### Tech Note 824 Using Microsoft .NET DLLs in Your Application Server Script

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### Introduction

This *Tech Note* provides an example of using a Microsoft .NET dll in your Application Server Script. Our example uses the Microsoft System.Speech.dll (Text to Speech library) to annunciate text. You can use this *Tech Note* as a guideline for using methods from any custom or Microsoft .NET dll in your Application Server script.

Several 3rd party libraries are available for annunciating text. Two such libraries (SDKs) from Microsoft are the **Directx** sdk and **SpeechSynthesizer** class from .NET 3.0 and later. For this *Tech Note*, we use the System.Speech.dll SpeechSynthesizer class from .NET 3.0 to annunciate text.

#### **Application Version**

• Application Server 3.1 SP3 P01 (the script was tested on the GR node).

### **Overall Process Tasks**

- 1. Import the System.Speech.dll
- 2. Create an Instance of the \$Userdefined Object
- 3. Confirm the Methods for the System.Speech.dll
- 4. Create UDAs for Use in the ArchestrA Script
- 5. Create the ArchestrA Script
- 6. Deploy and Test the Object

#### Import the System.Speech.dll

• Import the .NET dll from the Microsoft .NET framework version 3.0 folders. The DLL is located at C:\Program Files\Reference Assemblies\Microsoft\Framework\v3.0\System.Speech.dll.



FIGURE 1: IMPORT SCRIPT FUNCTION LIBRARY

Import Script F	unction Library	? 🛛
Look jn:	🔁 v3.0 🛛 🕑 🧊 🗁 🛄 -	
My Recent Documents Desktop My Documents	<ul> <li>System.IO.Log.dll</li> <li>System.Printing.dll</li> <li>System.Runtime.Serialization.dll</li> <li>System.ServiceModel.dll</li> <li>System.Speech.dll</li> <li>System.Workflow.Activities.dll</li> <li>System.Workflow.ComponentModel.dll</li> <li>System.Workflow.Runtime.dll</li> <li>UIAutomationClient.dll</li> <li>UIAutomationClientsideProviders.dll</li> <li>UIAutomationProvider.dll</li> <li>WindowsBase.dll</li> <li>WindowsFormsIntegration.dll</li> </ul>	
	<	>
	File name: System.Speech	<u>Open</u>
My Network	Files of type: .NET/COM Files (*.dll;*.tlb;*.olb;*.exe)	Cancel

FIGURE 2: IMPORT DLL

# Create an Instance of the \$Userdefined Object

• Create an instance from \$UserDefined template. This example is called UDTextToSpeech.

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Co Deployment	•	<b>ņ</b>	×
<ul> <li>OPSManage11</li> <li>Unassigned Host</li> <li>WinPlatform_001</li> <li>AppEngine_001</li> <li>Area_001</li> <li>UDTextToSpeech</li> <li>DefaultArea</li> </ul>			< >
<		>	
Deployment 🗠 Model 💊 Derivation			
Ready			

FIGURE 3: OBJECT INSTANCE FROM \$USERDEFINED OBJECT BASE TEMPLATE

# Confirm the Methods for the System.Speech.dll

Confirm that the System.Speech.dll appears in the ArchestrA Script Function Browser.

1. Edit the UDTextToSpeech Object Instance by clicking on the Scripts tab, then clicking the Fx symbol to open the Script Function Browser.

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ield Attributes Object Informa	tion Scripts	DAs Extensions Graphics	
	+ X «	Script name: textToSpeech	Configure execution orde
Scripts:		Alases:	5
Name 🔻 St On I	Ex Of Sh	Declarations:	.0
textToSpeech x	¢		
		Basics	Execution type: Execute S
		Expression: me.bTalkNow	···· •
		Trigger type: OnTrue	🗙 🗌 Quality changes 🖬
		Trigger period: 00:00:00.0000000 dP	Runs asynchronously
		Deadband: 0.0	Timeout limit: 0 ms 🗗
		Historize script state	Report alarm on execution error
			Priority:

FIGURE 4: SCRIPT EDITING

2. Confirm that the System.Speech.Synthesis.SpeechSynthesizer class appears in the script function browser.

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Script Function Browser	
System.Speech.Synthesis.SpeechSynthesizer	~
AddLexicon	_
GetCurrentlySpokenPrompt	
GetInstalledVoices	
- 🚰 Rate	
SelectVoice	_
SelectVoiceByHints	
SelectVoiceByHints	
SelectVoiceByHints	
SelectVoiceByHints	
SetOutputToAudioStream	
SetOutputToDefaultAudioDevice	
SetOutputToNull	~
<	>
System.Speech.Synthesis.SpeechSynthesizer	
OK	Cancel

FIGURE 5: DLL IN SCRIPT FUNCTION BROWSER

# Create UDAs for Use in the ArchestrA Script

- Create the following UDAs to use in the ArchestrA Script:
  - **bTalkNow**: Boolean to enable the ArchestrA Script.

UDTextToSpeech			
Field Attributes Object Information	n Scripts UDAs Extensi	ions Graphics	
+	UDA name:	bTalkNow	
UDAs: Name 🔻	Data type:	Boolean	~
bTalkNow saySomethingText	Category:	User writeable	~
speakerRate speakerVolume	Value		
	This is an ar Number of	ray elements:	
	True / False	C 🔕	

FIGURE 6: BTALKNOW UDA

• saySomethingText: String, configure a default text which will be then Annunciated(played back) when script runs.

UDTextTe	oSpeech						
Field Attributes	Object Information	Scripts	UDAs	Extensions	Graphics		
	+	×	UDA na	me:	saySometh	ingText	
UDAs:							
Name 🔻			Data ty	pe:	String		~
bTalkNow saySomething	Text		Categor	y:	User write	able	~
speakerVolume	•		Value				
			Thi:	s is an array			
			Nu	mber of elem	ents:		
			Hello! from Tenno	! This is Prera OPSManage : esee.	ina Kulkarni 2011, Nash	presenting ville,	<u>s</u> 9
							~

FIGURE 7: SAYSOMETHINGTEXT UDA

• **speakerRate**: Integer, default value 1. When this value is increased greater than 1, the text is spoken at a faster rate.

	Scripts OURS Extens	ions Graphics	
+	VDA name:	speakerRate	
JDAs:			
Name 🔻	Data type:	Integer	
bTalkNow			
saySomethingText	Category:	User writeable	
speakerVolume	<ul> <li>Value</li> </ul>		
	The second		
		ray	
	Number of	elements:	

FIGURE 8: SPEAKERRATE UDA

• **speakerVolume**: Integer, default value 100. This is full volume. To decrease the speaker volume, change this value to something less than 100.

UDTextToSpeech			
Field Attributes Object Inform	ation Scripts UDAs Extens	ions Graphics	
C	+ 🗙 UDA name:	speakerVolume	
UDAs:			
Name 🔻	Data type:	Integer	*
bTalkNow			
saySomethingText	Category:	User writeable	~
speakerVolume	Value		
	This is an a	724	
	Number of	elements:	
	100		£ 🧿

FIGURE 9: SPEAKERVOLUME UDA

Create the ArchestrA Script

- 1. On the Scripts tab, add a script and call it textToSpeech.
- 2. Configure the Expression and Trigger type for this script, so that the script will execute when the boolean bTalkNow is set to true.

Script name: tex	xtToSpeech			Configure exe	cution order
Aliases:					6
Declarations:					5
Basics			Execution type: E	xecute 💌 🗸	- d &
Expression:	me.bTalkNow			d	67
Trigger type:	OnTrue		~	Quality changes	0
Trigger period:	00:00:00.0000000	6	Runs async	hronously 🚽	¢ε.
Deadband:	0.0	ත්	Timeout limit:	0 ms 🖆	63
Historize scri	ipt state	6	Report alar	m on execution error 🛛 🔓	с).
			Priority:		

FIGURE 10: ME.BTALKNOW SET TO TRUE

3. Type the following script into the script editor. You can copy/paste from the section below.

```
Dim speaker as System.Speech.Synthesis.SpeechSynthesizer;
speaker = new System.Speech.Synthesis.SpeechSynthesizer;
Logmessage("Demo using a Microsoft Framework dll: UDTextToSpeech");
speaker.Rate = me.speakerRate; 'default value = 1;
speaker.Volume =me.speakerVolume; 'default value = 100;
speaker.SpeakAsync( <me.saySomethingText);
me.bTalkNow = false;
```

- The first 2 lines in the script declare the System.speech.synthesis.Speechsynthesizer class.
- Line #3 is the log message to Archestra Logger.
- Line #4 and Line#5 set up the properties: speaker Rate and speaker Volume.
- Line #6 sets up the text to be spoken. The SpeakAsync method is used which executes Acynchrousnously.
- Line #7 sets the boolean **btalkNow** to false. This is so that the text is spoken only once (it would be annoying to hear the text repeat over and over until the object undeployed!)

After configuring above, you should see the following in the Scripts editor (Figure 12 below).

UDText1	ToSpee	ech *									C.	? 暍 ×
Field Attributes	Objec	t Info	mation	Scripts	UD4	As Extensions Graphics						
		- 2	+	×	« :	Script name: textToSpeech				Configure	e execut	ion order
Scripts:						🗉 Aliases:						a .
Name 🔻	St	On	Ex	Of Sh	ŝ.	Declarationer						-
textToSpeech			х			E Deudrauoris:						<b>.</b>
						Scripts:			Execution type:	Execute 💌	~	6 3
						Basics 🖉						
-						Expression: me.bTalkNov					5	
						Trigger type: OnTrue			~	Quality changes	5	
						Trigger period: 00:00:00.00	0000 🗗		Runs as	nchronously	5	
						Deadband: 0.0	6		Timeout limi	t: 0 ms	al l	
									Report a	larm on execution error	3	
						Instonze script state	<u> </u>		Drioribut	[]	240	
									Prioricy.		930	
											Ju	•
-					1	Dim speaker as System	Speech.Syn	thesis.SpeechSynthesizer;				1
					1	speaker = new System.	peech.Synt	hesis.SpeechSynthesizer; fr Framework dll: UDTextToSpeech"):				
Inherited script	ts:					sognessage ( peno usi	i a nicroso	to reallevery are opiexcrospeeen ;;				
Name	St	On	Ex	or sh	5	speaker.Rate = me.spe	kerRate;	default value = 1;				
					1	speaker.Volume = me.s	eakerVolum	e; 'default value = 100;				
						speaker.speakksync(	. saysume ch	Ingrexc),				
						ne.bTalkNow = false;						

#### FIGURE 12: BTALKNOW ONTRUE SCRIPT

4. Save your script changes and close the Object editor.

### Deploy and Test the Object

This is the easiest part - right click on the Object and Deploy it.

1. For testing, open Object Viewer and add the following attributes into the Watch List window:

Ø Object Viewer							
Eile Edit View Options Help							Ì
🛛 🗞 🏹 🏘 🗹 🕘 🗍 Attribute	Reference:			•	Go		
🖃 💓 OPSManage11		Attribute Name		Value			^
WinPlatform_001[PRERAN	ScanStateCmd SecurityGroup ShortDesc speakerRate speakerVolume Tagname textToSpeech.AliasF textToSpeech.Asyni textToSpeech.Data(	References cShutdownCmd ChangeDeadband	true Default The UserDefined 1 100 UDTextToSpeech No Data false 0.0		bject prov	∕id ▼	
AttributeReference 🔺	Value		Timestamp	9	uality	Status	
UDTextToSpeech.bTalkNow	false		2/3/2012 2:37:59.971 PM	C	0:Good	Ok	
UDTextToSpeech.saySomethingText	Hello! This is Prerana k	Kulkarni presenting	2/3/2012 2:37:59.987 PM	M C0:Good		Ok	
UDTextToSpeech.speakerRate	1		2/3/2012 2:37:59.987 PM	( C	0:Good	Ok	
UDTextToSpeech.speakerVolume	100		2/3/2012 2:37:59.987 PM	c	0:Good	Ok	
<		11					>
Ready		FILE: C:	\Documents and Settings\p	reranaku\I	My Docum	nents\OP5	SMA /

FIGURE 13: OBJECT VIEWER ATTRIBUTES

- 2. Set the boolean **bTalkNow** value to true. You should now hear the text configured in the string UDA **saySomethingText**.
- 3. You can also change the Text, speakerRate and speakerVolume at runtime using the Watch List window.

#### References

- http://msdn.microsoft.com/en-us/library/system.speech.synthesis.speechsynthesizer(v=VS.90).aspx
- http://www.codeproject.com/Articles/28725/A-Very-Easy-Introduction-to-Microsoft-NET-Speech-S

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