestInputmode1 nbestInputmode2 … nbestInputmodeX	string	This set of element data stores the input modes of captured n-best utterances.

Exit States

Name	Notes
max_nomatch	The maximum number of nomatch events has occurred. If the nomatch max count is 0, this exit state will never occur.
max_noinput	The maximum number of noinput events has occurred. If the noinput max count is 0, this exit state will never occur.
done	The number capture was completed.

Note: If the number to be captured is a positive whole number and the input is via DTMF, the number can be entered using this voice element or the **Digits** voice element.

Audio Groups

Number Capture

Name (Label)	Req'd	Max1	Notes
number_initial_audio_group (Number Initial)	Yes	Yes	Played when the voice element first begins.
number_nomatch_audio_group (Number NoMatch)	No	No	Played when a nomatch event occurs.
number_noinput_audio_group (Number NoInput)	No	No	Played when a noinput event occurs.
number_help_audio_group (Number Help)	No	No	Played when the caller asked for help. If not specified, by default help is treated as a nomatch.

End

Name (Label)	Req'd	Max 1	Notes
done_audio_group (Done)	No	Yes	Played when the number capture is completed and the voice element exits with the done exit state.

Folder and Class Information

Studio Element Folder Name	Class Name
Number Capture	com.audium.server.voiceElement.number.MBasicNumber

Chapter 30

Number_with_Confirm

The **`Number_With_Confirm`** voice element captures a standard number, and presents a confirmation menu allowing the caller to either accept their entry or re-enter the number. The number can be spoken or entered using the keypad. The resulting value will be stored in element data as a decimal value. The number can be negative or positive and can contain a decimal point. Using DTMF entry, however, the number is restricted to being positive and the decimal point is entered by pressing the * key. Using speech input, the number may be spoken naturally.

This chapter contains the following topics:

Settings

Name (Label)	Type	Req'd	Single Setting Value	Substitution Allowed	Default	Notes
inputmode (Input Mode)	string enum	Yes	**`true`**	**`false`**	**`both`**	The type of entry allowed for input. Possible values are: **`voice`** | **`dtmf`** | **`both`**.
noinput_timeout (Noinput Timeout)	string	Yes	**`true`**	**`true`**	5s	The maximum time length allowed for silence or no keypress before a noinput event is thrown. Possible values are standard time designations including both a non-negative number and a time unit, for example, 3s (for seconds) or 300ms (for milliseconds). Default = 5s.

number_max_noinput_count (Number Max NoInput Count)	int ≥ 0	Yes	**true**	**true**	3	The maximum number of noinput events allowed during number input capture. 0 = infinite noinputs allowed.
number_max_nomatch_count (Number Max NoMatch Count)	int ≥ 0	Yes	**true**	**true**	3	The maximum number of nomatch events allowed during number input capture. 0 = infinite nomatches allowed.
confirm_max_noinput_count (Confirm Max NoInput Count)	int ≥ 0	Yes	**true**	**true**	3	The maximum number of noinput events allowed during number input confirmation. 0 = infinite noinputs allowed.
confirm_max_nomatch_count (Confirm Max NoMatch Count)	int ≥ 0	Yes	**true**	**true**	3	The maximum number of nomatch events allowed during number input confirmation. 0 = infinite nomatches allowed.
max_disconfirmed_count (Max Disconfirmed Count)	int ≥ 0	Yes	**true**	**true**	3	The maximum number of times a caller is allowed to disconfirm a captured input. 0 = infinite disconfirmations allowed.
number_confidence_level (Number Confidence Level)	decimal (0.0 – 1.0)	Yes	**true**	**true**	0.40	The confidence level threshold to use during number capture.
confirm_confidence_level (Confirm Confidence Level)	decimal (0.0 – 1.0)	Yes	**true**	**true**	0.50	The confidence level threshold to use during confirmation.
modal (Disable Hotlinks)	boolean	Yes	**true**	**true**	**false**	Whether or not to temporarily disable all hotlink grammars (global or local) and universal grammars. If set to true, only the grammars of the current Number_With_Confirm element (the builtin number and boolean grammars) will be enabled for the duration of the element. Otherwise all active grammars will be enabled.
secure_logging (Secure Logging)	boolean	Yes	**true**	**true**	**false**	Whether or not to enable logging of potentially sensitive data of the Number_With_Confirm element. If set to true, the following potentially sensitive data of the element will not log: utterance, interpretation, value, nbestUtteranceX† and nbestInterpretationX†. Instead, the above will be logged as the field name appended with the suffix "_secureLogging" and with the value "*****", for example nbestUtterance1_secureLogging,*****.

maxnbest (Maxnbest)	int ≥ 1	Yes	`true`	`true`	1	The maximum number of speech recognition results that can be generated per voice input.

†Refer to the Element Data table for information about nbestUtteraceX and nbestInterpretationX.

Element Data

Name	Type	Notes
Value	string	The number captured and stored as a whole or decimal number with an optional minus sign.
value_confidence	float	This is the confidence value of the captured number utterance. When n-best recognition is enabled, this stores the confidence score of the top hypothesis in the n-best list.
confirm_confidence	float	This is the confidence value of the captured confirm utterance.
nbestLength	int ≥ 1	This stores the number of n-best hypotheses generated by the speech engine.
nbestUtterance1 nbestUtterance2 … nbestUtteranceX	string	This set of element data stores the captured n-best utterances. While the maximum number of nbestUtteranceX values is equal to the maxnbest setting value, the actual number of these values available is determined by speech recognition at runtime, where nbestUtterance1 holds the utterance of the top hypothesis in the n-best list and nbestUtteranceX holds the utterance of the last hypothesis.
nbestInterpretation1 nbestInterpretation2 … nbestInterpretationX	string	This set of element data stores the interpretations of captured n-best utterances. While the maximum number of nbestInterpretationX values is equal to the maxnbest setting value, the actual number of these values available is determined by speech recognition at runtime, where nbestInterpretation1 holds the interpretation of the top hypothesis in the n-best list and nbestInterpretationX holds the interpretation of the last hypothesis.
nbestConfidence1 nbestConfidence2 … nbestConfidenceX	float	This set of element data stores the confidence scores of captured n-best utterances. While the maximum number of nbestConfidenceX values is equal to the maxnbest setting value, the actual number of these values available is determined by speech recognition at runtime, where nbestConfidence1 holds the confidence score of the top hypothesis in the n-best list and nbestConfidenceX holds the confidence score of the last hypothesis.
nbestInputmode1 nbestInputmode2 … nbestInputmodeX	string	This set of element data stores the input modes of captured n-best utterances.

Exit States

Name	Notes
max_nomatch	The maximum number of nomatch events has occurred. If the nomatch max count is 0, this exit state will never occur.
max_noinput	The maximum number of noinput events has occurred. If the noinput max count is 0, this exit state will never occur.
max_disconfirmed	The maximum number of disconfirmations has occurred. If the max disconfirmed count is set to 0, this exit state will never occur.
done	The number captured was confirmed.

Note: If the number to be captured is a positive whole number and the input is via DTMF, the number can be entered using this voice element or the **`Digits_With_Confirm`** voice element.

Note:

Audio Groups

Number Capture

Name (Label)	Req'd	Max1	Notes
number_initial_audio_group (Number Initial)	Yes	Yes	Played when the voice element first begins.
number_nomatch_audio_group (Number NoMatch)	No	No	Played when a nomatch event occurs during number capture.
number_noinput_audio_group (Number NoInput)	No	No	Played when a noinput event occurs during number capture.
number_help_audio_group (Number Help)	No	No	Played when the caller asks for help during number capture. If not specified, by default help is treated as a nomatch.

Number Confirm

Name (Label)	Req'd	Max1	Notes
confirm_initial_audio_group (Confirm Initial)	Yes	Yes	Played when confirmation first begins.

confirm_nomatch_audio_group (Confirm NoMatch)	No	No	Played when a nomatch event occurs during confirmation. The nomatch event count corresponds to the audio group count.
confirm_noinput_audio_group (Confirm NoInput)	No	No	Played when a noinput event occurs during confirmation. The noinput event count corresponds to the audio group count.
confirm_help_audio_group (Confirm Help)	No	No	Played when a help event occurs during confirmation. The help event count corresponds to the audio group count. If not specified, help throws a nomatch by default.
disconfirmed_audio_group (Disconfirmed)	No	No	Played after the caller disconfirms a captured number entry.

End

Name (Label)	Req'd	Max 1	Notes
yes_audio_group (Yes)	No	Yes	Played after the caller chooses the *yes* option. If not specified, no audio will be played when this option is chosen.

Folder and Class Information

Studio Element Folder Name	Class Name
Number Capture	com.audium.server.voiceElement.number.MBasicNumberWithConfirm

Folder and Class Information

Chapter 31

Phone

The **Phone** voice element captures a phone number input from the caller. The phone number can be spoken or entered using the keypad. The captured value will be stored in element data as a string. The string may contain a number of digits and an optional character “x” to indicate a phone number with an extension. Using speech input, the entire phone number (including the extension) may be spoken in natural language. Using DTMF entry, the caller can enter an extension by pressing the * keypress followed by the extension.

This chapter contains the following topics:

Settings

Name (Label)	Type	Req'd	Single Setting Value	Sub. Allowed	Default	Notes
inputmode (Input Mode)	string enum	Yes	**`true`**	**`false`**	**`both`**	The type of entry allowed for input. Possible values are: **`voice`** | **`dtmf`** | **`both`**.
noinput_timeout (Noinput Timeout)	string	Yes	**`true`**	**`true`**	5s	The maximum time length allowed for silence or no keypress before a noinput event is thrown. Possible values are standard time designations including both a non-negative number and a time unit, for example, 3s (for seconds) or 300ms (for milliseconds). Default = 5s.

collect_max_noinput_count (Phone Max NoInput Count)	int ≥ 0	Yes	**true**	**true**	3	The maximum number of noinput events allowed during phone input capture. 0 = infinite noinputs allowed.
collect_max_nomatch_count (Phone Max NoMatch Count)	int ≥ 0	Yes	**true**	**false**	3	The maximum number of nomatch events allowed during phone input capture. 0 = infinite nomatches allowed.
collect_confidence_level (Phone Confidence Level)	decimal (0.0 – 1.0)	Yes	**true**	**true**	0.40	The confidence level threshold to use during phone capture.
modal (Disable Hotlinks)	boolean	Yes	**true**	**true**	**false**	Whether or not to temporarily disable all hotlink grammars (global or local) and universal grammars. If set to true, only the grammars of the current Phone element will be enabled for the duration of the element. Otherwise all active grammars will be enabled.
secure_logging (Secure Logging)	boolean	Yes	**true**	**true**	**false**	Whether or not to enable logging of potentially sensitive data of the Phone element. If set to true, the following potentially sensitive data of the element will not log: utterance, interpretation, value, nbestUtteranceX† and nbestInterpretationX†. Instead, the above will be logged as the field name appended with the suffix "_secureLogging" and with the value "*****", for example nbestUtterance1_secureLogging,*****.
maxnbest (Maxnbest)	int ≥ 1	Yes	**true**	**true**	1	The maximum number of speech recognition results that can be generated per voice input.

†Refer to the following Element Data table for information about nbestUtteranceX and nbestInterpretationX.

Element Data

Name	Type	Notes
Value	string	The number captured and stored as a whole or decimal number with an optional minus sign.
value_confidence	float	This is the confidence value of the captured utterance. When n-best recognition is enabled, this stores the confidence score of the top hypothesis in the n-best list.
nbestLength	int ≥ 1	This stores the number of n-best hypotheses generated by the speech engine.
nbestUtterance1 nbestUtterance2	string	This set of element data stores the captured n-best utterances. While the maximum number of **nbestUtteranceX** values is equal to the **maxnbest** setting value, the actual number of these values available is determined by speech recognition

… nbestUtteranceX		at runtime, where **nbestUtterance1** holds the utterance of the top hypothesis in the n-best list and **nbestUtteranceX** holds the utterance of the last hypothesis.
nbestInterpretation1 nbestInterpretation2 … nbestInterpretationX	string	This set of element data stores the interpretations of captured n-best utterances. While the maximum number of **nbestInterpretationX** values is equal to the **maxnbest** setting value, the actual number of these values available is determined by speech recognition at runtime, where **nbestInterpretation1** holds the interpretation of the top hypothesis in the n-best list and **nbestInterpretationX** holds the interpretation of the last hypothesis.
nbestConfidence1 nbestConfidence2 … nbestConfidenceX	float	This set of element data stores the confidence scores of captured n-best utterances. While the maximum number of **nbestConfidenceX** values is equal to the **maxnbest** setting value, the actual number of these values available is determined by speech recognition at runtime, where **nbestConfidence1** holds the confidence score of the top hypothesis in the n-best list and **nbestConfidenceX** holds the confidence score of the last hypothesis.
nbestInputmode1 nbestInputmode2 … nbestInputmodeX	string	This set of element data stores the input modes of captured n-best utterances.

Exit States

Name	Notes
max_nomatch	The maximum number of nomatch events has occurred. If the nomatch max count is 0, this exit state will never occur.
max_noinput	The maximum number of noinput events has occurred. If the noinput max count is 0, this exit state will never occur.
done	The phone number capture was completed.

Audio Groups

Phone Capture

Name (Label)	Req'd	Max1	Notes
collect_initial_audio_group (Phone Initial)	Yes	Yes	Played when the voice element first begins.
collect_noinput_audio_group	No	No	Played when a noinput event occurs.

(Phone NoInput)			
collect_nomatch_audio_group (Phone NoMatch)	No	No	Played when a nomatch event occurs.
collect_help_audio_group (Phone Help)	No	No	Played when the caller asked for help. If not specified, help is treated as a nomatch by default.

End

Name (Label)	Req'd	Max 1	Notes
done_audio_group (Done)	No	Yes	Played after phone capture is completed.

Folder and Class Information

Studio Element Folder Name	Class Name
Number Capture	com.audium.server.voiceElement.phone.MBasicPhone

Chapter 32

Phone_With_Confirm

The **`Phone_With_Confirm`** voice element captures a phone number input from the caller, and presents a confirmation menu allowing the caller to either accept their entry or re-enter the phone number. The phone number can be spoken or entered using the keypad. The captured value will be stored in element data as a string. The string may contain a number of digits and an optional character “x” to indicate a phone number with an extension. Using speech input, the entire phone number (including the extension) may be spoken in natural language. Using DTMF entry, the caller can enter an extension by pressing the * keypress followed by the extension.

This chapter contains the following topics:

Settings

Name (Label)	Type	Req'd	Single Setting Value	Sub. Allowed	Default	Notes
inputmode (Input Mode)	string enum	Yes	**`true`**	**`false`**	**`both`**	The type of entry allowed for input. Possible values are: voice | dtmf | both.
noinput_timeout (Noinput Timeout)	string	Yes	**`true`**	**`true`**	5s	The maximum time length allowed for silence or no keypress before a noinput event is thrown. Possible values are standard time designations including both a non-negative number and a time unit, for example, 3s (for seconds) or 300ms (for milliseconds). Default = 5s.

collect_max_noinput_count (Phone Max NoInput Count)	int ≥ 0	Yes	**true**	**true**	3	The maximum number of noinput events allowed during phone input capture. 0 = infinite noinputs allowed.
collect_max_nomatch_count (Phone Max NoMatch Count)	int ≥ 0	Yes	**true**	**false**	3	The maximum number of nomatch events allowed during phone input capture. 0 = infinite nomatches allowed.
confirm_max_noinput_count (Confirm Max NoInput Count)	int ≥ 0	Yes	**true**	**true**	3	The maximum number of noinput events allowed during phone input confirmation. 0 = infinite noinputs allowed.
confirm_max_nomatch_count (Confirm Max NoMatch Count)	int ≥ 0	Yes	**true**	**false**	3	The maximum number of nomatch events allowed during phone input confirmation. 0 = infinite nomatches allowed.
max_disconfirmed_count (Max Disconfirmed Count)	int ≥ 0	Yes	**true**	**false**	3	The maximum number of times a caller is allowed to disconfirm a captured input. 0 = infinite disconfirmations allowed.
collect_confidence_level (Phone Confidence Level)	decimal (0.0 – 1.0)	Yes	**true**	**true**	0.40	The confidence level threshold to use during phone capture.
confirm_confidence_level (Confirm Confidence Level)	decimal (0.0 – 1.0)	Yes	**true**	**true**	0.50	The confidence level threshold to use during confirmation.
Modal (Disable Hotlinks)	boolean	Yes	**true**	**true**	false	Whether or not to temporarily disable all hotlink grammars (global or local) and universal grammars. If set to true, only the grammars of the current Phone_With_Confirm element (the builtin phone and boolean grammars) will be enabled for the duration of the element. Otherwise all active grammars will be enabled.
secure_logging (Secure Logging)	boolean	Yes	**true**	**true**	false	Whether or not to enable logging of potentially sensitive data of the Phone_With_Confirm element. If set to true, the following potentially sensitive data of the element will not log: utterance, interpretation, value, nbestUtteranceX† and nbestInterpretationX†. Instead, the above will be logged as the field name appended with the suffix "_secureLogging" and with the value "*****", for example nbestUtterance1_secureLogging,*****.
Maxnbest (Maxnbest)	int ≥ 1	Yes	**true**	**true**	1	The maximum number of speech recognition results that can be generated per voice input.

Refer to the Element Data table that follows for information about nbestUtteranceX and nbestInterpretationX.

Element Data

Name	Type	Notes
Value	string	The number captured and stored as a whole or decimal number with an optional minus sign.
value_confidence	float	This is the confidence value of the captured utterance. When n-best recognition is enabled, this stores the confidence score of the top hypothesis in the n-best list.
nbestLength	int ≥ 1	This stores the number of n-best hypotheses generated by the speech engine.
nbestUtterance1 nbestUtterance2 … nbestUtteranceX	string	This set of element data stores the captured n-best utterances. While the maximum number of **`nbestUtteranceX`** values is equal to the **`maxnbest`** setting value, the actual number of these values available is determined by speech recognition at runtime, where **`nbestUtterance1`** holds the utterance of the top hypothesis in the n-best list and **`nbestUtteranceX`** holds the utterance of the last hypothesis.
nbestInterpretation1 nbestInterpretation2 … nbestInterpretationX	string	This set of element data stores the interpretations of captured n-best utterances. While the maximum number of **`nbestInterpretationX`** values is equal to the **`maxnbest`** setting value, the actual number of these values available is determined by speech recognition at runtime, where **`nbestInterpretation1`** holds the interpretation of the top hypothesis in the n-best list and **`nbestInterpretationX`** holds the interpretation of the last hypothesis.
nbestConfidence1 nbestConfidence2 … nbestConfidenceX	float	This set of element data stores the confidence scores of captured n-best utterances. While the maximum number of **`nbestConfidenceX`** values is equal to the **`maxnbest`** setting value, the actual number of these values available is determined by speech recognition at runtime, where **`nbestConfidence1`** holds the confidence score of the top hypothesis in the n-best list and **`nbestConfidenceX`** holds the confidence score of the last hypothesis.
nbestInputmode1 nbestInputmode2 … nbestInputmodeX	string	This set of element data stores the input modes of captured n-best utterances.

Exit States

Name	Notes

max_nomatch	The maximum number of nomatch events has occurred. If the nomatch max count is 0, this exit state will never occur.
max_noinput	The maximum number of noinput events has occurred. If the noinput max count is 0, this exit state will never occur.
max_disconfirmed	The maximum number of disconfirmations has occurred. If the max disconfirmed count is set to 0, this exit state will never occur.
done	The phone number captured was confirmed.

Audio Groups

Phone Capture

Name (Label)	Req'd	Max1	Notes
collect_initial_audio_group (Phone Initial)	Yes	Yes	Played when the voice element first begins.
collect_noinput_audio_group (Phone NoInput)	No	No	Played when a noinput event occurs.
collect_nomatch_audio_group (Phone NoMatch)	No	No	Played when a nomatch event occurs.
collect_help_audio_group (Phone Help)	No	No	Played when the caller asked for help. If not specified, help is treated as a nomatch by default.

Phone Confirm

Name (Label)	Req'd	Max1	Notes
confirm_initial_audio_group (Confirm Initial)	Yes	Yes	Played when confirmation first begins.
confirm_noinput_audio_group (Confirm NoInput)	No	No	Played when a noinput event occurs during confirmation. The noinput event count corresponds to the audio group count.
confirm_nomatch_audio_group (Confirm NoMatch)	No	No	Played when a nomatch event occurs during confirmation. The nomatch event count corresponds to the audio group count.
confirm_help_audio_group (Confirm Help)	No	No	Played when a help event occurs during confirmation. The help event count corresponds to the audio group count.

disconfirmed_audio_group (Disconfirmed)	No	No	Played after the caller disconfirms a captured phone entry. Upon reaching the **`max_disconfirmed_count`**, the prompt content should be about exiting with the **`max_disconfirmed`** exit state.

End

Name (Label)	Req'd	Max 1	Notes
yes_audio_group (Yes)	No	Yes	Played after the caller chooses the *yes* option. If not specified, no audio will be played when this option is chosen.

Folder and Class Information

Studio Element Folder Name	Class Name
Number Capture	com.audium.server.voiceElement.phone.MBasicPhoneWithConfirm

Folder and Class Information

Chapter 33

Record

The **`Record`** voice element makes a recording of the caller's voice. A prompt is played to the caller then the voice element records the caller's voice until a termination key is inputted, the recording time limit has been reached, or (if the configuration specifies so) the caller hung up. An audio cue (beep) may be activated to signal to the caller that the system is ready to record the caller's voice. Different voice browsers may have varying default maximum lengths for voice recording.

The recording is sent to the Record element by the voice browser and is stored in an audio file in the location specified by the developer. Any pre-existing file with the same name will be overwritten. The element can be configured to produce a non-repeating filename so all recordings can be retained. The format for this filename is *audioN.wav* where N is the number of milliseconds since midnight January 1, 1970 (GMT). All recordings are saved in the WAV format.

This chapter contains the following topics:

Settings

Name (Label)	Type	Req'd	Single Setting Value	Substitution Allowed	Default	Notes
noinput_timeout (Noinput Timeout)	string	Yes	**`true`**	**`true`**	5s	The maximum time length allowed for silence or no keypress before a noinput event is thrown. Possible values are standard time designations including both a non-negative number and a time

						unit, for example, 3s (for seconds) or 300ms (for milliseconds). Default = 5s.
max_noinput_count (Max NoInput Count)	int ≥ 0	Yes	**true**	**true**	3	The maximum number of noinput events allowed during input capture. 0 = infinite noinputs allowed.
start_with_beep (Start With Beep)	boolean	Yes	**true**	**true**	**true**	Whether or not to play a beep before recording begins.
terminate_on_dtmf (Terminate On DTMF)	boolean	Yes	**true**	**true**	**true**	Whether or not the caller can end the recording by pressing a touchtone key.
keep_recording_on_hangup (Keep Recording On Hangup)	boolean	Yes	**true**	**true**	**false**	Whether or not the recording is stored if the caller hung up while making the recording. Default = false
max_record_time (Max Record Time)	string	Yes	**true**	**true**	180s	The maximum time (in seconds) the recording is allowed to last. Possible values are standard time designations including a positive integer followed by s (for seconds), for example, 30s. Default = 180s.
final_silence (Final Silence)	string	Yes	**true**	**true**	4s	The interval of silence (in seconds or milliseconds) that indicates the end of speech. Possible values are standard time designations including both a positive integer and a time unit identifier, for example, 3s (for 3 seconds) or 300ms (for 300 milliseconds). Default = 4s.
filename (Filename)	string	No	**true**	**true**	*None*	The filename of the recording (without extension). If left blank, an auto-generated filename will be used.
file_type (File Type)	string enum	Yes	**true**	**true**	**wav**	This specifies the audio type of the file that will hold the recording. Possible values are: **wav** | **vox** | **au** | **other**.
mime_type (Mime Type)	string	Yes	**true**	**true**	*None*	This specifies the MIME type of the file that will hold the recording, if file_type is set to **other**.
file_extension (File Extension)	string	No	**true**	**true**	*None*	This specifies the file extension to use for the recorded file. A file extension different from the file type can be used. For example, with a mime type of *vox*, the file extension could be set to ulaw.
path (Path)	string	No	**true**	**true**	*None*	The path to the file that will hold the recording. If left blank, the file is assumed to be sent via ftp.

ftp_host (FTP Host)	string	No	**true**	**true**	*None*	The domain name of the host to ftp the recording. If left blank, the recording is assumed to be stored in a local file.
ftp_user (FTP User)	string	No	**true**	**true**	*None*	The user name to use while FTPing the recording.
ftp_password (FTP Password)	string	No	**true**	**true**	*None*	The password to use while FTPing the recording.
ftp_path (FTP Path)	string	No	**true**	**true**	*None*	The directory in which to FTP the recording.
ftp_in_background (FTP In Background)	boolean	Yes	**true**	**true**	**true**	Whether or not the FTP is to be performed in the background.

Note:

- Nomatch events cannot be thrown in this voice element. Since all audio is recorded (except DTMF key presses), there is no reaction on spoken commands (including hotlinks).
- A noinput event is possible if the voice browser detects no audio once recording has started. If the input timeout has been reached, the noinput event is thrown.
- The path setting does not require a trailing slash. The voice element will determine the appropriate destination. The path may be specified in operating system specific format (for example, on Windows it might be specified as C:\directory\subdirectory\ and on UNIX it might be */usr/local/directory/*).
- For a recording to be stored, you can choose either to store it locally or remotely. For locally on the VXML server itself, configure only the filename (**myfile**) and the path (**c:/recordings/**). For remotely on a ftp server, configure the filename (**myfile**) and the FTP details such as: host, user, path, and password. Once your record element is configured, determine the url to access the recording from an external system. Run a simple test by playing the recording from your web browser. Make use of the url: **http://<ftpserver>/<ftppath>/filename** . Find the correct path to play the audio file and use the same url in the audio element settings.
- If **terminate_on_DTMF** is *false* or off, recording will stop only after the voice browser reaches the input timeout.
- Not all voice browsers support the ability to retain a recording if the caller hung up while making the recording.
- Some voice browsers may not accept all options provided for the **file_type** and **mime_type** settings. Check your voice browser documentation for information on supported audio types.
- It is important to ensure that VXML Server has permission to save audio files to the specified path.

Element Data

Name	Type	Notes

filename	string	This stores the filename of the recording (without the path).
filepath	string	This stores the path to the file holding the recording (including the filename).
hungUpWhileRecording	boolean	This stores a *true* if the caller hung up while making the recording, *false* if not.

Exit States

Name	Notes
max_noinput	The maximum number of noinput events has occurred. If the **`max_noinput`** count is 0, this exit state will never occur.
done	The message was recorded.

Audio Groups

Record Capture

Name (Label)	Req'd	Max1	Notes
initial_audio_group (Initial)	Yes	Yes	Played when the voice element first begins.
noinput_audio_group (No Input)	No	No	Played when a noinput event occurs.

Folder and Class Information

Studio Element Folder Name	Class Name
Record	com.audium.server.voiceElement.record.MRecord

Chapter 34

Record_With_Confirm

The **`Record_With_Confirm`** voice element combines the functionality of the Record voice element with that of the MenuYesNo voice element. The voice element records the caller's voice, then prompts the caller to confirm that the recording is acceptable. The caller can then accept or reject the confirmation or ask to have the message replayed. If the caller accepts the recording, the voice element saves the file just as the Record voice element does. This voice element contains all settings and audio groups from both the Record and MenuYesNo voice elements, however audio groups that are found in both voice elements (nomatch, noinput, and help) are now named differently for them to be distinguished.

This chapter contains the following topics:

Settings

Name (Label)	Type	Req'd	Single Setting Value	Sub. Allowed	Default	Notes
inputmode (Input Mode)	string enum	Yes	**`true`**	**`true`**	**`both`**	The type of entry allowed for input during confirmation. Possible values are: **`voice`** | **`dtmf`** | **`both`**.
noinput_timeout (Noinput Timeout)	string	Yes	**`true`**	**`true`**	5s	The maximum time length allowed for silence or no keypress before a noinput event is thrown. Possible values are standard time designations including both a non-negative number and a time unit,

						for example, 3s (for seconds) or 300ms (for milliseconds). Default = 5s.
record_max_noinput_count (Record Max NoInput Count)	int ≥ 0	Yes	**true**	**true**	3	The maximum number of noinput events allowed during input capture. 0 = infinite noinputs allowed.
confirm_max_noinput_count (Confirm Max NoInput Count)	int ≥ 0	Yes	**true**	**true**	3	The maximum number of noinput events allowed during confirmation. 0 = infinite noinputs allowed.
confirm_max_nomatch_count (Confirm Max NoMatch Count)	int ≥ 0	Yes	**true**	**true**	3	The maximum number of nomatch events allowed during confirmation. 0 = infinite nomatches allowed.
max_disconfirmed_count (Max Disconfirmed Count)	int ≥ 0	Yes	**true**	**true**	3	The maximum number of times a caller is allowed to reject a recording. 0 = infinite disconfirmations allowed.
confirm_confidence_level (Confirm Confidence Level)	decimal (0.0 – 1.0)	Yes	**true**	**true**	0.50	The confidence level threshold to use for the confirmation.
start_with_beep (Start With Beep)	boolean	Yes	**true**	**true**	**true**	Whether or not to play a beep before recording begins.
terminate_on_dtmf (Terminate On DTMF)	boolean	Yes	**true**	**true**	**true**	Whether or not the caller can end the recording by pressing a touchtone key.
keep_recording_on_hangup (Keep Recording On Hangup)	boolean	Yes	**true**	**true**	**false**	Whether or not the recording is stored if the caller hung up while making the recording or during the confirmation menu. Default = false.
max_record_time (Max Record Time)	string	Yes	**true**	**true**	180s	The maximum time (in seconds) the recording is allowed to last. Possible values are standard time designations including a positive integer followed by s (for seconds), for example, 30s. Default = 180s.
final_silence (Final Silence)	string	Yes	**true**	**true**	4s	The interval of silence (in seconds or milliseconds) that indicates the end of speech. Possible values are standard time designations including both a positive integer and a time unit identifier, for example, 3s (for 3 seconds) or 300ms (for 300 milliseconds). Default = 4s.
replay (Replay)	boolean	Yes	**true**	**true**	**false**	Adds an option to replay the confirm initial audio groups.
filename (Filename)	string	No	**true**	**true**	*None*	The filename of the recording (without extension). If left blank, an auto-generated filename will be used.

file_type (File Type)	string enum	Yes	**true**	**true**	**wav**	This specifies the audio type of the file that will hold the recording. Possible values are: **wav** | **vox** | **au** | **other**.
mime_type (Mime Type)	string	Yes	**true**	**true**	*None*	This specifies the MIME type of the file that will hold the recording, if file_type is set to **other**.
file_extension (File Extension)	string	No	**true**	**true**	*None*	This specifies the file extension to use for the recorded file. A file extension different from the file type can be used. For example, with a mime type of **vox**, the file extension could be set to **ulaw**.
path (Path)	string	No	**true**	**true**	*None*	The path to the file that will hold the recording. If left blank, the file is assumed to be sent via ftp.
ftp_host (FTP Host)	string	No	**true**	**true**	*None*	The domain name of the host to ftp the recording. If left blank, the recording is assumed to be stored in a local file.
ftp_user (FTP User)	string	No	**true**	**true**	*None*	The user name to use while FTPing the recording.
ftp_password (FTP Password)	string	No	**true**	**true**	*None*	The password to use while FTPing the recording.
ftp_path (FTP Path)	string	No	**true**	**true**	*None*	The directory in which to FTP the recording.
ftp_in_background (FTP In Background)	boolean	Yes	**true**	**true**	**true**	Whether or not the FTP is to be performed in the background.

Note:

- The path setting does not require a trailing slash. The voice element will determine the appropriate destination. The path may be specified in operating system specific format (for example, on Windows it might be specified as *C:\directory\subdirectory* and on UNIX it might be */usr/local/directory/*).
- For a recording to be stored, you can choose either to store it locally or remotely. For locally on the VXML server itself, configure only the filename (**myfile**) and the path (**c:/recordings/**). For remotely on a ftp server, configure the filename (**myfile**) and the FTP details such as: host, user, path, and password. Once your record element is configured, determine the url to access the recording from an external system. Run a simple test by playing the recording from your web browser. Make use of the url: **http://<ftpserver>/<ftppath>/filename** . Find the correct path to play the audio file and use the same url in the audio element settings.
- If **terminate_on_DTMF** is *false* or off, recording will stop only after the voice browser reaches the input timeout.
- Not all voice browsers support the ability to retain a recording if the caller hung up while making the recording.
- Some voice browsers may not accept all options provided for the **file_type** and **mime_type** settings. Check your voice browser documentation for information on supported audio types.

- It is important to ensure that VXML Server has permission to save audio files to the specified path.

Element Data

Name	Type	Notes
filename	string	This stores the filename of the recording (without the path).
filepath	string	This stores the path to the file holding the recording (including the filename).
confirm_confidence	float	This is the confidence value of the utterance for the confirmation menu.
hungUpWhileRecording	boolean	This stores a *true* if the caller hung up while making the recording or the confirmation menu, *false* if not.

Exit States

Name	Notes
max_nomatch	The maximum number of nomatch events has occurred. If the nomatch max count is 0, this exit state will never occur.
max_noinput	The maximum number of noinput events has occurred. If the noinput max count is 0, this exit state will never occur.
max_disconfirmed	The maximum number of disconfirmations has occurred. If the max disconfirmed count is set to 0, this exit state will never occur.
done	The recorded message was confirmed.

Audio Groups

Record Capture

Name (Label)	Req'd	Max1	Notes
record_initial_audio_group (Record Initial)	Yes	Yes	Played when the voice element first begins.
record_noinput_audio_group (Record NoInput)	No	No	Played when a noinput event occurs during recording.

Record Confirm

Name (Label)	Req'd	Max1	Notes

before_confirm_audio_group (Before Confirm)	No	Yes	Played before the recording is played back. The recording will be played back after this audio group is done playing.
after_confirm_audio_group (After Confirm)	No	Yes	Played after the recording is played back. At least one of the two confirm prompts must be specified.
confirm_nomatch_audio_group (Confirm NoMatch)	No	No	Played when a nomatch event occurs during confirmation.
confirm_noinput_audio_group (Confirm NoInput)	No	No	Played when a noinput event occurs during confirmation.
confirm_help_audio_group (Confirm Help)	No	No	Played when the caller asks for help during the confirmation menu. If not specified, help is treated as a nomatch by default.
max_disconfirmed_audio_group (Max Disconfirmed)	No	Yes	Played after the caller disconfirms the recorded entry, upon reaching the **`max_disconfirmed_count`**. The prompt should be about exiting with the **`max_disconfirmed`** exit state.

Folder and Class Information

Studio Element Folder Name	Class Name
Record	com.audium.server.voiceElement.record.MRecordWithConfirm

Folder and Class Information

Chapter 35

ReqICMLabel

The **`ReqICMLabel`** element allows a Call Studio script to pass caller input, Call Peripheral Variables, and External Call Context (ECC) variables to an ICM script. The ReqICMLabel must be inserted into a Call Studio script as a decision element. In Call Studio, the returned ICM label contains a result, which can be used by other elements in the same application, such as the Transfer or Audio element.

After the ReqICMLabel exits its done path, you can retrieve the values set by the ICM script by selecting the Element Data tab for the ReqICMLabel element. The element data value is {Data.Element.*ReqICMLabelElement*.result}. ReqICMLabelElement is the name of the ReqICMLabel element in the Studio script. The default name for this element is ReqICMLabel_<*n*>, where <*n*> is a number. The first ReqICMLabel you add to the script is named *ReqICMLabel_01*, the second is named *ReqICMLabel_02*, etc. For example, if you changed ReqICMLabel to GetICMLabel, the value returned from ICM would be {Data.Element.GetICMLabel.result}, where result is the variable of the ReqICMLabel element that contains the ICM label.

For more information on using the ReqICMLabel, refer to the **Configuration and Administration Guide for Cisco Unified Customer Voice Portal**[2].

This chapter contains the following topics:

Settings

Name (Label)	Type	Req'd	Single Setting Value	Substitution Allowed	Default	Notes

2) http://www.cisco.com/en/US/products/sw/custcosw/ps1006/products_installation_and_configuration_guides_list.html

Call Peripheral Variables 1 – 10 (callvar1 – callvar10)	string	No	**true**	**true**	*None*	Call Peripheral Variables passed by the Studio script to the ICM Server. Each of these settings can be a maximum length of 210 characters. The ICM Server returns a name-value pair for up to 10 Call Peripheral Variables in a result. Any value that is placed in callvar<n> from a Call Studio script is returned unchanged, if the ICM Script does not change it.
Call Peripheral Variables Return 1 – 10 (callvarReturn1 – callvarReturn10)	string	No	**true**	**true**	*None*	Call Peripheral Variables created upon the return of the ICM Label request, regardless of whether or not these variables are filled by the ICM Script. The reason we need two sets of these variables is to keep reporting the To ICM Call Peripheral Variables separate from what is returned from the ICM.
FromExtVXML0 - 3 (External VXML 0 – External VXML 3)	string array	No	**true**	**true**	*None*	External Call Context (ECC) variables passed by the Studio script to the ICM Server. Each variable is a string of name-value pairs, separated by semicolons, for up to 4 external VXML variables. Each of these settings can be a maximum length of 210 characters.
ToExtVXML0 - 4 (External VXML 0 – External VXML 4)	string array	No	**true**	**true**	*None*	External Call Context (ECC) variables received from the ICM script. The ICM Server returns a string of name-value pairs, separated by semicolons, for up to 5 external VXML variables.
Timeout	integer	Yes	**true**	**true**	3000 (ms)	The number of milliseconds the transfer request waits for a response from the ICM Server before timing out. Note: This value can only be increased or decreased by increments of 500 ms.
caller_input (Caller Input)	string	No	**true**	**true**	*None*	This setting can be a maximum length of 210 characters. The value of this setting will be sent from VXML Server to ICM at runtime. Should a response from ICM be needed, the Call Peripheral Variables or ToExtVXML settings should be used.

Element Data

Name	Type	Notes
result	string	ICM Label returned from an ICM server.

callvar<n>	string	Call Peripheral Variables that the Studio scripts passes to the ICM Server. Valid Call Peripheral Variables are callvar1 – callvar10.
callvarReturn<n>	string	Call Peripheral Variables that the ICM script returns to the VXML Server. Valid Call Peripheral Variables are callvarReturn1 – callvarReturn10. For example, if an ICM script contains call peripheral variable 3 with the string value "CompanyName=Cisco Systems, Inc", you can access the value of CompanyName that is returned by the ICM script by using: **`Data.Element.ReqICMLabelElement.callvarReturn3`**. The returned value is *Cisco Systems, Inc*.

Session Data

Name	Type	Notes
name	string	Value for a name-value pair contained in a **`ToExtVXML`** variable returned in the ICM label. You must know which name-value pairs are set in the ICM script to retrieve the correct value from the Call Studio script. For example, if an ICM script contains a **`user.microapp.ToExtVXML0`** variable with the string value *CustomerName=Mantle*, specify **`Data.Session.CustomerName`**. If the same ICM script contains a **`user.microapp.ToExtVXML0`** variable with the string value *BusinessType=Manufacturing*, you can access the customer business type returned by the ICM script by using **`Data.Session.BusinessType`**.

Exit States

Name	Notes
done	The element execution is complete and the value was successfully retrieved.
error	The element failed to retrieve the value.

Folder and Class Information

Studio Element Folder Name	Class Name
Cisco	com.cisco.cvp.vxml.custelem.ReqICMLabel

Folder and Class Information

Chapter 36

Subdialog Invoke

The **`Subdialog Invoke`** element initiates a subdialog invocation to another VoiceXML application, and handles passing data to and from the application. For the entire duration while a subdialog application is handling a call, the calling application waits in a dormant state for the subdialog to return. The goal of the Subdialog Invoke element is to allow voice applications to be invoked across multiple servers, as well as giving temporary control of the call to a voice application (such as flat VoiceXML and JSPs) created outside Call Studio.

This chapter contains the following topics:

Settings

Name (Label)	Type	Req'd	Single Setting Value	Substitution Allowed	Default	Notes
subdialog_uri (Subdialog URI)	string	Yes	**`true`**	**`true`**	*None*	Specifies the URI of the subdialog to invoke. This may either be a relative or absolute URI, but must be accessible to the voice browser at runtime.
local_application (Local Application)	boolean	Yes	**`true`**	**`true`**	*None*	Specifies whether or not the subdialog application is running on the same application server as the application in which the current element appears.
parameter (Parameter)	string	No	**`false`**	**`true`**	*None*	Holds the name and value of a parameter to pass to the subdialog. The format is the name of the parameter followed by an equal sign (=) followed by the value

						of the parameter. For example: *name=John Doe*. The element will use the text up to the first equal sign as the name of the parameter and the remaining text as the value .
return_value (Return Value)	string	No	`false`	`true`	*None*	Holds the name of a return value from the subdialog. For example: *result*. The names specified here must match the variable names returned by the subdialog. Return values will be stored as element data, in a variable of the name specified here.

Exit States

Name	Notes
done	The element execution is complete.

Folder and Class Information

Studio Element Folder Name	Class Name
General	com.audium.server.voiceElement.internal.SubdialogInvoke

Chapter 37

Subdialog Return

In most situations, the **`CVP Subdialog Return`** element (see CVP Subdialog Return (page 49)) **should be used instead of this one**, to offer full compatibility with ICM. However, there is **one exception** to this. If the voice application will *only* be called by a Subdialog Invoke element (that is, never by ICM), then the **`Subdialog Start`** and **`Subdialog Return`** elements may be used instead. In this scenario, using this element allows an arbitrary number of return values to be retrieved from the subdialog, whereas the **`CVP Subdialog Return`** element allows only four.

This chapter contains the following topics:

Settings

Name (Label)	Type	Req'd	Single Setting Value	Substitution Allowed	Default	Notes
return_value (Return Value)	string	No	**`false`**	**`true`**	*None*	Optional return argument that holds a name/value pair to be returned to the calling application. The format should be: the name of the argument followed by an equal sign and the value of the argument. For example; *name=John Doe*. The element will take the text up to the first equal sign to be the name of the argument and the text following the equal sign to the value.

Exit States

Name	Notes
done	The element execution is complete.

Folder and Class Information

Studio Element Folder Name	Class Name
General	com.audium.server.voiceElement.internal.DefaultSubdialogReturnElement

Chapter 38

Subdialog Start

In most situations, the **`CVP Subdialog Start`** element (see CVP Subdialog Start (page 51)) **should be used instead of this one**, to offer full compatibility with ICM. However, there is **one exception** to this. If the voice application will *only* be called by a **`Subdialog Invoke`** element (that is, never by ICM), then the **`Subdialog Start`** and **`Subdialog Return`** elements may be used instead.

Data can be passed to the VoiceXML application either as HTTP parameters or VoiceXML parameters (using the **`<param>`** tag). In the first case (that is, as HTTP parameters), Call Services will automatically create session data using the name of the data received. In the second case (that is, as VoiceXML parameters), the Subdialog Start element must be configured appropriately in order for the data to be available as element or session data for the duration of the call session. For each data passed as a VoiceXML parameter, the repeatable **`Parameter`** setting must be configured with the same exact name as the data.

This chapter contains the following topics:

Settings

Name (Label)	Type	Req'd	Single Setting Value	Substitution Allowed	Default	Notes
Parameter (Parameter)	string	No	**`false`**	**`true`**	*None*	Holds the name of a parameter passed as input to the subdialog. It must match the exact value specified in the calling dialog. This is a repeatable setting, so multiple values can be specified.
Store As	string	No	**`false`**	**`false`**	Session Data	Set to **`Session Data`** to store the listed parameters in Session data, or to

(Store As)						**`Element Data`** to store them in Element data.

Exit States

Name	Notes
done	The element execution is complete.

Folder and Class Information

Studio Element Folder Name	Class Name
General	com.audium.server.voiceElement.internal.DefaultSubdialogStartElement

Chapter 39

Time

The **Time** voice element captures a time input from the caller. The time input can be entered using spoken inputs (including hours and minutes) or DTMF inputs (in the HHMM format). The captured value will be stored in element data as a five character string in the format HHMMX, where X is one of four possible values: “a” for AM, “p” for PM, “h” for a military time, or “?” for an ambiguous time. Using speech input, the time input may be spoken in natural language.

This chapter contains the following topics:

Settings

Name (Label)	Type	Req'd	Single Setting Value	Sub. Allowed	Default	Notes
inputmode (Input Mode)	string enum	Yes	**true**	**false**	**both**	The type of entry allowed for input. Possible values are: **voice** | **dtmf** | **both**.
noinput_timeout (Noinput Timeout)	string	Yes	**true**	**true**	5s	The maximum time length allowed for silence or no keypress before a noinput event is thrown. Possible values are standard time designations including both a non-negative number and a time unit, for example, 3s (for seconds) or 300ms (for milliseconds). Default = 5s.

collect_max_noinput_count (Time Max NoInput Count)	int ≥ 0	Yes	**true**	**true**	3	The maximum number of noinput events allowed during time input capture. 0 = infinite noinputs allowed.
collect_max_nomatch_count (Time Max NoMatch Count)	int ≥ 0	Yes	**true**	**false**	3	The maximum number of nomatch events allowed during time input capture. 0 = infinite nomatches allowed.
collect_confidence_level (Time Confidence Level)	decimal (0.0 – 1.0)	Yes	**true**	**true**	0.40	The confidence level threshold to use during time capture.
modal (Disable Hotlinks)	boolean	Yes	**true**	**true**	**false**	Whether or not to temporarily disable all hotlink grammars (global or local) and universal grammars. If set to true, only the grammars of the current Time element will be enabled for the duration of the element. Otherwise all active grammars will be enabled.
secure_logging (Secure Logging)	boolean	Yes	**true**	**true**	**false**	Whether or not to enable logging of potentially sensitive data of the Time element. If set to true, the following potentially sensitive data of the element will not log: utterance, interpretation, value, nbestUtteranceX† and nbestInterpretationX†. Instead, the above will be logged as the field name appended with the suffix "_secureLogging" and with the value "******", for example nbestUtterance1_secureLogging,*****.
maxnbest (Maxnbest)	int ≥ 1	Yes	**true**	**true**	1	The maximum number of speech recognition results that can be generated per voice input.

†Refer to the Element Data table for information about nbestUtteranceX and nbestIInterpretationX. Element Data

Element Data

Name	Type	Notes
Value	string	The number captured and stored as a whole or decimal number with an optional minus sign.
value_confidence	float	This is the confidence value of the captured utterance. When n-best recognition is enabled, this stores the confidence score of the top hypothesis in the n-best list.
nbestLength	int ≥ 1	This stores the number of n-best hypotheses generated by the speech engine.
nbestUtterance1 nbestUtterance2 …	string	This set of element data stores the captured n-best utterances. While the maximum number of **nbestUtteranceX** values is equal to the **maxnbest** setting value, the actual number of these values available is determined by speech recognition at runtime, where **nbestUtterance1** holds the utterance of the top hypothesis in the n-best list and **nbestUtteranceX** holds the utterance of the last hypothesis.

nbestUtteranceX		
nbestInterpretation1 nbestInterpretation2 … nbestInterpretationX	string	This set of element data stores the interpretations of captured n-best utterances. While the maximum number of **nbestInterpretationX** values is equal to the **maxnbest** setting value, the actual number of these values available is determined by speech recognition at runtime, where **nbestInterpretation1** holds the interpretation of the top hypothesis in the n-best list and **nbestInterpretationX** holds the interpretation of the last hypothesis.
nbestConfidence1 nbestConfidence2 … nbestConfidenceX	float	This set of element data stores the confidence scores of captured n-best utterances. While the maximum number of **nbestConfidenceX** values is equal to the **maxnbest** setting value, the actual number of these values available is determined by speech recognition at runtime, where **nbestConfidence1** holds the confidence score of the top hypothesis in the n-best list and **nbestConfidenceX** holds the confidence score of the last hypothesis.
nbestInputmode1 nbestInputmode2 … nbestInputmodeX	string	This set of element data stores the input modes of captured n-best utterances.

Exit States

Name	Notes
max_nomatch	The maximum number of nomatch events has occurred. If the nomatch max count is 0, this exit state will never occur.
max_noinput	The maximum number of noinput events has occurred. If the noinput max count is 0, this exit state will never occur.
done	The time capture was completed.

Audio Groups

Time Capture

Name (Label)	Req'd	Max1	Notes
collect_initial_audio_group (Time Initial)	Yes	Yes	Played when the voice element first begins.
collect_noinput_audio_group (Time NoInput)	No	No	Played when a noinput event occurs. The noinput event count corresponds to the audio group count.

collect_nomatch_audio_group (Time NoMatch)	No	No	Played when a nomatch event occurs. The nomatch event count corresponds to the audio group count.
collect_help_audio_group (Time Help)	No	No	Played when a help event occurs. The help event count corresponds to the audio group count. If not specified, a help event is treated as nomatch.

End

Name (Label)	Req'd	Max 1	Notes
done_audio_group (Done)	No	Yes	Played after the time capture is completed. If not specified, no audio will be played.

Folder and Class Information

Studio Element Folder Name	Class Name
Date & Time	com.audium.server.voiceElement.time.MBasicTime

Chapter 40

Time_With_Confirm

The **`Time_With_Confirm`** voice element captures a time input from the caller, and presents a confirmation menu allowing the caller to either accept their entry or re-enter the time. The time input can be entered using spoken inputs (including hours and minutes) or DTMF inputs (in the HHMM format). The captured value will be stored in element data as a five character string in the format HHMMX, where X is one of four possible values: “a” for AM, “p” for PM, “h” for a military time, or “?” for an ambiguous time. Using speech input, the time input may be spoken in natural language.

This chapter contains the following topics:

Settings

Name (Label)	Type	Req'd	Single Setting Value	Sub. Allowed	Default	Notes
inputmode (Input Mode)	string enum	Yes	**`true`**	**`false`**	**`both`**	The type of entry allowed for input. Possible values are: **`voice`** | **`dtmf`** | **`both`**.
noinput_timeout (Noinput Timeout)	string	Yes	**`true`**	**`true`**	5s	The maximum time length allowed for silence or no keypress before a noinput event is thrown. Possible values are standard time designations including both a non-negative number and a time unit, for example, 3s (for seconds) or 300ms (for milliseconds). Default = 5s.

collect_max_noinput_count (Time Max NoInput Count)	int ≥ 0	Yes	**true**	**true**	3	The maximum number of noinput events allowed during time input capture. 0 = infinite noinputs allowed.
collect_max_nomatch_count (Time Max NoMatch Count)	int ≥ 0	Yes	**true**	**false**	3	The maximum number of nomatch events allowed during time input capture. 0 = infinite nomatches allowed.
confirm_max_noinput_count (Confirm Max NoInput Count)	int ≥ 0	Yes	**true**	**true**	3	The maximum number of noinput events allowed during time input confirmation. 0 = infinite noinputs allowed.
confirm_max_nomatch_count (Confirm Max NoMatch Count)	int ≥ 0	Yes	**true**	**false**	3	The maximum number of nomatch events allowed during time input confirmation. 0 = infinite nomatches allowed.
max_disconfirmed_count (Max Disconfirmed Count)	int ≥ 0	Yes	**true**	**false**	3	The maximum number of times a caller is allowed to disconfirm a captured input. 0 = infinite disconfirmations allowed.
collect_confidence_level (Time Confidence Level)	decimal (0.0 – 1.0)	Yes	**true**	**true**	0.40	The confidence level threshold to use during time capture.
confirm_confidence_level (Confirm Confidence Level)	decimal (0.0 – 1.0)	Yes	**true**	**true**	0.50	The confidence level threshold to use during confirmation.
modal (Disable Hotlinks)	boolean	Yes	**true**	**true**	**false**	Whether or not to temporarily disable all hotlink grammars (global or local) and universal grammars. If set to true, only the grammars of the current Time_With_Confirm element (the builtin time and boolean grammars) will be enabled for the duration of the element. Otherwise all active grammars will be enabled.
secure_logging (Secure Logging)	boolean	Yes	**true**	**true**	**false**	Whether or not to enable logging of potentially sensitive data of the Time_With_Confirm element. If set to true, the following potentially sensitive data of the element will not log: utterance, interpretation, value, nbestUtteranceX† and nbestInterpretationX†. Instead, the above will be logged as the field name appended with the suffix "_secureLogging" and with the value "*****", for example nbestUtterance1_secureLogging,*****.
maxnbest (Maxnbest)	int ≥ 1	Yes	**true**	**true**	1	The maximum number of speech recognition results that can be generated per voice input.

†Refer to the Element Data table for information about nbestUtteranceX and nbestInterpretationX.

Element Data

Name	Type	Notes
Value	string	The number captured and stored as a whole or decimal number with an optional minus sign.
value_confidence	float	This is the confidence value of the captured number utterance. When n-best recognition is enabled, this stores the confidence score of the top hypothesis in the n-best list.
confirm_confidence	float	This is the confidence value of the captured confirm utterance.
nbestLength	int ≥ 1	This stores the number of n-best hypotheses generated by the speech engine.
nbestUtterance1 nbestUtterance2 … nbestUtteranceX	string	This set of element data stores the captured n-best utterances. While the maximum number of nbestUtteranceX values is equal to the maxnbest setting value, the actual number of these values available is determined by speech recognition at runtime, where nbestUtterance1 holds the utterance of the top hypothesis in the n-best list and nbestUtteranceX holds the utterance of the last hypothesis.
nbestInterpretation1 nbestInterpretation2 … nbestInterpretationX	string	This set of element data stores the interpretations of captured n-best utterances. While the maximum number of nbestInterpretationX values is equal to the maxnbest setting value, the actual number of these values available is determined by speech recognition at runtime, where nbestInterpretation1 holds the interpretation of the top hypothesis in the n-best list and nbestInterpretationX holds the interpretation of the last hypothesis.
nbestConfidence1 nbestConfidence2 … nbestConfidenceX	float	This set of element data stores the confidence scores of captured n-best utterances. While the maximum number of nbestConfidenceX values is equal to the maxnbest setting value, the actual number of these values available is determined by speech recognition at runtime, where nbestConfidence1 holds the confidence score of the top hypothesis in the n-best list and nbestConfidenceX holds the confidence score of the last hypothesis.
nbestInputmode1 nbestInputmode2 … nbestInputmodeX	string	This set of element data stores the input modes of captured n-best utterances.

Exit States

Name	Notes

max_nomatch	The maximum number of nomatch events has occurred. If the nomatch max count is 0, this exit state will never occur.
max_noinput	The maximum number of noinput events has occurred. If the noinput max count is 0, this exit state will never occur.
max_disconfirmed	The maximum number of disconfirmations has occurred. If the max_disconfirmed_count is set to 0, this exit state will never occur.
done	The time captured is confirmed.

Audio Groups

Time Capture

Name (Label)	Req'd	Max1	Notes
collect_initial_audio_group (Time Initial)	Yes	Yes	Played when the voice element first begins.
collect_noinput_audio_group (Time NoInput)	No	No	Played when a noinput event occurs during time input. The noinput event count corresponds to the audio group count.
collect_nomatch_audio_group (Time NoMatch)	No	No	Played when a nomatch event occurs during time input. The nomatch event count corresponds to the audio group count.
collect_help_audio_group (Time Help)	No	No	Played when a help event occurs during time input. The help event count corresponds to the audio group count. If not specified, a help event throws a nomatch event.

Time Confirm

Name (Label)	Req'd	Max1	Notes
confirm_initial_audio_group (Confirm Initial)	Yes	Yes	Played when confirmation of the captured time first begins.
confirm_nomatch_audio_group (Confirm NoMatch)	No	No	Played when a nomatch event occurs during time confirmation. The nomatch event count corresponds to the audio group count.
confirm_noinput_audio_group (Confirm NoInput)	No	No	Played when a noinput event occurs during time confirmation. The noinput event count corresponds to the audio group count.
confirm_help_audio_group (Confirm Help)	No	No	Played when a help event occurs during time confirmation. The help event count corresponds to the audio group count. If not specified, by default help throws a nomatch.
disconfirmed_audio_group	No	No	Played after the caller disconfirms a time entry captured.

(Disconfirmed)			

End

Name (Label)	Req'd	Max 1	Notes
yes_audio_group (Yes)	No	Yes	Played after the caller chooses the *yes* option. If not specified, no audio will be played when this option is chosen.

Folder and Class Information

Studio Element Folder Name	Class Name
Date & Time	com.audium.server.voiceElement.time.MBasicTimeWithConfirm

Folder and Class Information

Chapter 41

Transfer

The **`Transfer`** voice element performs a call transfer to a phone number specified by a configuration setting. Depending on how the voice browser is configured, the call transfer can be a bridge transfer or a blind transfer. For a bridge transfer, the voice browser makes an outbound call while maintaining the original call and acts as a bridge between the two calls. The advantage of this is that once the secondary call ends, the original call can still continue with the IVR. The disadvantage is that two separate phone lines are used. For a blind transfer, the voice browser makes an outbound call and when connected, links the original call to the new caller through the use of a telephony switch. At this point, the voice browser (and as a result VXML Server) is no longer in control of the call. Blind transfers involve only one line.

The Transfer element defines exit states for the different ways bridge transfers can end such as the person being called hung up, there was no answer, there was a busy signal, or some other phone-related error occurred. Since blind transfers take the call away from the voice browser and VXML Server, a Transfer element performing a blind transfer would never return an exit state. Instead, an special event would be thrown by the voice browser, caught in the root document for the call, and VXML Server would terminate the session by interrupting the Transfer element.

The number to transfer to can be any phone number allowed by the voice browser telephony provider (some may place restrictions on outbound dialing). Please note that different voice browsers may or may not accept certain kinds of phone numbers. Check your voice browser documentation for specific requirements and restrictions for call transfer.

This chapter contains the following topics:

Settings

Name (Label)	Type	Req'd	Single Setting Value	Sub. Allowed	Default	Notes
transfer_destination (Transfer Destination)	string	Yes	**`true`**	**`true`**	*None*	The phone number to transfer to. It may contain non-numerical characters to allow support for phone extensions.
destination_type (Destination Type)	string	No	**`true`**	**`true`**	tel	The type of transfer destination to which the voice element is to connect. Possible values are: **`tel`** | **`sip`**.
connect_timeout (Connect Timeout)	string	Yes	**`true`**	**`true`**	60s	The maximum time (in seconds) that voice element is allowed to wait for an answer, before exiting with a *noanswer* exit state. Possible values are standard time designations including both a positive integer and a time unit s, for example, 10s (for 10 seconds). Default = 60s.
max_transfer_time (Max Transfer Time)	string	Yes	**`true`**	**`true`**	0s	The maximum duration (in seconds) that the transfer is allowed to last. Possible values are standard time designations including both a non-negative integer and a time unit s, for example, *30s* (for 30 seconds). Default = 0s (means no limit). This setting only applies when **`bridge`** is set to *true*.
bridge (Bridge)	binary	Yes	**`true`**	**`true`**	**`false`**	Determines whether the application remains connected to the caller after the transfer is initiated. Possible values are: **`true`** | **`false`**. Default = *false*. When set to *false* (that is, a blind transfer), the application redirects the caller to the callee without remaining in the connection; the transfer outcome is completely unsupervised. When set to *true* (that is, a bridge transfer), the application stays connected to the caller and adds the callee to the connection for the duration of the transferred call.
transfer_audio (Transfer Audio)	string	No	**`true`**	**`true`**	*None*	The URI location of the audio file to be played while connecting the call.
aai (Application-to-application Information)	string	No	**`true`**	**`true`**	*None*	A string containing Application-to-Application Information data to be sent to an application on the far-end.

Element Data

Name	Type	Notes

result	string	The value returned by the transfer field. This is dependent on the voice browser.

Exit States

Name	Notes
busy	The number was busy.
noanswer	There was no answer.
phone_error	There was some sort of phone-related error.
done	The call transfer completed successfully.

Note:

- Hosting voice browsers may disable call transfers for developer accounts. You should verify with your provider that transfer is enabled for your application.
- Some voice browsers use a code to indicate which call transfers will be allowed. This code appears before the phone number.
- Some voice browsers support the inclusion of an extension in the phone number so that the system can transfer to a particular extension. It is up to the developer to pass this voice element a string containing the appropriate format. Check the platform specific documentation for support of extension dialing in transfer.

Audio Groups

Transfer Audio

Name (Label)	Req'd	Max1	Notes
initial_audio_group (Initial)	No	Yes	Played to introduce the transfer. If there is none, the transfer occurs immediately.
busy_audio_group (Busy)	No	Yes	Played when there is a busy signal, right before the voice element exits with the "busy" exit state.
noanswer_audio_group (No Answer)	No	Yes	Played when there is no answer, right before the voice element exits with the *noanswer* exit state.
phone_error_audio_group (Phone Error)	No	Yes	Played when there is some kind of phone-related error, right before the voice element exits with the *phone_error* exit state.

End

Name (Label)	Req'd	Max 1	Notes
done_audio_group (Done)	No	Yes	Played when the call transfer completes with the party called hanging up and the caller staying on the line.

Folder and Class Information

Studio Element Folder Name	Class Name
Call Control	com.audium.server.voiceElement.transfer.MTransfer

Chapter 42

Yes_No_Menu

The **`Yes_No_Menu`** voice element presents a yes/no menu. It can be configured to accept DTMF entry (1 for yes and 2 for no) or spoken input (*yes* or *no* and other synonymous utterances, however this is dependent on the voice browser). There is an optional feature that allows the word *replay* to be spoken (or DTMF button 3) that replays the **`initial_audio_group`**. The voice element uses the browser specific VoiceXML builtin grammar for the boolean field type. A separate exit state exists for the yes and no choices (there is no exit state for replay since dialog execution is still contained within the confines of the voice element).

This chapter contains the following topics:

Settings

Name (Label)	Type	Req'd	Single Setting Value	Sub. Allowed	Default	Notes
max_noinput_count (Max NoInput Count)	int ≥ 0	Yes	**`true`**	**`true`**	3	0 = infinite noinputs allowed.
max_nomatch_count (Max NoMatch Count)	int ≥ 0	Yes	**`true`**	**`true`**	3	0 = infinite nomatches allowed.
inputmode (Input Mode)	string enum	Yes	**`true`**	**`false`**	**`both`**	The type of entry allowed for input (using speech recognition, DTMF entry, or both). Possible values are: **`voice`** | **`dtmf`** | **`both`**.

replay (Replay)	boolean	Yes	**true**	**true**	**false**	**True** adds a *replay* option which replays the initial prompt.
noinput_timeout (Noinput Timeout)	string	Yes	**true**	**true**	5s	The maximum time length allowed for silence or no keypress before a noinput event is thrown. Possible values are standard time designations including both a non-negative number and a time unit, for example, 3s (for seconds) or 300ms (for milliseconds). Default = 5s.
confidence_level (Confidence Level)	decimal (0.0 – 1.0)	Yes	**true**	**true**	0.50	The confidence level threshold to use.
modal (Disable Hotlinks)	boolean	Yes	**true**	**true**	**false**	Whether or not to temporarily disable all hotlink grammars (global or local) and universal grammars. If set to true, only the boolean builtin grammar will be enabled for the duration of the element. Otherwise all active grammars will be enabled.

Element Data

Name	Type	Notes
value	string	This is the value chosen by the caller. Can be: *yes* or *no*.
value_confidence	float	This is the confidence value of the utterance.

Exit States

Name	Notes
max_nomatch	The maximum number of nomatch events has occurred. If the nomatch max count is 0, this exit state will never occur.
max_noinput	The maximum number of noinput events has occurred. If the noinput max count is 0, this exit state will never occur.
yes	The utterance was recognized as *yes*.
no	The utterance was recognized as *no*.

Note: The replay option, when activated, resets all the event counts (noinput and nomatch).

Audio Groups

Yes / No Capture

Name (Label)	Req'd	Max1	Notes

initial_audio_group (Initial)	Yes	Yes	Played when the voice element first begins.
nomatch_audio_group (NoMatch)	No	No	Played when a nomatch event occurs.
noinput_audio_group (NoInput)	No	No	Played when a noinput event occurs.
help_audio_group (Help)	No	No	Played when the caller asks for help. If not specified, help is treated as a nomatch event by default.

End

Name (Label)	Req'd	Max 1	Notes
yes_audio_group (Yes)	No	Yes	Played when the caller chose the *yes* option. If not present, no audio will play when this option is chosen.

Folder and Class Information

Studio Element Folder Name	Class Name
Menu	com.audium.server.voiceElement.menu.MYesNoMenu

Folder and Class Information

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