Genesys App Automation Platform Reference Guide

Genesys Intelligent Automation 3.6.0

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Genesys App Automation Platform Reference Guide

Welcome to the Genesys App Automation Platform Reference Guide.

This document details useful reference information pertaining to your Genesys App Automation Platform (GAAP) deployment.

Who should use this document?

The intended audience for this document are advanced users who want more information on setting up advanced features in GAAP.

What is in this document?

This document explains the following topics:

- Using WebIVR MicroApps - How to deploy WebIVR-based MicroApps using the Genesys Widgets framework.
- Using Multimodal Communication - How to use multiple modes of communication in a single interaction to best serve the customer.
- Database schema information - Provides information on database views.
- Call Processing - Provides information on the logic applied at the end of calls and associated backlog processing, if necessary.

Using WebIVR MicroApps

This page describes how you can use WebIVR-based MicroApps in chat interactions to accomplish various business tasks. For example, if an agent is helping a customer with a purchase and you want to securely collect the customer's credit-card information, you can use a MicroApp to securely capture the information without requiring it to go through the agent.

See the Detailed process summary section, below, for more information on the GAAP widget architecture and how the process executes among various Genesys components.

Prerequisites

The following prerequisites are required:

- GAAP 3.6.x or higher with Messaging Server
- Workspace Desktop Edition or Workspace Web Edition (8.5.117.07 and higher)
- Genesys Widgets
- The following eServices components:
  - Chat Server (8.5.104.10 and higher)
  - Interaction Server (8.5.109.01 and higher)
  - Knowledge Manager (8.5.x and higher)
- Configuration Server (part of Management Framework) (8.5.101.08 and higher)

Configuring your environment

Update Genesys Widgets framework for GAAP

> **Important**
>
> The Genesys Widgets framework must be deployed in your environment before completing this section.

1. Go to the GAAP installation folder (for example, **C:\GAAP\Platform\TomcatMessaging\webapps\fish-messaging\widgets**).
2. Copy the latest widget JavaScript prefilters and CSS files from the GAAP folder noted in Step 1 to your website.

a. Add **cx-speechstorm.css** to the folder containing other style sheets used within your website.

b. Add **cx-speechstorm.js** to the JavaScript folder containing **widgets.min.js**.

3. Integrate the GAAP widgets into your existing website. Refer to **index.html**, which is found in the GAAP folder noted in Step 1, as a guide. This file contains various imports for the style sheets and JavaScript files that you copied in the previous step, along with the Standard CX Widget Instrumentation Script (which you should already have running as part of the Widgets framework).
4. In the file **index.html**, copy the script block that contains **sChatServerUrl** and **sSpeechStormServer** variables. You must update these variables to point to valid servers within your business. Verify all paths for imports are correct, according to the locations into which you copied files in the previous step.

   a. Update **sChatServerUrl** to point to your chat server. For example:

   ```
   var sChatServerURL = "http://<your_server>/gms_port_8010/genesys/2/chat/customer-
   support";
   ```

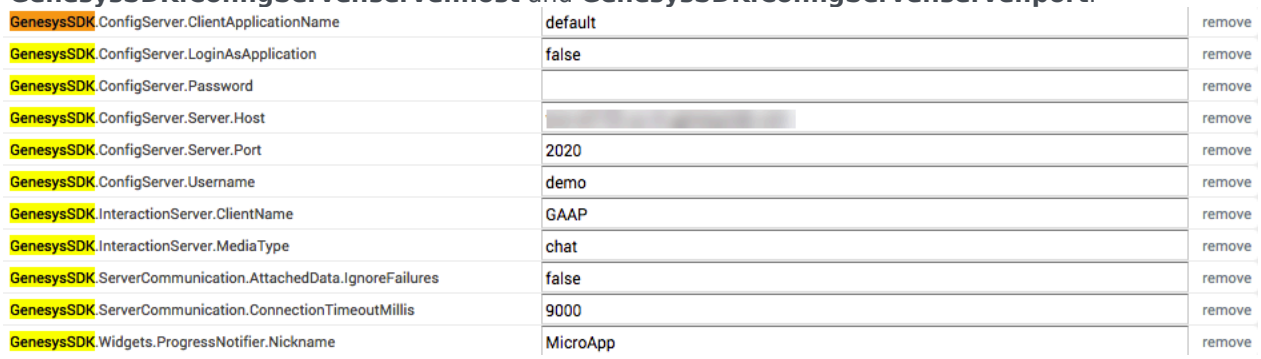
   b. Update **sSpeechStormServer** to point to your GAAP Messaging Server. For example:

   ```
   var sSpeechStormServer = "http://<Messaging_Server:Port";
   ```

Add default server settings in GAAP

Next, you must log in to GAAP and add default server settings for use with the widget framework:

1. Log in to GAAP.
2. Go to **Administration > Default Server Settings**.
3. Configure the following server settings as necessary for your environment. In particular, ensure you set the correct host and port for Configuration Server, as defined in **GenesysSDK.ConfigServer.server.host** and **GenesysSDK.ConfigServer.server.port**.



4. Open Windows Services and restart Messaging Server.

Using MicroApps

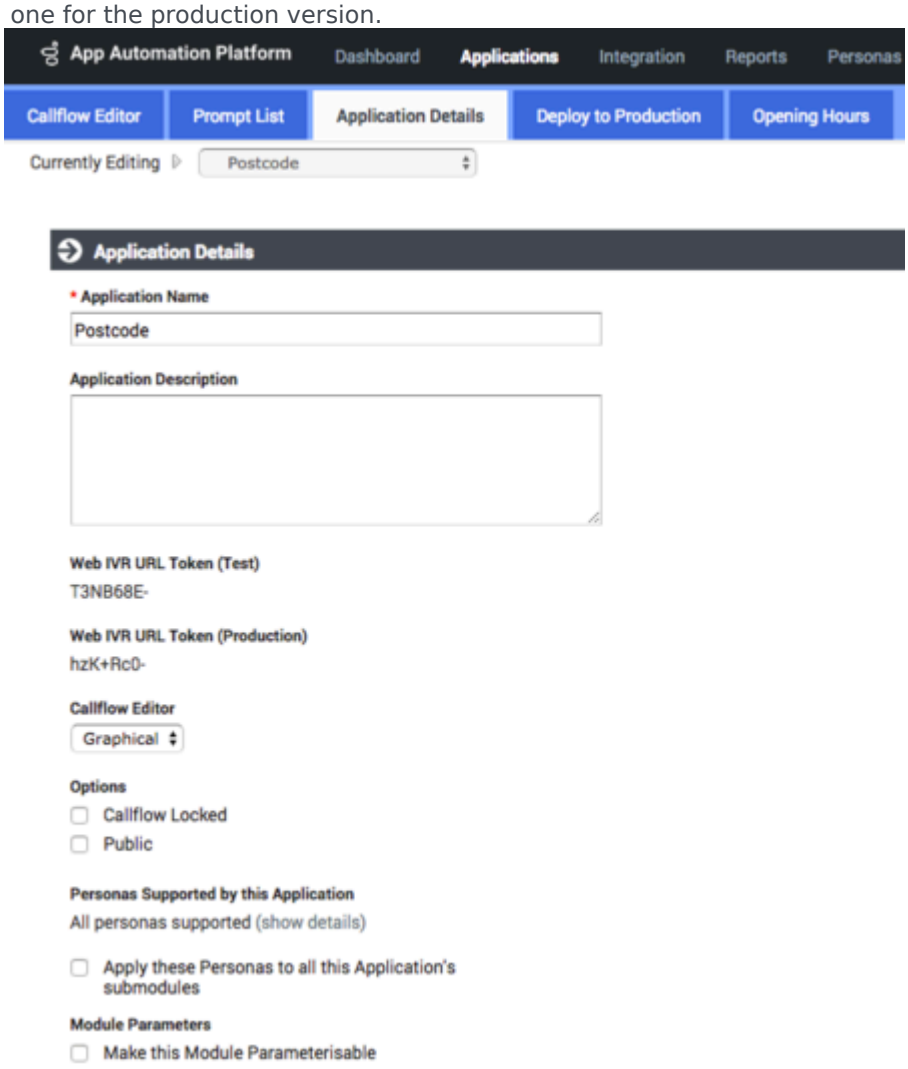
To use a MicroApp, an agent in a chat interaction with a customer enters a MicroApp URL into the chat. This chat message sets which MicroApp is used, and defines variables that Chat Server passes to the WebIVR application that powers the MicroApp. For example:

```
microapp://app/T3NB68E-/Payment
```

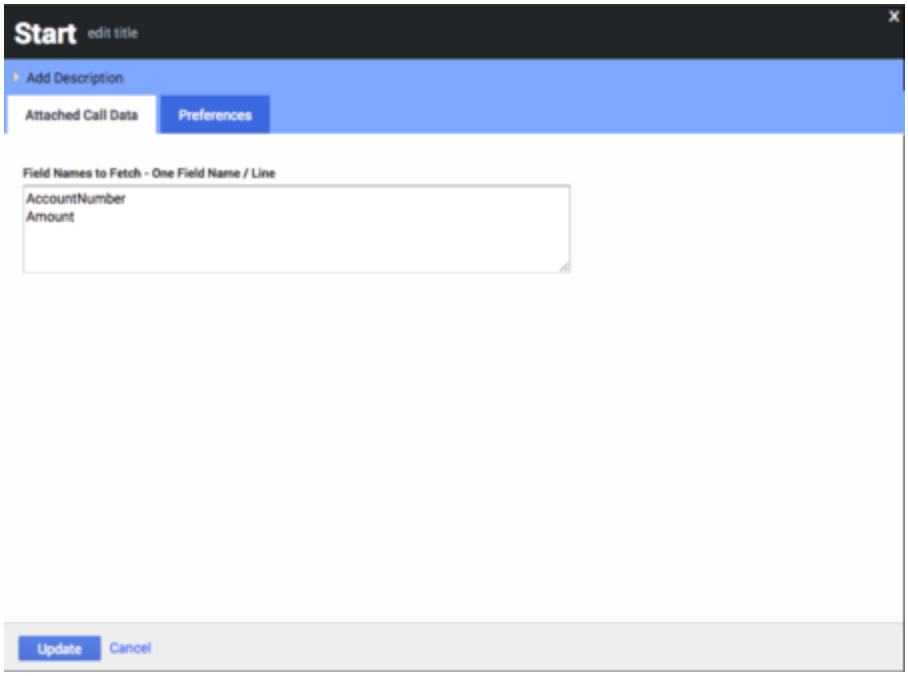
```
AccountNumber=1234567
Amount=USD77.80
```

In the example above, the following parameters are set:

- **T3NB68E-** - This is the WebIVR URL token that is unique to this particular WebIVR application. To find the token for your WebIVR application, open your WebIVR application in the Callflow Editor and click the **Application Details** tab. This tab displays two tokens - one for the test version of your application and one for the production version.



- **Payment** - This parameter is optional. It allows you to provide a name that describes the purpose of the widget to be launched.
- **AccountNumber=1234567** and **Amount=USD77.80** - These are parameters that Workspace passes into the GAAP widget. In this case, it specifies the **AccountNumber** variable has a value of **1234567** and the payment **Amount** is **USD77.80**. You define these variables in the **Start** block of your WebIVR application, as seen below:



> **Important**
> Contact your Genesys representative for more information on parameters you can use with your widget implementation.

Use Knowledge Manager to set up standard responses

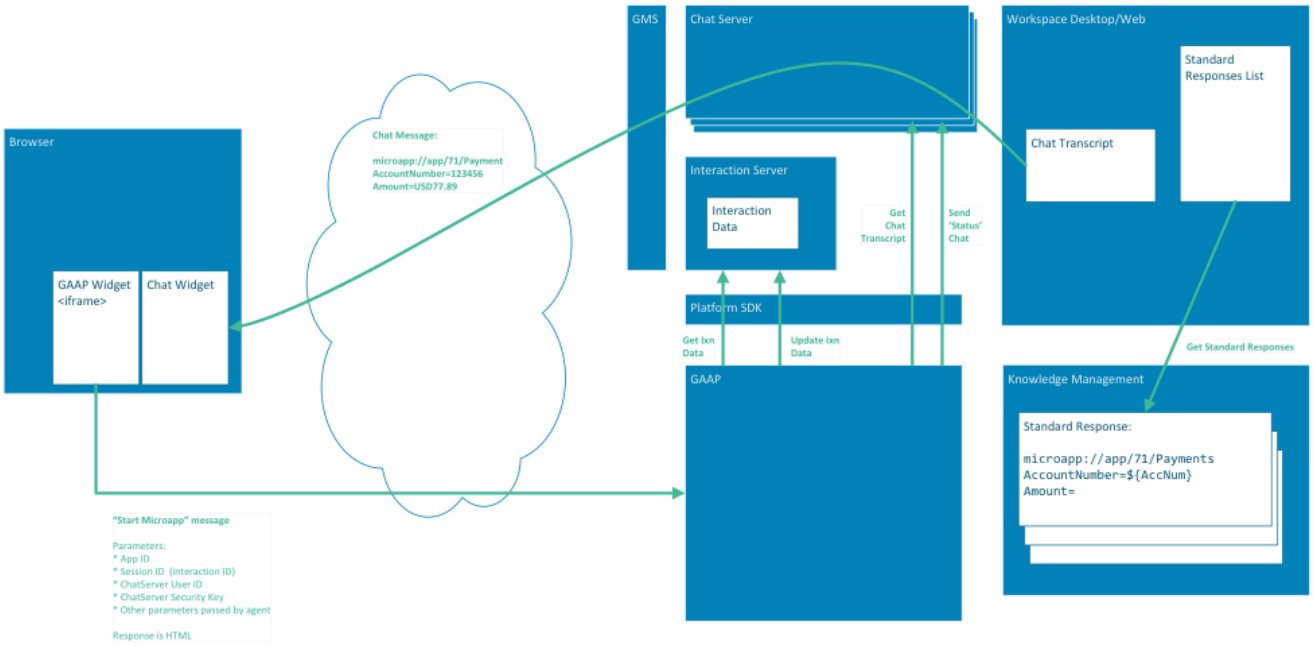
For a more efficient workflow, you can use Knowledge Manager (part of eServices) to set up standard responses that agents can insert into chats to invoke MicroApps.

Refer to the Genesys Knowledge Manager documentation for more information.

Detailed process summary

This section describes in more detail how MicroApps interact with GAAP and the Genesys environment.

The following graphic explains the high-level architecture of how MicroApps interact with other Genesys components:



The list below provides a step-by-step account of how GAAP interacts with the Genesys environment to provide the MicroApp service.

1. The agent invokes the MicroApp URL and parameters in a chat window with a customer, preferably using a standard response defined in Knowledge Manager.
2. After the agent sends the URL to the customer, the GAAP widget uses a pre-filter to prevent MicroApp messages from displaying in the customer's chat window.
3. The GAAP widget intercepts the *microapp request* message and forwards the request in the correct format to the GAAP Messaging Server, along with the session ID (also known as Interaction ID), the Chat Server user ID and security key for that session, the MicroApp App ID, and any additional parameters provided by the agent.
4. When the MicroApp session begins, the GAAP Messaging Server contacts Interaction Server to retrieve any attached data already present in the interaction. This data is made available to the MicroApp in the same way as SIP Server attached data is made available in a voice call.
5. GAAP Messaging Server contacts Chat Server with the user ID and security key, and retrieves the chat transcription for this session.
6. After receiving the chat transcription, the GAAP Messaging Server finds the matching *microapp request* message in the transcription to verify that parameters have not been changed by the customer or a third party.
7. As the MicroApp progresses, the GAAP Messaging Server send *status* chat messages to the agent. These messages state the location of the customer in the MicroApp. The GAAP widget filters these status messages so that they do not appear in the customer's chat window.
8. The MicroApp might use logic to attach data to the interaction. If so, the GAAP Messaging Server sends messages directly to Interaction Server. This results in an *interaction data update* notification in Workspace and updates to values in any Case Information fields. For example, you can use this functionality to notify agents when the caller has identified himself or herself.
9. After the MicroApp ends, the GAAP widget sends a pre-filtered *status* chat message to the agent on behalf of the user to signify the MicroApp portion of the interaction is complete.

> **Important**
>
> During the whole interaction described above, the agent and customer can send normal chat messages to one another without affecting the MicroApp's execution.

Using Multimodal Communication

> **Important**
> This feature requires Orchestration Server 8.5.x.

Multimodal communication allows you to take advantage of various communication channels in a single interaction to enhance the customer experience.

For example, a customer might call your company to enquire about a product you sell. Before getting to an agent, you want to ask the caller for his or her email address so you can send more information about the product. However, it's not practical to have the customer enter an email address in a traditional IVR environment - it is much easier to have the customer type this information using a mobile app on a smartphone. GAAP can take advantage of both methods in a single interaction to best serve the customer.

Here's how it works:

- The customer calls your company.
- A GAAP application answers the call, identifies the caller, and begins routing the caller to the right department.
- When prompted for an email address, the application sends the customer a SMS message to open a mobile app on a smartphone.
- The customer opens the link and provides the information. The call continues in the background, with the GAAP application guiding the customer throughout the entire interaction.
- Once the information is captured, the customer returns to the phone call without any interruption in service.

> **Important**
> When a call enters multimodal mode, **Message** block prompts appear in the WebIVR application but these prompts are not read aloud by the IVR application. Only **Menu** or **Question** block prompts are read aloud by the IVR application while in multimodal mode.

Preparing your environment

Integrating with ORS

Use Genesys Administrator to create a Routing Point to point to a new Orchestration script.

1. Log in to Genesys Administrator.
2. Go to **Provisioning > Routing/eServices > Orchestration.**
3. Click **New...**.
4. In the **Configuration** tab, configure the following:
   - **Name** - Enter a name for this object. For example, `GAAP_Multimodal`.
   - **Script Type** - Select **Enhanced Routing**.
   - **URI** - Enter the URL of the GAAP VUI server or VUI Load Balancer to use for multimodal communication. For example:

     ```
     http://<host:port>/fish-vui/ors/
     MultiModalContainer.jsp?gap_testsiteid=<#>≧_istestcall=<boolean>≧_url=<url_including_protocol_and_port>
     ```

     Where:

     - `<host:port>` specifies the URL for the GAAP VUI server.
     - `gap_testsiteid=` specifies the ID number of the GAAP application.
     - `gap_istestcall=` specifies whether this is a test call (`true` or `false`).
     - `gap_url=` specifies the URL for the GAAP VUI server.
5. Click **Save**.

Configuring GAAP

The following VUI preferences are available in GAAP installations after the 3.5.x release. For releases before 3.5.x that were upgraded to more recent versions, you must add these preferences manually or import a new standard application template.

Setting	Description	Valid values
Standard 'Visual Switch' exit read-only DTMF	Specifies the DTMF key that callers can press to exit multimodal operation and resume IVR-only mode. This is particularly useful for iPhone callers, as these users cannot click **Close** to end the WebIVR application.	Any DTMF key. For example: *.
Standard 'Visual Switch' menu caller phone no. grammar	Specifies the grammar used to capture the caller's phone number for SMS.	Select a specific country, or **Digits** for general use.
Standard 'Visual Switch' menu caller phone no. variable	Specifies the variable against which to store the caller's phone number. If this variable is pre-populated before the user enters multimodal mode, GAAP does not invoke the SMS phone number question and grammar.	String

Setting	Description	Valid values
Standard ‘Visual Switch’ menu mode	Specifies the multimodal mode to use for the current block.	• **IVR Only** - Use normal IVR operation with no multimodal functionality. Note: This value must not be used to switch back from multimodal mode. Instead, select **Visual Mandatory Off**. • **Visual Optional** - Allows the caller to choose whether to use IVR or multimodal. See **Standard ‘Visual Switch’ menu option DTMF** or **Standard ‘Visual Switch’ menu option synonyms** to set values for how the caller can change modes. • **Visual Mandatory On** - Forces use of multimodal. As a result, GAAP prompts the caller for a SMS phone number. • **Visual Mandatory Off** - Forces the interaction back to IVR only. Use this option in conjunction with **Visual Mandatory On** to specify when multimodal must begin and end. Important GAAP checks this setting for Menu blocks only. You cannot switch modes with any other block.
Standard ‘Visual Switch’ menu option DTMF	If **Standard ‘Visual Switch’ menu mode** is set to **Visual Optional**, this value specifies the DTMF key the caller must press to switch modes.	Any DTMF key
Standard ‘Visual Switch’ menu option synonyms	If **Standard ‘Visual Switch’ menu mode** is set to **Visual Optional**, this value specifies the ASR grammar used to switch modes when spoken by the caller.	Comma-separated list
Standard ‘Visual Switch’ menu option weight	If **Standard ‘Visual Switch’ menu mode** is set to **Visual Optional**, this value specifies the ASR weighting applied to the **Standard ‘Visual Switch’ menu option synonyms** spoken by the caller. This can be	From **-100** to **+100**

Setting	Description	Valid values
	set accordingly to reduce the likelihood of accidental recognition of a mode switch.	
Standard ‘Visual Switch’ menu sms cancel dtmf	After GAAP sends an SMS to the user, the IVR plays in a loop while it waits for the caller to click the WebIVR link. The IVR only moves forward after the caller opens the WebIVR link. Therefore, this value specifies the DTMF key that the caller can press to cancel the loop and resume IVR-only mode. This is useful if the caller does not receive the SMS message.	Any DTMF key
Standard ‘Visual Switch’ menu sms cancel synonyms	After GAAP sends an SMS to the user, the IVR plays in a loop while it waits for the caller to click the WebIVR link. The IVR only moves forward after the caller opens the WebIVR link. Therefore, this value specifies the ASR grammar item the caller can use to cancel the loop and resume IVR-only mode. This is useful if the caller does not receive the SMS message.	Comma-separated list
Standard ‘Visual Switch’ menu sms cancel weight	The ASR weighting applied to **Standard ‘Visual Switch’ menu sms cancel synonyms**. This is useful to reduce the likelihood of accidental recognition of a mode cancellation.	From **-100** to **+100**
Standard ‘Visual Switch’ menu sms wait prompt iterations	After GAAP sends an SMS to the user, the IVR plays in a loop while it waits for the caller to click the WebIVR link. The IVR only moves forward after the caller opens the WebIVR link. This value specifies the number of times the loop plays before resuming IVR-only mode. You can use this option in conjunction with **Standard ‘Visual Switch’ read-only timeout** to play the prompt only once and wait in silence until the link is clicked.	Integer
Standard ‘Visual Switch’ read-only max retries	After GAAP sends an SMS to the user, this value specifies the maximum number of times to reject invalid input before resuming IVR-only mode.	Integer

Setting	Description	Valid values
Standard ‘Visual Switch’ read-only max timeouts	After GAAP sends an SMS to the user, this value specifies the maximum number of times to time out before resuming IVR-only operation.	Integer
Standard ‘Visual Switch’ read-only prompt mode	Specifies whether to use the voice persona or the visual persona for prompts.	**Voice** or **Visual**
Standard ‘Visual Switch’ read-only timeout	After GAAP sends an SMS to the user, this value specifies the length of time, in milliseconds, to wait before timing out.	Integer

Frequently asked questions

How do I force the user to switch to multimodal mode at a certain point in the callflow?

To force a switch to WebIVR mode:

- Select a Menu block to force a switch to WebIVR.
- Open the **Menu** block.
- Add a VUI preference named **Standard ‘Visual Switch’ menu mode** and set it to **Visual Mandatory On**.

To force a switch back to the phone call:

- Select a Menu block to force a switch to WebIVR.
- Open the **Menu** block.
- Add a VUI preference named **Standard ‘Visual Switch’ menu mode** and set it to **Visual Mandatory Off**.

Can I let the caller choose when and where to use WebIVR?

Yes. Add the following default VUI preferences:

- **Standard ‘Visual Switch’ menu mode** - Set to **Visual Optional**.
- **Standard ‘Visual Switch’ menu option DTMF** - Specify a DTMF key the caller must press to initiate the switch to WebIVR.
- **Standard ‘Visual Switch’ menu option synonyms** - Specify recognition phrases the caller must say to initiate the switch to WebIVR.

Do I have to send the SMS to the phone I'm calling from?

No. You can set the VUI preference **Standard ‘Visual Switch’ menu caller phone no. variable** to

a variable name. When switching, the caller is asked to confirm the SMS number, so another phone number can be entered manually at that point. Add the VUI preference **Standard 'Visual Switch' menu caller phone no. grammar** to specify the allowed phone numbers.

The IVR reads back the text from the WebIVR while in multimodal mode. Can I change this?

Yes. The VUI preference **Standard 'Visual Switch' read-only prompt mode** indicates which persona set is used by the IVR when in multimodal mode.

The default value, **Visual**, allows a single callflow to support an optional visual switch. If a caller is on the phone, he or she hears prompts that are relevant to a phone call. If the caller switches to WebIVR, the Visual persona prompts are read back by the IVR.

However, should a particular callflow only need to support multimodal mode (in other words, you are forcing the caller to switch to WebIVR), the value can be set to **Voice**.

I didn't receive a text. Must I wait for the IVR to time out before getting out of the loop?

No. If you didn't receive the text, you can use the values of VUI preferences **Standard 'Visual Switch' menu sms cancel dtmf** and **Standard 'Visual Switch' menu sms cancel synonyms** to cancel the wait and move back to normal IVR mode.

If the IVR is in read-only mode and I lose connectivity, how can I return to IVR-only mode?

You can configure the VUI preference '**Standard 'Visual Switch' exit read-only DTMF** to specify a DTMF key that cancels multimodal mode. Any other DTMF key triggers a retry and, assuming the prompt is configured appropriately, reminds the caller of the only applicable DTMF key at that time.

I don't want the IVR to repeat the prompts in read-only mode. How can I achieve this?

Set the VUI preference **Standard 'Visual Switch' read-only timeout** to a large value to offer a larger *silence* time between prompts.

When using multimodal mode and the IVR is in read-only mode, why are only Menu and Question prompts spoken to the caller?

This is a limitation that will be addressed in a later release.

Where are the prompts that relate to multimodal functionality?

They are in the standard prompts of the inbound application, named:

- Standard visual goodbye
- Standard visual switch back to ivr
- Standard visual switch callback help prompt 1
- Standard visual switch callback help prompt 2
- Standard visual switch callback initial prompt 1
- Standard visual switch callback initial prompt 2

- Standard visual switch callback retry prompt 1
- Standard visual switch callback retry prompt 2
- Standard visual switch callback timeout prompt 1
- Standard visual switch callback timeout prompt 2
- Standard visual switch enter phoneno help prompt
- Standard visual switch enter phoneno initial prompt
- Standard visual switch enter phoneno retry prompt
- Standard visual switch enter phoneno timeout prompt
- Standard visual switch sms cancel confirmation prompt
- Standard visual switch sms sent prompt
- Standard visual switch sms system cancelled prompt
- Standard visual switch sms user cancelled prompt
- Standard visual switch sms wait prompt
- Standard visual switch transfer confirm help prompt
- Standard visual switch transfer confirm initial prompt
- Standard visual switch transfer confirm retry prompt
- Standard visual switch transfer confirm timeout prompt

How can I configure the WebIVR title bar?

Specify a new value for **Standard visual title bar message prompt**.

How can I configure the WebIVR **End** and **Back to Voice** buttons?

Specify new values for **Standard visual back to voice button prompt** and **Standard visual end button prompt**.

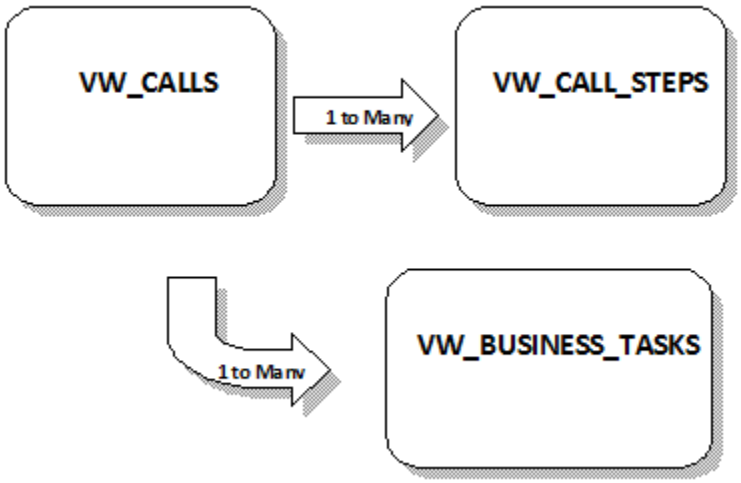
Database Views Schema

Call Reporting Database Views

The three main call reporting views within the reporting database are:

- VW_CALLS - Records each call made into the GAAP application.
- VW_CALL_STEPS - Records each step made by the caller.
- VW_BUSINESS_TASKS - Records which business tasks started and ended, along with details of each instance.

The diagram below describes the relationship between the three views:



These views are configured so they will not lock the database when they run. Genesys recommends that you always filter based on:

- **company_id**.
- **is_test_call**.
- **call_start_date**.

Refer to the Useful SQL Queries section to find queries that might be useful when working with the database

VW_CALLS

This view records each *call* made into the GAAP application.

Calls might be physical or not. For example, if a caller started a phone call to GAAP but was transferred out of GAAP to a routing strategy and then returned. In this case, two rows are recorded into this view.

Column	DataType	Length	Description	Example
call_id	bigint		Unique identifier for each call. This is an incrementing number.	10001
company_id	int		Link to GAAP company identifier. The company ID can be found in the GUI (look in **Administration > Companies**).	3
voice_platform_session_id	nvarchar	100	Media Platform Identifier for the call within GAAP (e.g. Genesys Voice Platform).	26A92695-9557-444A-A9B2-CCB4D71C1B69-1791
voice_platform_full_call_id	nvarchar	100	Unique identifier to link multiple GAAP interactions together within a single phone call.	10KMMSG8LL37TETGHTNQOF4KK80001NV
start_site_id	int		The module ID of the Inbound application from which the call started.	1
start_site_name	nvarchar	100	The name of the Inbound application from which the call started.	SIM Activation
call_start_time	datetime		The timestamp for when the call started.	2014-02-13 15:35:31.737
call_start_date	datetime		The date timestamp for when the call started (time is always **00.00.00.000**).	2014-02-13 00:00:00.000
call_start_hour	int		The hour of the day for when the call started, in 24-hour format.	15
call_end_time	datetime		The timestamp for when the call ended.	2014-02-13 15:36:02.640
call_end_date	datetime		The date timestamp for	2014-02-13 00:00:00.000

Column	DataType	Length	Description	Example
			when the call ended (time is always **00.00.00.000**).	
call_end_hour	int		The hour of the day when the call ended, in 24-hour format.	15
call_end_site_id	int		The ID of the last module accessed on the call.	3
call_end_site_name	nvarchar	100	The name of the last module accessed on the call.	Transfer to RS – With Announcement
call_end_block_type	tinyint	1	Type of the last block accessed on the call. Possible values are: • **1** – Start. • **2** – End. • **3** – Script. • **4** – Message. • **5** – Menu. • **6** – Custom Question. • **7** – Phone Transfer. • **8** – URL Transfer. • **9** – Recording. • **10** – Interceptor.	2
call_end_block_name	nvarchar	100	The name of the last block or step accessed on the call.	End Call
call_end_result	nvarchar	100	The resulting outcome	**hangup**

Column	DataType	Length	Description	Example
			description. Possible values are: • **error**. • **success**. • **hangup**. • **system hangup**.	
has_recent_failure	bit	1	Internal flag to determine if an error or recognition failure occurred in the callflow step/block. This flag can be reset, as controlled by VUI preferences, if the succeeding Menu or Custom Question step/block is successful.	0
is_test_call	bit	1	Flag to determine if call is for the test or production version of the module. Values can be **1** for Test or **0** for production.	1
call_duration	int		Call duration in seconds.	30
cli	nvarchar	45	Calling Line Identifier (the number that the caller is calling from).	3100
dnis	nvarchar	45	Dialed number that is associated to the GAAP application.	1234
cluster_id	int		The ID of the GAAP server cluster that handled the call. Cluster information can be	1

Column	DataType	Length	Description	Example
			found in the GAAP GUI (look in **Administration > Clusters**).	
cluster_name	nvarchar	100	The name of the GAAP server cluster that handled the call. Cluster information can be found in the GAAP GUI (look in **Administration > Clusters**).	Default Voice Cluster
cti_fields	nvarchar	1000	Computer Telephony Integration (CTI) attached data. Fields are pipe separated, with each field represented as a key-value pair separated by colon. Literal colons, pipes, or percent symbols within keys or values are represented as **%c**, **%p**, or **%%**, respectively. You can define the list of allowed CTI variables that are included in this field in the GAAP GUI (look in **Administration > Default Server Settings**).	Segment:Gold
last_menu_block_type	tinyint	1	The type of the last Menu or Custom Question block accessed on the call. Possible values are: • **5** – Menu • **6** – Custom Question	5

Column	DataType	Length	Description	Example
last_menu_block_name	nvarchar	100	The name of the last Menu or Custom Question block accessed on the call.	If the callflow visited the following blocks: Welcome Message > Proceed With Activation Menu >Process Request Script > Successful Message > End Call This value is **Proceed With Activation Menu**.
cli_type	smallint	1	Representation of whether the caller is using a landline or a mobile handset. Possible values are: • **0** - Unknown • **1** - Landline • **2** - Mobile The list of CLI mobile number prefixes that are defined in server settings is used to determine if the CLI is a mobile number.	1
server_id	int		The ID of the GAAP server that handled the call. Server information can be found in the GAAP GUI (look in **Administration > Servers**).	1
start_channel	int		The channel in which the call started. Possible values are: • **0** - Unknown. • **1** – Voice.	2

Column	DataType	Length	Description	Example
			• **2** – Web. • **3** – Facebook. • **4** – Web with Voice.	

VW_CALL_STEPS

Each row in this view details a single block within the callflow that the caller progressed through.

Column	DataType	Length	Notes	Example
id	int		Unique call step identifier within call. This is an incrementing number.	1
call_id	int		See VW_CALLS.call_id.	10001
call_start_site	int		See VW_CALLS.start_site_id.	1
call_start_date	date		See VW_CALLS.call_start_date.	2014-02-13
cli_type	smallint	1	See VW_CALLS.cli_type.	1
company_id	int		See VW_CALLS.company_id.	3
is_test_call	bit	1	See VW_CALLS.is_test_call.	1
site_id	int		The ID of the GAAP module where this block/step (in the callflow) belongs.	265
site_name	nvarchar	100	The name of the GAAP module where this block/step (in the callflow) belongs.	Call Initialization
is_submodule	bit	1	Flag to determine if the module is flagged as an Inbound application or just a module.	1
block_type	tinyint	1	Block type indicator. Possible values are: • **1** – Start • **2** – End • **3** – Script • **4** – Message	1

Column	DataType	Length	Notes	Example
			• **5** – Menu • **6** – Custom Question • **7** – Phone Transfer • **8** – URL Transfer • **9** – Recording • **10** – Interceptor	
block_name	nvarchar	100	Name of the block or step in the callflow.	Start
block_detail	nvarchar	500	Internal field used to store additional information (if any) about the block.	For example, if this is a URL Transfer block, this field will show the module it will transfer to. (**Link to module : 5**)
start_time	datetime		Timestamp for when the callflow step/block was first visited.	2014-02-13 15:35:34.770
start_date	datetime		Date timestamp for when the callflow step/block was first visited (time is always **00.00.00.000**).	2014-02-13 00:00:00.000
start_hour	int		Hour of the day when the callflow step/block was first visited, in 24-hour format.	15
end_time	datetime		Timestamp for when the callflow step/block ended.	2014-02-13 15:35:34.780
end_date	datetime		Date timestamp for when the callflow step/block ended (time is always	2014-02-13 00:00:00.000

Column	DataType	Length	Notes	Example
			00.00.00.000).	
end_hour	int		Hour of the day for when the callflow step/block ended, in 24-hour format	15
duration	int		Duration, in seconds, spent within the step/block.	0
result	nvarchar	100	Resulting outcome description. Possible values are: • **error**. • **success**. • **hangup**. • **system hangup**.	Success
result_detail	nvarchar	100	Additional information relating to the result (for example, **transferred telephone number**).	tel://123456789
error_messages	nvarchar	500	Detailed error messaging (if any)	
wav_filename	nvarchar	200	Only applicable for a Recording block. This is the filename of the saved recording.	temprecording_123456.wav
is_recording_saved	bit	1	Only applies for a Recording block. This is the flag to determine if there is a wav file recording saved. Possible values are **0** if no recording is saved or **1** if a recording exists.	1

Column	DataType	Length	Notes	Example
recognition_type	int		Internal recognition type. Possible values are: • **0** – None • **1** – Menu • **2** – Custom • **3** – Defaults • **4** - Global	1
is_dtmf	bit	1	Flag that indicates if block/step is DTMF enabled. Value will be set to **1** if its DTMF enabled; otherwise, this value is **0**.	1
num_retries	tinyint		Count of no-match entries by caller in this callflow step/block. This field populates only if the caller leaves this block (i.e. doesn't hang up).	2
num_timeouts	tinyint		Count of no-input entries by caller in this callflow step/block. This field populates only if the caller leaves this block (i.e. doesn't hang up).	1
num_helps	tinyint		Number of times the *help* command was used in this callflow block/step. This field populates only if the caller leaves this block (i.e. doesn't hang up).	1
num_repeats	tinyint		Number of times the *repeat*	1

Column	DataType	Length	Notes	Example
			command was used in this callflow block/step. This field populates only if the caller leaves this block (i.e. doesn't hang up).	
num_recovery_attempts	int		Number of times the callflow step/block was visited when the caller failed to be recognized and took the GAAP recovery route.	1
num_nbest	tinyint		Number of best possible matches (nbest) recognized in Automatic Speech Recognition (ASR). For an answer provided via DTMF, this will always have a value of **1**.	10
nbest_meaning_1	nvarchar	45	First highest match from the ASR against the SRGS grammar in context.	07712344401
nbest_rawanswer_1	nvarchar	100	First highest synonym match from the ASR against the SRGS grammar in context.	Oh seven seven one two three four four four oh one
nbest_confidence_1	int		Confidence scoring out of 1000 of first highest match against the SRGS grammar in context. For DTMF, this value is always **1000**.	700
nbest_slots_1	nvarchar	100	First highest slot content from the ASR against the SRGS grammar in context.	Type:Mobile|Number:12344401
nbest_recognition_type_1	int		Internal recognition type reference for the first highest match.	2

Column	DataType	Length	Notes	Example
			Possible values are: • **0** – None • **1** – Menu • **2** – Custom • **3** – Defaults • **4** - Global	
nbest_meaning_2	nvarchar	45	Second highest match from the ASR against the SRGS grammar in context.	07712344501
nbest_rawanswer_2	nvarchar	100	Second highest synonym match from the ASR against the SRGS grammar in context.	Zero seven seven one two three four four five oh one
nbest_confidence_2	int		Confidence scoring out of 1000 of second highest match against the SRGS grammar in context. For DTMF, this value is always **1000**.	10
nbest_slots_2	nvarchar	100	Second highest slot content from the ASR against the SRGS grammar in context.	Type:Mobile|Number:12344501
nbest_recognition_type_2	int		Internal recognition type reference for the second highest match. Possible values are: • **0** – None	2

Column	DataType	Length	Notes	Example
			• **1** – Menu • **2** – Custom • **3** – Defaults • **4** - Global	
nbest_meaning_3	nvarchar	45	Third highest match from the ASR against the SRGS grammar in context.	07712345401
nbest_rawanswer_3	nvarchar	100	Third highest synonym match from the ASR against the SRGS grammar in context.	Zero seven seven one two three four five four zero one
nbest_confidence_3	int		Confidence scoring out of 1000 of third highest match against the SRGS grammar in context. For DTMF, this value is always **1000**.	10
nbest_slots_3	nvarchar	100	Third highest slot content from the ASR against the SRGS grammar in context.	Type:Mobile|Number:12345401
nbest_recognition_type_3	int		Internal recognition type reference for the third highest match. Possible values are: • **0** – None • **1** – Menu • **2** – Custom	2

Column	DataType	Length	Notes	Example
			• **3** – Defaults • **4** - Global	
output_node_name	nvarchar	100	Name of the path that leads to this callflow step/block.	success
sequence_in_call	int		Given the list of callflow steps/blocks that were visited within the call, this is the position this step/block was visited within the sequence.	3
sequence_in_site	int		Given the list of callflow steps/blocks that were visited within the module, this is the position this step/block was visited within the sequence.	1
persona_name	nvarchar	100	The name of the persona active during the current call step. An empty string is saved if using the default persona.	French
channel	int		The channel that is being used by the caller during this call step. Possible values are: • **0** – Unknown • **1** – Voice • **2** – Web • **3** – Facebook	2

Column	DataType	Length	Notes	Example
			• **4** – Web with Voice	

VW_BUSINESS_TASKS

Each row in this view details the business task that was processed (started, ended, and so on) within the callflow that the caller progressed through.

Column	DataType	Length	Notes	Example
id	bigint		Unique business task identifier within the call. This is an incrementing number.	10008
call_id	int		See VW_CALLS.call_id.	10001
voice_platform_session_id	nvarchar	100	See VW_CALLS.voice_platform_session_id.	26A92695-9557-444A-A9B2-CCB4D71C1B69-1791
voice_platform_full_call_id	nvarchar	100	See VW_CALLS.voice_platform_full_call_id.	10KMMSG8LL37TETGHTNQOF4KK80001NV
company_id	int		See VW_CALLS.company_id.	3
is_test_call	bit	1	See VW_CALLS.is_test_call.	1
start_site_id	int		The ID of the module where this business task belongs.	10
start_site_name	nvarchar	100	The name of the module where this business task belongs.	Payment By Full Balance
start_time	datetime		Timestamp for when this business task started.	2014-02-13 15:36:31.367
start_date	datetime		Date timestamp for when this business task started (time is always **00.00.00.000**).	2014-02-13 00:00:00.000
start_hour	int		Hour of the day for when this business task started, in 24-hour format.	15
end_time	datetime		Timestamp for when this business task ended.	2014-02-13 15:36:50.367
end_date	datetime		Date timestamp for when this business task ended (time is always **00.00.00.000**).	2014-02-13 00:00:00.000

Column	DataType	Length	Notes	Example
end_hour	int		Hour of the day for when this business task ended, in 24-hour format	15
duration	int		Duration, in seconds, between when the time business task started and ended.	19
name	nvarchar	100	Name of the business task (for example, **postal address lookup**).	Payment
outcome_category	tinyint	1	Outcome category identifier. Possible values are: • **1** – success • **2** – failure • **3** – CPFL (customer perceived failure) • **4** – Unknown • **5** - Hangup	3
outcome_description	nvarchar	100	Outcome category description.	Invalid balance
details	nvarchar	100	Additional information regarding the business task outcome.	Balance = null
call_start_site	int		See VW_CALLS.start_site_id.	1
call_start_date	date		See VW_CALLS.call_start_date.	2014-02-13

Useful SQL Queries

This page describes SQL queries that might be useful when working with the database.

Get complete call details for a given call ID

```
SELECT
calls.*, call_steps.*
FROM VW_CALLS calls
INNER JOIN VW_CALL_STEPS call_steps
ON calls.call_id = call_steps.call_id
AND calls.call_id = xxx
```

Get complete business task details for a given call ID

```
SELECT
calls.*, business_tasks.*
FROM VW_CALLS calls
INNER JOIN VW_BUSINESS_TASKS business_tasks
ON calls.call_id = business_tasks.call_id
AND calls.call_id = xxx
```

Get complete call details for a company, filtered by call date and module version

```
SELECT
calls.*, call_steps.*
FROM
VW_CALLS calls,
VW_CALL_STEPS call_steps
WHERE
        calls.company_id = call_steps.company_id
        AND calls.company_id = 1
        AND calls.is_test_call = call_steps.is_test_call
        AND calls.is_test_call = 0
        AND calls.call_start_date = '2017-01-01'
```

Call Processing

This page describes the logic applied at the end of calls. It also describes associated backlog processing, if necessary.

End-of-call logic

When a call ends, GAAP writes the call records to the configured database. A call ends under the following conditions:

- GAAP receives a hang-up event from MCP.
- There are no more blocks to process in the callflow.
- The call reaches the **End Call** block (can be configured either to disconnect or return to strategy).
- The call reaches a **Transfer** block.
- Session timeout due to no MCP requests during the configured timeout period.

  The **<session-timeout>** parameter value, found in the application **web.xml** file, defines this timeout period in seconds. In the example below, the session timeout period is set at 30 seconds:

```
<session-config>
 <session-timeout>30</session-timeout>
 </session-config>
```

> **Important**
>
> The **<session-timeout>** parameter resets to the default value each time you upgrade GAAP. Therefore, you must update this value after each upgrade if you do not want to use the default value.

Backlog processing

> **Important**
>
> Backlog processing of calls only occurs if the **Backlog.Processor.Enabled** setting is set to **true** and the hive-off process is not running. Backlog processing is paused during the hive-off process.

When a call ends, GAAP attempts to write the call to the database. If this process fails, GAAP sends the call to backlog processing.

The table below, **Handled Database Write Errors**, describes reasons for why the write might fail. If the write fails for another reason that is not described in this table, the call is unrecoverable and its data is lost.

Handled Database Write Errors

Database timeout
Connection pool exhaustion
The SQL Exception from the JDBC driver matches one of the following: • 08 – Connection Error • 66 – Driver Error • HY – Operation Cancelled • S0001 – SQL Login Failed

Configuring backlog processing

You can configure the settings below to periodically check the the backlog folder size:

- **Backlog.DiskSpaceMonitor.CheckIntervalMillis** - Specify, in milliseconds, how often to check the size of the backlog folder.
- **Backlog.DiskSpaceMonitor.WarningUsedMB** - Specify, in megabytes, the size that the backlog folder must exceed before a WARNING-level SMTP alert is sent.
- **Backlog.DiskSpaceMonitor.MaxUsedMB** - Specify, in megabytes, the size that the backlog folder must exceed before a MAJOR-level SMTP alert is sent. This is the size that, once reached, data is lost.

As of the 3.5.100.04 release, you must configure the following settings to specify which call-records errors are sent to the backlog:

- **Backlog.TreatAllFailuresAsBackloggable** - If `true`, all possible errors are sent to the backlog. If `false`, you can specify which errors are backlogged by configuring the following settings:
  - **Backlog.BackLoggableErrorsList.ExactMatch** - Specify an error code that must be matched. For example, `S0001`.
  - **Backlog.BackLoggableErrorsList.StartsWith** - Specify a comma-separated list of prefixes for accepted error codes. For example, `08,66,HY`.

> ### Important
> If you set **Backlog.TreatAllFailuresAsBackloggable** to `true`, GAAP sends all records to the backlog, even if these records cannot be backlogged. This movement consumes bandwidth until the records are manually removed from the backlog directory on the disk.

Sending backlog items to the database

If processing continues, the call data is serialized to XML, saved in an XML file on disk, and added to the internal file backlog list. You can use the setting **Backlog.Processor.MinItemAgeBeforeProcessingMillis** to specify, in milliseconds, how long GAAP must wait before trying to re-insert an item from the backlog back into the database.

Multiple backlog processor threads process any items that are added to the backlog. The **Backlog.Processor.ThreadCount.CallHistory** server setting defines the number of threads to use. Consequently, this value is also the maximum number of concurrent database writes from the backlog, regardless of database pool availability.

> ### Important
> The backlog shares the connection pool with the main application. Therefore, pool exhaustion might result if the **Backlog.Processor.ThreadCount.CallHistory** server setting is set too high.

Scenario

The following provides an example of how backlog processing functions.

Consider the following scenario:

- Maximum Pool Size = **100**
  - Main Application Connection Usage = **95**
  - Backlog Thread Count = **10**

The total number of items is **105**, which is five more than the maximum pool size. The excess items are sent to the backlog.

> ### Important
> GAAP does not guarantee whether excess items come from the backlog or the main application. Therefore, you must provide some headroom on your maximum pool size configuration. You must also account for the number of VUI servers and gauge whether the database server can cope with the number of total connections configured per server.

Once items are in the backlog, each backlog processing thread tries to grab an item from the backlog and re-insert it into the database. If no backlog items exist, the processing threads sleep for 20 seconds. This sleep value is not configurable.

Once a thread finds an item to process:

1. It attempts to move the file into the processing folder.

2. It de-serializes the file contents back into call data and deletes the XML file.

> **Important**
>
> If an error occurs in one of the first two steps, the file moves permanently to the *failed* folder and is no longer accessible to the backlog processing threads. This is the only scenario by which a file is moved to the *failed* folder and abandoned. In other words, the *failed* folder is not used for calls that cannot be re-saved. In that case, a backlog thread continues to put the call into the work queue without limit on failed attempts (unless the error does not match one of the handled errors referenced above).

3. It attempts to re-save the call data. One of the following occurs:
   - If the re-save is successful, the thread moves onto the next item in backlog.
   - If the save fails but it is a handled error, the thread adds a new backlog item for the call data. The thread that tried to process the item sleeps for 60 seconds (this value is non-configurable). The new item is not processed by another thread until the value of **Backlog.Processor.MinItemAgeBeforeProcessingMillis** has passed.
   - If the save fails and it is an unhandled error (not part of the list of handled errors, call data is lost.

Notes

- There is no limit on the the number of times a backlog thread can fail to process an item. Each time it fails, the item is added to the backlog again.
- The same code executes each time a backlog thread attempts to re-save an item. Therefore, a thread in the reporting connection pool is used each time an attempt is made.
- The only server setting that you can change at runtime is **Backlog.Processor.Enabled**. All other settings require a restart of the server.