Wavelink Telnet Client Voice-Enabled Emulation Reference Guide

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Chapter 1: Introduction

This document provides information about using Voice-Enabled Emulation.

This section provides the following information:

- Document Assumptions
- Document Conventions
- About Voice-Enabled Emulation

Document Assumptions

This document assumes that the reader has the following:

- Knowledge of wireless networks and wireless networking protocols.
- Knowledge of TCP/IP, including IP addressing, subnet masks, routing, BootP/DHCP, WINS, and DNS.
- Knowledge of Wavelink Avalanche Manager or Avalanche MC.
- Knowledge of Wavelink Telnet Client.
- Knowledge of Telnet Client Scripting.

Document Conventions

The following section contains information about text-formatting conventions in this manual.

Table 1-1 lists the conventions that are used in this manual.

Convention	Description
`courier new`	Any time you interact directly with text-based user interface options, such as a button, or type specific information into an text box, such as a file pathname, that option appears in the `Courier New` text style. This text style is also used for keys that you press, filenames, directory locations, and status information. For example: Press `ENTER`. Click `OK`.
bold	Any time this document refers to a labelled user interface option, such as descriptions of the choices in a dialog box, that option appears in the **Bold** text style. Examples: Enable the **DHCP** checkbox. Access the TelnetCE Client **Session** menu.
italics	Italicized text is used to indicate the name of a window or dialog box. For example: The *Update Utility* dialog box. The *Profile Manager* dialog box.

Table 1-1: *Text-Formatting Conventions*

About Voice-Enabled Emulation

Voice-Enabled Emulation is a verbal communication system that facilitates real-time voice communication between the host computer and the mobile device user. Voice-Enabled Emulation provides the ability to translate data from the host computer into spoken directions that the user is able to hear. The user's response can then be translated into data and transmitted back to the host computer.

NOTE Voice-Enabled Emulation is included in Telnet Client 7.0 and later versions.

Language Support

Voice-Enabled Emulation provides support for the following languages:

- US English
- French
- German

Licensing

Voice-Enabled Emulation requires a separate license in addition to the standard Telnet Client licenses. You can use Voice-Enabled Emulation without a license, but you will be limited to the demo version. Voice-Enabled Emulation is not included in any Telnet Client maintenance licenses.

NOTE To obtain Telnet Client licenses, please contact Wavelink Customer Service. *Appendix A: Wavelink Contact Information* on page 27 provides Wavelink contact information.

Chapter 2: Installation and Configuration

This chapter provides information about the following:

- Installation
- Configuration

Installation

This section provides Voice-Enabled Emulation installation information, including the following:

- Installation Requirements
- Installing Voice-Enabled Emulation

Installation Requirements

This section lists the hardware, software, and memory requirements that Voice-Enabled Emulation requires for best performance.

Hardware Requirements

Voice-Enabled Emulation requires the following hardware components to operate effectively:

- Mobile device with headset jack
- Microphone with a signal-to-noise ratio (SNR) better than 20 dBA

NOTE A headset microphone is recommended.

- Headphones or speakers

Software Requirements

Voice-Enabled Emulation requires the following software to run effectively:

- Wavelink Avalanche Manager version 3.6 or later, or Avalanche MC
- Wavelink Avalanche Enabler version 4.02 or later

- Wavelink Telnet Client version 7.0

Memory Requirements

Voice-Enabled Emulation requires the following available memory to run effectively:

- 128 MB RAM

  -Or-

- 64 MB RAM with an SD card

  -Or-

- 128 MB Flash Memory

Installing Voice-Enabled Emulation

Voice-Enabled Emulation consists of multiple packages (in addition to the Telnet 7.0 package) that must be deployed to the mobile device using Wavelink Avalanche Manager or Avalanche MC. Depending on your organization's needs, you may choose to install only speech-to-text, or only text-to-speech packages.

NOTE To obtain software packages, please contact Wavelink Customer Service. *Appendix A: Wavelink Contact Information* on page 27 provides Wavelink contact information.

This section provides the following information:

- Installing the Speech Registry Package
- Installing Speech-to-Text Packages
- Installing Text-to-Speech Packages

Installing the Speech Registry Package

The Speech Registry package allows you to choose where Voice-Enabled Emulation files are stored on the mobile device. The Speech Registry package is not optional, you must install this package to use Voice-Enabled emulation.

To install the Speech Registry package:

1 Install the `TESpchRg` package in Avalanche Manager or Avalanche MC.

2 Configure the package as described in *Configuring the Speech Registry Package* on page 10.

3 Deploy the package to the mobile device.

NOTE For more information about installing and deploying software packages, refer to *Wavelink Avalanche Manager User's Guide* or *Wavelink Avalanche Mobility Center User Guide*.

Installing Speech-to-Text Packages

To utilize speech-to-text functionality, you need the following software packages:

- Base Package
- Language Package(s)

The Language package determines the language that will be used when converting speech to text. For a list of available languages, refer to *Language Support* on page 5. Choose either a Full, Compact, or UltraCompact Language package depending on your mobile device's memory capacity.

NOTE The UltraCompact Language package requires the least amount of memory; however, the mobile device must still have at least 64 MB RAM or an SD card.

To install speech-to-text:

1 Install the Base and Language packages in Avalanche Manager or Avalanche MC.

2 If desired, configure the Base package as described in *Configuring the Speech-to-Text Base Package* on page 11.

3 Deploy the packages to the mobile device.

NOTE For more information about installing and deploying software packages, refer to *Wavelink Avalanche Manager User's Guide* or *Wavelink Avalanche Mobility Center User Guide*.

Installing Text-to-Speech Packages

To utilize text-to-speech functionality, you need the following software packages:

- Base Package
- Voice Package(s)

The Voice packages are language-specific and determine whether a male or female voice will be used when converting text to speech. If desired, you can install multiple voice packages (dependant on your mobile device's memory capacity).

To install text-to-speech:

1. Install the Base and Voice packages in Avalanche Manager or Avalanche MC.
2. If desired, configure the Base package as described in *Configuring the Text-to-Speech Base Package* on page 12.
3. Deploy the packages to the mobile device.

NOTE For more information about installing and deploying software packages, refer to *Wavelink Avalanche Manager User's Guide* or *Wavelink Avalanche Mobility Center User Guide*.

Configuration

After you have installed the necessary software packages, you may configure those packages. This section provides the following information:

- Configuring the Speech Registry Package
- Configuring the Speech-to-Text Base Package

- Configuring the Text-to-Speech Base Package

Configuring the Speech Registry Package

The Speech Registry package allows you to determine whether to store Voice-Enabled Emulation files on an SD card or on the mobile device.

To configure the Speech Registry package:

1 Right-click on the Speech Registry package in Avalanche Manager or Avalanche MC.

2 Select `Configure Package > TE Speech Configuration`.

The *Telnet Speech Install Config* dialog box appears.

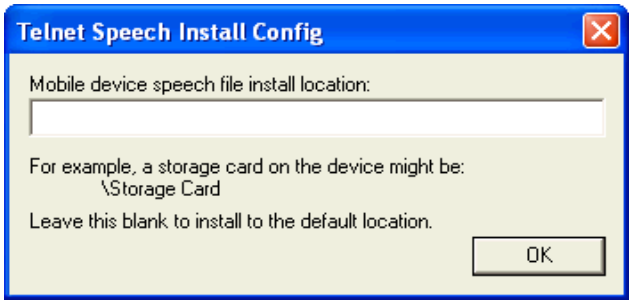

Figure 2-1. *Telnet Speech Install Config Dialog Box*

3 If you want to install Voice-Enabled Emulation files on an SD card, enter the location of the card on the mobile device in the available text box.

Example: `\Storage Card`

-Or-

Leave the text box empty to install Voice-Enabled Emulation files to the default location on the mobile device.

4 Click `OK`.

Your changes are saved.

Configuring the Speech-to-Text Base Package

Configuring the Speech-to-Text Base package involves accessing the Grammar File Manager (included in the package). The Grammar File Manager allows you to maintain text files that define which words, phrases, and symbols are recognized.

To configure the Speech-to-Text package:

1 Right-click the Speech-to-Text Base package in Avalanche Manager or Avalanche MC.

The *Grammar File Manager* dialog box appears.

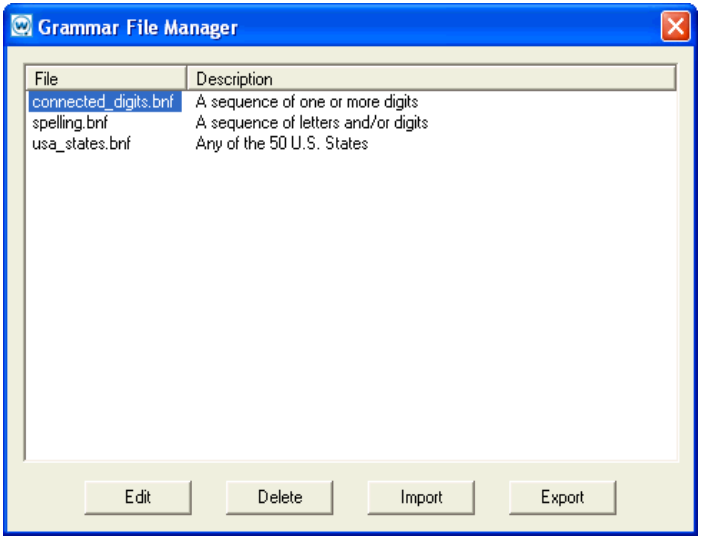

Figure 2-2. *Grammar File Manager*

For information about importing, exporting, and editing Grammar Files, refer to Nuance's *RealSpeak Solo Software Development Kit User's Guide and Programmer's Reference*.

NOTE Nuance documents can be obtained from www.wavelink.com, or by contacting Wavelink Customer Service. *Appendix A: Wavelink Contact Information* on page 27 provides Wavelink contact information.

Configuring the Text-to-Speech Base Package

Configuring the Text-to-Speech Base package involves accessing the Dictionary File Manager (included in the package). The Dictionary File Manager contains dictionaries that direct the pronunciation of text.

To configure the Text-to-Speech package:

1 Right-click the Text-to-Speech Base package in Avalanche Manager or Avalanche MC.

The *Dictionary File Manger* dialog box appears.

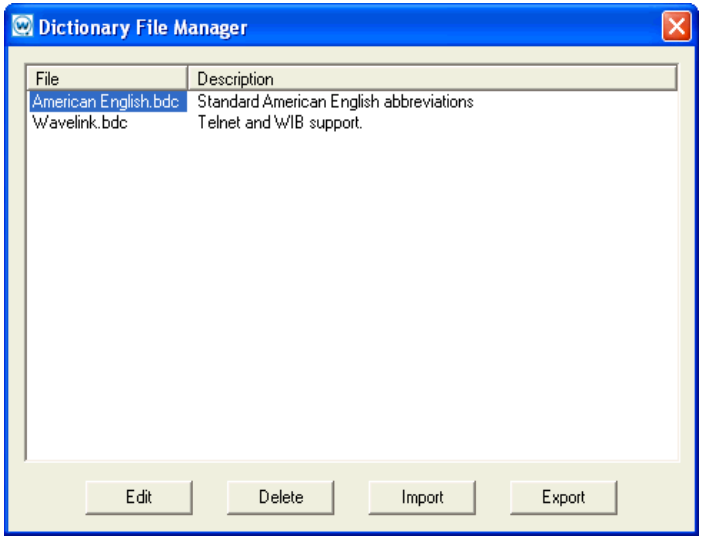

Figure 2-3. *Dictionary File Manager*

To import, export, and edit Dictionary Files, you must install Nuance's Speech SDK on your host computer. Refer to the documentation contained in the Speech SDK for further information.

NOTE Nuance's Speech SDK can be obtained from www.wavelink.com, or by contacting Wavelink Customer Service. *Appendix A: Wavelink Contact Information* on page 27 provides Wavelink contact information.

Chapter 3: Voice-Enabled Emulation and Scripting

Voice-Enabled Emulation functions primarily through Telnet Client Scripting. This chapter provides information about the following:

- Scripting
- Voice-Enabled Emulation Scripting Commands
- Voice-Enabled Emulation Settings

Scripting

Use the Telnet Client Script Editor to create and execute scripts that automate Voice-Enabled Emulation processes. For more information about Telnet Client scripting, refer to *Wavelink Telnet Client Scripting Reference Guide*. This section provides the following information:

- Creating Voice-Enabled Emulation Scripts
- Sample Voice-Enabled Emulation Scripts

Creating Voice-Enabled Emulation Scripts

The following steps provide an overview of how you manually create a Voice-Enabled Emulation script. For more detailed information about these steps, refer to *Wavelink Telnet Client Scripting Reference Guide.*

1 Name the script.

2 Select an activation method.

3 Build the script code. In the **Actions** tab, create the code, line-by-line, that describes what you want actions you want the script to perform.

NOTE For actions specific to Voice-Enabled Emulation, refer to *Voice-Enabled Emulation Scripting Commands* on page 18.

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4 Create any variables that you need for your script in the **Boolean Variables**, **Number Variables**, or **String Variables** tabs.

5 Assign host profiles that can perform the script.

Sample Voice-Enabled Emulation Scripts

This section contains example scripts that perform various Voice-Enabled Emulation functions. You can use the Script Editor to modify and customize these scripts as desired.

For information on using the sample scripts once they have been deployed to a mobile device, refer to *Chapter 4: Using Voice-Enabled Emulation* on page 23.

Play_Screen Sample Script

The following example script that converts the current Telnet Client screen into speech that the user can hear.

```
nNumRows=Get_Screen_Rows
nCurrentRow=1
While(Number_Less_Than_Or_Equal(nCurrentRow,nNumRows))
  Speech_From_Text(Get_Screen_Text
  (nCurrentRow,1),FALSE)
  nCurrentRow=Number_Plus(nCurrentRow,1)
End_While
Return
```

Get_Number_Test Sample Script

The following example script converts a spoken number into text that displays on the mobile device. This script must be used in conjunction with the Get_Number sample script.

```
Speech_From_Text("Say a number",FALSE)
Call:Get_Number
   nResult <--> nResult
Ask_OK(Number_To_String_Decimal(nResult),
"Number Returned")
Return
```

Get_Number Sample Script

The following example script is called by the Get_Number_Test script. It retrieves the appropriate number for the Get_Number_Test script to display.

```
Comment:This script is designed to be called by other
scripts.
Comment:The result of the Speech-to-Text will be in the
nResult variable.
Comment:The number.bnf file must be available as a
grammar file.
```

```
Speech_To_Text(sResult,"number")
nResult=0
While_Not(String_Empty(sResult))
 nNextSpace=String_Find_First(sResult,"",FALSE)
 nResult=Number_Plus(nResult,String_To_Number_Decimal
 (sResult))
 If_Number_Less_Than(nNextSpace,0))
    Break
 End_If
 nNextSpace=Number_Plus(nNextSpace,1)
 sResult=String_Right(sResult,Number_Minus
 (String_Length(sResult),nNextSpace))
End_While
Return
```

Speech_Button_Demo Sample Script

The following example script creates the following buttons on the screen: `Digits`, `State`, `Play Screen`, `Done`. When selected, the buttons allow the user to verbally input data.

For more information about each button and its function, refer to *Using the Speech_Button_Demo Sample Script* on page 24.

```
While_Not(bExit)

 If_Not(bButtonsVisible)
    Button_Create_View("Digits",999,1,6,bGetDigits)
    Button_Create_View("State",999,16,5,bGetState)
    Button_Create_View("PlayScreen",1000,1,11,
    bPlayScreen)
    Button_Create_View("Done",1000,13,4,bExit)
 End_If

 Wait_For_Screen_Update

 If(bPlayScreen)
    bPlayScreen=FALSE
    Button_Remove_All
    bButtonsVisible=FALSE
    Delay(1)

    nNumRows=Get_Screen_Rows
    nCurrentRow=1
    While(Number_Less_Than_Or_Equal
    (nCurrentRow,nNumRows))
     Speech_From_Text(Get_Screen_Text
     (nCurrentRow,1),FALSE)
     nCurrentRow=Number_Plus(nCurrentRow,1)
    End_While
 End_If
```

```
If(bGetDigits)
   bGetDigits=FALSE
   Button_Remove_All
   bButtonsVisible=FALSE

   Message("Say 1 or more digits...",0)
   szResult=""
   Speech_To_Text(szResult,"connected_digits")
   Message_Clear
   szResult=String_Strip_Characters(szResult,"",FALSE)
   Keypress_String(szResult)
End_If

If(bGetState)
   bGetState=FALSE
   Button_Remove_All
   bButtonsVisible=FALSE

   Message("Say a USA state...",0)
   szResult=""
   Speech_To_Text(szResult,"usa_states")
   Message_Clear
   Keypress_String(szResult)
End_If

End_While
Button_Remove_All
Return
```

Voice-Enabled Emulation Scripting Commands

Use the following commands to create scripts that facilitate Voice-Enabled Emulation. For more information about using scripting commands, refer to *Wavelink Telnet Client Scripting Reference Guide*.

Speech_From_Text_Avaliable

Returns TRUE if text-to-speech is supported on the computer; returns FALSE otherwise.

Speech_From_Text

Converts text into sound and plays the resulting sound on the computer. Returns TRUE if the sound was played successfully; returns FALSE otherwise.

Speech_To_Text_Available

Returns TRUE if speech-to-text is supported on the computer; returns FALSE otherwise.

Speech_To_Text

Returns the text equivalent of a user's speech. Returns an empty string if no acceptable speech was detected. If a grammar is specified, the grammar file with that name is used for speech recognition; otherwise, the previously used grammar file is reused.

Speech_Setting_Available

Identifies speech settings by case-insensitive name strings. Returns TRUE if the speech setting name is supported; returns FALSE otherwise. Refer to *Voice-Enabled Emulation Settings* on page 20 for a list of available setting names.

Speech_Change_Settings

Changes the speech setting to the specified value. Returns TRUE if the specified setting is supported and the value is valid for that setting. Returns FALSE otherwise.

Speech_Get_Setting

Returns the current value for the speech setting. Returns `-1` if the speech setting is not valid.

Speech_Get_Setting_Max

Returns the largest possible value for a speech setting. Returns `0` if only one setting value is supported; returns `-1` if the speech setting is not valid.

Speech_Find_Setting_Value

Searches all possible value descriptions for the speech setting and returns the value of the setting that is the closest match. If `"Exact Only"` is TRUE, then only exact matches are returned. Returns `-1` if no match is found.

Speech_Get_Setting_Value_Desc

Returns a string that describes the value for the speech setting (this does not need to be the setting's current value). Returns an empty string if the setting or value is not valid.

Speech_To_Text_No_Wait

Returns the text equivalent of a user's speech in a string variable. The boolean variable is set to TRUE when the speech is recognized or times out. If a grammar is specified, the grammar file with that name is use for the speech recognition. If no grammar is specified, the previous grammar file is reused.

Speech_To_Text_Cancel

Returns after canceling the last Speech_To_Text_No_Wait action. Returns immediately if there is no action to cancel.

Voice-Enabled Emulation Settings

This section lists the settings supported by Voice-Enabled Emulation. These settings are to be used in conjunction with the preceding scripting commands. The following information is provided:

- Text-to-Speech Settings
- Speech-to-Text Settings

Text-to-Speech Settings

The following settings are supported by the Text-to-Speech engine:

tts_engine	The speech engine name.
tts_language	The full name of the language that is currently selected.
tts_voice	The name of the voice that is currently selected.
tts_frequency	The sampling frequency. **Possible Values:** 11 KHz, 16 KHz, 22 KHz
tts_context	The processing module (usually text or email).

tts_volume The sound level.

Possible Values: Any number from 0 (silent) to 100 (loudest)

tts_rate The speed level.

Possible Values: Any number from 0 (slowest) to 99 (fastest)

tts_readmode Indicates how text should be separated.

Possible Values: Sentence, Character, Word, Line

tts_waitfactor The length of the pause between messages.

Possible Values: 0 milliseconds (ms), 200 ms, 400 ms, 600 ms, 800 ms, 1000 ms, 1200 ms

Speech-to-Text Settings

The following settings are supported by the Speech-to-Text engine:

stt_domain Indicates the situation in which speech-to-text is being used.

Possible Values: Car, Mobile

stt_language Displays the three-letter abbreviation of the language currently being used.

stt_frequency Displays the sampling frequency.

Possible Values: 8KHz, 11KHz, 16KHz

stt_size Displays the size of the speech-to-text engine being used.

Possible Values: Full, Compact, Ultra Compact

stt_timeout Indicates the total milliseconds (ms) for the system to wait before responding to the speaker.

stt_silence Indicates milliseconds of silence used to indicate the user is done speaking.

stt_expanded

If `1`, Speech-to-Text actions return a string with each likely Speech-to-Text result, followed by a newline character, the confidence value for the result, and another newline character.

There may be more than one result returned; however, the first result is the one with the highest confidence value. You can use this information to determine the appropriate `sst_threshold` and `sst_confidence` values.

Default Value: 0

stt_confidence

Indicates the minimum amount of difference between the confidence for the most likely and next-most likely items that will be accepted.

If the difference is less than the set value, the result will be discarded and the Speech-to-Text action will report that it failed.

Default Value: 1

NOTE You may want to use different values for different grammars.

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stt_threshold

Indicates the minimum amount of confidence for the most-likely result that will be accepted.

If the confidence is less than the set value, the result will be discarded and the Speech-to-Text action will report that it failed.

Default Value: 4500

NOTE You may want to use different values for different grammars.

Chapter 4: Using Voice-Enabled Emulation

This chapter provides information about using Voice-Enabled Emulation with the example scripts described in *Chapter 3: Voice-Enabled Emulation and Scripting* on page 15. The following information is provided:

- Using the Play_Screen Sample Script
- Using the Get_Number_Test Sample Script
- Using the Speech_Button_Demo Sample Script

Using the Play_Screen Sample Script

The Play_Screen script converts the mobile device's current Telnet Client screen into speech that the user can hear.

To use the Play_Screen script:

1. Launch the Telnet Client.
2. From the **Term** menu, select `Scripting > Execute Script`.

   The *Select Script* dialog box appears.
3. Select `Play_Screen` and click `OK`.

   The text is read back to the user.

Using the Get_Number_Test Sample Script

Using the Get_Number_Test script, the mobile device requests the user to speak a number. The number then displays on the mobile device screen.

To use the Get_Number_Test script:

1. Launch the Telnet Client.
2. From the **Term** Menu, select `Scripting > Execute Script`.

   The *Select Script* dialog box appears.
3. Select `Get_Number_Test` and click `OK`.

4 The mobile device requests, “Say a number.”

5 Clearly speak any number (one through ten).

The *Number Returned* dialog box appears, displaying the number you indicated.

Using the Speech_Button_Demo Sample Script

The Speech_Button_Demo script creates the following buttons on the mobile device screen:

- Digits
- State
- Play Screen
- Done

The `Digits` and `State` buttons allow the user to input a verbal response which is then displayed on the screen. The `Play Screen` button causes the mobile device to read back all the text on the screen, and the `Done` button allows the user to exit the script.

To use the Speech_Button_Demo script:

1 Launch the Telnet Client.

2 From the **Term** menu, select `Scripting > Execute Script`.

The *Select Script* dialog box appears

3 Select `Speech_Button_Demo` and click `OK`.

Four buttons appear on the screen.

4 Select the `Digits` button.

The “Say 1 or more digits” message appears.

5 Clearly speak any number.

NOTE To enter numbers higher than ten, you must speak each number individually. For example, if you want to enter the number 157, you would say “one, five, seven” rather than “one hundred fifty seven.”

The number displays on the mobile device.

6 Select the `State` button.

The “Say a U.S.A. state...” message appears.

7 Clearly speak the name of any state.

The state name displays on the mobile device.

8 Select the `Play Screen` button.

The mobile device responds with the contents of the screen.

9 To exit the script, select the `Done` button.

Appendix A: Wavelink Contact Information

If you have comments or questions regarding this product, please contact Wavelink Customer Service via e-mail or telephone.

Email: customerservice@wavelink.com

Phone: 425-823-0111

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