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Composer Help

Debugging Voice Applications

Debugging Voice Applications

Contents

- 1 Debugging Voice Applications
 - 1.1 Video Tutorial
 - 1.2 GVP Debugger
 - 1.3 Run Versus Debug
 - 1.4 Starting a Debugging Session
 - 1.5 Debugging When Using Context Services
 - 1.6 GVP Debugging Perspective
 - 1.7 Debugging Tools
 - 1.8 Debugging Views
 - 1.9 Debugging a Callflow
 - 1.10 Creating a Debug Launch Configuration
 - 1.11 Debugging-results Folder
 - 1.12 Code Generation of Multiple Callflows
 - 1.13 Debugging VoiceXML Files
 - 1.14 Creating a Run Launch Configuration
 - 1.15 Adding Breakpoints
 - 1.16 Debugging Server-Side Pages
 - 1.17 Debugging TLS Support
 - 1.18 Limitations

Video Tutorial

Below is a video tutorial on debugging VoiceXML applications.

Important Note: While the interface for Composer in this video is from release 8.0.1, the steps are the basically the same for subsequent releases.



GVP Debugger

Composer's GVP Debugger provides real-time debugging capabilities for Genesys Voice Portal voice applications. The debugger is integrated with GVP for making test calls, viewing call traces, and debugging applications. It supports accessing SOAP and REST based Web Services. Database access is provided using server-side logic and a Web services interface. Prior to debugging, set preferences for the GVP Debugger, which supports both Run and Debug modes.

Run Versus Debug

- In the Run mode using Run > Run Configuration, call traces are provided and the application continues without any breakpoints.
- In the Debug mode, using Debug as > Debug Configuration, you can input breakpoints, single-step through the code, inspect variable and property values, and execute any ECMAScript from the query console.

Integration with a SIP Phone is provided with a click-to dial feature for making the test calls. You can debug:

- A callflow built with Composer, or
- Any VoiceXML application or set of VoiceXML pages whether or not they were created with Composer.

Notes:

• Previous to GVP 8.1.4, one instance of GVP's Media Control Platform (MCP) supported only one

Composer debugging session. This limitation no longer exists in GVP 8.1.4.

- Debugging is supported only on Tomcat. VXML debugging is the same on any application server so debugging using Tomcat is sufficient.
- Composer 8.1 uses TCP to send SIP messages (previous releases used UDP). This is not a configurable option.

Starting a Debugging Session

If using Context Services:

 Set Context Services parameters: Window > Preferences > Composer > Context Services. In Context Services Preferences, specify the Universal Contact Server host and port.

You can start a debugging session in the following ways:

- Right-click on the diagram/VXML file. Select **Run As > Run Callflow** or **Debug As > Debug Callflow**.
- On the main toolbar, there is a Debug * button and a Run * button. Clicking relaunches the most recently used configuration. You can also use the keyboard shortcuts Ctrl+F11 (for Run) and F11 (for Debug).
- If you click the down arrow on these buttons to drop down a menu, a history of recent launches appears.

All of the above is also available in the Run top-level menu.

Debugging When Using Context Services

If using Context Services, you must do the following before debugging a callflow or a VXML application:

- 1. Check the **Connect to the Universal Contact Server when designing diagrams** preference option in the **Context Services preference** page.
- 2. Set the UCS parameters Context Services preference page.

Composer then automatically appends an extra context_services_url parameter to the SIP URI. This parameter is then read by the GVP application at runtime, enabling the GVP application to connect to the UCS.

GVP Debugging Perspective

The figure below shows Composer's elements for the GVP Debugging perspective (callflow debugging):

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🗉 💰 Main.califlow (BusLow	gicJavaComposerPro	ject) [Composer - GVP Debugger]		(= 🚮 🗖 🗸		
🖻 🔐 RTD			Name Value			
🖻 🛷 VXMLI Threa	d (Paused)			Application State Variables		
Califlow	Execution [Callflow:]	Main.callflow, block: EntryBlock]	t	Service Object		
				Session object		
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Note: The external w	eb service beir a			🗁 Basic Blocks 🛛 🔹		
invoked in the "getGo	idRate" web	ō		i Entry		
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the time you run run	this application.	WelcomePrompt		🖕 j 🗁 Server Side Blo		
4		· · · ·		E Genesys CTI Bl		
🔏 Cal Trace 🕅 🔲 Co	onsole			🗑 - 📕 😓 = 🗋		
Call Trace <terminated></terminated>						
Timestamp	Category	Text				
2009-06-27 15:49:24	📝 platform	eval_script external:/Resources/Prompts/en-US/P	layBuiltinType.js done			
2009-06-27 15:49:24	📝 platform	eval_script inline:21 done				
2009-05-27 15:49:24	💮 doc flow	form_select :FORMITEM_NAME_\$52\$_:BLOCK				
2009-06-27 15:49:24	doc flow	goto :#EntryBlack				
2009-06-27 15:49:24	승관 doc flow	form_enter :EntryBlock				
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i Connected to Configura	ation Server (10.10.1	102.151:2020)				

- The **Debug** view shows the callflow diagram name being debugged, as well as the status of the debug progress or result.
- The Navigator view shows the same Project folder structure shown in the Project Explorer window of the Composer perspective.
- The callflow diagram is displayed below if you are debugging a callflow. At the beginning of the debug session, a red box surrounds the Entry block of the callflow to indicate the start point. The focus changes as the session progresses, and a red box displays wherever the call execution suspends, regardless of whether or not there's a breakpoint.
- The **Call Trace** view displays metrics which describe the events occurring in the application, such as recognition events, audio playback, user input, errors and warnings, and application output. The history functionality of the call trace view shows the call traces from past calls.
- The **Console** is for executing ECMAScript commands on the interpreter.

Debugging Tools

See the Debugging Toolbars topic.

Debugging Views

The upper right of GVP Debugging Perspective contains the following views:

- **Variables** allows you to monitor the state and value of any variable used in the application, to see how the variable changes during execution. This shows all global variables of the application, and also the recognition results of the previous recognition, if any.
- **Breakpoints** allows you to select a position in the VoiceXML application to suspend execution instead of stepping through the application one command at a time.
- **Expressions** indicates watch expressions you can add and monitor during execution. You can change the value of these expressions to see how they impact the application.

Note: The VXML Properties and Configuration views are for information only; they do not perform any tasks.

- VXML Properties are the properties defined in the VXML application by <property> tags. This includes application-specific properties (set in the Entry block) as well as default properties defined by the platform.
- **Configuration parameters** are the configuration items of the VXMLI. Basically it is what you would see in the vxmli section of the MCP settings in MF.

Debugging a Callflow

The GVP Debugger allows you to debug a callflow by single-stepping through the blocks. Prior to debugging, you should have validated the callflow, generated the code, and deployed the project for testing. Also, if you have not already done so, set GVP Debugger preferences. Select **Window** > **Preferences** > **Composer** > **Debugging** > **GVP Debugger** and configure the GVP Debugger.

Creating a Debug Launch Configuration

To test your callflow by stepping through it, use Debug Configurations to first create a launch configuration: To run your callflow for debugging use Debug Configurations:

- 1. In the Project Explorer, expand the Composer Project and its callflows subfolder.
- Right-click on the callflow filename in the Project Explorer and select **Debug as > Debug** Configurations.
- 3. Expand Composer GVP Debugger.

4. Select **New Configuration**. The Debug Configurations dialog box opens. An example is shown below.

Hebug Configurations	×
Create, manage, and run config (SIP Phone Settings): Please enter the	urations SIP address of your local softphone.
Image: Second	Name: New_configuration Workspace Storage Location SIP Phone Settings Workspace location The debugger will save a local copy of all the VoiceXML pages executed by GVP. Please specify the project name and location for Location Icreate Automaticaly: Ereate Automaticaly:
Filter matched 13 of 13 items	ApplyRevert
?	Debug Close

- 5. Name the configuration.
- 6. Click the **Create Automatically** button to create a new project folder to save the metric traces and VXML pages as the calls are being executed. This folder appears in the Location field as shown above.
- 7. Click the **SIP Phone Settings** tab and provide your SIP Phone information if not already there from GVP Debugger Preferences. An example is shown below:

👬 Debug Configurations		×
Create, manage, and run config	jurations	-
(Application Settings]: Please enter the set of the	ne SIP address of the voice platform.	
Image: Second	Name: New_configuration Workspace Storage Location SIP Phone Settings Application Settings When starting a debugging session, the debugger will establish a call between you and the voice application Please specify the hostname or IP address and port where your SIP phone is listening. By default this will be desktop. The username is the name specified in your SIP phone configuration. Username: bonniem Hostname/IP: 172.21.82.39 Port: 5060 SIP URI This is the SIP URI to the SIP phone that the debugger will call. sip:bonniem@172.21.82.39:5060	e your local
Fiter matched 13 of 13 items	Apply	Regert
?	Debug	Close

8. Click the **Application Settings** tab and select **Callflow Diagram**. An example is shown below:

🔮 Debug Configurations	
Create, manage, and run config	urations
Apache Tomcat Apache Tomcat Composer - GVP Debugger New_configuration Composer - ORS Debugger New_configuration Composer - ORS Debugger New_configuration Generic Server Generic Server Generic Server Generic Server(External Launc Java Application Junt Junt Junt Junt OSGI Framework Remote Java Application	Name: New_configuration Workspace Storage Location SIP Phone Settings When starting a debugging session, the debugger will establish a call between you and the voice application. Please select the application that you would like to debug. The application may be addressed by using a provisioned DNIS on the server, by using an application URL or by specifying the application start page in your workspace. The application will be executed on the voice platform specified by the hostname or IP address and port below. Select application by: ONIS Application URL Workspace Location Callflow Diagram Callflow Diagram File: JawaComposerProject/Callflows/Main.call Browse Hostname/IP: 10.10.30.115 Port: 2020 Extra parameters: SIP URI This is the SIP URI to the voice platform that the debugger will call.
Filter matched 13 of 13 items	Appl <u>y</u> Reyert
?	Debug Close

- You can pass CTI Input variables in a Debugger call. Input variables in a callflow diagram can be initialized in a Debugger call using the Extra Parameters field in the Run / Debug Configurations > Application Settings tab. The Parameter names should match the "Input" variable defined in the Entry Block of the Callflow diagram.
- 10. Click **Apply**.
- 11. Click **Debug**. This will automatically dial out your SIP Phone.
- 12. Accept the call and you will be connected to the application on GVP. Composer switches to the GVP Debugging perspective.

Once the call is initiated you will see a red box around the first block of the application. This indicates the current location where the call is paused. Note: The GVP Debugger skips over deactivated blocks.

12. Click the **Step Over** button to single step through the blocks. **Note:** Step Over on the Debugging Toolbar is the only way to step for both routing and voice applications. Blocks in the diagram correspond to <form> elements in the generated VXML. When stepping through a callflow diagram, the debugger is stepping through <form> elements in the underlying VXML. The call traces will become visible in the Call Trace view at the bottom. An example is shown below.

Call Trace <terminated></terminated>					
Timestamp	Category	Line #	Text		
2011-03-22 16:39:32	📝 platform	137	fetch_start script:http://138.120.72.35:8080/debug		
2011-03-22 16:39:32	📝 platform	137	fetch_end Done (proxy-hit):http://138.120.72.35:80		
2011-03-22 16:39:32	📝 platform	137	eval_script external:/Resources/Prompts/en-US/en		
2011-03-22 16:39:32	📝 platform	137	eval_script inline:21 done		
2011-03-22 16:39:32	📝 platform	137	compile_done :http://138.120.72.35:8080/debugsed		
2011-03-22 16:39:32	doc flow	137	form_select :FORMITEM_NAME_\$0\$_:BLOCK		
2011-03-22 16:39:33	doc flow	146	goto :#Entry1		
2011-03-22 16:39:33	💮 doc flow	146	form_enter :Entry1		
2011-03-22 16:39:33	doc flow	146	form_select :Entry:BLOCK		

Application state and last user input values can be seen in the Variables tab.

- You can input breakpoints from the context menu on a block and select Toggle Breakpoint. When breakpoints are set, you can press F5 to resume the call to the next breakpoint, instead of single stepping block-by-block.
- 14. You can change values of variables in the middle of the callflow. This could be used to quickly change the execution path as the call is progressing. Right-click in the Expressions tab and select Add Watch Expression. In the Add Watch Expression window, add a new expression to watch during debugging. For example, give the name as AppState.<actual variable name>.
- 15. To change the value, expand the variable, right-click on the child item and select **Change value**. A popup window as shown above will open, and you can specify the new value. Click **OK**. Proceed with debugging of the application and see the changed value. The value of the watch expression can be refreshed at any time by right-clicking on it and selecting **Reevaluate Watch Expression**.

Debugging-results Folder

The GVP debugger creates a debugging-results folder in the Project Explorer. There is currently no automatic cleanup so the number of files can become large. Clean up the debugging results by deleting the gvp-debug.<timestamp> folders from the Project Explorer. Each gvp-debug.<timestamp> folder corresponds to a single debug call that was made at the time specified by the timestamp. It contains files downloaded by the debugger. The metrics.log file contains the Call Trace of the call.

Code Generation of Multiple Callflows

When using the **Run Califlow** or **Debug Califlow** functions, Composer automatically generates the VXML files from the diagram file that you want to run. In the case of a Java Composer Project that has multiple califlows, Composer attempts to generate the VXML for all the califlows before running (because the application might move between multiple califlows for subdialogs). However, if one of the califlows has an error, Composer provides the option to continue running the application anyway, because the erroneous califlow may be a califlow that's not used by the one being run (if there are two or more main califlows, for example). When this happens, the VXML files are basically out of synce

with the diagram files and this may affect execution. Genesys recommends that you fix all errors before running the application.

Debugging VoiceXML Files

- VXML debugging does not work on 64-bit operating systems when Transport Layer Security if TLS is enabled in Context Services Preferences. If TLS is not enabled, debugging works as expected.
- Debugging is supported only on Tomcat. VXML debugging is the same on any application server so debugging using Tomcat is sufficient.
- When subdialog calls external VXML page in debug mode, Composer throws the following error: An
 internal error occurred during: Debug Source Lookup. This is a known limitation. The problem occurs
 when stepping through a callflow with a subdialog block that links to a VXML page. A "mode switch"
 between debugging a callflow diagram and debugging a VXML page is not supported. Workaround is to
 start debugging the generated code instead as a VXML page, which will step into the hand written
 VXML page when it is called.
- VoiceXML applications can be tested using the real-time GVP Debugger. Support for both Run and Debug mode is provided.
- In the Run mode, the call traces are provided and the application continues without any breakpoints.
- In the Debug mode, you can input breakpoints, single-step through the VoiceXML code, inspect variable and property values, and execute any ECMAScript from the query console. Integration with a SIP Phone is provided and click to dial feature is provided for making the test calls.
- Tomcat engine is bundled as part of Composer and the application is auto deployed and auto-configured for testing. Programmers can test by specifying the DNIS of the application already provisioned in MF or provide the URL of the application or let Composer auto-configure the application for testing.

There are various ways to start a debug session. The next section describes Run Mode and Run Launch Configurations.

Creating a Run Launch Configuration

In order to test and debug applications configured in the Genesys Administrator Console as an IVR Profile, you will have to create a launch configuration for making test calls.

- 1. From the Run menu select Run Configurations.
- 2. In the dialog box, right-select NGI Real Time Debugger and select New from the menu.
- 3. Define the launch configuration. The figure below shows an example completed Workspace Storage Configuration tab.

Run Configurations Create, manage, and run configura (20 [Application Settings]: Please enter the SI	Ations P address of the voice platform.
Ype filter text Apache Tomcat Eclipse Application Generic Server Generic Server (External Launch) HTTP Preview J2EE Preview Java Applet Java Applet Java Applet Java Applet OSGI Real-time Debugger ANW Workflow OSGI Framework	Neme: New_configuration Workspace Storage Location SIP Phone Settings Workspace location The debugger will save a local copy of all the VoiceXML pages executed by GVP. Please specify the project name and location for saving these Location /vxml-debug-project.200906181345.05/fetchresults Browse Create Automatically
Filter matched 14 of 14 items	Apply Regent
0	Bun Close

- 4. Click the **Create Automatically** button to create a new Project folder to save the metric traces and VXML pages as the calls are being executed. This folder appears in the Location field as shown above.
- 5. Click the **SIP Phone Settings** tab and provide your SIP Phone information if not already there. An example is shown below:

and Configurations	X
Create, manage, and run configura () [Application Settings]: Please enter the SI	Ations P address of the voice platform.
Sype filter text Bype filter text	Name: New_configuration Workspace Storage Location SIP Phone Settings Application Settings When starting a debugging session, the debugger will establish a call between you and the voice application. Please specify the hostname or IP address and port where your SIP phone is listening. By default this will be your local desktop. The username is the name specified in your SIP phone configuration. Username: borniem Hostname/IP: 172.21.26.61 Port: 5060 SIP URI This is the SIP URI to the SIP phone that the debugger will call. sip:borniem@172.21.26.61:5060 sip:borniem@172.21.26.61:5060
Filter matched 14 of 14 items	Apply Reyert
0	Burn Close

 Click the Application Settings tab and select the DNIS option. Specify the DNIS of your application and the IP Address of your GVP (MCP / RM), as well as the port. An example is shown below:

st Run Configurations	X
Create, manage, and run configura	otions
Image: Second	Name: New_configuration Workspace Storage Location SIP Phone Settings Application Settings When starting a debugging session, the debugger will establish a call between you and the voice application. Please select the application that you would like to debug. The application may be addressed by using a provisioned DNIS on the server, by using an application URL, or by specifying the application start page in your workspace. The application will be executed on the voice platform specified by the hostname or IP address and port below. Select application by: • Application URL • O Workspace Location • Calflow Diagram • DNIS • Calflow Diagram • DNIS • So70 • Extra parameters: • SiP URI This is the SIP URI to the voice platform that the debugger will call. sip:6261119890@10.10.102.151:5070 • Sip URI This is the SIP URI to the voice platform that the debugger will call. sip:6261119890@10.10.102.151:5070 • Sip URI • Sip URI to the voice platform that the debugger will call. sip:6261119890@10.10.102.151:5070 • Sip URI • Sip URI • Sip URI • Sip URI to the voice platform that the debugger will call. sip:6261119890@10.10.102.151:5070 • Sip URI • Sip URI to the voice platform that the debugger will call. sip:6261119890@10.10.102.151:5070 • Sip URI
Filter matched 14 of 14 items	ApplyRevert
0	Run Close

- The **Application URL** option is for an application that is not provisioned, but is hosted at an HTTP URL.
- The Workspace Location and Callflow Diagram options are generally not used to create launch configurations. Those launch configurations are automatically created using Run As Callflow or Run As VXML file.
- You can pass CTI Input variables in a Debugger call. Input variables in a callflow diagram can be initialized in a Debugger call using the Extra Parameters field in the Run / Debug Configurations > Application Settings tab. The Parameter names should match the "Input" variable defined in the Entry Block of the Callflow diagram.
- 7. Click the **Apply** button and then click **Run**.
- 8. Your SIP Phone should get dialed. Accept the call in your SIP Phone and then the Debugger will dial out to GVP and connect the call.
- 9. You should then see call traces in the Call Trace view.

Adding Breakpoints

To toggle breakpoints, double-click the side area of the Editor window as shown in the figure below:



Debugging Server-Side Pages

This section covers server-side debugging with the TCP/IP monitor. Composer includes a TCP/IP monitor which can be used to debug server-side code such as Server Side blocks and Database blocks. To monitor TCP traffic on the Tomcat or IIS port, follow these steps:

- 1. Check the Composer Preferences page to determine the port on which your bundled Tomcat is running. If you are using IIS, see the IIS port configured for Composer in Preferences.
- 2. Enable the TCP/IP monitor in Preferences (Window > Preferences, expand Run/Debug and select TCP/IP Monitor. Select the Show the TCP/IP Monitor view when there is activity check box.
- Add a new monitor entry in TCP/IP monitor preferences. The Monitor section refers to the target being monitored. Use the configured port in the previous step as the port to monitor. For example, use 8080 and start the monitor.

ee Preferences					_ 🗆 🗙
type filter text	TCP/IP Monitor				(= + -) + +
General Ant Composer Voice Help Install/Update	Configure TCP/IP monitors	on local and remote p or view when there is	orts. activity		
🕀 - Java	Status Host name	Type	Local Port	Auto-start	Add
 → JavaScript → Model Validation 	Stopped localhost:80	80 TCP/IP	9001	No	<u>E</u> dit
 openArchitectureWare Run/Debug 	Edit Monitor			×	Remove
	Local monitoring por Monitor Host name: Port: Type: Timeout (in millised	t: 2001 localhost 8080 TCP/IP conds): 0 C Start mon	tor automatica	in ancel	<u>Start</u> Stop
0				ОК	Cancel

- 4. Update your Tomcat port / IIS port to the Local Monitoring Port.
- 5. Start debugging your application and put breakpoints on appropriate blocks. The debug perspective will start showing the TCP/IP Monitor view. If the view is not visible, access it from Window > Show View. The image below shows the bundled Database Stock Application being debugged. The TCP/IP Monitor view shows the error returned by server-side pages that handle database interactions.

equest.cs 🔄 D6Data_Oracle_UnitTest.studio_diagram	Sample2_GVP_81.studio_diagram	GrammarMenublock.studio_diagram	Main.studio_diagram
error com.genesyslab.composer.dberg	DBDataGetCompanies	noinput	[®] DBinputGetCompany
C PromptRetriesExceeded	.com.penesysiab.composer.dbconnecti	onemor	error.com.genesyslab.composer.dberorg error.com.g
e the C PromptDEError		C SorryDidNotUnderstand	
Trace 🖾 Console 🛄 Properties 🖳 TCP/IP Monitor 💱			
ocahost:8080 ↓ locahost:8080			Tr Re
t: localhost:9001 103 (1103) bytes : POST //vpTemplate_Database_Stocks/include/dbrequest.jsp H	Response: localhost:8080 Size: 350 (350) bytes TTP/1.0 Header: HTTP/1.1 200 OK		
/jvpTemplate_Database_Stocks/include/o : 10.10.10.70:9001 pt: */* sion-Id: FE140097-10003052	Boreq A HTTP/1.1 200 OK Server: Apache-Coyo Set-Cookie: JSESSIO Content-Type: appli	te/1.1 NID=279D920CCE00C13DDBA7FE2 ication/json;charset=UTF-8	D4E918E71; Path=/jvpTemplate_Database_
-Agent: GVPi ent-Length: 731 ent-Type: application/x-www-form-urleng 1.1 dex:00-00113128 (couid/2.5 STARE	content-Length: 85 Date: Mon, 19 Jan 2 Connection: keep-al	009 21:47:32 GMT live	
rwarded-For: 127.0.0.1	("errorMsg":"Unknow	n error occurred: Query Ha	in_DBDataGetCompanies.sql not found")

additional information, see the following sections in the Eclipse *Workbench User Guide* Help available from within Composer (**Help > Help Contents**):

- TCP/IP Monitor view
- Defining TCP/IP Monitor preference
- Using the TCP/IP monitor to test web services

Debugging TLS Support

The instructions below describe how to (optionally):

- Configure a secure connection (Use Secure Connection) to GVP's Media Control Platform (MCP) during voice application debugging when using SIPS.
- Use a Transport Layer Security (TLS) connection for the Debugger control channel.

For additional information, see the *Genesys 8.1 Security Deployment Guide*. Note: MCP version 8.1.401.07 or later is required to use the TLS feature for debugging. 1. Import the certificate for MCP as follows:

- a. In the MCP's configuration, in section vxmli, there is a debug.server.tlscert parameter. (By default, this is \$InstallationRoot\$/config/x509_certificate.pem.) Copy this file from the MCP installation to a location on Composer's local machine.
- b. In Composer, go to Window > Preferences. Select Composer > Security in the tree. Click Import Certificate and navigate to the x509_certificate.pem file.
- c. Restart Composer.

- 2. Enable debugging from MCP configuration as follows:
- a. Set[vxmli]:debug.enabled to **true**.
- b. Ensure that [vxmli]:debug.server.tlsport and [vxmli]:debugserver.tlsport.public are set. (By default, it is set to port 27668.)
- c. In Composer, go to Window > Preferences and select Composer > Debugging > GVP Debugger. Check Use Secure Connection to enable security. The Platform Port setting should match the MCP configuration [sip]:transport.2.

Limitations

The GVP Debugger has the following limitations:

- CTI calls are not supported.
- Transfers of type blind and consultation do not work when a test call is made using the GVP debugger. The call will reach the Transfer block, but then it will hang and not proceed so you will need to terminate the call or debugging session manually.

A partial workaround is to set the Transfer Method property to bridge (i.e.. Transfer Type = blind/ consultation, Method = bridge) before debugging. The transfer will proceed, but the debugging session and the call will terminate immediately afterwards. Genesys recommends that you do full testing for Transfer applications by provisioning the application in Genesys Administrator and making test calls directly from the SIP phone. These limitations apply to **Run Callflow** (in Run mode) as well.