

Oracle® Application Testing Suite

OpenScript User's Guide

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Preface

Welcome to the Oracle OpenScript User's Guide. Oracle OpenScript is an extensible, standards-based test automation platform designed to test the next generation of Web applications. This guide explains how to use the features and options of Oracle OpenScript for testing Web applications.

Audience

This document is intended for test engineers who will be developing Oracle OpenScript scripts for regression and performance (load and scalability) testing of a Web site or application. The guide does require an understanding of software or Web application testing concepts. Test engineers using Oracle OpenScript should be familiar with the concepts of regression testing, load testing, and scalability testing.

The record/playback paradigm of Oracle OpenScript does not require any programming experience to develop scripts for testing. However, the advanced programming features available in Oracle OpenScript do require experience with the Java programming language. The programming sections and code examples of this manual assume that you understand programming concepts in Java.

Using This Guide

This guide is organized as follows:

[Chapter 1, "Getting Started With OpenScript"](#) introduces OpenScript and provides an overview of the features and user interface.

[Chapter 2, "Setting Preferences"](#) explains the available options in the OpenScript Preferences categories.

[Chapter 3, "Creating and Modifying Scripts"](#) explains the procedures for creating and modifying basic scripts in OpenScript.

[Chapter 4, "Using Databanks"](#) explains the concepts and procedures of Data Driven Testing using Databanks.

[Chapter 5, "Using the Web Functional Test Module"](#) provides instructions on configuring and using the OpenScript Web Functional Test Module for functional testing of applications through the Document Object Model (DOM) of the Web browser.

[Chapter 6, "Using the HTTP Module"](#) provides instructions on configuring and using the OpenScript HTTP Module for load testing of Web applications through the underlying HTTP protocol traffic.

[Chapter 7, "Using the Oracle Forms Functional Test Module"](#) provides instructions on configuring and using the OpenScript Oracle Forms Functional Test Module for functional testing of Oracle Forms web applications.

[Chapter 8, "Using the Oracle Forms Load Test Module"](#) provides instructions on configuring and using the OpenScript Oracle Forms Load Test Module for load testing of Oracle Forms web applications.

[Chapter 9, "Using the Web Services Module"](#) provides instructions on using the OpenScript Web Services Module for testing Web Services.

[Chapter 10, "Using the Siebel Functional Test Module"](#) provides instructions on configuring and using the OpenScript Siebel Functional Test Module for testing Siebel applications through the Document Object Model (DOM) of the Web browser and the Siebel test automation framework.

[Chapter 11, "Using the Siebel Load Test Module"](#) provides instructions on configuring and using the OpenScript Siebel Load Test Module for load testing Siebel web applications through the underlying HTTP protocol traffic.

[Chapter 12, "Using the Utilities Module"](#) provides instructions on using the OpenScript Utilities Module, which provides commonly used testing functions.

[Chapter 13, "Using the Shared Data Module"](#) provides instructions for using the Shared Data Module for transferring data using message queues and hash maps.

[Appendix A, "Command Line Reference"](#) provides reference information for command line settings.

[Appendix B, "Error Message Reference"](#) provides reference information for error messages.

[Appendix C, "Troubleshooting"](#) provides basic troubleshooting information.

[Appendix D, "Third-Party Licenses"](#) contains copyright information about certain third-party products used with Oracle Application Testing Suite.

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Related Documents

For more information, see the following documents in the Oracle Application Testing Suite documentation set:

- *Oracle Application Testing Suite Release Notes*
- *Oracle Application Testing Suite Getting Started Guide*
- *Oracle Application Testing Suite OpenScript User's Guide*
- *Oracle Functional Testing for Web Applications Functional Testing User's Guide*
- *Oracle Functional Testing for Web Applications Job Scheduler User's Guide*
- *Oracle Functional Testing for Web Applications Navigation Editor User's Guide*
- *Oracle Functional Testing for Web Applications Application Programming Interface Reference*
- *Oracle Functional Testing for Web Applications Result Objects Reference*
- *Oracle Functional Testing for Web Applications Settings Manager Reference*
- *Oracle Load Testing for Web Applications Load Testing User's Guide*
- *Oracle Load Testing for Web Applications Load Testing ServerStats Guide*
- *Oracle Test Manager for Web Applications Test Manager User's Guide*

Conventions

The following text conventions are used in this document:

Convention	Meaning
boldface	Boldface type indicates graphical user interface elements associated with an action, or terms defined in text or the glossary.
<i>italic</i>	Italic type indicates book titles, emphasis, or placeholder variables for which you supply particular values.
monospace	Monospace type indicates commands within a paragraph, URLs, code in examples, text that appears on the screen, or text that you enter.

Getting Started With OpenScript

OpenScript is an updated scripting platform for creating automated extensible test scripts in Java. Combining an intuitive graphical interface with the robust Java language, OpenScript serves needs ranging from novice testers to advanced QA automation experts.

OpenScript is built on a standards-based platform and provides the foundation for OpenScript Modules and Application Programming Interfaces (APIs). OpenScript APIs are used to build scripts for testing Web applications. The OpenScript API consists of a set of procedures that can be used to customize the scripts within the development environment. The API can also be used by advanced technical users to enhance scripts for unique testing needs.

1.1 OpenScript Features

OpenScript is the next generation environment for developing Oracle Application Testing Suite scripts for Web application testing. OpenScript provides the following features:

- **Scripting Workbench** - OpenScript provides an Eclipse -based scripting Workbench where you can create and run your automated test scripts. Users can use the Tree View graphical scripting interface for creating and editing scripts through the UI. Users can also switch to the Java Code View programming interface and leverage the integrated Eclipse IDE for creating and editing their scripts programmatically.

Functional test scripts created in OpenScript can be played back to test and validate application functionality. Load test scripts created in OpenScript will run in Oracle Load Testing for Web Applications for application load testing, allowing users to simulate hundreds our thousands of users executing scripts at the same time.

- **Test Modules** - The OpenScript Test Modules provide application-specific test automation capabilities. Each Test Module is custom built to test a specific application or protocol. OpenScript includes several functional and load testing modules for testing Web-based applications. Additional modules can be developed for the OpenScript platform.

OpenScript's Test Module interface is completely open and extendable by end-users. Users can leverage the Test Module API to build their own modules for testing specific applications or can extend an existing module to add custom functionality.

- **Graphical/Tree View Scripting Interface** - The OpenScript Tree View scripting interface provides a graphical representation of the test script. Multiple script

windows can actually be open at the same time. Within each script window, the Tree View is broken down into 3 main script sections:

- Initialize: For script commands that only execute once on the first iteration
- Run: Main body of the script for commands that will run on every iteration
- Finish: For script commands that only execute once on the last iteration

Within each section, script Steps and Navigation nodes can be created automatically during script recording or manually through the Tree View user interface. Additional script commands will also be represented as nodes in Tree View including test cases, data inputs, log messages, etc. Each Tree View node has a corresponding representation in the Java Code View.

- **Programming/Code View Scripting Interface** - The OpenScript Java Code View scripting interface provides a Java representation of the test script. This view provides full access to Eclipse IDE for creating, editing & debugging script code. Script commands in Java are mapped to a corresponding representation in the Tree View. Users can edit their script in either the code or tree view and changes will be automatically reflected in both views.
- **Properties View & Results View** - The OpenScript Properties View allows users to view detailed properties for selected script nodes in the Tree View. The Results View shows detailed step-by-step results of script playback which are linked to the OpenScript display window.
- **Data Banking** - OpenScript allows users to parameterize script data inputs to perform data driven testing using Data Banking. Users can select any data inputs for their script and then substitute a variable to drive the input from an external file during playback. Multiple Data Bank files can be attached to a single script and users can specify how OpenScript assigns data during script playback.
- **Correlation** - The OpenScript Correlation interface allows users to create correlation libraries to automatically parameterize dynamic requests during playback. Correlation libraries contain rules for automatically handling dynamic request parameters such as urls, query strings and post data for the load testing modules.
- **OpenScript Preferences** - The OpenScript Preferences interface is where users specify settings to control script recording, script playback, correlation and general preferences for the OpenScript Workbench.
- **Multi-User Execution** - launch more than one OpenScript instance under separate named Windows user accounts. Playback for multiple scripts is supported using any of the following:
 - OpenScript Playback button
 - Command-Line Interface
 - Oracle Load Testing for Web Applications
 - Oracle Test Manager for Web Applications

1.2 Installing OpenScript

To install OpenScript:

Note: OpenScript requires Administrator Privileges to be installed and uninstalled. It does not require Administrator Privileges to run.

1. Download the product Zip file from the Web site and save it to a temporary directory on your hard disk.
2. Unzip the file and run the openscript###.exe to install OpenScript.
3. Follow the installation prompts to do the following:
 - Accept the license agreement.
 - Specify the installation directory.
4. Click **Finish** when done.

1.3 Starting the OpenScript Workbench

To start the OpenScript workbench:

From the Start menu:

- Select **Programs** from the **Start** menu and then select **OpenScript** from the **Oracle Application Testing Suite** menu.

From the Welcome Screen:

- Click **Goto the OpenScript Workbench**.

1.4 Overview of the OpenScript Main Window (Workbench)

The OpenScript main window (Workbench) is where you perform the majority of your test development activities. The main window consists of the perspectives used for developing scripts. OpenScript includes a Tester Perspective and a Developer Perspective. The menu bar, toolbar, and the views and editors vary depending upon which perspective is being used. The following sections describe the functionality and various elements of the OpenScript Workbench.

Some dialogs and views require the user to hit the popup menu keyboard button in order to access some features in the UI that are normally accessible using the right-click menu.

1.4.1 Tester Perspective

The OpenScript Tester Perspective provides a convenient way to record and edit scripts and view the playback results. The Tester Perspective opens the following views by default.

- **Script View:** Shows the recorded script in two tabs: Tree View and Java Code. The Tree View tab shows the steps and pages and the Initialize, Run, and Finish nodes of each step using a graphical tree view. The Java Code tab shows the underlying Java code used for the script.
- **Details View:** Shows the content details for URL navigations or pages added to the script.
- **Problems View:** Shows any problems in the script code that may produce errors or prevent compiling the script.
- **Properties View:** Shows the properties for the selected node in the script.
- **Console View:** Shows the playback command output and status information for the script. Script log message also appear in the Console.
- **Results View:** Shows the results of script playback.

The following Error log view is also available but does not open by default:

- **Error Log View:** Shows the error log information for the project and script.

The views are described in more detail in the following sections.

1.4.2 Developer Perspective

The OpenScript Developer Perspective provides advanced options for developers when creating and editing scripts using the advanced features of OpenScript and the Eclipse development platform. The Developer Perspective opens the following views by default:

- **Navigator and Package Explorer Views:** Shows hierarchical views of the script project resources. You can open the resource files in an editor to view and edit the contents.
- **Script View:** Shows the recorded script in two tabs: Tree View and Java Code. The Tree View tab shows the steps and pages and the Initialize, Run, and Finish nodes of each step using a graphical tree view. The Java Code tab shows the underlying Java code used for the script.
- **Debug View:** Shows the debugging options and provides options for stepping through code.
- **Variables and Breakpoint Views:** Shows the script variables and breakpoints set in the code.
- **Problems View:** Shows any problems in the script code that may produce errors or prevent compiling the script.

The following views are also available but do not open by default:

- **Details View:** Shows recorded page details in three tabs: HTML, Browser, and Header. The HTML tab shows the page HTML source. The Browser tab shows the page. The Header tab shows the page response header.
- **Properties View:** Shows the properties for the selected node in the script.
- **Console View:** Shows the playback command output and status information for the script. Script log message also appear in the Console.
- **Results View:** Shows the results of script playback.
- **Error Log View:** Shows the error log information for the project and script.

The views are described in more detail in the following sections.

1.4.3 OpenScript Menu Options

The menu options that appear change depending upon which perspective is set in the Workbench (Tester or Developer) and which view is the active view. Specific test modules may also add or remove menu options.

1.4.3.1 File

- **New** - opens the New Project wizard. You can select the type of project including OpenScript scripts, jobs and modules
- **Open Script** - opens a window for selecting the OpenScript Repository, workspace, and script to open.

- **Open Object Library** - opens a window for selecting the object library file to use for Web Functional Test Scripts. This option appears only when a Web Functional Test script is the current script.
- **Open File** - opens a window for selecting the file to open.
- **Close** - closes the script editor.
- **Close All** - closes all script editors.
- **Save** - saves the data in the currently active editor.
- **Save As** - save the data in the currently active editor using a new name.
- **Save All** - saves the data in all open editors.
- **Restart** - restarts the OpenScript application and the Eclipse IDE.
- **Import Script** - opens a window for importing an archived OpenScript script project from a .zip file.
- **Export Script** - opens a window for exporting the OpenScript script project to an archive .zip file.
- **Exit** - exits OpenScript.

The following options are also available in the Developer Perspective:

- **Revert** - reverts changes to the last saved file contents.
- **Move** - opens a dialog box for selecting where to move the resource.
- **Rename** - opens a dialog box for specifying a new name for the resource.
- **Refresh** - refreshes the resources in the Navigator or Package view.
- **Convert Line Delimiters To** - opens a sub menu for selecting the type of line delimiters for the conversion: Windows, UNIX, or Mac OS.
- **Print** - prints the contents of the selected editor view.
- **Switch Workspace** - opens a dialog box for selecting the workspace to use.
- **Import** - opens a window for selecting the type of project to import.
- **Export** - opens a window for exporting the type of project to export.
- **Properties** - opens the properties information for the selected resource.

1.4.3.2 Edit

- **Undo** - undoes the last action.
- **Redo** - redoes the last action.
- **Cut** - cuts the selected text/data to the clipboard.
- **Copy** - copies the selected text/data to the clipboard.
- **Paste** - pasted text/data on the clipboard to cursor location.
- **Delete** - deletes the selected text/data.
- **Select All** - selects all text/data in the currently active editor.
- **Find/Replace** - opens a dialog box for setting the text search and replace options. The menu option is available when an editor is open.
- **Search** - opens a dialog box for specifying the search criteria.

The following options are also available when the Java Code editor is open in the Script view.

- **Expand Selection To** - opens a sub menu for selecting which element to use to expand the selection.
- **Find Next** - finds the next instance of the Find text specified in the Find/Replace settings.
- **Find Previous** - finds the previous instance of the Find text specified in the Find/Replace settings.
- **Incremental Find Next** - finds the next instance of the Find text specified in the Find/Replace settings.
- **Incremental Find Previous** - finds the previous instance of the Find text specified in the Find/Replace settings.
- **Add Bookmark** - opens a dialog box for specifying the bookmark name.
- **Add Task** - opens a dialog box for defining a task to perform on a resource.
- **Smart Insert Mode** - when selected, code typing aids such as automatic indentation and closing of brackets are enabled in the code view.
- **Show Tooltip Description** - opens a description for the current selection in the Code View.
- **Content Assist** - opens a context assist menu to bring up Java code assist proposals and templates. See the Templates preference page for available templates (Window > Preferences > Java > Editor > Templates) and go to the Editor preference page (Window > Preferences > Java > Editor > Code Assist) for configuring the behavior of code assist.
- **Word Completion** - completes typing of a partial word.
- **Quick Fix** - If the cursor is located at a location with problem indication this opens a context assist dialog at the current cursor to present possible corrections.
- **Set Encoding** - opens a dialog box for setting the type of text file encoding.

1.4.3.3 Search

- **Search** - opens a dialog box for specifying the search criteria.
- **File** - opens a dialog box for specifying the file search criteria.
- **Text** - opens a sub menu for selecting the text search location.

1.4.3.4 Script

- **Record** - starts the selected OpenScript script recorder.
- **Playback** - plays back the currently open OpenScript
- **Iterate** - plays back the script repeatedly, with or without a Databank.
- **Stop** - stops the OpenScript script recorder.
- **Configure Recorders** - opens a window for pausing and restarting the current script recorder. This option is only available while in Recorde mode.
- **Configure Databanks** - opens a window for configuring the databank to use with the OpenScript script.
- **Revert all Navigations to Recorded** - reverts changes back to the recorded version of the script.

- **Create Step Groups** - creates step groups in the script based on page navigations.
- **Correlate Script** - opens a dialog box for selecting a defined correlation library to manually apply to the script. Correlation libraries are used to convert dynamic data in page navigations to variable values for script playback. Use the Correlation options in the in the OpenScript Preferences to define the correlation libraries and rules.
- **Add** - opens a sub menu for adding options to the script tree.
- **Script Properties** - opens a window for setting script-related properties such as correlation, databanks, modules, object libraries, and step groups. Script properties will vary depending upon the script type.

The Script menu includes additional options for functional test scripts:

- **Inspect Path** - starts the object capture mode and opens a browser for selecting the object path to capture. The object path is used by functional test scripts for object identification.
- **Add Object Test** - opens a dialog box for defining an object test for a functional test script.
- **Add Table Test** - opens a dialog box for defining a table test for a functional test script.
- **Add Text Matching Test** - opens a dialog box for defining a Text Matching test for a functional test script.
- **Add Capture Page** - opens a dialog box for specifying a page to capture for a functional test script. The Capture Page option captures a screenshot and the page HTML.

1.4.3.5 View

- **Tester Perspective** - changes the Workbench to the Tester Perspective.
- **Developer Perspective** - changes the Workbench to the Developer Perspective.
- **Reset Perspective** - resets the current perspective to the default settings.
- **Error Log** - toggles the Error Log View. When selected, the Error Logs view is displayed. When cleared, the Error Log View is hidden.
- **Properties** - toggles the Properties View. When selected, the Properties view is displayed. When cleared, the Properties View is hidden.
- **Problems** - toggles the Problems View. When selected, the Problems view is displayed. When cleared, the Problems View is hidden.
- **Details** - toggles the Details View. When selected, the Details view is displayed. When cleared, the Details View is hidden.
- **Console** - toggles the Console View. When selected, the Console view is displayed. When cleared, the Console View is hidden.
- **Results** - toggles the Results View. When selected, the Results view is displayed. When cleared, the Results View is hidden.
- **OpenScript Preferences** - opens the OpenScript Preferences dialog box for specifying default settings and options.

1.4.3.6 Run

- **External Tools** - opens a sub menu for selecting the external tools option.

The following options are also available in the Developer Perspective:

- **Resume** - resumes suspended code execution or script playback.
- **Suspend** - suspends the current code execution or script playback.
- **Terminate** - ends the current code execution or script playback.
- **Step Into** - single steps code execution into the highlighted statement or method. The Step options are active in debug mode.
- **Step Over** - single steps code execution over the current statement or method to the next statement or method.
- **Step Return** - steps code execution out of the current method and stops after exiting the current method.
- **Run to Line** - resumes execution until the specified line is executed. Used When a thread is suspended.
- **Use Step Filters** - toggles step filters on and off. When set to on, all step functions apply step filters.
- **Run** - runs the last launched code or script playback.
- **Debug** - opens the debug configuration options for the last launched code or script playback. You can customize the debug configuration before launching the code or script playback for debugging.
- **Run History** - opens a sub menu listing run configurations. Selecting a run configuration shows the run history in the debug view.
- **Run As** - opens a sub menu listing available external run tools. External tools need to be configured to appear on the sub menu by selecting **External Tools** from the **Run** menu.
- **Run Configurations** - opens the run configuration options for the last launched code or script playback. You can customize the run configuration before launching the code or script playback.
- **Debug History** - opens a sub menu listing debug configurations. Selecting a debug configuration shows the run history in the debug view.
- **Debug As** - opens a sub menu listing available external run tools. External tools need to be configured to appear on the sub menu by selecting **External Tools** from the **Run** menu.
- **Debug Configurations** - opens the debug configuration options for the last launched code or script playback. You can customize the debug configuration before launching the code or script playback.

1.4.3.7 Tools

- **Manage Scripts** - opens a window for managing OpenScript scripts.
- **Manage Workspaces** - opens a window for managing OpenScript Workspaces.
- **Manage Repositories** - opens a window for managing OpenScript Repositories.
- **XPath Generator** - opens a dialog box for generating an XPath from an XML file.

1.4.3.8 Help

- **Welcome** opens the welcome page with links to the Workbench product documentation.

- **OpenScript Diagnosis Tool** - opens the Diagnosis Wizard for verifying the connection status of the OpenScript Internet Explorer Browser Helper Object (BHO), FireFox extensions, and Forms Internet Explorer helper object.
- **Help Contents** - opens the help table of contents.
- **Search** - opens the help search view.
- **Dynamic Help** - opens the available help topics for the currently active view and perspective.
- **Key Assist** - opens the list of keyboard shortcuts.
- **Tips and Tricks** - opens the help tip and tricks window.
- **Cheat Sheets** - opens the Cheat Sheets view.
- **About OpenScript** - provides version and copyright information and configuration details.

1.4.3.9 Navigate

The Navigate menu appears when the Developer perspective is open.

- **Go Into** - refocuses the active view so that the current selection is at the root. This allows web browser style navigation within hierarchies of artifacts.
- **Go To** - opens a sub menu with options for selecting the location to which to navigate. The sub menu options change depending upon the current view.
- **Open Type** - opens a dialog box for selecting the type library to open in an editor view.
- **Open Type in Hierarchy** - opens a dialog box for selecting the type library to open in a hierarchy view.
- **Open Resource** - opens a dialog box for selecting the resource file to open in an editor view.
- **Show In** - opens a sub menu for selecting where to show the statement or method selected in the code view: Package Explorer, Navigator, or Outline view.
- **Next** - moves the selection to the next annotation in the Code View.
- **Previous** - moves the selection to the next annotation in the Code View.
- **Last Edit Location** - moves the selection to the location of the last edit made in the Code View.
- **Back** - moves the selection back through the list of locations previously selected in the Code view.
- **Forward** - moves the selection forward through the list of locations previously selected in the Code view.

Additional menu options may appear depending upon the current Java Code editor selection.

1.4.3.10 Project

The Project menu appears when the Developer perspective is open.

- **Open Project** - opens the project selected in the Navigator View.
- **Close Project** - closes the project selected in the Navigator View.

- **Build All** - builds all projects. This option is only available if the Build Automatically option is not selected.
- **Build Project** - builds the current project. This option is only available if the Build Automatically option is not selected.
- **Build Working Set** - opens a sub menu for selecting or creating a working set of projects. Working set projects are only available if the Build Automatically option is not selected.
- **Clean** - opens a dialog box for selecting the project to clean of build problems.
- **Build Automatically** - toggles the automatic build option on and off.
- **Generate Javadoc** - opens the Generate Javadoc window.
- **Properties** - opens the properties window for the current project.

1.4.3.11 Window

- **New Window** opens a new OpenScript window.
- **New Editor** opens a new editor view of the current file.
- **Open Perspective** opens a sub menu for selecting the perspective to open.
- **Show View** opens a sub menu for selecting the view to show.
- **Customize Perspective** opens a window for selecting the shortcuts and commands to customize.
- **Save Perspective As** opens a dialog box for specifying a name for the saved perspective.
- **Reset Perspective** resets the current perspective to the default settings.
- **Close Perspective** closes the currently open perspective.
- **Close All Perspectives** closes all perspectives.
- **Navigation** opens a sub menu for selecting navigation options.
- **Preferences** opens a window for specifying the project preferences.

1.4.4 OpenScript Tool Bar

The following toolbar buttons are available in the Tester and Developer Perspectives:

- **New** - opens a Wizard for creating new OpenScript scripts or Java platform objects and resources.
- **Open** - opens a dialog box for selecting an existing OpenScript script.
- **Save** - saves the changes in the currently active editor. The button is only active if an editor is open with changes to be saved.
- **Print** - prints the information in the currently selected editor. The button is only active if an editor with printable content is open.
- **Record** - starts OpenScript script recording using the selected script recorder. Clicking the menu button opens the a menu listing the available recorder types.
- **Playback** - starts playback of the currently open Visual Script.
- **Iterate** - opens a dialog box for specifying the playback iterations options.
- **Stop** - stops OpenScript script recording.

- Configure Recorders - opens a window for pausing and restarting the current script recorder. This option is only available while in Record mode.
- Add Object Test - opens a dialog box for defining an object test for a functional test script.
- Add Table Test - opens a dialog box for defining a table test for a functional test script.
- Add Text Matching Test - opens a dialog box for defining a Text Matching test for a functional test script.
- Add Capture Page - opens a dialog box for specifying a page to capture for a functional test script.
- Toolbar - opens the floating toolbar.
- Debug - opens a dialog box for specifying a debug configuration.
- Run - Runs the selected configuration type or application.
- Run External Tools - Runs an external application.
- New Java Project - opens a window for creating a new Java project.
- New Java Package - opens a window for creating a new Java package
- New Java Class - opens a window for creating a new Java class.
- Open Type - opens a window for specifying the type library to open.
- Search - opens a dialog box for specifying search options.
- Next Annotation - goes to the next annotation in the Java code. This button is only active when a Java Code view is open.
- Previous Annotation - goes to the previous annotation in the Java code. This button is only active when a Java Code view is open.
- Last Edit Location - opens the edit view that was open and goes to the last edit location.
- Back to (location) - browses back to the last OpenScript script view.
- Forward - browses forward to the previous OpenScript script view.

1.4.5 Script View

Shows the recorded script in two tabs: Tree View and Java Code. The Tree View tab shows the steps and pages and the Initialize, Run, and Finish nodes of each step using a graphical tree view. The Java Code tab shows the underlying Java code used for the script.

The script view is where you perform the majority of script editing actions. The Script view has the following tab views:

1.4.5.1 Tree View

The Tree View shows the script navigations and data as nodes in a collapsible tree view. The Tree View corresponds to the Java Code view. Any changes in the Tree View will be automatically updated in the Java Code view. The Tree View has the following standard nodes:

- Initialize - specifies script actions to perform once at the beginning of script playback.

- Run - specifies script actions to perform one or more times during script playback depending upon databanks or other custom programming.
- Finish - specifies script actions to perform once at the end of script playback.

Use the Record options and right-click shortcut menu to add options to script nodes or modify the properties of script nodes in the Tree View.

1.4.5.2 Java Code

The Java Code view shows the script navigations and data as Java programming code. The Java Code view corresponds to the Tree View. Any changes in the Code View will be automatically updated in the Tree View. The Java Code view has the following standard procedures:

- `initialize()` - corresponds to the Initialize node of the Tree View and executes any custom code added once at the beginning of script playback.
- `run()` - corresponds to the Run node of the Tree View and executes recorded and custom code one or more times during script playback depending upon databanks or other custom programming.
- `finish()` - corresponds to the Finish node of the Tree View and executes any custom code added once at the end of script playback.

Use Ctrl-space to open an Intellisense window listing available procedures. See the API Reference in the OpenScript Platform Reference help for additional programming information.

1.4.6 Details View

The Details view shows the content details for URL navigations added to the script. The Details view may have the following tab views depending upon the selected script node and type of script:

- ScreenShot - shows a screen capture of the web page.
- Browser - shows the Browser rendered page for the script navigation selected in the tree view.
- HTML - shows the HTML source for the script navigation selected in the tree view.
- Headers - shows the Request Header and Response Header source for the script navigation selected in the tree view.
- Comparison - shows the recorded and playback text for the Content, Request Header, or Response Header selected in the Compare list. The Comparison tab appears only after a script is played back and a navigation is selected in the Results View.
- Results Report - shows the results report for the script playback. The Results Report tab appears only after a script is played back and a navigation is selected in the Results View.

1.4.7 Problems View

The Problems view shows any problems in the script code that may produce errors or prevent compiling the script. The Problems view shows the following information:

- # error, # warnings, # infos - shows the number of errors, warning messages, and information messages in the problems view.

- Description - shows a description of the errors, warning messages, and information messages.
- Resource - shows the name of the resource file where the error, warning, or information message was generated.
- Path - shows the script name, workspace, and repository path where the resource file is located.
- Location - shows the location/line number where the error, warning, or information message was generated.

The following toolbar button is available in the Problems View:

- Configure the filters to be applied to this view - opens a dialog box for configuring the filters to apply to the Problems View.

1.4.8 Properties View

The Properties view shows the properties for the selected node in the script. The Properties view shows the following information:

- Property - shows the names of the properties for the script node. The properties vary depending upon which type of script node is selected.
- Value - shows the value of the script node properties. Property values can be edited in the properties view.

The following toolbar buttons are available in the Properties View:

- Show Categories - toggles the property categories.
- Show Advanced Properties - toggles the advanced properties.
- Restore Default Value - restores any changed property values to the default values.

1.4.9 Console View

The Console view shows the playback command output and status information for the script. Script log message also appear in the Console. See the Process Console View topics in the reference section of the Java development user guide online help for additional information about console toolbar options.

1.4.10 Results View

The Results view shows the playback results for the script. The Results view shows the following information:

- Name - shows the test date or navigation name.
- Duration - shows the playback time for the page navigations.
- Result - shows the playback result: Passed or Failed.
- Summary - shows the data values from the Data Bank that are passed to parameters or it shows failure descriptions.

The following toolbar buttons are available in the Result View:

- Delete Result - deletes the selected result row.
- Delete All Results - deletes all rows from the Results View.
- Scroll Lock - toggles scroll lock on and off for the Result View.

- Properties - opens the Properties for the selected result.

1.4.11 Navigator and Package Explorer Views

The Navigator and Package Explorer view shows the Java resources for the script and Java package. Double-click on a resource to open it in an editor view. See the Package Explorer View topics in the reference section of the Java development user guide online help for additional information about Package Explorer toolbar options.

1.4.12 Debug View

The Debug view provides options for debugging script playback. See the Debug View topics in the reference section of the Java development user guide online help for additional information about debugging toolbar options.

1.4.13 Variables and Breakpoints Views

The Variables and Breakpoints view shows variable values and breakpoints for debugging script playback. See the Breakpoints and Variables View topics in the reference section of the Java development user guide online help for additional information about breakpoints and variables toolbar options.

1.5 About Multi-User Execution

The Multi-User Execution feature lets multiple users run OpenScript from a single installation using multiple concurrent interactive desktop sessions (for example, Terminal Server or Remote Desktop sessions). All users must have Administrator privileges.

Users must login as a different, unique user accounts for each instance of OpenScript they want to run. One installation serves all user accounts on the machine. Users manage their settings and private data in their own workspaces. Any user who opens OpenScript creates a workspace under their "User Profile Folder", for example, C:\Documents and Settings*username*\osworkspace. All of the user's OpenScript Settings and private data are stored under this workspace, including the user's Http Trust Stores (ostruststore).

If more than one user attempts to open the same the script in the same workspace, the second or subsequent users will receive a message indicating the script is in use and locked. The second or subsequent users can make a copy of the script and files in use.

Only load-test scripts can be played in the same desktop session. There no script type limitations for playback in different desktop sessions.

You configure the port range to use for each user in the OpenScript General Preferences. The ports within the configured port range are checked and if none are available, an error message will appear.

Setting Preferences

The OpenScript Preferences let you specify default values and settings to use for OpenScript options. This chapter explains the available options in the OpenScript Preferences categories. The OpenScript preferences are under the OpenScript node. The available preferences may vary depending upon installed modules.

2.1 Setting OpenScript Preferences

To set OpenScript preferences:

1. Start OpenScript.
2. Select **OpenScript Preferences** from the **View** menu.
3. Expand the OpenScript node and select the preference category.
4. Specify the preferences as necessary for the selected category.

The following sections explain the available options for each category.

2.2 Correlation Category

The OpenScript Correlation interface allows users to create correlation libraries to automatically parameterize dynamic requests during playback. Correlation libraries contain rules for automatically handling dynamic request parameters such as urls, query strings and post data for the specific modules.

This category lets you specify libraries and rules for transforming dynamic data in recorded script URLs and related parameters (headers, post data, etc.) to variable names that will be recognized by the script playback engine (OpenScript or Oracle Load Testing for Web Applications). Correlation rules must be defined within OpenScript modules and are not available with the basic platform.

2.2.1 Module Correlation Preferences

Selected Module: Shows the names of the defined correlation libraries. Use the Add button to define libraries. After you define a library you can use the Add Rule button to specify the rules to include in the library.

- **Add Library:** Opens a dialog box for adding a correlation library name.
- **Add Rule:** Opens a dialog box for adding a correlation rule to the selected library.
- **Edit:** Opens a dialog box for editing the selected correlation library name.

- **Delete:** Deletes the selected correlation library from the Preferences list. The defined rules for the library are also removed from the preferences. The correlation library .XML file is not deleted from disk.
- **Up:** Moves the correlation rule up in the priority list.
- **Down:** Moves the correlation rule down in the priority list.
- **Import:** Opens a dialog box for selecting the correlation library file to import.
- **Export:** Opens a dialog box for selecting the location where you want to export the selected correlation library .XML file.
- **Revert:** Reverts the library to the default values.

Tab view: Shows the library or rule details for the selected correlation library or rule. The tab view information changes depending upon whether a library or rule node is selected and which type of correlation rule is selected. See the module chapters for details about specific correlation libraries.

2.2.2 Add Library

This dialog box lets you specify a new correlation library for transforming dynamic data in recorded script URLs and related parameters (headers, post data, etc.) to variable names that will be recognized by the script playback engine (OpenScript or Oracle Load Testing for Web Applications).

- **Name:** Specifies the name of the correlation library. After you define a library you can use the Add Rule button to specify the rules to include in the library. The name is required. You can also select Copy rules to copy correlation rules from an existing library.
- **Copy rules from existing library:** Lets you copy correlation rules from an existing library to a new library. Specifies the name of the correlation library. After you define a library you can use the Add Rule button to specify the rules to include in the library. The name is required. You can also select Copy rules to copy correlation rules from an existing library.
 - **Copy Rules:** When selected, a list of existing correlation rule libraries will be enabled for copying.
 - **Library:** Lists the correlation rule libraries available for copying.

2.2.3 Add/Edit Rule

This dialog box lets you specify or edit a correlation rule for transforming dynamic data in recorded script URLs and related parameters (headers, post data, etc.) to variable names that will be recognized by the script playback engine (OpenScript or Oracle Load Testing for Web Applications).

- **Type:** Specifies the type of correlation rule. The available Source and Target options change depending upon the rule type.
- **Name:** Specifies the name of the correlation rule. The name is required.
- **Source:** Specifies which object(s) to substitute as dynamic data.
- **Target:** Specifies which object(s) to use as the target location of the transform.

2.3 General Category

This category lets you specify general preferences.

2.3.1 General Preferences

These preferences set the default general preferences. The resulting dialog presents the following fields:

Confirm exit when closing last window: When selected, a confirmation message appears when closing the OpenScript workbench.

Remove script from workbench on close: When selected, any opens scripts will be removed from the workbench when OpenScript is closed.

Record and Playback Port Range: Specifies the range of ports to use to avoid port conflicts when multiple users run OpenScript from a single installation using multiple concurrent interactive desktop sessions (for example, Terminal Server or Remote Desktop sessions).

- **Minimum:** Specifies the port number to use as the minimum.
- **Maximum:** Specifies the port number to use as the maximum.

2.3.2 Browser Preferences

The Browser preferences specify the browser and any additional arguments. The resulting dialog presents the following fields:

Browser Type: Select which browser to use.

- **Internet Explorer:** When selected, OpenScript uses the Internet Explorer browser.
 - **Path Override:** Specifies the path and file name to use to override the default Internet Explorer browser location.
 - **Additional Arguments:** Specifies any additional command arguments to include when starting the browser.
- **FireFox:** When selected, OpenScript uses the FireFox browser.
 - **Path Override:** Specifies the path and file name to use to override the default FireFox browser location.
 - **Additional Arguments:** Specifies any additional command arguments to include when starting the browser.

Start Up: Specifies the browser start up settings.

- **Startup Timeout:** Specifies the amount of time, in seconds, to use for the browser startup timeout.

2.3.3 Encryption Preferences

These preferences set the default encryption preferences. The resulting dialog presents the following fields:

Do not encrypt script data: When selected, passwords are stored and displayed as plain text in the script.

Obfuscate script data: When selected, passwords are obfuscated before storing and displaying in the script. Obfuscated passwords are hidden but *not* securely encrypted.

Encrypt script data: When selected, passwords are encrypted in the script. Specify an encryption password to use.

- **Password:** Specifies the password to use when encrypting and decrypting data strings using the `encrypt()` and `decrypt()` functions. Only users who use the same encryption password in their copy of OpenScript will be able to decrypt

script passwords. This same encryption password must be used for authentication on all agent machines that will run or open the script in Oracle Load Testing for Web Applications Authentication Manager or Oracle Test Manager for Web Applications.

Warning: HTTP scripts do not automatically obfuscate/encrypt sensitive script passwords.

2.3.4 Repository Preferences

These preferences lets you specify the name and location of the repository to use to store script files. The resulting dialog presents the following fields:

Name: Shows the names of the defined repositories. Use the Add button to define repositories and locations.

Location: Shows the location of defined repositories.

Add: Opens a dialog box for specifying a repository and location.

Edit: Opens a dialog box for editing the selected repository and location. The Default repository location can be changed but it cannot be renamed.

Delete: Deletes the selected repository and location from the Preferences list. The script files and directory are not deleted. The Default repository cannot be deleted.

2.4 Playback Category

This category lets you specify script playback preferences.

2.4.1 General Playback Preferences

This category lets you specify general playback preferences. The resulting dialog box displays the following sections and fields:

2.4.1.1 General

This section lets you specify general playback preferences and displays the following fields:

VU Pacing (Think Time): Specifies the script playback delay between pages for each virtual user. This is the amount of time the user looks at a page before making the next request and is commonly referred to as "think time." There are four options:

- **Recorded:** Uses the delay times that were recorded in the Script. You can set minimum and maximum delay times (in seconds) that override the script delay times in the Minimum and Maximum edit boxes.
- **Recorded/Random:** Uses random delay times based upon the recorded user delay. The low end of the random range as the actual recorded user delay minus the Lower percentage setting. The high end of the random range as the actual recorded user delay plus the Upper percentage setting. For example, if the actual recorded delay time was 100 seconds and the Lower and Upper settings are 10% and 25% respectively, Oracle Load Testing for Web Applications uses random delay times between 90 and 125 seconds.
- **Random:** Uses random times for Virtual User pacing. You can set minimum and maximum delay times for random delay in the Minimum and Maximum edit boxes.

- **No Delay:** Plays back the Visual Scripts at the fastest possible speed with no time between page requests.

Preserve variables between iterations: Used to preserve or automatically clear variables defined in the **Run** section between successive iterations of the **Run** section.

Variables defined in the **Initialize** section will be preserved forever, unless explicitly removed in script code.

Variables set in the **Run** section will always be preserved between the final iteration of the **Run** section and the **Finish** section.

Variables include all items that are added into the script variables collection (see: `getVariables()` script method). This includes variables for elements such as HTTP form fields defined using `http.solve(...)` and `http.solveXPath(...)`.

Additional Arguments: Used to specify custom OpenScript script.java code arguments. You can create your own settings in OpenScript scripts. For example, you can create custom settings in OpenScript script.java code, as follows.

```
if (getSettings().get("MyCustomSetting").equals("abc")) {
    info("We're running in ABC mode.");
}
```

You can then set the additional arguments in the **Additional Arguments** field as follows:

```
-MyCustomSetting abc
```

2.4.1.2 Error Handling

This section specifies the default playback error handling settings.

On iteration failure, do not run more iterations: When selected, virtual user playback is stopped if an error occurs between playback iterations.

Use recorded value if variable is not found: When selected, the recorded data value will be used if a variable is not found. Databank variables will always use the recorded value if the databank attached to the script cannot be found. If the databank cannot be found and **Use Recorded Value If Variable Is Not Found** is not selected, the recorded data value will still be used.

2.4.1.3 System

This section specifies the default playback system settings.

Maximum JVM Heap Size: Specifies the maximum size of the JVM heap. This value cannot be more than 90% of the total memory size.

JVM Arguments: Used to specify additional Java Virtual Machine (JVM) or program arguments to pass to a script upon playback. It can accept all standard JVM arguments. For example, if you specify a custom argument `-Dmyvariable=myvalue` in the Additional Arguments, the argument will be passed to the script upon playback. Within the script code you can use `System.getProperty("myvariable")` to get "myvalue".

If the specified argument conflicts with existing OpenScript playback setting, (for example the "Maximum Heap Size" playback setting) the playback setting replaces the setting being specified in the JVM Arguments.

Debug logging: When selected, debug logging is enabled and DEBUG messages appear in the Console view during script playback. When cleared, debug logging is

disabled and DEBUG messages do not appear in the console view during script playback.

2.4.2 Error Recovery Preferences

This category lets you specify error recovery actions for exceptions that occur during playback. You can set the error recovery action for individual playback exceptions. Expand specific sections and set the error recovery action. You can set the action as Fail, Warn, or Ignore, as follows:

- **Fail:** Report the error as failure and stop script execution.
- **Warn:** Report the error as a warning and continue script execution.
- **Ignore:** Ignore the error and continue script execution.

Error Recovery playback preferences specified in the OpenScript Preferences are stored on the local machine and only apply when the script is played back from inside OpenScript on that machine. If you upload your script to Oracle Load Testing for Web Applications on another server and your script depends on an error recovery setting being a certain way in order for it to work, then you can set the error recovery setting in the OpenScript script Java code.

In OpenScript scripts, error settings can be turned on and off at any time, overriding the default Oracle Load testing for Web Applications and OpenScript Preferences using script Java code. For example:

```
getSettings().setErrorRecovery("http.zeroLengthDownloads", "IGNORE");  
// user code executed in script, such as http.get(), http.post(), ...  
getSettings().setErrorRecovery("http.zeroLengthDownloads", "FAIL");
```

2.4.2.1 General

This section lets you specify the default General error recovery actions, as follows:

Variable Not Found - specifies the error recovery action if a variable cannot be found when parsing transformed strings.

Create Variable Failed - specifies the error recovery action if a script fails to create a variable.

File Not Found - specifies the error recovery action if a file is not found.

Segment Parser Failed - specifies the error recovery action if the XPath Segment Parser cannot verify the correctness of an XPath.

Binary Decode Failed - specifies the error recovery action if a binary post data parameter error occurs.

Encryption Service Not Initialized - specifies the error recovery action when the password encryption service was not initialized.

Unexpected Script Error - specifies the error recovery action if any unexpected script error occurs.

2.4.2.2 Functional Test

This section lets you specify the default Functional Test error recovery actions, as follows:

Text Matching Failed - specifies the error recovery action if a text matching test fails.

Object Test Failed - specifies the error recovery action if an object test fails.

Table Test Failed - specifies the error recovery action if a table test fails.

2.4.2.3 HTTP

This section lets you specify the default HTTP error recovery actions, as follows:

Zero Length Downloads - specifies the error recovery action if a server response indicates zero bytes length.

Text Matching Failed - specifies the error recovery action if a text matching test fails.

Response Time Error - specifies the error recovery action if a Server Response Time test fails.

Solve Variable Failed - specifies the error recovery action if a table test fails.

HTML Parsing Error - specifies the error recovery action if an HTML parsing error occurs.

Invalid URL - specifies the error recovery action if the server returns an Invalid URL response code.

Invalid HTTP Response Code - specifies the error recovery action if the sever returns an invalid HTTP response code.

Client Certificate Keystore Error - specifies the error recovery action if the Client Certificate Keystore indicates and error.

2.4.2.4 Oracle Forms Functional Test

This section lets you specify the default Oracle Forms Functional test error recovery actions, as follows:

Oracle Forms - specifies the error recovery action if any Oracle Forms Functional test error occurs.

2.4.2.5 Oracle Forms Load Test

This section lets you specify the default Oracle Forms Load test error recovery actions, as follows:

Form Connect Error - specifies the error recovery action if a server connection error occurs.

Forms Input/Output Communication Error - specifies the error recovery action if a read or write error occurs with an Oracle Forms message.

Forms Content Match Failed - specifies the error recovery action if the content of a form does not match on playback.

Forms Playback Error - specifies the error recovery action if there is an error playing back a form.

Forms Component Not Found - specifies the error recovery action if a component of a form is not found.

2.4.2.6 Utilities

This section lets you specify the default Utilities error recovery actions, as follows:

SQL Execute Error - specifies the error recovery action if an SQL execute error occurs.

XML Parsing Error - specifies the error recovery action if any XML parsing error occurs.

CSV Loading Error - specifies the error recovery action if an error occurs while loading a CSV file.

2.4.2.7 Web Functional Test

This section lets you specify the default Web Functional Test error recovery actions, as follows:

Response Time Error - specifies the error recovery action if a Server Response Time test fails.

Solve Variable Failed - specifies the error recovery action if the value of any variable cannot be solved.

Wait for Page Timeout - specifies the error recovery action if a page timeout error occurs.

2.4.3 Functional Test Preferences

This category lets you specify playback preferences for that apply to all Functional Test scripts. The resulting dialog box displays the following sections and fields:

2.4.3.1 Object Enumeration

This section lets you specify the default Smart Match setting.

Smart Match: When selected, the OpenScript Smart Match object identification ranking feature is enabled. The following example explains how the Smart Match ranking feature enhances object identification in an XPath. With the following XPath,

```
/web:a[@text='Search' OR @href='search.jsp' OR @index='0']
```

it is possible for multiple links on a page to match the XPath criteria. For example:

```
link A: text='Logout', href='logout.jsp', index=0
link B: text='Search', href='search.jsp', index=3
link C: text='Search', href='doNotSearch.jsp', index=15
link D: text='Find', href='search.jsp', index=22
```

When Smart Match is *not* enabled, OpenScript returns the first result found on the page (Link A in the above example).

When Smart Match is enabled, OpenScript ranks all the results based on how well they match the specified attributes in the XPath. OpenScript evaluates the XPath from left-to-right and produce a list of attribute name=value pairs. For example:

```
Attribute 1: text=Search
Attribute 2: href=search.jsp
Attribute 3: index=0
```

OpenScript then builds a table and assigns a score to each attribute for each result. OpenScript assigns a 0 or a 1 based on whether or not each result matches a particular attribute name=value pair. The result with the highest numerical ranking will be used during playback. For example:

Link	Attr 1 text=Search	Attr 2 href=search.jsp	Attr 3 index=0	Smart Mode Score
A	0	0	1	001
B	1	1	0	110 (Best Match)

Link	Attr 1 text=Search	Attr 2 href=search.jsp	Attr 3 index=0	Smart Mode Score
C	1	0	0	100
D	0	1	0	010

Logical operators (AND, OR) in the XPath are ignored when Smart Match is enabled during playback. In Smart Match mode, all attributes are matched as one group in left-highest priority.

When Smart Match is disabled, you can use single or mixed Logical operators (AND, OR) and Parentheses. You can specify required attributes by using the Logical AND operator. All attributes joined together using the Logical OR operator are optional. The AND operator has a higher priority than the OR operator when both operators are used in a single XPath. Parenthetical groups of attributes are also permitted. For example:

```
/web:a[@text='Search' AND (@alt='Find' OR @title='Find')]
```

In this XPath, the text attribute is required, and the alt and title attributes are ranked using the Smart Match ranking system.

You can turn on/off Smart Mode for an individual action(s) by using the `getSettings().set()` API.

2.4.3.2 Browser

This section lets you specify the browser settings for functional tests.

Hide browser during playback: Specifies if the browser appears or is hidden during script playback. However, the browser will be changed to be visible automatically when focus is set to an element inside of that browser by a mouse click or key press event.

Close browser after playback: Specifies if the browser automatically closes after playback.

2.4.4 HTTP Preferences

This category lets you specify HTTP playback preferences. The resulting dialog box displays the following sections and fields:

2.4.4.1 Proxy

This section lets you specify HTTP playback preferences and displays the following fields:

Proxy Host: Specifies the host name of the proxy server.

Proxy Port: Specifies the port to use on the proxy server.

Username: Specify the user name to use for authentication.

Password: Specify the password to use for authentication.

Non-Proxy Hosts: Specifies the host name of the non-proxy servers.

2.4.4.2 Compression

This section lets you specify specifies the default HTTP compression playback settings.

Enable GZIP: When selected, the GZIP compression format is enabled.

Enable Deflate: When selected, deflate is enabled.

2.4.4.3 Headers

This section specifies the default HTTP header playback settings.

Browser Emulation: Specifies which browser to emulate for script playback. The Default is the recorded browser.

Language: Specifies which language to use for script playback. The default is English.

HTTP Version: Specifies which HTTP version to use for script playback.

Accept String: Specifies the Accept string to use in the Request header for script playback.

2.4.4.4 Connections

This section specifies the default HTTP playback connections settings.

Enable Keep Alive: When selected, keep alive is enabled.

Max Number of Keep Alive Requests: Specifies the maximum number of requests to make on a keep alive connection before closing it or select Unlimited for an unlimited number.

Max HTTP Connections Per User: Specifies the maximum number of server connections per process per server. Each VU makes multiple connections to request additional resources for images and additional frames for example. Setting this option specifies a limit on the total number of connections that the VUs can make to the server. The default setting is 'Default', which means use the default connection limits as configured on the agent machine. (See Microsoft KBBase article Q183110 for more information.)

2.4.4.5 SSL

This section specifies the default HTTP playback Secure Sockets Layer (SSL) settings.

SSL Version: Specifies the SSL version to use.

2.4.4.6 Other

This section specifies the default miscellaneous HTTP playback settings.

Do not request URLs ending in: Specifies the URLs that will not be requested when the URL ends with one of the specified patterns or file types. Specify the ending pattern or file type separated by commas.

Cache Emulation: Specifies the type of user to simulate. This is useful for simulating different profiles of virtual users. A first time user places more of a load on the Web server because pages and image are not yet cached. A repeat user places less of a load on the server as only newer pages are requested and brought down from the Web server. There are three options:

- **Do Not Cache:** cache is not used. When using WinInet, selecting **Do Not Cache** has the same effect as selecting **1st Time** as the Cache Emulation method. In this case, document cache is not created and not cleared.
- **1st Time User:** The virtual users are considered to be using the Web site or application for the first time for each iteration so no cache is used. The cache is used during the iteration.
- **Repeat User:** The virtual users are considered to have visited or used the Web site or application previously. Pages and images are retrieved from the cache.

Enable Cookies: When selected, the virtual user profiles will use cookies. Use this setting if your Web application uses cookies to manage session and other context information.

Download Local Files: When selected, the Java Agent retrieves the requested local file contents.

Preserve Cookies between iterations: Used to preserve or automatically clear cookies added to the browser in the **Run** section between successive iterations of the **Run** section.

- Cookies added to the browser in the **Initialize** section will be preserved forever, unless explicitly removed in script code.
- Cookies added to the browser in the **Run** section will always be preserved between the final iteration of the **Run** section and the **Finish** section.

Preserve Connections Between Iterations: Used to preserve connections between OpenScript and the browser between successive iterations of the script.

Max Content Size (KB): Specifies the maximum number of KB to download from a server for a given request.

Socket Timeout: Specifies the maximum number of seconds to wait for a socket connection before timing out.

2.4.5 Oracle EBS/Forms Functional Test Preferences

This category lets you specify playback preferences for Oracle EBS/Forms Functional Tests. The resulting dialog box displays the following sections and fields:

2.4.5.1 Event Timeout

This section lets you specify the default forms event timeout setting.

Forms Startup Timeout: Specifies the maximum number of seconds OpenScript should wait for a form to appear before considering the form not found. This is the default timeout when waiting for a form to appear before invoking an action against it. This is also the default timeout when waiting for a form to appear before continuing the script.

Forms Action Timeout: Specifies the maximum number of seconds OpenScript should wait for forms action playback until success.

Forms Response Timeout: Specifies the maximum number of seconds OpenScript should wait for forms response before timing out.

2.4.5.2 Miscellaneous

This section lets you specify screenshot capture preferences.

Capture screenshots: Specifies the amount of time to wait before capturing a screenshot of the page.

2.4.6 Oracle EBS/Forms Load Test Preferences

This category lets you specify playback preferences for Oracle EBS/Forms Load Tests. The resulting dialog box displays the following sections and fields:

2.4.6.1 Miscellaneous

This section lets you specify playback log preferences.

Capture Playback Log: Specifies if forms message logs are captured during playback. The captured log messages appear in the Console view. Message playback logs can be used to compare the recorded vs. played back forms messages to troubleshoot script problems. Select a result in the Results view and compare the recorded vs. playback messages in the Comparison tab of the Details view.

2.4.7 Shared Data Service Preferences

This category lets you specify playback preferences for the agent Shared Data Service. The resulting dialog box displays the following fields:

OATS Credential: Specifies the authentication credentials to use to establish the communication between the shared queue and the Virtual User.

- **Address:** Specifies the address of the Oracle Load Testing for Web Application server to use for the shared data service.
- **User name:** Specifies the user name to use for authentication. The default name is `oats` unless changed in the Oracle Application Testing Suite configuration.
- **Password:** Specifies the password to use for authentication. This should be the same password specified in the Encryption setting of the General preferences if the **Encrypt script data** setting is selected.

Actions on Shared Data: Specifies actions on shared data.

- **Timeout:** Specifies the maximum number of seconds to wait for actions on shared data to occur before timing out.

2.4.8 Web Functional Test Preferences

This category lets you specify the default preferences for Web Functional Test script playback. The resulting dialog box displays the following sections and fields:

2.4.8.1 Object Timeout

This section lets you specify the default object playback timeout setting.

Timeout(S): Specifies the maximum number of seconds OpenScript should wait for an object to appear before considering the object not found. This is the default timeout when waiting for an object to appear before invoking an action against it. This is also the default timeout when waiting for an object to appear before continuing the script.

You can override individual object wait timeouts in `waitForPage()` or `object.waitFor()` by editing their "timeout" properties. Action timeouts cannot be overridden.

2.4.8.2 Miscellaneous

This section lets you specify the default playback settings.

Capture HTML: When selected, the page HTML will be captured.

Capture ScreenShot: When selected, a screen image of the page will be captured.

Capture URLs: When selected, the page URL will be captured.

Capture Frames: When selected, the HTML frames on the page will be captured.

Clear cookies between iterations: When selected, cookies are cleared from cache between playback iterations.

Clear cache between iterations: When selected, pages are cleared from cache between playback iterations.

Clear cookies before playing back: When selected, cookies are cleared from cache before playback.

Clear cache before playing back: When selected, pages are cleared from cache before playback.

2.4.8.3 Capture Screenshot Interval

This section lets you specify the default screen capture delay setting.

Delay time for capture screenshot: Specifies the amount of time to wait before capturing a screenshot of the page.

2.4.8.4 Object Tests

This section lets you specify the default date format.

Date Format: Specifies the month, day, year, and time format. The Date Pattern follows standard Java SimpleDateFormat string conventions. The default value is `MMM d, YYYY h:mm:ss a` (month, day, year, hour, minutes, seconds, am/pm).

2.5 Record Category

This category lets you specify recording preferences.

2.5.1 HTTP Preferences

This dialog box lets you specify recording preferences for the HTTP module. The resulting dialog box displays the following sections and fields:

2.5.1.1 General

This tab lets you specify the general browser recorder settings.

Setup: Specifies the network settings for proxy recording.

- **Network Interface:** Enter or select the network IP address of the proxy server.
- **Port:** Specify the port to use on the proxy server.
- **Additional Arguments:** Specify any additional command line arguments to use when starting the proxy server.
- **Maximum Download Size (MB):** Specify the file size for file downloads.

Client-Side Digital Certificate File: Enter the name of a .PFX-formatted digital certificate file or use the **Browse** button to select a file.

- **File:** Specifies the name of the setup file. Enter the name or use the **Browse** to select the file from a drive and directory location.
- **Choose above pfx file to store:** Specifies the private-key password defined for the client certificate PFX file when the certificate was exported from Internet Explorer. Click **Store** and enter the private-key password for the client certificate.

SSL Version: Specifies the SSL version to use.

- **SSL Version:** Select SSL version to use for the proxy server.

Close browser when stopping recorder: Specify the browser options that will be used during HTTP recording.

- **Close browser:** When selected, the browser closes automatically when recording is stopped.

Always Launch a new browser when starting recorder: Specify the browser options that will be used during HTTP recording.

- **Launch browser:** When selected, the browser launches automatically when recording is started.

Error Handling: Specify the error handling options that will be used during HTTP recording.

- **Record navigations that return error code 404:** When selected, the HTTP recorder records navigations that return a Server Status Code 404: Not Found.

2.5.1.2 Proxy Settings

This tab lets you specify the default Proxy recorder settings.

Chain Proxy: Specifies if the OpenScript proxy is chained to another proxy.

- **Use browser's proxy:** When selected, the HTTP recorder uses the proxy configuration specified by the browser.
- **Use specified proxy:** When selected, OpenScript uses the specified proxy.
 - **Use proxy configuration script:** When selected, the specified configuration scripts will be used.
 - **Address:** Specify the URL to the JavaScript file containing the FindProxyForURL JavaScript function supplied by the system administrator for the intranet environment.
 - **Use proxy server:** When selected, the specified proxy server will be used.
 - **Address:** specify the network IP address of the proxy server to which to chain the OpenScript proxy.
 - **Port:** Specify the port to use on the chained proxy server.

Proxy Authentication: Specifies the log in credentials for authentication.

- **Username:** Specify the user name to use for authentication.
- **Password:** Specify the password to use for authentication.

2.5.1.3 URL Filters

This tab lets you specify the URL filters.

Name: Shows the name(s) of the defined filters. Select the checkbox to enable the filter. Clear the checkbox to disable the filter.

Pattern: Shows the pattern(s) specified for the defined filters.

Match by: Shows the match setting(s) (Content Type or URL) specified for the defined filters.

Add: Opens a dialog box for specifying a URL filter.

Edit: Opens a dialog box for editing the selected URL filter.

Delete: Deletes the selected URL filter.

2.5.2 Oracle EBS/Forms Functional Test Preferences

This dialog box lets you specify recording preferences for the Oracle Forms Functional Test module. The resulting dialog box displays the following sections and fields:

2.5.2.1 General

This tab lets you specify the general browser recorder settings.

Miscellaneous: Specifies if screenshots are captured.

- **Capture screenshots:** When selected, screenshots are captured during recording.

2.5.2.2 Object Identification

This tab lets you specify the Oracle Forms object identification attributes.

Name: Shows the name(s) of the defined Oracle Forms object identifiers.

Attributes: Shows the pattern(s) specified for the defined Oracle Forms object identifiers.

Add: Opens a dialog box for specifying a new Oracle Forms object identifier.

Edit: Opens a dialog box for editing the selected Oracle Forms object identifier.

Delete: Deletes the selected Oracle Forms object identifier.

2.5.3 EBS/Forms Load Test Preferences

This dialog box lets you specify recording preferences for the Oracle Forms Load Test module. The resulting dialog box displays the following section and fields:

2.5.3.1 General

This tab lets you specify the general preferences for EBS/Forms load tests scripts.

Applet Parameters: Specifies the Forms Applet Class property to use to record Forms applications.

- **EBS Forms:** When selected, the OpenScript Applet Class property `oracle.forms.engine.main` is used to record EBS/Forms applications.
- **Custom Forms:** When selected, the specified Applet Class property is used to record custom non-Web deployed Forms applications.

2.5.4 Siebel Functional Test Preferences

This dialog box lets you specify recording preferences for the Siebel Functional Test module. The resulting dialog box displays the following section:

2.5.4.1 Object Identification

This tab lets you specify the Siebel object identification attributes.

Name: Shows the name(s) of the defined Siebel object identifiers.

Attributes: Shows the pattern(s) specified for the defined Siebel object identifiers.

Add: Opens a dialog box for specifying a new Siebel object identifier.

Edit: Opens a dialog box for editing the selected Siebel object identifier.

Delete: Deletes the selected Siebel object identifier.

2.5.5 Web Functional Test Preferences

This dialog box lets you specify recording preferences for the Web Functional Test module. The resulting dialog box displays the following sections and fields:

2.5.5.1 General

This tab lets you specify the general Web Functional test recorder settings.

Browser: Specify the browser options that will be used during Web Functional test recording.

- **Always launch a new browser when recording a different script:** When selected, a new instance of the Internet Explorer browser is launched for each new script recording. When cleared, a new browser is launched only for the first script recording of the OpenScript session. The general case is to launch a new browser instance for each specific script. However, when chaining scripts using a shell script where each script needs to use the same instance of the browser, clearing this setting will cause subsequent scripts recordings to use the same browser instance as the first recording.

Miscellaneous: Specifies the miscellaneous record settings.

- **Capture screenshots:** When selected, screen images are captured during recording.
- **Capture HTML:** When selected, page source HTML is captured during recording.
- **Capture URLs:** When selected, the page URL will be captured.
- **Capture Frames:** When selected, the HTML frames on the page will be captured.
- **Ignore Auto Page:** When selected, server-side auto pages are ignored during recording.
- **Action Cache Interval(s):** Specifies how often to cache page actions during recording. The following cases are determined by this setting:

If while recording, the text on the same Web page element is changed within the Action Cache Interval time setting, the previously recorded value will be replaced by the changed value. In the Java code, the `setText` action will be replaced with the changed value.

If while recording, a browser window closes within the Action Cache Interval after a user performs an action on a web page (for example, a button click) the window close event will not be recorded, as the window close event is considered to be caused by the previously performed action.

2.5.5.2 Object Identification

This tab lets you specify recording preferences for the Web Functional Test module.

Name: Shows the name(s) of the defined Web object identifiers.

Attributes: Shows the pattern(s) specified for the defined Web object identifiers.

Add: Opens a dialog box for specifying a new Web object identifier.

Edit: Opens a dialog box for editing the selected Web object identifier.

Delete: Deletes the selected Web object identifier.

2.5.6 Web Services Preferences

This tab lets you specify recording preferences for the Web Services module. The resulting dialog box displays the following sections and fields:

2.5.6.1 General

This tab lets you specify the general browser recorder settings.

Request Timeout: Specifies the amount of time in seconds to wait for a response to a request before timing out.

Generate default values for requests: When selected, the OpenScript XML parser generates the specified values for the primitive data types by default. The values may be empty. (For other Axis or Oracle parsers the parameters of the methods must be specified.)

- **xsd:string:** Specifies the default value for String data type parameters.
- **xsd:int:** Specifies the default value for Integer data type parameters.
- **xsd:long:** Specifies the default value for Long data type parameters.
- **xsd:float:** Specifies the default value for Float data type parameters.
- **xsd:double:** Specifies the default value for Double data type parameters.
- **xsd:boolean:** Specifies the default value for Boolean data type parameters.

2.5.6.2 Parser Tools

This tab lets you specify additional Apache AXIS parsers to use with the Web Services module.

Apache AXIS 1.X: Specifies the root folder of the Apache AXIS 1.X implementation of the SOAP ("Simple Object Access Protocol") parser. Download "AXIS 1.4 Final" binary ZIP file (axis-bin-1_4.zip) from <http://ws.apache.org/axis/>, unpack the zip file, and then specify the AXIS 1.X root folder using the **Browse** button.

Apache AXIS 2: Specifies the root folder of the Apache AXIS 2 implementation of the SOAP ("Simple Object Access Protocol") parser. Download the AXIS 2 Standard Binary Distribution ZIP file (axis2-1.3-bin.zip) from <http://ws.apache.org/axis2/>, unpack the zip file, and specify the AXIS 2 root folder using the **Browse** button.

2.5.6.3 Proxy Configuration

This tab lets you specify the proxy configuration to use with the Web Services module. The Web Services module uses the integrated HTTP Proxy recorder to record SOAP/HTTP protocol requests. Specify the proxy settings for the parsers to be able to parse the internet WSDL file from an internal network.

Automatic configuration: Specifies if an automatic configuration script should override the proxy server settings.

- **Automatically detect browser's automatic configuration script:** When selected, the proxy recorder automatically detects the automatic configuration script specified in the browser's Local Area Network (LAN) connection settings.
- **Use automatic configuration script:** When selected, the proxy recorder uses the automatic configuration script specified in the **Address** field.
 - **Address:** Specifies the URL of the automatic configuration script to use.

Proxy server: Specifies a proxy server to use for Web Services recording.

- **Use a proxy when downloading wsdl file:** When selected, the proxy recorder uses the specified proxy server settings.
 - **Address:** Specifies the URL of the proxy server to use.
 - **Port:** Specifies the port number to use.
 - **Username:** Specifies the username to use for authentication on the proxy server.
 - **Password:** Specifies the password to use for authentication on the proxy server.

2.6 Step Group Category

This category lets you specify script step group creation, naming, and numbering preferences. Step groups allow you to optionally organize your OpenScript script commands into logical groupings based on the type of script you are creating. If step groups are enabled during recording, your script commands will be listed within a step group node (or sections) in the tree view (or code view) of the script. Step groups can also be added or modified manually or completely disabled if you prefer not to use them.

2.6.1 Basic Module Preferences

This dialog box lets you specify how step groups are created. The resulting dialog box displays the following options:

Step Creation: Specifies if step groups are created or not by default during script recording.

- **Based on time threshold:** When selected, step groups are created based upon the specified recording time interval threshold. Specify the **Threshold** time value in seconds. Script commands that occur within the specified time interval relative to each other, will be organized into the same step group. For example, if a user performs multiple actions on a page within the specified time interval would result in those action commands being grouped into the same step group. This may be useful for grouping commands into step groups for AJAX applications where full Web page transitions may not occur which would allow you to group commands by page.
- **Do not create steps:** When selected, step groups will not be created automatically during script recording.

Step Naming: Specifies if step groups are named or not by default during script recording. Step names will be displayed in the step nodes of the tree view and also shown in the code view. Step names can also be edited manually in either view.

- **Do not name steps:** When selected, step groups will not be named automatically during script recording.

Step Numbering: Specifies if step groups are numbered or not by default during script recording.

- **Auto number:** When selected, step groups are numbered sequentially starting with step 1.
- **Do not number steps:** When selected, step groups will not be numbered automatically during script recording.

2.6.2 HTTP Preferences

This dialog box lets you specify how step groups are created, named, and numbered for HTTP scripts. See the Basic module Step Group preferences on page 2-18 for additional information. The resulting dialog box displays the following options:

Step Creation: Specifies if step groups are created or not by default during script recording.

- **Based on time threshold:** When selected, step groups are created based upon the specified recording time threshold. Specify the Threshold time value in seconds.
- **Do not create steps:** When selected, step groups will not be created automatically during script recording.

Step Naming: Specifies if step groups are named or not by default during script recording.

- **By page title:** When selected, step groups include the title of the web page.
- **Do not name steps:** When selected, step groups will not be named automatically during script recording.

Step Numbering: Specifies if step groups are numbered or not by default during script recording.

- **Auto number:** When selected, step groups are numbered sequentially starting with step 1.
- **Do not number step:** When selected, step groups will not be numbered automatically during script recording.

2.6.3 Oracle EBS/Forms Functional Test Preferences

This dialog box lets you specify how step groups are created for EBS Forms Functional Tests. See the Basic module Step Group preferences on page 2-18 for additional information. The resulting dialog box displays the following options:

Step Creation: Specifies if step groups are created or not by default during script recording.

- **Based on time threshold:** When selected, step groups are created based upon the specified recording time threshold. Specify the **Threshold** time value in seconds.
- **Forms Functional Test:** When selected, step groups will be created based on the windows in which the actions occur. Groups are created whenever a Window Activate action is recorded.
- **Web Functional:** When selected, step groups are created based upon the loading of a new Web page being loaded in the browser. When a new page is finished loading, the page and subsequent user actions performed on that page prior to the next page load will be grouped into the same step group.
- **Do not create steps:** When selected, step groups will not be created automatically during script recording.

Step Naming: Specifies if step groups are named or not by default during script recording.

- **Forms Functional Test:** When selected, step groups will be named the same as the window titles. Groups will be named the same as the window that is active.
- **Web Functional:** When selected, step groups are named based upon the title of the Web page as defined in the HTML <Title> tag for the main page and the page URL

will also be shown in parentheses in the step group name, If a title is not specified then the step group will be named "No Title" but the URL will still be displayed.

- **Do not name steps:** When selected, step groups will not be named automatically during script recording.

Step Numbering: Specifies if step groups are numbered or not by default during script recording.

- **Auto number:** When selected, step groups are numbered sequentially starting with step 1.
- **Do not number steps:** When selected, step groups will not be numbered automatically during script recording.

2.6.4 Oracle EBS/Forms Load Test Preferences

This dialog box lets you specify how step groups are created for EBS Forms Load Tests. See the Basic module Step Group preferences on page 2-18 for additional information. The resulting dialog box displays the following options:

Step Creation: Specifies if step groups are created or not by default during script recording.

- **Based on time threshold:** When selected, step groups are created based upon the specified recording time threshold. Specify the **Threshold** time value in seconds.
- **Oracle EBS/Forms Load:** When selected, step groups will be created based on the windows in which the actions occur. Groups are created whenever a Window Activate action is recorded.
- **Do not create steps:** When selected, step groups will not be created automatically during script recording.

Step Naming: Specifies if step groups are named or not by default during script recording.

- **By page title:** When selected, step groups are named based upon the title of the Web page as defined in the HTML <Title> tag for the main page and the page URL will also be shown in parentheses in the step group name. If a title is not specified then the step group will be named "No Title" but URL will still be displayed.
- **Oracle EBS/Forms Load:** When selected, step groups will be named the same as the window titles. Groups will be named the same as the window that is active.
- **Do not name steps:** When selected, step groups will not be named automatically during script recording.

Step Numbering: Specifies if step groups are numbered or not by default during script recording.

- **Auto number:** When selected, step groups are numbered sequentially starting with step 1.
- **Do not number steps:** When selected, step groups will not be numbered automatically during script recording.

2.6.5 Siebel Functional Test Preferences

This dialog box lets you specify how step groups are created for Siebel Functional Tests. See the Basic module Step Group preferences on page 2-18 for additional information. The resulting dialog box displays the following options:

Step Creation: Specifies if step groups are created or not by default during script recording.

- **Based on time threshold:** When selected, step groups are created based upon the specified recording time threshold. Specify the **Threshold** time value in seconds.
- **Web Functional:** When selected, step groups are created based upon the loading of a new Web page being loaded in the browser. When a new page is finished loading, the page and subsequent user actions performed on that page prior to the next page load will be grouped into the same step group.
- **Do not create steps:** When selected, step groups will not be created automatically during script recording.

Step Naming: Specifies if step groups are named or not by default during script recording.

- **Siebel Functional:** When selected, step groups will be named based upon the Siebel URL pattern. OpenScript uses a heuristic to evaluate the recorded URL of pages to determine a meaningful title.
- **Web Functional:** When selected, step groups are named based upon the title of the Web page as defined in the HTML <Title> tag for the main page and the page URL will also be shown in parentheses in the step group name, If a title is not specified then the step group will be named "No Title" but the URL will still be displayed.
- **Do not name steps:** When selected, step groups will not be named automatically during script recording.

Step Numbering: Specifies if step groups are numbered or not by default during script recording.

- **Auto number:** When selected, step groups are numbered sequentially starting with step 1.
- **Do not number steps:** When selected, step groups will not be numbered automatically during script recording.

2.6.6 Siebel Load Test Preferences

This dialog box lets you specify how step groups are created, named, and numbered for Siebel scripts. See the Basic module Step Group preferences on page 2-18 for additional information. The resulting dialog box displays the following options:

Step Creation: if step groups are created or not by default during script recording.

- **Based on time threshold:** When selected, step groups are created based upon the specified recording time threshold. Specify the Threshold time value in seconds.
- **Do not create steps:** When selected, step groups will not be created automatically during script recording.

Step Naming: Specifies if step groups are named or not by default during script recording.

- **By Siebel URL Pattern:** When selected, step groups will be named based upon the Siebel URL pattern. OpenScript uses a heuristic to evaluate the recorded URL of pages to determine a meaningful title.
- **By page title:** When selected, step groups include the title of the web page.
- **Do not name steps:** When selected, step groups will not be named automatically during script recording.

Step Numbering: Specifies if step groups are numbered or not by default during script recording.

- **Auto number:** When selected, step groups are numbered sequentially starting with step 1.
- **Do not number step:** When selected, step groups will not be numbered automatically during script recording.

2.6.7 Web Functional Test Preferences

This dialog box lets you specify how step groups are created for Web Functional Tests. See the Basic module Step Group preferences on page 2-18 for additional information. The resulting dialog box displays the following options:

Step Creation: Specifies if step groups are created or not by default during script recording.

- **Based on time threshold:** When selected, step groups are created based upon the specified recording time threshold. Specify the **Threshold** time value in seconds.
- **Web Functional:** When selected, step groups are created based upon the loading of a new Web page being loaded in the browser. When a new page is finished loading, the page and subsequent user actions performed on that page prior to the next page load will be grouped into the same step group.
- **Do not create steps:** When selected, step groups will not be created automatically during script recording.

Step Naming: Specifies if step groups are named or not by default during script recording.

- **Web Functional:** When selected, step groups are named based upon the title of the Web page as defined in the HTML <Title> tag for the main page and the page URL will also be shown in parentheses in the step group name. If a title is not specified then the step group will be named "No Title" but the URL will still be displayed.
- **Do not name steps:** When selected, step groups will not be named automatically during script recording.

Step Numbering: Specifies if step groups are numbered or not by default during script recording.

- **Auto number:** When selected, step groups are numbered sequentially starting with step 1.
- **Do not number steps:** When selected, step groups will not be numbered automatically during script recording.

2.7 Setting Project Preferences

To set Project preferences:

1. Start OpenScript.
2. Switch to the Developer Perspective.
3. Select **Preferences** from the **Window** menu.
4. Expand the desired node and select the Preferences category.
5. Specify the preferences as necessary for the selected category.

Creating and Modifying Scripts

This chapter explains the procedures for creating and modifying basic scripts in OpenScript. The module chapters provide additional information about creating scripts using the features and capabilities provided within specific modules.

3.1 Creating Repositories and Workspaces

Repositories and workspaces store project related script files and results log files. You can use repositories and workspaces to organize your various testing projects. OpenScript lets you create multiple workspaces. You can create repositories to organize the storage of your script projects.

A repository is the directory location where you store workspaces. Workspaces are user-specified subdirectories of the repository. OpenScript automatically appends an exclamation point to the directory name to identify the directory as a Workspace directory.

When you record and save scripts, or play back a script and save the log file, OpenScript stores the script or log file in the specified Workspace.

OpenScript initially uses the default Oracle Functional Testing for Web Applications repository and workspaces (C:\OracleATS\OFT). You can create your own repositories and workspaces using OpenScript.

3.1.1 Creating a Repository

To create a repository:

1. Select **OpenScript Preferences** from the **View** menu.
2. Expand the OpenScript node.
3. Expand the General node.
4. Select the Repository node.
5. Click **Add**.

This dialog box lets you specify the name and location of the repository to use to store script files.

6. Enter a repository name. The name is required.

Name: Enter any name to identify the repository.

7. Enter the drive and directory location or click **Browse** to select the location to use for the repository.

Location: Enter the drive and directory path to the repository or use the Browse button to select a location. The location must be a valid drive and directory path.

8. Click **OK** to add the new repository to the list of repositories.
9. Click **OK** to close the preferences.

When you create new a script project, you can select the repository to use to store the project.

3.1.2 Managing Repositories

To add, edit, or delete repositories:

1. Select **Manage Repositories** from the **Tools** menu.
2. Select the repository where you want to create the workspace.
3. Click the **Add**, **Edit** or **Delete** buttons to manage repositories.
4. Click **Close** when finished.

3.1.3 Managing Workspaces

When starting a new testing project, you should create a project-specific Workspace to store related files.

To create, rename, or delete workspaces:

1. Select **Manage Workspaces** from the **Tools** menu. OpenScript opens a dialog box for managing Workspaces.
2. Select the repository where you want to create the workspace.
3. Click **New**, **Rename**, or **Delete** buttons to manage workspaces.
4. Click **Close** when finished.

3.1.4 Managing Scripts

To rename or delete scripts:

1. Select **Manage Scripts** from the **Tools** menu.
2. Select the script.
3. Click the **Rename** or **Delete** buttons to manage script files.
4. Click **Close** when finished.

3.2 Creating a Script Project

You must create a script project to generate the basic structure that you can then customize.

To create a script project:

1. Select **New** from the **File** menu.
2. Expand a group node and select the type of script to create:

Functional Testing (Browser/GUI Automation): The Functional Testing group contains the following script types:

- **Oracle EBS/Forms:** This option lets you create a new script for automated functional testing of Oracle E-Business Suite and other applications that utilize Web and Oracle Forms components at the browser/gui level. The resulting script will contain the Initialize, Run, and Finish nodes. The Run node will contain recorded Web navigations based upon the defined Step Group preferences and the Web navigations and Forms actions performed during recording. You can edit the script tree or Java code to customize the script.
- **Siebel:** This option lets you create a new script for automated functional testing of Siebel applications that utilize Siebel High Interactivity and Standard Interactivity/Web controls at the browser/gui level. The resulting script will contain the Initialize, Run, and Finish nodes. The Run node will contain recorded Web navigations based upon the defined Step Group preferences and the Web navigations performed during recording. You can edit the script tree or Java code to customize the script.
- **Web:** This option lets you create a new script for automated functional testing of Web applications at the browser/gui level. The resulting script will contain the Initialize, Run, and Finish nodes. The Run node will contain recorded Web navigations based upon the defined Step Group preferences and the Web navigations performed during recording. You can edit the script tree or Java code to customize the script.

General: The General group contains the following script types:

- **Java Code Script:** This option lets you create a new automated test script using your own custom Java code through the OpenScript Eclipse IDE. A basic script structure contains only the Initialize, Run, and Finish nodes. You can edit the script tree or Java code to develop your own custom script.
- **Web Services:** This option lets you create the basic structure of a Web Services script a new script for automated testing of Web Services at the SOAP/HTTP protocol level. A Web Services script structure contains only the Initialize, Run, and Finish nodes. You can use the WSDL Manager to add WSDL files and edit the script tree or Java code to customize the script. If you have a Web Services client application written already that communicates over HTTP and which communicates through a proxy, you can record the traffic using the OpenScript HTTP recorder.

Load Testing (Protocol Automation): The Load Testing group contains the following script types:

- **Oracle EBS/Forms:** This option lets you create a new script for load testing of Oracle E-Business Suite and other applications that utilize HTTP and Oracle Forms (NCA) protocols at the protocol level. The resulting script will contain the Initialize, Run, and Finish nodes. The Run node will contain recorded HTTP protocol navigations based upon the defined Step Group preferences and the navigations and Forms protocol for actions performed during recording. You can edit the script tree or Java code to customize the script.
- **Siebel** This option lets you create a Siebel script structure of a new OpenScript script project. A Siebel script lets you record Siebel Web navigations using a browser for load testing Siebel applications. The resulting script will contain the Initialize, Run, and Finish nodes. The Run node will contain recorded HTTP protocol navigations based upon the defined Step Group preferences and the Web and Siebel navigations performed during recording. You can edit the script tree or Java code to customize the script.
- **Web/HTTP** This option lets you create a new script for load testing of Web Applications at the HTTP protocol level. The resulting script will contain the

Initialize, Run, and Finish nodes. The Run node will contain recorded Web navigations based upon the defined Step Group preferences and the Web navigations performed during recording. You can edit the script tree or Java code to customize the script.

3. Click **Next**.
4. Select the Repository and workspace where you want to store the script project.
 - **Repository:** Specifies the repository where the script project will be saved. Select a repository from the list or click the New button to open the OpenScript repository preferences and create a new repository.
 - **Workspace:** Specifies the workspace within the repository where the script project will be saved. Select a workspace from the list or click the New button to open a dialog box for creating a new workspace.

The New Workspace dialog box lets you specify a new OpenScript workspace.

 - **Name:** Specifies the name of the new workspace.
5. Enter a script name.
 - **Script:** Specify a name for the script project. The script name is required and must be unique.
 - **Existing Scripts:** List the names of the existing scripts in the workspace.
6. Click **Finish**. For Java Code Scripts, a basic script tree will be created in the script view. You can edit the Java code in the code view. For module scripts, a script tree will be created in the script view. After you record the script, the tree view will contain the navigations and actions depending upon the type script.

3.2.1 Opening Existing Scripts

For existing scripts, the file concurrency control prevents multiple users from editing the same script. If you try to open a script that is in use by another user, the script copy wizard opens and you will be asked if you want to make a copy of the script and additional files.

3.3 Modifying Scripts

Once you have created a script project, you can customize the script for your specific testing purposes using the available menu options or editing your own code in the Java Code view.

3.3.1 Adding Step Groups to a Script

Step groups provide a way to group multiple procedures into a single reporting step.

To add a manual step group to a script:

1. Open or create a script project.
2. Select the script node where you want to add the step group.
3. Select the **Script** menu and then select **Step Group** from the **Add** sub menu.

This dialog box lets you specify or modify a step group node in a script tree.
4. Enter a name for the Step Group.

Title: Specify the title text of the step group. The title text will appear in the script tree.

5. Enter any think time delay to add to the Step Group.

Think time: Specify the amount of time in milliseconds to use as a think time delay for the step group.

6. Click **OK**. The Step Group is added to the script tree.

To add a step groups to a script based upon preferences:

1. Open or create a script project.
2. Select **OpenScript Preferences** from the **View** menu.
3. Expand the OpenScript node.
4. Expand the Record node.
5. Select the Step Groups node.
6. Specify the step Group preferences and click **OK**.
7. Select **Create Step Groups** from the **Script** menu. The Step Groups will be automatically added to the script tree.
8. In the Java Code view, the step group consists of the code executed between `beginStep` and `endStep`:

```
beginStep("Step Group 1", 10);
{
    /**
     * Add code to be executed for the step group.
     */
    getLogger().info("Step Group 1");
}
endStep();
```

3.3.2 Adding a Delay to a Script

To add a delay to a script:

1. Open or create a script project.
2. Select the script node where you want to add the delay.
3. Select the **Script** menu and then select **Other** from the **Add** sub menu.
4. Expand the General node and select **Think Time**.

This dialog box lets you specify or modify a delay time in seconds.

5. Enter a valid integer to use as the think time in seconds.
6. Click **OK**. The Think node is added to the script tree.
7. In the Java Code view, the `think(time);` (the time is in seconds) statement will be added to the script code:

```
think(10.0);
```

3.3.3 Adding a Log Message to a Script

To add a log message to a script:

1. Open or create a script project.

2. Select the script node where you want to add the log message.
3. Select the **Script** menu and then select **Message** from the **Add** sub menu.
This dialog box lets you specify or modify a log message in a script tree.
4. Enter the message text.
Message: Specify the text of the log message. The text will appear in the Console view on script playback.
5. Click **OK**. The log message node is added to the script tree.
6. In the Java Code view, the `type("log message")` method will be added to the script code:

```
info("Message");  
warn("Message");  
fail("Message");
```

The log message text appears in the Console View when the script is played back.

3.3.4 Adding a For Statement to a Script

To add a For statement to a script:

1. Open or create a script project.
2. Select the script node where you want to add the For statement.
3. Select the **Script** menu and then select **Other** from the **Add** sub menu.
4. Expand the Control Statements node and select **For**.
This dialog box lets you specify or modify the For statement loop count.
5. Enter a valid integer to use as the loop count.
Loop Count: Specify the number of times to loop though the For statement.
6. Click **OK**. The For node is added to the script tree.
7. In the Java Code view, the `for (int i=0; i < loop count; i++)` statement will be added to the script code:

```
for (int i=0; i < 10; i++)
```

3.3.5 Adding a Function to a Script

You can add your own custom functions to your script and specify the arguments to pass to the function.

To add a function to a script:

1. Create a script project.
2. Record a complete script.
3. Select the **Run** node in the script tree.
4. Select the **Script** menu and then select **Other** from the **Add** sub menu.
5. Expand the General node and select **Function**.
This dialog box lets you specify a custom function name with multiple arguments.
Name: Specifies the name of the custom function. Click **Add** to define the names and data type of an argument.

Argument: Lists the defined function arguments for the custom function.

Type: Lists the data type for the defined argument for the custom function.

Add: Opens a dialog box for defining a new argument for the custom function.

Edit: Opens a dialog box for editing the selected argument.

Delete: Removes the selected argument from the list.

Up: Moves the selected argument up one place in the list.

Down: Moves the selected argument down one place in the list.

6. Enter the function name.

7. Click **Add**.

This dialog box lets you specify a custom function argument to use to pass data to the function.

Name: Specify a name of the custom function argument (you may want to include the data type in the argument name so that it is indicated in the Substitute Variable list).

Type: select the data type: String, Integer, Double, Long, or Boolean.

8. Enter an argument name.

9. Select the data type for the argument.

10. Click **OK**.

11. Click **Add** and add more arguments or click **OK** to add the function to the script. The *function name* node is added to the script tree.

12. In the Java Code view, the `public void function name` statement will be added to the script code followed by the arguments with the data types:

```
public void MyFunction(@Arg("argString") String argString,
    @Arg("argInt") int argInt,
    @Arg("argDouble") double argDouble,
    @Arg("argLong") long argLong,
    @Arg("argBool") boolean argBool)
    throws Exception {
```

13. Add items into the Function. You can use the Tree View drag/drop or cut/paste features to move Tree View items to the function. You can use the Script **Add** option to add variable items to the function. You can also use the Code View to add custom code to the function.

To pass arguments into a function:

Define the variables to use to pass values to the custom function arguments somewhere in the script before where the Call Function statement will be placed in the script:

1. Select the script node where you want to add variables.

2. Select the **Script** menu and then select **Other** from the **Add** sub menu.

3. Expand the Variables node and select **Set Variable**.

This dialog box lets you define a variable in a script.

4. Enter the variable name and value.

- **Name:** Specify the name of the variable.

- **Value:** Specify the value to assign to the variable.
5. Enter a value or click the Substitute Variable icon to select a variable value to assign to the variable.
 6. Click **OK**.
 7. In the Java Code view, the `getVariables().set()` statement will be added to the script code followed by the variable name and value for each variable:

```
getVariables().set("MyString", "String");
getVariables().set("MyInt", "1");
getVariables().set("MyDouble", "1234");
getVariables().set("MyLong", "1234560");
getVariables().set("MyBool", "True");
```

The following is an example of a variable set to a Databank value:

```
getVariables().set("MyString", "{{db.customer.FirstName,String}}");
```

8. Select the Function node (your custom function name) in the script.
9. Select the **Script** menu and then select **Other** from the **Add** sub menu.
10. Expand the tree and select the item to add. For example **Message** under the General node or **Set Variable** under the Variables node.
11. Click the Substitute Variable icon to select a custom variable or function argument. The Select Variable tree lists the custom function with all of its defined arguments.
12. Select an argument for the custom function.
13. Click **OK**.
14. In the Java Code view, the message statement (`info`, `warn` or `fail`) or `getVariables().set()` statement will be added to the script code followed by the variable name and value for each variable:

```
public void MyFunction(@Arg("argString") String argString,
    @Arg("argInt") int argInt,
    @Arg("argDouble") double argDouble,
    @Arg("argLong") long argLong,
    @Arg("argBool") boolean argBool)
    throws Exception {
    info("{{arg.argString}}");
    getVariables().set("MyArgString", "{{arg.argString}}");
    getVariables().set("MyArgInt", "{{arg.argInt}}");
    getVariables().set("MyArgDouble", "{{arg.argDouble}}");
    getVariables().set("MyArgLong", "{{arg.argLong}}");
    getVariables().set("MyArgBool", "{{arg.argBool}}");
}
```

To call a custom function in a script:

1. Select the node in the script tree here you want to call the function.
2. Select the **Script** menu and then select **Other** from the **Add** sub menu.
3. Expand the General node and select **Call Function**.

This dialog box lets you specify a custom function to call and specify the argument values.

4. Enter the argument data to pass to the custom function or click the Substitute Variable icon to select a custom variable or databank variable.

- **Function:** Select the name of the custom function. The names of custom functions that were added to the script will appear in this list.
 - **Arguments:** A field for each custom function argument will appear for the selected function. Enter the argument value or click the Substitute Variable icon to select a custom variable or databank variable.
5. Click **OK**.
 6. In the Java Code view, the `callFunction` statement will be added to the script code followed by the function name and arguments as String data types:

```
callFunction("MyFunction", "MyStringArg");
```

To pass data types other than String, enclose a defined variable name in double curly braces as follows, `{{VarName}}`.

```
callFunction("MyFunction", "{{MyString}}", "{{MyInt}}", "{{MyDouble}}",
"{{MyLong}}", "{{MyBool}}");
```

3.3.6 Adding a Script to Run from a Script

To add a script to run to a script:

1. Open or create a script project.
2. Select the script node where you want to add the script to run.
3. Select the **Script** menu and then select **Other** from the **Add** sub menu.
4. Expand the **Expand the General** node and select **Run Script**.

This dialog box lets you specify the script to run from within another script.

5. Select or clear the **Use Absolute Path** option. If you select **Use Absolute Path**, select the path and script using **Browse** next to the **Script File** field and skip to Click **OK**. If you clear **Use Absolute Path** continue the remaining steps.

Use Absolute Path: When selected, the Script File field becomes enabled. Click **Browse** next to the Script File field to select the script path and file name.

6. Select the repository and workspace.

Repository: Lists the defined OpenScript repositories.

Workspace: Lists the defined OpenScript workspaces.

7. Select the script to run.

Script: Lists the available OpenScript scripts in the selected repository and workspace.

Script File: Specifies the absolute path and script name for a script when the **Use Absolute Path** option is selected. Click **Browse** to select the script path and file name.

8. Select or clear the **Sections of script to run** option.

Sections of script to run: Specifies which script sections to run during playback.

- **Initialize Section:** When selected, the code in the Initialize section of the selected script to run is executed during playback. When cleared, the code in the Initialize section is skipped.
- **Run Section:** When selected, the code in the Run section of the selected script to run is executed during playback. When cleared, the code in the Run section is skipped.

- **Finish Section:** When selected, the code in the Finish section of the selected script to run is executed during playback. When cleared, the code in the Finish section is skipped.
9. Click **OK**. The *script name* node is added to the script tree.
 10. In the Java Code view, the `runScript()` statement will be added to the script code:

```
runScript("repository", "workspace", "scriptName", initialize = true|false, run
= true|false, finish = true|false);
```

Example

```
runScript("Default", "Default", "fmstocks1", true, true, true);
```

3.3.7 Adding a Set Variable to a Script

To add a Set Variable to a script:

1. Open or create a script project.
2. Select the script node where you want to add the set variable.
3. Select the **Script** menu and then select **Other** from the **Add** sub menu.
4. Expand the Variable node and select **Set Variable**.

This dialog box lets you set a variable value in a script.

5. Enter the variable name and value.
 - **Name:** Specify the name of the variable.
 - **Value:** Specify the value to assign to the variable.
6. Click **OK**. The *Set variable = value* node is added to the script tree.
7. In the Java Code view, the `getVariables().set("variable name", "value");` method will be added to the script code:

```
getVariables().set("sVar_MyVar", "My_Value");
```

If you want to set the variable with a value from an Oracle Functional Testing for Web Applications transform variable (i.e. a variable value contained in `{{}}` syntax), use the `Transforms.transform` method with the `getVariables().set`, as follows (requires HTTP module):

```
http.solve("varTitle", "<TITLE>(.)</TITLE>", "Page Title Error", false,
Source.Html, 0);
```

```
getVariables().set("sVar_MyVar", Transforms.transform("{{varTitle}}",
getVariables()));
```

3.3.8 Adding Comments to Script Results

To add comments to script results:

1. Open or create a script.
2. Click the Code view tab.
3. Add comments or warnings using one of the following code examples:
 - Using a step group:

```
beginStep("Any comment string", 0);
{
//The comment string appears in the Name column of the Results view.
}
endStep();
```

- Using the `getStepResult().addComment` method:

```
//The comment string appears in the Summary column of the Results view
getStepResult().addComment("Any comment string");
```

- Using the `getStepResult().addWarning` method:

```
//The warning string appears in the Summary column of the Results view.
//addWarning overrides addcomment.
getStepResult().addWarning("Any warning string");
```

3.3.9 Adding Error Recovery to a Script

To add error recovery to a script:

1. Open or create a script project.
2. Select the script node where you want to add the log message.
3. Select the **Script** menu and then select **Other** from the **Add** sub menu.
4. Expand the General node and select **Error Recovery Action**.

Exception: Select the type of exception error. The list will vary depending upon the script type.

Action: Select the error recovery action: Fail, Warn or Ignore.

5. Click **OK**. The log message node is added to the script tree.
6. In the Java Code view, the `setErrorRecovery(scriptType.constant, ErrorRecoveryAction.action);` method will be added to the script code:

```
setErrorRecovery(BasicErrorRecovery.ERR_VARIABLE_NOT_FOUND,
ErrorRecoveryAction.Fail);
```

3.3.9.1 Script Types

The following are the possible values for *scriptType* in the Java code statements:

BasicErrorRecovery (Basic module)

FormsErrorRecovery (EBS/Forms Functional module)

FTErrorRecovery (Generic functional module)

HttpErrorRecovery (HTTP module)

NcaErrorRecovery (EBS/Forms Load module)

UtilitiesErrorRecovery (Generic Utilities)

WebErrorRecovery (Web Functional module)

3.3.9.2 Constants

The following are the possible values for *constant* in the Java code statements:

BasicErrorRecovery (Basic module)

ERR_VARIABLE_NOT_FOUND

ERR_CREATE_VARIABLE_ERRORCODE
 ERR_FILE_NOT_FOUND
 ERR_SEGMENT_PARSER_ERROR
 ERR_BINARY_DECODE
 ERR_ENCRYPTION_SERVICE_NOT_INITIALIZED
 ERR_GENERIC_ERROR_CODE

FormsErrorRecovery (EBS/Forms Functional module)

ERR_FORMS_FT_ERROR

FTErrorRecovery (Generic Functional Module)

ERR_FT_MATCH_ERROR
 ERR_OBJECT_TEST_ERROR
 ERR_TABLE_TEST_ERROR

HttpErrorRecovery (HTTP Module)

ERR_ZERO_LENGTH_DOWNLOAD
 ERR_MATCH_ERROR
 ERR_RESPONSE_TIME_ERROR
 ERR_SOLVE_ERROR
 ERR_HTML_PARSING_ERROR
 ERR_INTERNET_INVALID_URL
 ERR_INVALID_HTTP_RESPONSE_CODE
 ERR_KEYSTORE_LOAD_ERROR

NcaErrorRecovery (EBS/Forms Load Module)

CONNECT_ERROR
 MESSAGE_IO_ERROR
 CONTROL_INITIALIZE_ERROR

UtilitiesErrorRecovery (Generic Utilities)

ERR_SQL_EXECUTE_ERROR
 ERR_XML_PARSING_ERROR
 ERR_CSV_LOADING_ERROR

WebErrorRecovery (Web Functional module)

ERR_RESPONSE_TIME_ERROR
 ERR_WEBDOM_SOLVE_ERROR
 ERR_WAIT_FOR_PAGE_TIMEOUT_ERROR

3.3.9.3 Actions

The following are the possible values for *action* in the Java code statements:

Fail
 Ignore
 Warn

3.3.10 Chaining Multiple Scripts

You can run multiple scripts from within a single script to chain playback of scripts together.

The procedure involves the following major steps:

- Setting the browser preferences
- Recording scripts

- Creating a shell script

3.3.10.1 Setting the Browser Preferences

The browser preferences specify if a new browser will launch when recording a different script. Because the navigation sequence between multiple scripts is important, the same instance of the browser should run all scripts if the scripts are a continuation of each other. If each script is self-contained and there is no navigation between scripts, each script can launch its own browser and you can skip the Browser Preferences steps.

1. Select **Preferences** from the **View** menu.
2. Expand the General category and select **Browsers**.
3. Clear the **Always launch a new browser when recording a different script** option.
4. Click **OK**.

3.3.10.2 Recording Scripts

When recording scripts for chained playback, it is important to plan the start and stop points between scripts. This is especially true if session state needs to be maintained between scripts. All of the scripts must be of the same type.

1. Create and record the first script, for example a Web Functional test log in script.
2. Stop the recording but do not close the browser.
3. Save the script.
4. Create and record the next script. The navigation in this script should start from the point in the browser where the first script stopped.
5. Stop the recording and save the script.
6. Create and record any additional scripts to chain. The navigation in these script should start from the point in the browser where the previous script stopped.

3.3.10.3 Creating a Shell Script

The shell script is used to run the previously recorded scripts in sequence.

1. Create a new script to use as the shell script.
2. Select the script node where you want to add the first script. This could be either the Initialize or Run nodes.
3. Select the **Script** menu and then select **Other** from the **Add** sub menu.
4. Expand the General node and select Run Script.
5. Click **OK**.
6. Select the Repository and Workspace names.
7. Select the script to run.
8. Click **OK**.
9. Select the script node where you want to add the next script. This could be either the Initialize, Run, or Finish nodes.
10. Select the **Script** menu and then select **Other** from the **Add** sub menu.
11. Expand the General node and select Run Script.

12. Click **OK**.
13. Select the Repository and Workspace names.
14. Select the next script to run.
15. Click **OK**.
16. Repeat the Add script steps for each additional script to run.
17. Save and playback the shell script to verify the script navigations work together correctly.
18. In the Java Code view, the `runScript()` methods will be added to the script code:

```
runScript("Default", "Default", "Web1", true, true, true);  
runScript("Default", "Default", "Web2", true, true, true);
```

3.3.11 Moving Nodes in a Script

You can click and drag a node in the script tree view to move the node to another location in the script tree. For example, you move a step group node from the Run section to the Initialize section or move a navigation node.

To move script nodes in the script tree:

1. Open or create a script project.
2. Select the script node to move in the Tree View tab of the Script View.
3. Click and drag the mouse to move the node in the script tree. The script tree shows an indicator line that points to the location in the script tree where the node will be moved.
4. Release the mouse button when the indicator line is at the location where you want to move the script node.

When moving Step Groups between script sections (i.e. between Run and Initialize, etc.) you may need to move the node to the section node.

You can also switch to the code view and move lines of code manually.

3.4 Changing Text File Encoding

Before recording sites with international characters on an English OS, users should change the default character set encoding to a character set that supports the desired character set.

To change the text file encoding:

1. Start OpenScript and select **Developer Perspective** from the **View** menu.
2. Select **Preferences** from the **Windows** menu.
3. Expand the General node.
4. Select the Workspace node.
5. Select the **Other** option under **Text file encoding**.
6. Select desired text file encoding (i.e. UTF-8 for Japanese language Web sites, etc.).
7. Click **Close** when finished.

3.5 Debugging Scripts

You can use features of the Eclipse IDE to debug scripts. For debugging purposes, it is not always necessary to switch to the Debug Perspective to debug a script. You can add views to the Tester Perspective, such as Breakpoints, Debug, and Expressions views. In most cases, you do not need to use the Outline, Variables, and Tasks views. This section provides tips for basic script debugging techniques.

3.5.1 Adding Views to the Tester Perspective

In some cases, you may want to add additional views to the Tester Perspective for debugging purposes. You select the view to open using the shortcut keys to get to the Show View window.

To open the Show View window:

1. Press and hold the Shift and Alt keys, then press the Q key (Shift+Alt+Q).
2. Press the Q key again. The Show View window opens.
3. If necessary, expand the Debug tree.
4. Select the View(s) you want to open:
 - Press and hold the Shift key and click to select multiple contiguous view names.
 - Press and hold the Ctrl key and click to select multiple non-contiguous view names.
5. Click OK.

The selected views open in the Tester Perspective.

Note: If you are in the Developer Perspective, you can add a view by selecting **Show View** from the **Window** menu and then selecting **Other**.

3.5.2 Adding Breakpoints to a Script

You can add breakpoints to the script Java Code to halt script execution at a specific line of code in the script.

To add a breakpoint to the script code:

1. Create a script project.
2. Record the script.
3. In the Script view, click the Java Code tab.
4. Double-click in the right-most column of the code view frame next to the code line where you want to add a breakpoint. The breakpoint indicator appears as a round dot in the frame. You can add as many breakpoints as needed.
5. Play back the script.

When you play back the script, code execution will stop at the breakpoint. The **Confirm Perspective Switch** message appears when the code execution arrives at a breakpoint. Select the **Remember my decision** option if you do not want the message to appear again during future script playback.

6. Click **No** to stay in the Tester perspective or **Yes** to switch to the Debug Perspective. You can use the following keyboard debug features to execute code while in debugging mode:
 - Single-step (F6) - executes the next line of code.
 - Step-into (F5) - opens the method/function class file.

Note: Source code for the JRE or for the Eclipse IDE is not included with the product. When stepping into code, an editor may appear that does not contain source code. In this case, close the editor and resume script playback. You can use the Step-into feature to step into your own custom functions that you have added to a script.

- Resume (F8) - resumes code execution to the script end or to the next breakpoint.

3.5.3 Adding a Java Exception Breakpoint

You can pause a script when any error occurs by adding a "Java Exception Breakpoint" to the Breakpoints list.

To add a Java Exception Breakpoint:

1. Create a script project.
2. Record the script.
3. Open the Breakpoints view.
4. Click the **Add Java Exception Breakpoint** icon on the Breakpoints View toolbar.
5. Type "AbstractScriptException" and click **OK** to add this exception to the breakpoint list.
6. Right-click on the breakpoint in the Breakpoints view and select **Breakpoint Properties**.
7. Select the **Suspend on Subclasses of this Exception** option in the breakpoint properties and click **OK**.

During script playback, if an exception occurs, you can correct the problem and then continue script playback.

3.5.4 Pausing and Resuming Script Playback in Debug Mode

You can pause and resume script playback using the Debug view.

To pause and resume play back in Debug mode:

1. Create a script project.
2. Record the script.
3. In the Script view, click the Java code tab.
4. If necessary, add a Debug view to the Tester Perspective. If the Developer Perspective is open the Debug view should already be open.
5. Play back the script.

6. In the Debug view tree, select the Thread [Iterating Agent 1] thread and click the **Pause** toolbar button. The Thread [Iterating Agent 1] thread is the Virtual User's thread. You can ignore the others.
7. In the Debug view tree, select `script.run()` and click the **Resume** toolbar button to resume playback.

If you want to resume from a specific point in a script, comment out all lines before the current one, save the script, and then resume.

You can also execute portions of the script without having to comment out lines and restart the playback.

1. Insert a breakpoint at the first line of the `run()` section.
2. Playback the script. You can execute or inspect any line when playback halts at the breakpoint.
3. Select the specific line(s) of code you want to playback, right-click and select **Execute**. You can modify the code and re-execute without having to save the script.
4. Repeat the select code, right-click, Execute process until the script works the way you want it to work.
5. Stop playback, or select the **Resume** button on the Debug view to replay from the breakpoint.

3.5.5 Inspecting and Changing Script Variable Values

You can inspect or watch script variable values to debug scripts. The script must be running or stopped at a breakpoint.

There is a difference between Java local variables and script variables. Java local variables are declared using standard Java syntax, such as `String x` or `int i`. Script variables are set using the OpenScript API methods, such as `getVariables().set("someVariable", "123")` or `http.solve()`.

To inspect the value of a script variable:

1. Create a script project.
2. Record the script.
3. In the Script view, click the Java Code tab.
4. Add a breakpoint to the script.
5. Play back the script.
6. At the breakpoint highlight the script code containing the variable or type the following code and highlight the code:


```
getVariables().get("someVariable")
```
7. Right-click and select **Inspect** or **Watch**.
 - **Inspect** opens a pane that shows the variable (Shift-Alt-I adds the variable to the Expressions view).
 - **Watch** copies the variable to the Expressions view.
8. To change the value of a script variable, type the following code:

```
getVariables().set("someVariable", "newValue")
```

9. Highlight the code.
10. Right-click and select **Execute**.

Note: You can also test individual web actions by pausing the script, selecting the code for the action to test, then right-clicking and selecting **Execute** (or pressing Ctrl+U).

3.6 Enabling Debug Logging

OpenScript provides debug logging capability using Jakarta Log4j.

To enable debug logging:

1. Close OpenScript.
2. Open the file `log4j.xml` located in `C:\OracleATS\OpenScript`.
3. Locate the following section at the end of the file:

```
<!-- ===== -->
<!-- Setup the Root category -->
<!-- ===== -->

    <!-- For production -->
<root>
  <priority value="WARN"/>
  <appender-ref ref="AGENTFILE" />
</root>

    <!-- For debugging
<root>
  <priority value="DEBUG"/>
  <appender-ref ref="AGENTFILE" />
  <appender-ref ref="CONSOLE" />
</root>
-->
```

4. Move the ending comment brackets from:

```
<!-- For production -->
<root>
  <priority value="WARN"/>
  <appender-ref ref="AGENTFILE" />
</root>

    <!-- For debugging
<root>
  <priority value="DEBUG"/>
  <appender-ref ref="AGENTFILE" />
  <appender-ref ref="CONSOLE" />
</root>
-->
```

to:

```
<!-- For production
<root>
  <priority value="WARN"/>
  <appender-ref ref="AGENTFILE" />
</root>
```

```
-->

    <!-- For debugging -->
<root>
  <priority value="DEBUG" />
  <appender-ref ref="AGENTFILE" />
  <appender-ref ref="CONSOLE" />
</root>
```

5. Save the file `log4j.xml` and restart OpenScript.

6. Run scripts.

The debug messages are stored in the file `OpenScript.log` located in `<installdir>\OpenScript`.

To turn off debugging, move the ending comment braces back to the original locations.

Using Databanks

OpenScript allows users to parameterize script data inputs to perform data driven testing using Data Banking. Users can select any data inputs for their script and then substitute a variable to drive the input from an external file during playback. Multiple Data Bank files can be attached to a single script and users can specify how OpenScript assigns data during script playback.

4.1 Understanding Data Driven Testing (Parameterization)

Data Driven Testing, or parameterization, allows you to quickly and efficiently create automated data-driven tests.

The OpenScript Modules record parameters defined by each page of the Web application to a script. Databanks are used to hold unlimited amounts of input data that can be automatically fed as parameters into your Web application when the script is run. You can use the OpenScript databanking features to define variable values in script parameters and substitute values from Databank files for the variable values.

During playback, the parameters in the Web page are filled with values from the Databank file. Databank files can be easily created or modified using any simple text editor, spreadsheet, word processor, or database application. Users can create sophisticated unattended regression tests to thoroughly exercise a Web application by using varied input data from Data Bank files.

Data Input Parameterization enables users to parameterize recorded script inputs to perform data driven testing in either the script GUI view or code view. These inputs could be form field inputs for Web applications but could also be other types of script inputs that users may parameterize. Types of inputs users may parameterize include:

- Any user entered input data (i.e. parameterize the data I entered for the search field)
- Test case values (i.e. parameterize a text string for validation so I can use different inputs for comparison during playback)
- Recorded navigations (i.e. parameterize a starting navigation so I can navigate to different host servers during playback)
- Recorded user actions/object identified (i.e. parameterize a link object path so I can click on different links during playback)

Data Input Sources enables users to drive input values from an external CSV file or other external data source such as a database (i.e. using a database query to pull inputs from a database table).

Data Parameterization GUI View enables users to configure the inputs they want to parameterize and the data source they want to drive the inputs from through a

substitute variable GUI interface. For example, the "ticker" query string parameter for "Page [4] Ticker List" in the following Tree View is set to the variable value "{{fmstocks_data.ticker,ter}}".

Within the variable "{{fmstocks_data.ticker,ter}}", "fmstocks_data" is the name of the Databank file, ".ticker" identifies the field name within the Databank file, and "ter" is the recorded value.

Data Parameterization Code View Commands enable users to specify the inputs they want to parameterize and the data source they want to drive the inputs from through data parameterization in the code view.

For example, the "ticker" query string parameter for "Page [4] Ticker List" in the above Tree View appear as `http.querystring(http.param("ticker", "{{fmstocks_data.ticker,ter}}"))` in the `http.get` method code in the Code View, as follows (line breaks and spacing added for clarity):

```
beginStep("[4] Ticker List", 3422);
{
    http.get(6, "http://testserver2/fmstocks/{{LINK_1_3,TickerList.asp}}",
        http.querystring(http.param("ticker", "{{fmstocks_data.ticker,ter}}"),
            http.param("company", "")), null, true, "ASCII", "ASCII");
}
endStep()
```

4.2 Using Script Databanks

Databanks are used to hold unlimited amounts of input data that can be automatically fed into your Web application. During playback, the parameters in the Web page are filled with values from the databank file. The databank and script parameter shortcut menu options allow you to map parameters in a script to fields in a databank file as variable names.

Scripts must be configured to use databanks. Use the **Configure Databank** option on the **Script** menu to specify the databank file(s) to use with a script. Scripts can be configured to use more than one databank file.

When you record a script that has a navigation that uses parameters, the parameter nodes appear under the Query String node:

In the Code View, the parameters appear in the `http.param` parameters of the `http.querystring` parameter:

When you configure the databank(s) to use with the script, the Get next databank record from *databank name* node and Java code are added to the script.

Select the script parameter node to map to a databank and use the **Substitute Variable** option on the right-click shortcut menu to select the databank field name to map to the parameter. The Databank file and field name appear in the parameter node of the script tree.

The variable appears in the Code view in the `http.param` parameters of the `http.querystring` parameter:

Use the Playback iterations to playback using the records in the databank. You can also use custom code to loop through databank records and assign values to variables.

4.3 Configuring Databanks

You must configure the databank to use with a script before you can get records from the databank to use in a script.

To configure databanks to use with a script:

1. Open or create a Script project.
2. Select **Configure Databank** from the **Script** menu.
This dialog box lets you configure the databank files used with the script.
3. Click the **Add** button.
Add: Opens a dialog box for selecting a databank file to add to the script.
4. Enter the databank file name or click **Browse** to select the databank file.
 - **Databank:** Shows the name(s) of the comma-separated value databank file(s) added to the script.
 - **Browse:** Opens a dialog box for selecting the path and file to use as the databank.
 - **Edit:** Opens the selected databank file.
 - **Delete:** Deletes the selected databank file from the script. The file is not deleted from disk.
5. Enter an alias name to use for the databank or leave the default alias name. The default alias name is the name of the .CSV databank file.

Alias: Specifies an alias name to use for the databank. The databank file name is the default. The databank alias name is the name that appears when you add a databank record retrieval node to a script tree.

6. Click **OK**.

The following information appears after a databank file has been selected:

- **Line numbers:** Shows the line number of the databank record.
- **Column Headers:** Shows the field name(s) used in the databank file.
- **Rows:** Shows the data values specified for each record in the databank.

Databank files are comma-separated value files. The field names are on the first line of the file separated by commas (no spaces). The field data is on subsequent lines separated by commas (different line for each record, no spaces around commas). The following shows an example:

```
FirstName, LastName, Mail, Phone
John, Smith, JohnS@company.com, x993
Mary, Ellen, MaryE@company.com, x742
```

If a data value contains a comma, place quotation marks around the value, as follows:

```
John, Smith, "Anytown, MA", "(603) 993-0000"
```

4.4 Getting Databank Records

To get databank records to use with a script:

1. Open or create a script project.
2. Configure the databank to use with a script.
3. Select the script node where you want to use the databank record.
4. Select the **Script** menu and then select **Other** from the **Add** sub menu.

5. Expand the General node and select Get Next Databank Record.
6. Click **OK**.
7. Select the databank alias to specify the databank file to get the record from.
8. Click **OK**. A GetNextDatabankRecord: *databank alias* node will be added to the script.
9. In the Java Code view, the `getDatabank("databank alias").getNextDataBankRecord()` method will be added to the script code:

```
getDatabank("customer").getNextDatabankRecord();
```
10. Add your custom code to create an array variable to retrieve data from the databank record.

Using the Web Functional Test Module

This chapter provides instructions on configuring and using the OpenScript Web Functional Test Module, which tests Web-based applications by accessing objects through the Document Object Model (DOM) of the Web browser.

5.1 About the Web Functional Test Module

The OpenScript Web Functional Test Module is an application module that supports functional testing of Web-based applications that uses the Web Document Object Model (DOM). OpenScript provides a flexible and easy-to-use scripting interface for both Technical Testers and Non-Technical Testers. The OpenScript Functional Test Module enables script creation from both the code view and GUI view scripting interfaces.

The Functional Test Module extends the OpenScript platform with Document Object Model (DOM) recording and playback capabilities. The DOM recorder automatically captures Web page objects, actions, and navigations and records them as tree view nodes (with the underlying code in the Code View) in the script. The Functional Test Module also provides additional GUI script modification options. Web Functional Test Scripts differ from HTTP Scripts. Even though both are used to test web applications, HTTP scripts automate the underlying HTTP network protocol, whereas Web Functional Test scripts automate the browser UI.

The Web Functional Test Module is an extension module to the Oracle OpenScript platform that extends the platform with Web Functional Test recording and playback capabilities. The Web Functional Test Module is fully integrated with the OpenScript platform including the Results view, Details view, Properties view, Console/Problems views, Preferences, Step Groups, Script Manager, and Workspace Manager.

The Web Functional Test recorder displays commands in the Tree View in easy-to-understand commands. By default, script commands are grouped into Steps Groups by the Web page on which they were performed. Each Step Group contains one or more script commands corresponding to recorded actions that were performed on the page. The default name for the Step Group is the Web page Title (as specified in the "Title" tag).

OpenScript shows the results of Web Functional Test script playback in the Results view. The Results view shows results for each script command (including duration and summary for failures). The Results Report compiles the same information into an HTML Results Report. Results can be exported from the OpenScript GUI in standard format (CSV / HTML). Results are also generated for unattended playback through the command line.

The Web Functional Test Module API includes a "Web" class that provides additional programming functionality.

5.1.1 Key Features of the Web Functional Test Module

The Web Functional Test Module provides the following functionality:

- Records Document Object Model objects and actions for playback automation. The objects and actions can be generated by a Web browser (i.e. IE or FireFox).
- Plays back functional testing scripts to validate proper functionality. Playback runs interactively in the OpenScript user interface. Playback runs interactively in the OpenScript user interface and is also supported in Oracle Test Manager for Web Applications.
- Provides full script code view integration to support script generation for the Web Functional Test Module. The Web Functional Test Module includes an additional API to support Web Functional Test protocol code scripting.
- Allows users to parameterize user inputs to Functional Test scripts and drive those inputs from an external data file (Databank).
- Allows users to insert test cases for validation of objects and actions.
- Provides additional options/settings that are specific to Functional Test scripts within the Functional Test categories in the preferences interface.
- Reports playback results for Functional Test scripts in the Results and Console views.

5.2 Recording Web Functional Tests

The Web Functional Test Module records Document Object Model objects and actions in a Web browser for playback automation. The Recorder creates functional and regression test scripts for automating GUI applications in a browser.

OpenScript records standard Web DOM objects (links, images, forms, form elements, etc.) and events (click, mousedown, focus, etc.) for playback. Web DOM objects are identified by one or more attribute as configured through the Web Functional Test Record Preferences under Object Identification. Object Identification attributes can later be modified by users through the Preferences global settings for new scripts or for already recorded commands in the tree view or code view. All Web DOM objects, events and attributes should be supported. Recording can be configured through Internet Explorer or Firefox. You can set the browser type in the Preferences.

The Web Functional Test Module provides a record toolbar button that lets you initiate the Web DOM recorder and capture Web page actions to the script view. The record toolbar includes start and stop recording toolbar buttons. OpenScript recorders also open a floating toolbar that can be used while recording without having to switch between the browser and OpenScript.

5.2.1 Setting Web Functional Test Record Preferences

Before recording Web Functional Test scripts, set Web record preferences.

1. Start OpenScript.
2. Select **OpenScript Preferences** from the **View** menu.
3. Expand the OpenScript node and the Record category.
4. Select **Web Functional Test**.
5. Click the **General** tab and set the general recording preferences as follows:

- **Browser:** Specify the browser options that will be used during Web Functional test recording.
 - **Always launch a new browser when recording a different script:** When selected, a new browser opens each time a new script is recorded.
 - **Miscellaneous:** Specifies the miscellaneous record settings.
 - **Capture Screen Shots:** When selected, screen images are captured during recording.
 - **Capture HTML:** When selected, page source HTML is captured during recording.
 - **Capture URLs:** When selected, the page URL will be captured.
 - **Capture Frames:** When selected, the HTML frames on the page will be captured.
 - **Ignore Auto Page:** When selected, server-side auto pages are ignored during recording.
 - **Action Cache Interval(s):** Specifies how often to cache page actions during recording. The following cases are determined by this setting:

If while recording, the text on the same Web page element is changed within the Action Cache Interval time setting, the previously recorded value will be replaced by the changed value. In the Java code, the `setText` action will be replaced with the changed value.

If while recording, a browser window closes within the Action Cache Interval after a user performs an action on a web page (for example, a button click) the window close event will not be recorded, as the window close event is considered to be caused by the previously performed action.
6. Click the **Object Identification** tab and use **Add** or **Edit** to customize the object identification elements or attributes.
 7. Click **OK** when finished.

5.2.2 Adding/Editing Object Identifiers

The Web Functional Module uses object identification to specify attributes used to identify Web objects. The Web Functional Test Module includes predefined path attributes for common Web objects. Object paths are specified in XPath format. For example, for web objects, the object identification path appears as follows in Java code commands:

```
/web:window[@index='0']
  /web:document[@index='0']
    /web:form[@index='0']
      /web:input_text[@id='ticker' or @name='ticker' or @index='0']
```

You can set the default object attributes in the Web Functional Test Module Record Preferences. You can also edit object attributes in recorded scripts in the tree view or the code view.

In addition to the predefined object identification, you can add an Object Library to the script to record paths into a library file. Object Library files may be shared and reused across other scripts. The Object Library files provide a more convenient "short name" for objects to provide for more convenient programming.

The Web Functional Test Module includes object identifiers that specify how the recorder identifies Browser objects. You can add object identifiers or edit the existing object identifiers in the Record preferences.

To add or edit an object identifier:

1. Select the **OpenScript Preferences** from the **View** menu.
2. Expand the Record node and select Web Functional Test.
3. Click the **Object Identification** tab.
4. Click **Add** or select an existing object identifier and click **Edit**.

The Object Element dialog box lets you define an object identifier for a Web Functional Test recorder. The object identifier specifies how the OpenScript Web Functional Test recorder module identifies web objects in the Document Object Model on a Web page.

Name: Specify the name of the object identifier.

Attributes: Shows the attributes defined for the object identifier. The attributes can consist of an object attributes group and specific object element attributes.

Add: Opens a dialog box for specifying a new Web object identifier.

Edit: opens a dialog box for editing the selected Web object identifier.

Delete: Deletes the selected Web object identifier.

Up: Moves the selected Web object identifier up in the priority order.

Down: Moves the selected Web object identifier down in the priority order.

For each object element, you specify a name (typically a Web object attribute), an operator, a value and a value type. As you add object elements, OpenScript builds the object identifier using logical OR between each object identifier element. Click **Edit** to change between logical OR and AND.

5. If adding a new object identifier, click **Add** and specify the path segments for the object identifier.

The Path Segment dialog box lets you define a segment of an object identifier for a Web Functional Test recorder. The object identifier specifies how the OpenScript Web Functional Test recorder module identifies web objects in the Document Object Model on a Web page.

Attribute: When selected, specify the name, operator, value, and value type for the object identifier.

- **Name:** Specify the name of the Web object attribute to use to identify the object.
- **Operator:** Specify the logical operator to use to identify the object value.
- **Value:** Specify the value of the Web object attribute to use to identify the object.
- **Value Type:** Specify the value type to use to identify the object. The value type can be a string, a number, or by variable reference. Set the **Value type** to match the specified value.
 - **String:** The value in the **Value** field will be matched as a text string to identify the Web object.
 - **Number:** The value in the **Value** field will be matched as a numeric value to identify the Web object.

- **Reference:** The value in the **Value** field will be matched as a variable name to identify the Web object.

Group: when selected the Web object identifier can be specified as a string representing a logical group of Names, Operators, and Values.

6. If editing an existing segment, click **Edit** and specify the path attributes for the object identifier.

The Path Attribute dialog box lets you edit an element of an object identifier.

Name: Specify the name of the Web object attribute to use to identify the object.

Operator: Specify the logical operator to use to identify the object value.

Value: Specify the value of the Web object attribute to use to identify the object.

Value Type: Specify the value type to use to identify the object. The value type can be a string, a number, or by variable reference. Set the **Value type** to match the specified value.

- **String:** The value in the **Value** field will be matched as a text string to identify the Web object.
- **Number:** The value in the **Value** field will be matched as a numeric value to identify the Web object.
- **Reference:** The value in the **Value** field will be matched as a variable name to identify the Web object.

And/Or: specifies logical OR or AND between object elements. This option does not appear if the object element being edited is the last object element in the object identifier group.

7. If editing an existing path, click **Edit** and specify the path attributes for the object identifier.

The Path Attribute Group dialog box lets you edit an object identifier group as a string value.

Group: A text string of the object identifier group. The object identifier group syntax follows the *@name operator value/type* format. Values by reference are enclosed in double curly braces `{{}}`. String values are enclosed in single quotation marks. Numeric values are not enclosed. Logical OR or AND are used between object elements. Parenthesis are used for logical grouping of multiple object elements. Object identifiers can use the wildcard characters `*` (asterisk) for multiple characters and `?` (question mark) for single characters. For example, `@text="Login*"`. The following are examples of object identifier group syntax:

```
@index={{index}} or @title='title' or @number=5
```

```
@text={{text}} or @href={{href}} or @index={{index}}
```

```
(@id={{id}} or @name={{name}} or @index={{index}}) and multiple mod  
{{multiple}}
```

8. Click **OK** when finished adding or editing segments or attributes. The object identifier is added to the record preferences.
9. If you have the browser open when adding or editing object identifiers, close and restart the browser.

5.2.2.1 Available Attributes for Web DOM Elements

The following table lists the attributes available for Web Document Object Model objects.

Element	Attributes
Common attributes for all web DOM elements	tag, id, index, title, style, class, html, _adfftrueval, rn, un, ot
web:window	index, title
web:document	index, url
web:a	disabled, text, href
web:button	type, name, value, disabled, text
web:input_button	type, name, value, disabled, text
web:input_file	type, name, value, index, disabled, size
web:input_hidden	type, name, value, index, disabled
web:input_image	type, name, disabled, alt, align, border, height, hspace, src, lowsrc
web:input_submit	type, name, value, disabled, text
web:input_text	type, name, value, defaultValue, disabled, maxLength, readOnly, size
web:input_check	type, name, value, disabled, checked, defaultChecked, readOnly, size
web:input_radio	type, name, value, disabled, checked, defaultChecked, readOnly, size
web:img	alt, height, longdesc, name, src, width
web:option	value, text, optionIndex(index in the select), defaultSelected, selected
web:select	name, disabled, value, selectedIndex
web:textarea	name, disabled, value, defaultValue, readonly, cols, rows

5.2.3 Recording Web Functional Test Scripts

To record Web Functional Test scripts:

1. Start OpenScript.
2. Set the Web Functional Test Recording preferences.
3. Select **New** from the **File** menu.
4. Expand the Functional Testing group.
5. Select **Web**.
6. Click **Next**.
7. Select the Repository and Workspace.
8. Enter a script name.
9. Click **Finish**. A new Script tree is created in the Script View.
10. Select **Record** from the **Script** menu. The browser automatically opens when you start recording.

11. Load the web page where you want to start recording into the browser.
12. Navigate the web site to record page objects, actions, and navigations. The page objects, actions, and navigations will be added to the **Run** node of the script tree.
13. When finished navigating pages, close the browser.
14. Select **Stop** from the **Script** menu or click the Stop button on the OpenScript toolbar.
15. Expand the **Run** node of the script to view the page objects, actions, and navigation nodes in the script tree.

You can customize the script using the menu options or the Code View for specific testing requirements.

Note: Do not close the script editor view or script project while recording or playing back scripts. Doing so could result in unpredictable behavior in the OpenScript application.

5.3 Playing Back Scripts

OpenScript plays back recorded Web actions/commands which consist of an event plus an object identified by its attributes (for example: `click link(text="Home")`). The actions used for playback will either be those that are recorded or are specified manually in the Java Code view. Playback can be configured through Internet Explorer or Firefox. Unattended playback is supported through Oracle Test Manager for Web Applications or third-party tools using OpenScript's command line interface. Web Functional Test scripts do not play in Oracle Load Testing for Web Applications.

The Web Functional Test Module provides playback and iterate toolbar buttons that allows users to start the script playback for either a single playback through the script or multiple iterations using data from a databank file. Playback results for Web Functional scripts can be viewed in the Results and Console views.

5.3.1 Setting Web Functional Test Playback Preferences

To set Web Functional Test Playback preferences:

1. Start OpenScript.
2. Select **OpenScript Preferences** from the **View** menu.
3. Expand the OpenScript node and the Playback category.
4. Select **Web Functional Test**.
5. Expand the **Object Timeout** group and set the preferences as follows:
 - **Timeout(S):** Specifies the maximum number of seconds OpenScript should wait for an object to appear before considering the object not found. This is the default timeout when waiting for an object to appear before invoking an action against it. This is also the default timeout when waiting for an object to appear before continuing the script.

You can override individual object wait timeouts in `waitForPage()` or `object.waitFor()` by editing their "timeout" properties. Action timeouts cannot be overridden.

6. Expand the **Miscellaneous** group and set the preferences as follows:

- **Capture HTML:** When selected, the page HTML will be captured.
 - **Capture ScreenShot:** When selected, the a screen image of the page will be captured.
7. Expand the **Agent Port** group and set the preferences as follows:
 - **Port:** Specifies the port number to use to communicate with the agent machine.
 8. Expand the **Capture Screenshot Interval** group and set the preferences as follows:
 - **Delay time for capture screenshot:** Specifies the amount of time to wait before capturing a screenshot of the page.
 9. Click **OK** when finished.

5.3.2 Playing Back Web Functional Scripts

To play back Web Functional scripts:

1. Start OpenScript.
2. Open the Web Functional script to play back.
3. Select **Playback** from the **Script** menu or click the toolbar button.

You can view the progress of the script playback in the Console View. You can review the results of script playback in the Results View.

5.3.3 Playing Back Web Functional Scripts with Iterations

To play back Web Functional scripts with iterations:

1. Start OpenScript.
2. Open the Web Functional script to play back.
3. Select **Iterate** from the **Script** menu or click the toolbar button.
4. Set the iteration count.
5. Select which databank file to use, if necessary.
6. Set the starting record and data usage.
7. Click **OK**.

You can view the progress of the script playback in the Console View. You can review the results of script playback in the Results View.

5.4 Modifying Scripts

Once a script has been created/recorded, you can make modifications to customize the script for your specific testing needs.

5.4.1 Adding Browser Navigation to a Script

To add a Browser Navigation to a Script:

1. Record a Web Functional Test script.
2. Select the script node where you want to add the navigation.
3. Select the **Script** menu and then select **Other** from the **Add** sub menu.

4. Expand the Web Actions node.
5. Expand the Browser node and select Navigate.
6. Click **OK**.
7. Enter the object identification path for the browser. You can use the **Capture** or **Select** buttons to capture or select an object path.
8. Enter the URL.
9. Click **OK**. The navigate node is added to the script tree.

In the Java Code view, the `web.window(objectId).navigate` method will be added to the script code:

```
web.window(1,
"/web:window[@index='0']").navigate("http://testserver2/fmstocks");
```

The Browser web actions includes additional options for browser navigation such as Back, Forward, Close, Refresh, Wait for Page, etc. Additional browser actions have corresponding Java code methods:

```
web.window(1,
"/web:window[@index='0']").waitForPage("http://testserver2/fmstocks/",
"Stocks", true, null)
web.window("/web:window[@index='0']").close();
web.window("/web:window[@index='0']").back();
web.window("/web:window[@index='0']").forward();
web.window("/web:window[@index='0']").refresh();
web.window("/web:window[@index='0']").capturePage();
web.window("/web:window[@index='0']").solve("MyVariable", "(.+)", true, 1);
web.window("/web:window[@index='0']").storeResponseTime("MyRespTime");
web.window("/web:window[@index='0']").waitFor(10);
web.window("/web:window[@index='0']").storeAttribute("MyAttribVar",
"MyAttribute");
```

5.4.2 Adding Web Actions on Browser Objects

The Web Functional Test Module includes actions for Browser objects that can be added to a script.

To add Web actions on Browser objects to a script:

1. Record a Web Functional Test script.
2. Select the script node where you want to add the action.
3. Select the **Script** menu and then select **Other** from the **Add** sub menu.
4. Expand the Web Actions node.
5. Expand an action node and select the action.
6. Click **OK**.
7. Enter the object identification path for the object. You can use the **Capture** or **Select** menu options to capture or select an object path.
8. Click **OK**. The action node is added to the script tree.

In the Java Code view, a `web.object(objectId).action()` method will be added to the script code:

```
web.button("/web:window[@index='0']
/web:document[@index='0']
```

```
/web:form[@index='0'  
  or @id='loginform'  
  or @name='loginform']  
/web:input_submit[@name='LoginButton'  
  or @value='Login'  
  or @index='0']").click()
```

The Web Actions node includes actions for objects such as buttons, check boxes, dialogs, images, links, tables, etc. Other object actions have corresponding Java code methods:

```
web.link("/web:window[@index='0']  
  /web:document[@index='0']  
  /web:a[@text='Open a new account.'  
    or @href='http://testserver2/fmstocks/_NewAccount.asp'  
    or @index='0']").click()
```

or

```
web.select("/web:window[@index='0']  
  /web:document[@index='0']  
  /web:form[@index='0']  
  /web:select[(@id='namespace'  
    or @name='namespace'  
    or @index='0')  
    and multiple mod 'False']").selectOptionByText("[select product]");
```

or

```
web.clearSessionCookies();  
web.clearAllPersistentCookies();  
web.clearPersistentCookies("domain");  
web.clearCache("domain");
```

5.4.3 Adding Object Libraries to a Script

To add Object Libraries to a script:

1. Open or create a Web Functional Test script project.
2. Select the Initialize node.
3. Select the **Script** menu and then select **Other** from the **Add** sub menu.
4. Expand the General node and select Load Object Library.
5. Click **OK**.
6. Select the location to save or retrieve the library. Script libraries will be saved in an ObjectLibraries directory below the script directory. Repository libraries will be saved in an ObjectLibraries directory below the installation directory. You can also specify a specific directory for the libraries.
7. Add the library file and alias:
 - If you have already created an Object library, browse to the file and select it.
 - If you have not created a library file, click **Browse**, enter a file name, and click **Save**. A new file will be created. When you record a Web Functional Test script, the browser actions will be automatically added to the object library file.
8. Click **OK**. The Object Library node is added to the script tree.

- Record a Web Functional Test script to use the object library.

The object identification paths for browser objects will be automatically added to the object library file during recording. You can open and edit the object library file using the Object Library Editor. Select the Load Object Library node in the script tree and then select **Open Object Library** from the right-click shortcut menu.

In the Java Code view, the `ft.loadObjectLibrary` method will be added to the script code:

```
ft.loadObjectLibrary("MyLibrary", "mylibrary.properties",
LibraryLocation.ScriptLibraries)
```

5.4.4 Adding a Server Response Test

You can use Server Response Tests to report an error and/or abort the script if a Web page does not return back to the client within a specified time range.

To add a Server Response Test to a script:

- Record a Web Functional Test script.
- Expand the **Run** node.
- Select the script node where you want to add the Server Response test.
- Select the **Script** menu and then select **Other** from the **Add** sub menu.
- Expand the Web Actions group.
- Expand the Test group.
- Select **Server Response Test** and click **OK**.
- Enter the window path.
- Enter a name for the test.
- Enter the minimum and maximum time values.
- Set the **Stop Iteration on Failure** option.
- Click **OK** to add the Server Response node to the script tree.

In the Java Code view, the Server Response Test consists of the code executed in the `web.window(objectId).verifyResponseTime()` or `web.window(objectId).assertResponseTime()` method:

```
web.window("/web:window[@index='0']").verifyResponseTime("MyserverResp", 10.0,
20.0);
```

or

```
web.window("/web:window[@index='0']").assertResponseTime("MyserverResp2", 10.0,
50.0)
```

In the above code examples, `verify` means "do not stop on failure" and `assert` means "stop on failure".

5.4.5 Adding Text Matching Tests to a Script

To add a Text Matching Test to a Script:

- Open or create a Web Functional Test script project.
- Select the script node where you want to add the Text Matching Test.

3. Select the **Script** menu and then select **Other** from the **Add** sub menu.
4. Expand the Web Actions node.
5. Expand the Tests node and select Text Matching Test.
6. Click **OK**.
7. Select the **Look in** location.
8. If you selected Specified Document, enter the object identification path for the browser, document, or frame.
9. Enter a name for the test.
10. Specify the text to match string.
11. Select the **Pass when** setting.
 - **Selected text is present:** The test case passes if the **Text to Match** string is found in the selected source.
 - **Selected text is absent:** The test case passes if the **Text to Match** string is not found in the selected source.
12. Select the **Match** type.
 - **Exact:** Matches the **Text to Match** string exactly.
 - **Regular Expression:** Matches using the Regular Expression specified in **Text to Match**.
 - **Wildcard:** Matches using the wildcard characters specified in **Text to Match**.
13. Set the **Stop Iteration On Failure** option.
14. Click **OK**. The Text Matching Test node is added to the script tree.

In the Java Code view, the `web.assertText` or `web.document(specifiedDoc).assertText` method will be added to the script code if the **Stop Iteration On Failure** option is selected:

```
web.assertText("MyTextMatchTest", "Home", TextPresence.PassIfPresent,
MatchOption.Exact)
```

```
web.document("Main").assertText("MyTextMatchTest2", "Home",
TextPresence.PassIfPresent, MatchOption.RegEx);
```

In the Java Code view, the `web.verifyText` or `web.document(specifiedDoc).verifyText` method will be added to the script code if the **Stop Iteration On Failure** option is not selected:

```
web.verifyText("MyTextMatchTest", "Home", TextPresence.PassIfPresent,
MatchOption.Exact)
```

```
web.document("Main").verifyText("MyTextMatchTest2", "Home",
TextPresence.PassIfPresent, MatchOption.RegEx);
```

5.4.6 Adding Object Tests

The Web Functional Test Module includes an object test case for Browser objects that can be added to a script.

To add an object test to a script:

1. Record a Web Functional Test script.

2. Select the script node where you want to add the object test.
3. Select the **Script** menu and then select **Other** from the **Add** sub menu.
4. Expand the Web Actions node.
5. Expand the Tests node and select Object Test.
6. Click **OK**.
7. Enter the object identification path for the object. You can use the **Capture** or **Select** menu options to capture or select an object path.
 - **Substitute Variable**: Opens a dialog box for selecting the variable to use for the object ID.
 - **Capture Object**: Opens a capture object dialog box and starts the capture mode. Navigate to the object to capture and use options in the capture dialog box to capture the object path.
 - **Edit Object Path**: Opens a dialog box for editing the currently selected object path.
 - **View Object Path**: Opens a dialog box for editing the currently selected object path.
 - **Select from Object Library**: Opens a dialog box for selecting an object from a saved library.
 - **Save to Object Library**: Opens a dialog box for saving the current object to a library.
8. Enter a test name.
9. Select an Attribute/Value pair and specify the test details.

Attributes: Shows the attributes of the selected object. Select an attribute and specify the test details.

 - **Attribute**: Shows the name of the attribute. When selected, the attribute is included in the object test. When cleared, the attribute is not included in the object test.
 - **Value**: Shows either the recorded value or the test criteria for the attribute depending upon which **Display** option is selected.
 - **Enable All**: Enables all properties for inclusion in the test criteria.
 - **Disable All**: Disables all properties for exclusion from the test criteria.
 - **Add Row**: Adds a new row to the table.
 - **Display**: Selects which values appear in the properties list.
 - **Test**: When selected, the **Value** list shows the test criteria defined for each attribute.
 - **Recorded Values**: When selected, the **Value** list shows the recorded value for each attribute.

Test Details: Specifies the test criteria for the selected attribute.

 - **Recorded Value**: Shows the recorded value of the attribute.
 - **Enable**: When selected, the attribute is included in the object test. When cleared, the attribute is not included in the object test.

- **Value Type:** Specifies the data type to use as the test criteria for the attribute. The available options in the **Operator** list depend upon the selected value type to test: String, Boolean, Date, or Numeric.
- **Operator:** Specifies the operator to use for the playback test criteria. The list of operators changes depending upon the selected **Value Type**.

The following options are available for String values:

- **Exact:** The test passes if the text or attribute value matches exactly the current value of the text string during playback of the script.
- **Wildcard:** The test passes if the text or attribute value matches the current value of the Like operator pattern during playback of the script.
- **Regular Expression:** The test passes if the text or attribute value matches the current value of the Regular Expression pattern during playback of the script.

The following options are available for Numeric and Date values:

- [Relational Operators]: Lists the relational operators. Select the type of comparison to use during playback of the script. If you select the Range operator, the Object Test adds a field for specifying the range. Specify the from-to range.

The following option is available for Boolean values:

- **Exact:** The test passes if the text or attribute value matches the True or False value specified in the **Value** field during playback of the script.
 - **Value:** Specifies the value to use for the test criteria for the attribute.
 - [Substitute Variable]: Opens a window for selecting a databank variable to substitute as the value to use for the test criteria for the attribute.
10. Specify the test details for each Attribute/Value pair as required for the test.
 11. Click **OK**. The object test node is added to the script tree.

In the Java Code view, a `web.element(objectId).verifyAttributes` method will be added to the script code:

```
web.element(15, "/web:window[@index='0']
/web:document[@index='0']
/web:form[@index='0'
or @id='loginform'
or @name='loginform']
/web:input_password[@name='password' or @index='0']").verifyAttributes(
    "MyObjectTest", web.attributes(web.attribute("index", "0",
TestOperator.StringExact),
web.attribute("tag", "INPUT", TestOperator.StringExact),
web.attribute("name", "password", TestOperator.StringExact),
web.attribute("value", "ta", TestOperator.StringExact),
web.attribute("type", "password", TestOperator.StringExact),
web.attribute("checked", "False", TestOperator.StringExact),
web.attribute("disabled", "False", TestOperator.StringExact)));
```

5.4.7 Adding Table Tests

The Web Functional Test Module includes a table test case for HTML tables that can be added to a script.

To add a table test to a script:

1. Record a Web Functional Test script.
2. Select the script node where you want to add the table test.
3. Select the **Script** menu and then select **Other** from the **Add** sub menu.
4. Expand the Web Actions node.
5. Expand the Tests node and select Table Test.
6. Click **OK**.
7. Enter the object identification path for the table. You can use the **Capture** or **Select** menu options to capture or select an object path.
 - **Substitute Variable:** Opens a dialog box for selecting the variable to use for the object ID.
 - **Capture Object:** Opens a capture object dialog box and starts the capture mode. Navigate to the object to capture and use options in the capture dialog box to capture the object path.
 - **Edit Object Path:** Opens a dialog box for editing the currently selected object path.
 - **View Object Path:** Opens a dialog box for editing the currently selected object path.
 - **Select from Object Library:** Opens a dialog box for selecting an object from a saved library.
 - **Save to Object Library:** Opens a dialog box for saving the current object to a library.
8. Enter a test name.
9. Select a row and column cell and specify the test details.

Test Details: Specifies the test to perform for each value. Select a value in the row and column list to set the details for that specific value.

 - **Row:** Shows the row number of the selected table value.
 - **Column:** Shows the column number of the selected table value.
 - **Enable:** When selected, the table value is included in the comparison test.
 - **Recorded value:** Shows the selected attribute's recorded value.
 - **Value Type:** Specifies the data type of the selected value: String, Numeric, Date, or Boolean.
 - **Operator:** Specifies how to compare the value. The **Operator** options change depending upon the selected value type. For relational operators, if you select the Range operator, a field is added for specifying the numeric or date range. Specify the from-to range.
 - **Value:** Specifies the value to test.
 - [Substitute Variable] - opens a dialog box for selecting the variable to use as the value to test.
10. Specify the test details for each table cell as required for the test.
11. Click **OK**. The table test node is added to the script tree.

In the Java Code view, a `web.table(objectId).verifyCells` method will be added to the script code:

```
web.table(24, "/web:window[@index='0']  
/web:document[@index='0']  
/web:table[@index='6']").verifyCells("MyTableTest",  
web.cells(web.cell(1, 1, "Ticker ", TestOperator.StringExact),  
web.cell(1, 2, "Company ", TestOperator.StringExact),  
web.cell(2, 1, "ORCL ", TestOperator.StringExact),  
web.cell(2, 2, "Oracle Corporation ", TestOperator.StringExact)))
```

5.4.8 Adding a Wait for Page

You can use the Wait for Page browser option to cause the script playback to wait until a page is returned by the server before continuing playback.

To add a Wait for Page command to a script:

1. Record a Web Functional Test script.
2. Expand the **Run** node.
3. Select the script node where you want to add the Wait for Page node.
4. Select the **Script** menu and then select **Other** from the **Add** sub menu.
5. Expand the Web Actions group.
6. Expand the Browser group.
7. Select **Wait For Page** and click **OK**.
8. Enter the document ID in XPath format.
9. Select or clear the **Wait for any page** option.
10. If you clear the **Wait for any page** option, specify the URL and Match option.
11. Set the **Timeout** value.
12. Click **OK** to add the Server Response node to the script tree.

In the Java Code view, a `web.window(objectId).waitForPage()` method will be added to the script code:

```
web.window(6,  
"/web:window[@index='0']").waitForPage("http://testserver2/fmstocks/home.asp",  
null, null)
```

5.4.9 Inspecting Object Paths

To inspect a Web object path:

1. Record a Web Functional Test script.
2. Select the **Script** menu and then select **Inspect Path**. OpenScript opens the capture mode.
3. Navigate to the Web object and place the mouse cursor on the object.
4. Press F10 to capture the path.
5. Highlight the path with the mouse cursor and press the Ctrl+C keys to copy the path to the clipboard.
6. Click **OK** when finished.

5.4.10 Setting Script Properties

To set script properties:

1. Record a Web Functional Test script.
2. Select the **Script** menu and then select **Script Properties**.
3. Select the properties category.
4. Specify the properties for the category.
5. Click **OK** when finished.

5.4.11 Substituting Databank Variables

To substitute a databank variable for a query string parameter in a script:

1. Record a Web Functional test script that has text string parameters.
2. Expand the **Run** node.
3. Expand the node containing text parameters.
4. Right-click a text parameter node and select **Properties** from the shortcut menu.
5. If you have already configured the script with one or more databanks, select the click the [Substitute Variable] icon and select the databank field to substitute for the text parameter from the desired databank file and click **Finish**.
6. If you have not already configured the script with a databank, select **Add new databank** and click **Next**.
 - a. Click the **Browse** button and select the databank file to use.
 - b. Select the column (field name) to substitute for the text parameter and click **Finish**.

In the Tree View, the databank variable appears in place of the recorded value as `{{db.databankFileName.field,recordedValue}}`.

In the Java Code view, the databank variable appears as `{{db.databankFileName.field,recordedValue}}` in the `web.text(objectId).setText` method:

```
web.text(1, "/web:window[@index='0']
/web:document[@index='0']
/web:form[@index='0']
/web:input_text[@id='ticker'
or @name='ticker'
or @index='0']").setText("{{db.fmstocks_data.ticker,orcl}}")
```

5.5 Editing Object Libraries

To edit an object library:

1. Create a Web Functional Test script project.
2. Add an Object Library to the script and record the Web application under test.
3. Select the Load Object Library node in the script tree and then select **Open Object Library** from the right-click shortcut menu.
4. If necessary, click the Object Library tab.
5. Select an object in the Objects list.
6. Edit the object attributes in the Details section.

You can add objects to and delete objects from the Object list. You edit the object attributes in the object string or in the tree hierarchy of the Details section. The tree hierarchy lets you move attributes up or down in the priority order.

You can click the *libraryName.properties* tab to view or edit the object/object attribute text strings in the object library file source.

7. Select **Save** from the **File** menu or click the Save toolbar button to save changes to the object library file.

5.5.1 Using the Web Functional Test Module API

The Web Functional Module includes a script Application Programming Interface (API) specific to Web DOM functional testing. The Web Functional Test Module recorder creates the Java code that corresponds to the Tree View and displays the Web Functional Test commands in the Java Code view using easy-to-understand function names. The Java Code view commands correspond to the Tree View and you can edit your scripts in either view.

You can use the Web Functional Test API to enhance recorded scripts with additional testing functionality. Commands that are specific to the Web Functional Testing Module are part of the "web" class. Additional functional test methods are available in the "ft" class. You can also leverage other commands from other enabled classes (services) or general Java commands in your scripts.

Some examples of the Web Testing Module API include:

- Adding control statements
- Adding think time
- Launching and closing the Browser
- Navigating to a URL
- Performing actions on Web objects (click, double click, etc.)
- Setting text fields
- Waiting for a page to load

Many API methods can be added using the Web Functional Test Module Tree View. Additional methods can be added using the Java Code view.

Using the HTTP Module

This chapter provides instructions on configuring and using the OpenScript HTTP Module, which tests Web-based applications by automating the underlying HTTP protocol traffic.

6.1 About the HTTP Module

The OpenScript HTTP Module is an application/protocol module that supports load testing of Web-based applications that communicate via http(s) protocol. OpenScript provides a flexible and easy-to-use scripting interface for both Technical Testers and Non-Technical Testers. The OpenScript HTTP Module enables script creation from both the code view and GUI view scripting interfaces.

The HTTP Module extends the OpenScript platform with HTTP Proxy recording and playback capabilities. The proxy recorder automatically captures Web page navigations and records them as tree view nodes (with the underlying code in the Code View) in the script. The HTTP Module also provides additional GUI script modification options for HTTP navigation.

6.1.1 Key Features of the HTTP Module

The HTTP module provides the following functionality:

- Records HTTP protocol requests for playback automation. The requests can be generated by a Web browser (i.e. IE) or by a plug-in (i.e. AJAX XMLHTTP plug-in).
- Plays back HTTP scripts to validate proper functionality. Playback runs interactively in the OpenScript user interface and is also supported in the Oracle Load Testing for Web Applications Agents (i.e. Java Agent).
- Provides full script code view integration to support script generation for the HTTP Module. The commands include (but are not limited to) methods to generate GET requests, POST requests, correlation substitutions, validation, etc. The HTTP Module includes an additional API to support HTTP protocol code scripting.
- Allows users to parameterize user inputs to HTTP scripts and drive those inputs from an external data file (Databank).
- Provides additional options/settings that are specific to HTTP scripts within the HTTP categories in the preferences interface.
- Reports playback results for HTTP scripts in the Results and Console views.

6.2 Navigation Editing (Correlation)

The HTTP Module enables users to view and edit all recorded navigations and related parameters (headers, post data, etc.) in either the script GUI Tree view or Code View. It also enables them to view and edit any default correlation/parameterization of dynamic navigations and apply their own correlation to handle dynamic navigations.

- **Navigation Editing GUI View:** Configures the navigations they want to parameterize and the correlation rules they want to apply through a navigation editing GUI view interface. The GUI allows viewing and editing properties for different types of navigations (for both Web/HTTP applications and non-Web/HTTP applications) and data inputs. This GUI View includes:
 - **Display & Editing for Recorded Navigations:** Includes recorded navigations and any navigation parameters like headers, etc. and a mechanism for users to edit/add/delete navigations including dynamic parameter sources/targets.
 - **Display & Editing for Correlation Rules Library & Editing:** Includes a list of all default correlation rules included in the module(s) (listed by application type) and a mechanism for users to add/edit/delete correlation rules.
- **Navigation Editing Code View Commands:** Users are able to specify the navigations they want to parameterize and the data source they want to drive the inputs from through navigation editing commands in the code view. These commands map to the navigation editing GUI view.

```
beginStep("[2] Home", 3266);
{
  http.post(4, "http://testserver2/fmstocks/{{FORMACTION_0,default.asp}}",
    null,
    http.postdata(http.param("login", "{{INPUT_0,ta616}}"),
      http.param("password", "{{INPUT_1,ta}}"),
      http.param("LoginButton", "{{INPUT_2,Login}}")),
    null, true, "ASCII", "ASCII");
  {
    http.solveXPath("LINK_1_3", "//*[@text()='research a company']
      /@href", "TickerList.asp", 0);
    http.solveXPath("LINK_1_2", "//*[@text()='Logout']
      /@href", "logout.asp", 0);
  }
}
endStep();
```

6.2.1 Setting Correlation Preferences

To set correlation preferences:

1. Start OpenScript.
2. Select **OpenScript Preferences** from the **View** menu.
3. Expand the OpenScript node and the Correlation category.
4. Select **HTTP**.
5. Select or clear the check boxes for defined rules.
6. Select **Add Library**, **Add Rule**, or **Edit Rule** to define custom correlation rules.
7. Click **OK**.

6.2.2 Adding Correlation Libraries

Selecting **Add Library** in the Correlation Rules Preferences opens the **Add Library** dialog box. This dialog box lets you specify a new correlation library for transforming dynamic data in recorded script URLs and related parameters (headers, post data, etc.) to variable names that will be recognized by the script playback engine (OpenScript or Oracle Load Testing for Web Applications). The dialog box has the following options:

- **Name:** Specifies the name of the correlation library. After you define a library you can use the **Add Rule** button to specify the rules to include in the library. The name is required. You can also select **Copy rules** to copy correlation rules from an existing library.
- **Copy rules from existing library:** Lets you copy correlation rules from an existing library to a new library.
 - **Copy Rules:** When selected, a list of existing correlation rule libraries will be enabled for copying.
 - **Library:** Lists the correlation rule libraries available for copying.

6.2.3 Adding and Editing Correlation Rules

Selecting **Add Rule** or **Edit Rule** in the Correlation Rules Preferences opens the **Add Rule** or **Edit Rule** dialog box. This dialog box lets you specify or edit a correlation rule for transforming dynamic data in recorded script URLs and related parameters (headers, post data, etc.) to variable names that will be recognized by the script playback engine (OpenScript or Oracle Load Testing for Web Applications). The dialog box has the following options:

- **Type:** Specifies the type of correlation rule. The available Source and Target options change depending upon the rule type. The following rule types are available:
 - **Client Set Cookie:** This rule type automatically transforms web page cookie objects with dynamic data.
 - **Correlate Header:** This rule type automatically transforms web page header objects with dynamic data.
 - **Correlate Referer Header:** This rule type automatically transforms web page referer header objects with dynamic data.
 - **DOM Correlation:** This rule type automatically transforms web page Document Object Model (DOM) objects with dynamic data.
 - **Function/Text Substitution:** This rule type lets you specify a user-defined function to replace a specific parameter or parameters.
 - **Substitute Recorded Date:** This rule type lets you specify a Regular Expression pattern to find and replace a date parameter with a variable value.
 - **Variable Substitution:** This rule type lets you specify a Regular Expression pattern to find and replace a specific parameter or parameters with a variable value.
- **Name:** Specifies the name of the correlation rule. The name is required.

The following sections describe the rule types.

6.2.3.1 Client Set Cookie

When Client Set Cookie is selected, the **Source** and **Target** show the following options:

- **Source:** Always cookies.
- **Target:** Specifies which document object(s) to use as the target location of the transform.
 - **Replace all locations:** When selected, the correlation rule applies to any object matching the source criteria.
 - **Replace specified location:** When selected, the correlation rule applies only to the object matching the **Location** criteria.
 - **Location:** Specifies the cookie parameter(s) to which to apply the correlation rule using a Regular Expression. (See Variable Substitution Rules below for examples.)

6.2.3.2 Correlate Header

When Correlate Header is selected, the **Source** and **Target** show the following options:

- **Source:** Always web page headers.
- **Target:** Specifies which header object(s) to use as the target location of the transform.
 - **Replace all locations:** When selected, the correlation rule applies to any object matching the source criteria.
 - **Replace specified location:** When selected, the correlation rule applies only to the object matching the **Location** criteria.
 - **Location:** Specifies the header parameter(s) to which to apply the correlation rule using a Regular Expression. (See Variable Substitution Rules below for examples.)

6.2.3.3 Correlate Referer Header

When Correlate Referer Header is selected, the **Source** and **Target** show the following options:

- **Source:** Always web page referer headers.
- **Target:** Specifies which referer header object(s) to use as the target location of the transform.
 - **Replace all locations:** When selected, the correlation rule applies to any object matching the source criteria.
 - **Replace specified location:** When selected, the correlation rule applies only to the object matching the **Location** criteria.
 - **Location:** Specifies the referer header parameter(s) to which to apply the correlation rule using a Regular Expression. (See Variable Substitution Rules below for examples.)

6.2.3.4 DOM Correlation Rules

When DOM Correlation Rules is selected, the **Source** and **Target** show the following options:

- **Source:** Specifies which document object(s) to substitute as dynamic data.
 - **Links:** When selected, web page link objects with dynamic data will automatically transformed to variable values.

- **Action:** When selected, web page action objects with dynamic data will automatically transformed to variable values.
- **Input:** When selected, web page input objects with dynamic data will automatically transformed to variable values.
- **TextArea:** When selected, web page TextArea objects with dynamic data will automatically transformed to variable values.
- **JavaScript:** When selected, web page JavaScript objects with dynamic data will automatically transformed to variable values.
- **Target:** Specifies which referer header object(s) to use as the target location of the transform.
 - **Replace all locations:** When selected, the correlation rule applies to any object matching the source criteria.
 - **Replace specified location:** When selected, the correlation rule applies only to the object matching the **Location** criteria.
 - **Location:** Specifies the web page object(s)/parameter(s) to which to apply the correlation rule using a Regular Expression. (See Variable Substitution Rules below for examples.)

6.2.3.5 Function/Text Substitution Rules

When Function/Text Substitution Rules is selected, the **Source** and **Target** show the following options:

- **Source:** Specifies the function name or text to use as the substitute for dynamic data.
 - **Function/Text:** Specifies the name of the function to use to search the source location. The following functions are available:
 - * `{{@timestamp}}`: Searches the source using the specified Target Regular Expression and replaces the data with the script variable `{{@timestamp}}`. The timestamp value is the difference, measured in milliseconds, between the current time and Midnight, January 1, 1970 UTC.
 - * `{{@today (MM/dd/YYYY)}}`: Searches the source using the specified Target Regular Expression and replaces the data with the script variable `{{@today (MM/dd/YYYY)}}`. The value is the current date in month/day/year format.
 - * `{{@hostip}}`: Searches the source using the specified Target Regular Expression and replaces the data with the script variable `{{@hostip}}`. The value is the host IP address.
 - * `{{@hostname}}`: Searches the source using the specified Target Regular Expression and replaces the data with the script variable `{{@hostname}}`. The value is the host name.
 - * `{{@jstr ({{myVariable}})}}`: Searches the source using the specified Target Regular Expression and replaces the data with the script variable `{{@jstr ({{myVariable}})}}`. The value is a serialized Java string that specifies a Hexadecimal length value followed by the string contained in *myVariable* in the format `\00\09var_value`.
 - * `{{@file ({{myVariable}})}}`: Searches the source using the specified Target Regular Expression and replaces the data with the script variable

`{{@file({{myVariable}})}}`. The value is the text string contained in the file specified by `myVariable` or a hard coded path such as `{{@file(c:\\OpenScript_Sample.txt)}}`.

- * `{{@len({{myVariable}})}}`: Searches the source using the specified Target Regular Expression and replaces the data with the script variable `{{@len({{myVariable}})}}`. The value is the length of the string contained in `myVariable`.

Note: For `@jstr`, `@file`, and `@len` functions, `myVariable` is an OpenScript script variable defined using the `http.solve` or `http.solveXPath` methods. The variable name must be enclosed in double `{{ }}` braces within the function parenthesis. For example:

```
{{@len({{myVariable}})}}
```

- * `{{@iterationnum}}`: Searches the source using the specified Target Regular Expression and replaces the data with the script variable `{{@iterationnum}}`. The value is the script playback iteration number.
 - * `{{@sessionname}}`: Searches the source using the specified Target Regular Expression and replaces the data with the script variable `{{@sessionname}}`. The value is the script playback session number.
 - * `{{@timestampsecs}}`: Searches the source using the specified Target Regular Expression and replaces the data with the script variable `{{@timestampsecs}}`. The value is the current timestamp in seconds instead of milliseconds.
 - * `{{@siebeltimestampsecs}}`: Searches the source using the specified Target Regular Expression and replaces the data with the script variable `{{@siebeltimestampsecs}}`. The value is the current timestamp in seconds instead of milliseconds and sets the `SWSECancelID=@timestampsecs` (Siebel scripts).
- **Target:** Specifies which referer header object(s) to use as the target location of the transform.
 - **Replace all locations:** When selected, the correlation rule applies to any object matching the source criteria.
 - **Replace specified location:** When selected, the correlation rule applies only to the object matching the **Location** criteria.
 - **Location:** Specifies the web page object(s)/parameter(s) to which to apply the correlation rule using a Regular Expression. (See Variable Substitution Rules below for examples.)

6.2.3.6 Substitute Recorded Date

When Substitute Recorded Date is selected, the **Source** and **Target** show the following options:

- **Source:** Specifies the attribute to use as the substitute for dynamic data.
 - **Attribute Name:** for internal use only and should only be set to "value" (without quotations).
 - **Date Pattern:** Specifies the date pattern in the form `M/dd/yyyy`. The Date Pattern follows standard Java Date format string conventions. When

correlating scripts, the time that the navigation was recorded is converted to a date using the specified Date Pattern. If the current date is found in a request, it is replaced with: `{{@today(date_pattern)}}`.

- **Target:** Specifies which referer header object(s) to use as the target location of the transform.
 - **Replace all locations:** When selected, the correlation rule applies to any object matching the source criteria.
 - **Replace specified location:** When selected, the correlation rule applies only to the object matching the **Location** criteria.
 - **Location:** Specifies the referer header parameter(s) to which to apply the correlation rule using a Regular Expression. (See Variable Substitution Rules below for examples.)

6.2.3.7 Variable Substitution Rules

When Variable Substitution Rules is selected, the **Source** and **Target** show the following options:

- **Source:** Specifies the attribute to use as the substitute for dynamic data.
 - **Variable Name:** Specifies the name of the variable to use as the substitute for dynamic data.
 - **Pattern:** Specifies the Regular Expression to use to locate the dynamic data to replace.
 - **Error Message:** Specifies an error message to report if the source data is not found on playback.
 - **Source:** Specifies where to search for the dynamic data to replace: HTML Display Contents, Raw HTML or Response Header.
 - **Encoding:** Specifies if encoding should be used for the search and the type.
- **Target:** Specifies which referer header object(s) to use as the target location of the transform.
 - **Replace all locations:** When selected, the correlation rule applies to any object matching the source criteria.
 - **Replace specified location:** When selected, the correlation rule applies only to the object matching the **Location** criteria.
 - **Location:** Specifies the web page object(s)/parameter(s) to which to apply the correlation rule using a Regular Expression. Specify a regular expression to narrow down which part of a target request may be replaced with the correlated variable. All or part of a url, query string, and/or postdata may be substituted. Use `((.+?))` to indicate where the variable should be substituted.

- * The expression may be used to substitute a variable into a specific name=value pair. For example, to substitute the session ID in this post data: `Post Data: sessionId=123456&color=blue.`

Specify the following expression: `sessionId=((.+?))`.

Using the above expression, if the correlation rule's variable is found on a page and its value matches "123456", then the post data will become: `sessionId={{correlationRuleVariable-Name,123456}}&color=blue.`

- * If the name=value pair appears URL-encoded in the post data or query string, do NOT URL-encode the expression. For example, to substitute the "file/folder" parameter in this post data: Post Data:
file%2Ffolder=folderXYZ%2FfileABC&session=ABC%2FDEF.
Specify the following expression: file/folder=((.+)).
- * If substituting a variable into a non-URL-encoded postdata or querystring, do not URL-encode the expression. For example, to substitute the "id" value of the following unencoded XML post data: Post Data:
<xml><session id="12345"/></xml>.
Specify the following expression: <session id="((.+))"/>.
Using the above expression, if the correlation rule's variable is found on a page and its value matches "12345", then the entire post data will become:
<xml><session id="{correlationRuleVariableName,12345}"/></xml> .
- * If substituting a variable into a range of URL-encoded Name=Value pairs, then URL-encode the expression. For example, to replace all but the first parameter of the following URL-encoded query string data with one value: Query String:
file=root%2Fdata.txt&sessionId=123%2Fxyz&color=blue.
Specify the following expression: file=root%2Fdata.txt((.+)).
Using the above expression, if the correlation rule's variable is found on a page and its value matches "&sessionId=123%2Fxyz&color=blue", then the entire query string will become:
file=root%2Fdata.txt{{correlationRuleVariableName,&sessionId=123%2Fxyz&color=blue}}

6.3 Recording Scripts

The OpenScript HTTP Module records parameters defined by each page of the Web application to a script which can then be played back, with parameters in the Web page filled in with values from a Databank file.

The HTTP Module records HTTP protocol requests generated by a Web browser for playback automation. The HTTP Recorder records Web browser events for playback correlation which allows users to correlate dynamic HTTP requests based on knowledge of the GUI events which generated the navigation (i.e. dynamic GET request originated from click on link "x"). The HTTP Module provides a Record toolbar button that allows users to initiate the HTTP proxy recorder and captures Web page navigations to the script view. The toolbar includes start and stop recording toolbar buttons.

6.3.1 Setting HTTP Record Preferences

Before recording HTTP scripts, first set the HTTP record preferences.

1. Start OpenScript.
2. Select **OpenScript Preferences** from the **View** menu.
3. Expand the OpenScript node, then expand the **Record** category.
4. Select **HTTP**.
5. Click the **General** tab and set the general recording preferences as follows:

- **Setup** - specifies the network settings for proxy recording.
 - **Network Interface:** enter or select the network IP address of the proxy server.
 - **Port:** specify the port to use on the proxy server.
 - **Additional arguments:** specify any additional command line arguments to use when starting the proxy server.
 - **Maximum Download Size (MB):** specify the file size for file downloads.
 - **Client-Side Digital Certificate File:** enter the name of a .PFX-formatted digital certificate file or use the **Browse** button to select a file.
 - **File:** specifies the name of the PFX file. Enter the name or use the **Browse** to select the file from a drive and directory location.
 - **Choose above pfx file to store:** specifies the private-key password defined for the client certificate PFX file when the certificate was exported from Internet Explorer. Click **Store** and enter the private-key password for the client certificate.
 - **SSL Version:** specifies the SSL version to use.
 - **SSL Version:** select SSL version to use for the proxy server.
 - **Close browser when stopping recorder:** specify the browser options that will be used during HTTP recording.
 - **Close browser:** when selected, the browser closes automatically when recording is stopped.
 - **Always Launch a new browser when starting recorder:** Specify the browser options that will be used during HTTP recording.
 - **Launch browser:** When selected, the browser launches automatically when recording is started.
 - **Error Handling:** specifies the error handling options that will be used during HTTP recording as follows.
 - **Record navigations that return error code 404:** When selected, the HTTP recorder records navigations that return a Server Status Code 404: Not Found.
6. Click the **Proxy Settings** tab and configure the default Proxy recorder settings as follows:
- **Chain Proxy:** specifies if the OpenScript proxy is chained to another proxy.
 - **Use Browser's proxy:** when selected, the HTTP recorder uses the proxy configuration specified by the browser.
 - **Use specified proxy:** when selected, OpenScript uses the specified proxy.

Use proxy configuration script: when selected, the specified configuration scripts will be used.

Address: specify the URL to the JavaScript file containing the FindProxy-ForURL JavaScript function supplied by the system administrator for the intranet environment.

Use proxy server: when selected, the specified proxy server will be used.

Address: specify the network IP address of the proxy server to which to chain the OpenScript proxy.

Port: specify the port to use on the chained proxy server.

- **Proxy Authentication:** specifies the log in credentials for authentication.
 - **Username:** specify the user name to use for authentication.
 - **Password:** specify the password to use for authentication.
7. Click the **URL Filters** tab to create a new Proxy URL filter or to select a pre-defined filter.
- To use a pre-defined filter, select the checkbox for the filter in the list. Clear the checkbox to disable the filter.
- To create a new filter or edit an existing filter:
- Click **Add** or **Edit**.
 - Specify the filter name.
 - Specify the URL filter wild card or Regular Expression pattern to match against. Wild card characters include the asterisk (*) to represent a string of characters and the question mark (?) to represent a single character.
 - Select what to apply the filter against as the value for Match:
 - **Content type:** When selected, the filter applies to the page content type.
 - **URL:** When selected, the filter applies to the page URL.
 - Select the type of filtering method to use as the value for Method:
 - **Wild card:** If selected, the filter uses wild card characters to filter the content.
 - **Regular expression:** If selected, the filter uses the regular expression provided to filter the content.
8. Click **OK** when finished.

6.3.2 Recording a New HTTP Script

To create a new HTTP script, you essentially record the script.

1. Start OpenScript.
2. Set the HTTP Recording preferences if you haven't already.
3. Select **New** from the **File** menu.
4. Select **HTTP Script**.
5. Click **Next**.
6. Select the Repository and Workspace.
7. Enter a script name.
8. Click **Finish**. A new Script tree is created in the Script View.
9. Select **Record** from the **Script** menu or click the arrow on the Record toolbar button and select **Proxy Recorder**.
10. If you set the **Launch browser** option in the HTTP Record preferences, the browser automatically opens when you start recording with the HTTP Proxy recorder. If you did not set the **Launch browser** option, you will have to open a browser manually.
11. Load the web page where you want to start recording into the browser.

12. Navigate the web site to record page navigations. The page navigations will be added to the **Run** node of the script tree.
13. When finished navigating pages, stop the script by selecting **Stop** from the **Script** menu or clicking the **Stop** button on the OpenScript toolbar.
14. If you set the **Close browser** option in the HTTP Record preferences, the browser automatically closes when you stop recording. If you did not set the **Close browser** option, you will have to close the browser manually.
15. Expand the **Run** node of the script to view the page navigation nodes in the script tree.

You can customize the script using the menu options or the Code View for specific testing requirements.

Note: Do not close the script editor view or script project while recording or playing back scripts. Doing so could result in unpredictable behavior in the OpenScript application.

6.4 Playing Back Scripts

Once HTTP scripts have been recorded, you can play them back to validate functionality. Playback runs interactively in the OpenScript user interface and is also supported in the Oracle Load Testing for Web Applications.

The HTTP Module provides playback and iterate toolbar buttons that allows users to start the HTTP script playback for either a single playback through the script, or run through multiple iterations using data from a databank file. Playback results for HTTP scripts can be viewed in the Results and Console views.

6.4.1 Setting HTTP Playback Preferences

Before playing back scripts, you should set the playback preferences.

1. Start OpenScript.
2. Select **OpenScript Preferences** from the **View** menu.
3. Expand the OpenScript node, then select the **Playback** category.
4. Select **HTTP Module**.
5. Expand the **Proxy** group and set the preferences as follows:
 - **Proxy Host:** The host name of the HTTP proxy server.
 - **Proxy Port:** The port to use on the proxy server.
 - **Proxy Username:** The use name to use for authentication.
 - **Proxy Password:** The password to use for authentication.
 - **Non-Proxy Hosts:** The host name of the non-proxy servers.
6. Expand the **Compression** group and set the preferences as follows:
 - **Enable GZIP:** When selected, the GZIP compression format is enabled.
 - **Enable Deflate:** When selected, deflate is enabled.
7. Expand the **Headers** group and set the preferences as follows:
 - **Browser Emulation:** The browser to emulate for script playback. By default the recorded browser is used.

- **Language:** The language to use for script playback. The default is English.
 - **HTTP Version:** The HTTP version to use for script playback.
 - **Accept String:** The Accept string to use in the Request header for script playback.
8. Expand the **Connections** group and set the preferences as follows:
- **Enable Keep Alive:** If selected, keep alive is enabled on the connection.
 - **Max Number of Keep Alive Requests:** The maximum number of requests to make on a keep alive connection before closing it. Select **Unlimited** for an unlimited number of requests.
9. Expand the **SSL** group to specify the default HTTP playback Secure Sockets Layer (SSL) settings:
- **SSL Version:** The SSL version to use.
10. Expand the **Other** group and set the preferences as follows:
- **Do not request URLs ending in:** URLs ending with any of the specified patterns or file types will not be requested. Specify the ending pattern or file type separated by commas.
 - **Cache Emulation:** The type of user to simulate when playing back the script. This is useful for simulating different profiles of virtual users.

A first time user places more of a load on the Web server because pages and image are not yet cached. A repeat user places less of a load on the server as only newer pages are requested and brought down from the Web server.

Select one of the following options:

- **Do not request URLs ending in:** Virtual users are considered to be using the Web site or application for the first time for each iteration so no cache is used. The cache is used during the iteration.
- **Do Not Cache:** Select to not use the cache.

Note: When using WinInet, selecting Do Not Cache has the same effect as selecting 1st Time as the Cache Emulation method. In this case, document cache is not created and not cleared.

- **1st Time User:** Virtual users are considered to be using the Web site or application for the first time for each iteration so no cache is used. The cache is used during the iteration.
- **Repeat User:** Virtual users are considered to have visited or used the Web site or application previously. Pages and images are retrieved from the cache.

- **Enable Cookies:** If selected, the virtual user profiles will use cookies. Use this setting if your Web application uses cookies to manage session and other context information.
- **Download Local Files:** When selected, the Java Agent retrieves the requested local file contents.
- **Preserve Cookies Between Iterations:** Used to preserve or automatically clear cookies added to the browser in the **Run** section between successive iterations of the **Run** section.

Cookies added to the browser in the **Initialize** section will be preserved forever, unless explicitly removed in script code.

Cookies added to the browser in the **Run** section will always be preserved between the final iteration of the **Run** section and the **Finish** section.

- **Preserve Connections Between Iterations:** Used to preserve connections between OpenScript and the browser between successive iterations of the script.
- **Max Content Size (KB):** Specifies the maximum number of KB to download from a server for a given request.

11. Click **OK** when finished.

6.4.2 Playing Back HTTP Scripts

Once an HTTP script has been recorded, you can play it back.

1. Start OpenScript.
2. Open the HTTP script to play back.
3. Select **Playback** from the **Script** menu or click the toolbar button.
4. You can view the progress of the script playback in the Console View. You can review the results of script playback in the Results View.

See "[Viewing Script Playback Results](#)" on page 6-13 for more information.

6.4.3 Playing Back HTTP Scripts With Iterations

OpenScript allows repetitive playback of navigations in a script. The iterations can be performed with or without databanks.

1. Start OpenScript.
2. Open the HTTP script to play back.
3. Select **Iterate** from the **Script** menu or click the toolbar button.
4. Set the iteration count to the desired number of playback iterations.
5. Select which databank file to use, if desired.
 - **Name:** Lists the alias name(s) for the databank file(s).
 - **Starting Row:** The starting record for the databank. You can specify the starting row for the selected databank in the Databank Settings section.
 - **Data:** Shows the data in the specified starting row.
6. Set the starting record for the selected databank in the Databank Settings section:
 - **Name:** Shows the alias name of the selected databank file.
 - **Starting Record:** The starting record for the selected databank. The starting record will be updated in the Databanks section.
7. Click **OK**.

You can view the progress of the script playback in the Console View. You can review the results of script playback in the Results View.

6.4.4 Viewing Script Playback Results

To view HTTP script play back results:

1. Start OpenScript.

2. Open the HTTP script to play back.
3. Select **Playback** from the **Script** menu or click the toolbar button.
4. When playback is finished, click the Results view. If necessary, select **Results** from the **View** menu to open the Results View.
5. In the Name column, expand the results node to view the results.

6.4.5 Resetting Encoding

The Reset Encoding menu option changes the character set used when displaying the recorded HTML. Use this option to reset the encoding for non-English web sites where the correct character encoding may not be set automatically.

To reset encoding:

1. Start OpenScript.
2. Open the HTTP script.
3. Expand the HTTP script and select a navigation node.
4. Right-click on the navigation node and select **Reset Encoding** from the shortcut menu.
5. Enter the encoding value for the recorded HTML page and click **OK**.

6.4.6 Comparing Recorded/Playback Results

To compare HTTP script play back results with the recorded navigations:

1. Start OpenScript.
2. Switch to the Tester Perspective and make sure the Details View is open. If not, select **Details** from the **View** menu to open the Details View.
3. Open the HTTP script to play back.
4. Select **Playback** from the **Script** menu or click the toolbar button.
5. When playback is finished, view the results. If necessary, select **Results** from the **View** menu to open the Results View.
6. In the Name column, expand the results node to view the results.
7. In the Name column, click a navigation node for a page.
8. In the Detail View, click the **Comparison** tab.
9. In the Comparison tab, select Content, Request Headers or Response Headers to view the Recorded and Playback text to compare in the lower panes.

6.4.7 Playing Back HTTP Scripts In Oracle Load Testing for Web Applications

Once recorded, you can play back HTTP scripts in Oracle Load Testing for Web Applications.

If OpenScript and Oracle Load Testing for Web Applications are on the same machine:

1. Start Oracle Load Testing for Web Applications.
2. Select the Repository and Workspace where the OpenScript scripts are located.
3. Select the script to play back.

4. Set the User Mode to Java Client.
5. Configure the scenario parameters as required for the test.
6. Run the scenario in the Autopilot mode.

If OpenScript and Oracle Load Testing for Web Applications are on the different machines:

1. Select **Export Script** from the **File** menu.
2. Select the additional files to export to a Zip file and click **OK**.
3. Copy the exported Zip file to the Oracle Load Testing for Web Applications machine.
4. Start Oracle Load Testing for Web Applications.
5. Select **Upload File** from the **Tools** menu.
6. Select OpenScript Zip as the file type.
7. Enter the name and location of the exported OpenScript Zip file.
8. Select the Repository and Workspace where the OpenScript scripts is to be uploaded.
9. Click **Upload** to upload the file.
10. In the **Build Scenarios** tab, select the script to play back.
11. Set the User Mode to Java Client.
12. Configure the scenario parameters as required for the test.
13. Run the scenario in the Autopilot.

Note: Any external files, such as databanks files, must be available to Oracle Load Testing for Web Applications (i.e. located in the path specified in script file).

6.4.8 Posting Binary or XML File Data

To post Binary or XML File Data:

1. Record an HTTP script as described in "[Recording a New HTTP Script](#)" on page 6-10.
2. Open the Java Code view.
3. Use the following code to specify a binary data variable and the `http.navigate()` method to post the data:

```
byte[] data =
oracle.oats.utilities.FileUtil.readBytesFromFile("c:\\image.jpg");
http.navigate(0, "http://www.mysite.com/", null, data, null, true);
```

The same solution works for an XML file:

```
byte[] data = oracle.oats.utilities.FileUtil.readBytesFromFile("c:\\file.xml");
http.navigate(0, "http://www.mysite.com/", null, data, null, true);
```

If you want to store your binary or XML file inside the script itself:

1. Switch to the Developer perspective.
2. In the Navigator View, create a folder in the script project called "resources".
3. Add your jpg or XML file into the new "resources" folder.

4. Change the first line of the above code sample to this:

```
byte[] data =
getScriptPackage().getResourceFile("resources/yourfile.jpg").getData();
```

By storing the file locally with the script, the file will always be available to the agent, even if it is run on a remote agent machine through Oracle Load Testing for Web Applications.

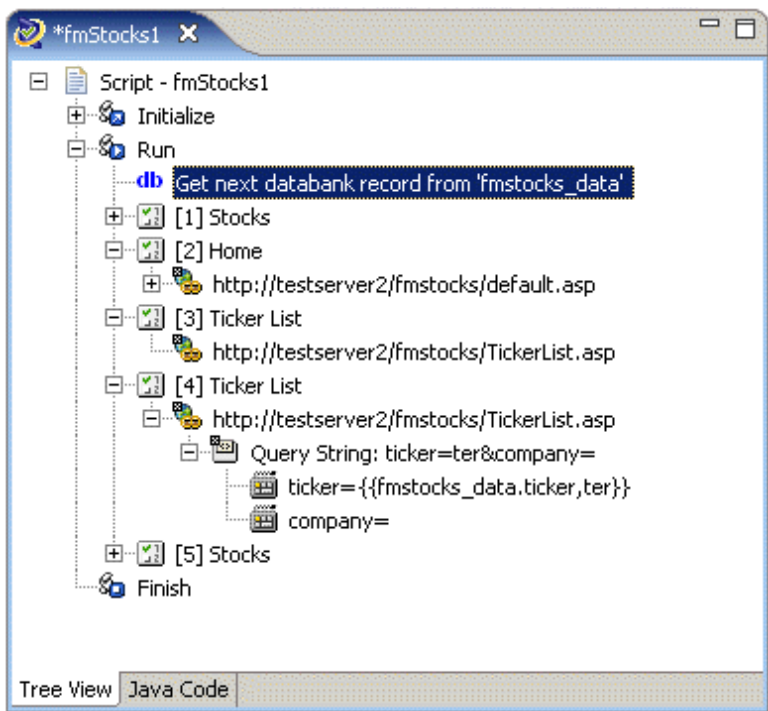
6.5 Modifying Scripts

Once a script has been created/recorded, you can make modifications to customize the script for your specific testing needs.

6.5.1 Understanding the HTTP Module Script View

The default display for an HTTP proxy recorded script is the Tree View GUI in the Script View. The HTTP Recorder generates the Tree View and code based upon the Step Group preferences set in OpenScript. The default Step Group settings will generate Step Groups based upon page navigations in the HTTP web application.

Figure 6–1 Script Tree View



Below each navigation will be child nodes for additional information about a page navigation, such as query strings and form action inputs. The right-click shortcut menu includes additional script modification options specific to the script generated using the HTTP Module. The Tree View is a graphical representation of the underlying code in the Code View. For example, "Page [4] Ticker List" in the above Tree View appears as Step Group and `http.get` method code in the Code View, as follows (line breaks and spacing added for clarity):

```
beginStep("[4] Ticker List", 3422);
{
```

```

    http.get(6, "http://testserver2/fmstocks/{{LINK_1_3,TickerList.asp}}",
        http.querystring(http.param("ticker", "ter"),
            http.param("company", "")),
        null, true, "ASCII", "ASCII");
}
endStep();

```

Changes made in the Tree View are automatically updated in the Code View. Changes made in the Code View are automatically updated in the Tree View. The HTTP Module includes an API with HTTP protocol-specific methods. The commands include (but are not limited to) methods to generate GET requests, POST requests, correlation substitutions, validation, etc.

6.5.2 Using Script Variables

OpenScript scripts use variables to pass dynamic data between navigations. The navigation can be in step groups or another code sequence. You can use the Tree view and **Script** menu options to add custom variables to a script or code them manually using the Code view. The HTTP Proxy recorder also defines variables when recording. The following example shows how the HTTP Proxy recorder's default settings record Step Groups, navigations and variables for form inputs and links.

The script is a three page script. the first page is a login page. The second page is the page returned after login which includes links to other pages. The page in the script is the page returned by a click on a link.

Step Group 1 (beginStep("[1] Stocks", 0);) gets the page navigation and form input parameters. The http.solveXPath method assigns the input values to script variables using XPath's (for example, ".//INPUT[@name='login']/@value") to find the input value in the page source.

```

beginStep("[1] Stocks", 0);
{
    http.get(2, "http://testserver2/fmstocks/", null, null, true, "ASCII", "ASCII");
    {
        http.solveXPath("FORMACTION_0", ".//FORM[@name='loginform']/@action",
            "default.asp", 0);
        http.solveXPath("INPUT_0", ".//INPUT[@name='login']/@value", "ta496", 0);
        http.solveXPath("INPUT_1", ".//INPUT[@name='password']/@value", "ta", 0);
        http.solveXPath("INPUT_2", ".//INPUT[@name='LoginButton']/@value", "Login", 0);
    }
}
endStep();
beginStep("[2] Home", 3246);
{
    http.post(4, "http://testserver2/fmstocks/{{FORMACTION_0,default.asp}}",
        null, http.postdata(http.param("login", "{{INPUT_0,ta496}}"),
            http.param("password", "{{INPUT_1,ta}}"),
            http.param("LoginButton", "{{INPUT_2,Login}}")),
        null, true, "ASCII", "ASCII");
    {
        http.solveXPath("LINK_1_3", ".//A[text()='research a company']/@href",
            "TickerList.asp", 0);
    }
}
endStep();
beginStep("[3] Ticker List", 1703);
{
    http.get(13, "http://testserver2/fmstocks/{{LINK_1_3,TickerList.asp}}", null,
        null, true, "ASCII", "ASCII");
}

```

```

}
endStep();

```

In step Group 2 (`beginStep (" [2] Home", 3264);`), the page navigation uses the variables defined in Step Group 1 to pass the data values as parameters to the `http.post` method. The `http.solveXpath` method assigns links HREF values to variables using XPaths.

```

beginStep("[1] Stocks", 0);
{
    http.get(2, "http://testserver2/fmstocks/", null, null, true, "ASCII",
            "ASCII");
    {
        http.solveXpath("FORMACTION_0", ".//FORM[@name='loginform']/@action",
            "default.asp", 0);
        http.solveXpath("INPUT_0", ".//INPUT[@name='login']/@value", "ta496", 0);
        http.solveXpath("INPUT_1", ".//INPUT[@name='password']/@value", "ta", 0);
        http.solveXpath("INPUT_2", ".//INPUT[@name='LoginButton']/@value",
            "Login", 0);
    }
}
endStep();
beginStep("[2] Home", 3246);
{
    http.post(4, "http://testserver2/fmstocks/{FORMACTION_0,default.asp}",
        null, http.postdata(http.param("login", "{{INPUT_0,ta496}}"),
            http.param("password", "{{INPUT_1,ta}}"),
            http.param("LoginButton", "{{INPUT_2,Login}}")),
        null, true, "ASCII", "ASCII");
    {
        http.solveXpath("LINK_1_3", ".//A[text()='research a company']/@href",
            "TickerList.asp", 0);
    }
}
endStep();
beginStep("[3] Ticker List", 1703);
{
    http.get(13, "http://testserver2/fmstocks/{LINK_1_3,TickerList.asp}",
        null, null, true, "ASCII", "ASCII");
}
endStep();

```

In Step Group 3 (`beginStep (" [3] Ticker List", 1703);`), the page navigation uses a variable defined in Step Group 2 to pass the data values as parameters to the `http.get` method.

```

beginStep("[1] Stocks", 0);
{
    http.get(2, "http://testserver2/fmstocks/", null, null, true, "ASCII",
            "ASCII");
    {
        http.solveXpath("FORMACTION_0", ".//FORM[@name='loginform']/@action",
            "default.asp", 0);
        http.solveXpath("INPUT_0", ".//INPUT[@name='login']/@value", "ta496", 0);
        http.solveXpath("INPUT_1", ".//INPUT[@name='password']/@value", "ta", 0);
        http.solveXpath("INPUT_2", ".//INPUT[@name='LoginButton']/@value",
            "Login", 0);
    }
}
endStep();
beginStep("[2] Home", 3246);

```



```

{
  http.post(4, "http://testserver2/fmstocks/{{FORMACTION_0,default.asp}}",
    null,      http.postdata(http.param("login", "{{INPUT_0,ta496}}"),
      http.param("password", "{{INPUT_1,ta}}"),
      http.param("LoginButton", "{{INPUT_2,Login}}")),
    null, true, "ASCII", "ASCII");
  {
    http.solveXPath("LINK_1_3", ".//A[text()='research a company']/@href",
      "TickerList.asp", 0);
  }
}
endStep();
beginStep("[3] Ticker List", 1703);
{
  http.get(13, "http://testserver2/fmstocks/{{LINK_1_3,TickerList.asp}}",
    null, null, true, "ASCII", "ASCII");
}
endStep();

```

6.5.3 Adding a Variable to a Script

The following describes how to add a variable to a script. A regular expression is used to search a specified location for a value to set for the variable.

1. Open or create a script project.
2. Select the script node in which you want to add the variable.
3. Select the **Script** menu and then select **Other** from the **Add** sub menu.
4. Expand the Variable node and select Variable.
5. Enter the variable name.
6. Enter the variable value.
7. Click **OK**. The Set: *variableName* = *value* node is added to the script tree.
8. In the Java Code view, the `getVariables().set("varName", "value");` method will be added to the script code.

6.5.4 Adding a Solve XPath to a Script

To add a SolveXPath to a script:

1. Open or create a script project.
2. Select the script node where you want to add the XPath value.
3. Select the **Script** menu and then select **Other** from the **Add** sub menu.
4. Expand the Variable node and select Solve XPath.
5. Enter the variable name.
6. Enter the XPath to use to search for the value for the variable.
7. Enter the Result index value to use for the variable method.
8. Click **OK**. The SolveXPath: *name* node is added to the script tree.
9. In the Java Code view, the `http.solveXPath();` method will be added to the script code:

```
http.solveXPath("var_MyDomVar", ".//INPUT[@name='login']/@value", "ta610", 0);
```

```
Example:  
http.solveXPath("FORMACTION_0", " ../FORM[@name='loginform']/@action",  
"default.asp", 0);  
  
getLogger().info("Form Name: {{FORMACTION_0}}");
```

6.5.5 Finding a Variable in a Script

To find a variable in a script:

1. Open or create a script.
2. Right-click on a post data or query string parameter containing {{ }} syntax and select **Find Variable Source**.

The variable referenced inside the {{ }} will be selected in the script tree node.

If more than one variable exists inside the given parameter, OpenScript will display a dialog box from which to pick which variable to find.

6.5.6 Deleting Variables from a Script

Deleting a variable from the tree view causes references to the variable using {{ }} notation in any string in the script to be reverted to their recorded values. Variable references in the Java code are also reverted.

To delete a variable from a script:

1. Open or create a script.
2. Right-click on a post data or query string parameter containing {{ }} syntax and select **Delete**.

The variable referenced inside the {{ }} syntax will be reverted to its recorded value.

To delete similar variables from a script:

1. Open or create a script.
2. Right-click on a post data or query string parameter containing {{ }} syntax and select **Delete all *type_* Variables**. This menu option appears for any variables whose name is prefixed with a word followed by an underscore (_) character.

All variables of *type_* referenced inside the {{ }} syntax will be reverted to their recorded values.

6.5.7 Adding Authentication to a Script

To add authentication to an HTTP script:

1. Record an HTTP script as described in ["Recording a New HTTP Script"](#) on page 6-10.
2. Select the **Run** node.
3. Select the **Script** menu and then select **Other** from the **Add** sub menu.
4. Select the **Authentication** node and click **OK**.
5. Enter the URL to access for authentication.
6. Enter a username.
7. Enter the password for the user. Passwords are encrypted using the Base-64 Crypt algorithm.

8. Click **OK** to add the Authentication node to the script tree.
9. In the Java Code view, the Authentication consists of the code executed in the `http.addAuthentication` procedure:

```
http.addAuthentication("http://testserver2", "username",
decrypt("KRT/J/xJDPD"));
```

6.5.8 Adding Text Matching Tests to a Script

You can use Text Matching Tests to report an error and/or abort the script if a single HTTP request does not match the Text Matching Test criteria.

To add a Text Matching Test to an HTTP script:

1. Record an HTTP script as described in ["Recording a New HTTP Script"](#) on page 6-10.
2. Expand the **Run** node.
3. Select the HTTP navigation node where you want to add the Text Matching test.
4. Select the **Script** menu and then select **Text Matching Test** from the **Add** menu.
5. Enter a name for the test.
6. Enter the text to match. This is a regular expression pattern to use to match against the source location.
7. Enter a custom error message to display if the text matching test fails on script playback, such as "Could not find {text to match}".
8. Select the source location that will be searched for the matching text:
 - **HTML:** Search the HTML source of the page.
 - **Response Header:** Search the page's Response Header.
9. Select the **Pass when** setting.
 - **Selected text is present:** The test case passes if the **Text to Match** string is found in the selected source.
 - **Selected text is absent:** The test case passes if the **Text to Match** string is not found in the selected source.
10. Select the **Regular Expression** option if the Text to Match is a Regular Expression. Clear the **Regular Expression** option if the Text to Match is plain text.
11. Set the **Stop Iteration On Failure** option.
12. Click **OK**. The Text Matching Test node is added to the script tree.

In the Java Code view, the `http.assertText` method will be added to the script code if the **Stop Iteration On Failure** option is selected:

```
http.assertText("MyTextMatchTest", "Home", TextPresence.PassIfPresent,
MatchOption.Exact)
```

In the Java Code view, the `http.verifyText` method will be added to the script code if the **Stop Iteration On Failure** option is not selected:

```
http.verifyText("MyTextMatchTest", "Home", TextPresence.PassIfPresent,
MatchOption.Exact)
```

6.5.9 Adding Server Response Tests to a Script

You can use Server Response Tests to report an error and/or abort the script if a single HTTP request does not return back to the client within a specified time range.

To add a Server Response Test to an HTTP script:

1. Record an HTTP script as described in ["Recording a New HTTP Script"](#) on page 6-10.
2. Expand the **Run** node.
3. Select the HTTP navigation node where you want to add the Server Response test.
4. Select the **Script** menu and then select **Other** from the **Add** sub menu.
5. Select **Server Response Test** from the Validation group.
6. Enter a name for the test.
7. Enter the minimum and maximum time values.
8. Enter any error message text to log if the test fails.
9. Set the **Stop Iteration on Failure** option.
10. Click **OK** to add the Server Response node to the script tree.

6.5.10 Substituting Databank Variables

During playback, the parameters in the Web page are filled with values from the Databank file. However, you can substitute a databank variable for a query string parameter in an HTTP script.

1. Record an HTTP script as described in ["Recording a New HTTP Script"](#) on page 6-10 that has query string parameters.
2. Expand the **Run** node.
3. Expand the node containing query string parameters.
4. Right-click a query string parameter node and select **Substitute Variable** from the shortcut menu.
 - If you have already configured the script with one or more databanks, select the databank field to substitute for the query string parameter from the desired databank file and click **Finish**.
 - If you have not already configured the script with a databank, select **Add new databank** and click **Next**.
 - Click the **Browse** button and select the databank file to use.
 - Select the column (field name) to substitute for the query string parameter and click **Finish**.

In the Tree View, the databank variable appears in place of the recorded value as `{{databankFileName.field,recordedValue}}`.

In the Java Code view, the databank variable appears as `{{databankFileName.field,recordedValue}}` in the `http.querystring(http.param()` parameter of the `http.get` method:

```
http.get(6, "http://testserver2/fmstocks/TickerList.asp",
    http.querystring(http.param("ticker", "{{fmstocks_data.ticker,ter}}"),
    http.param("company", "")),
    null, true, "ASCII", "ASCII");
```

6.5.11 Substituting Post Data Variables

To substitute a variable for a Post Data parameter in an HTTP script:

1. Record an HTTP script that has Post Data parameters.
2. Expand the **Run** node.
3. Expand the node containing Post Data parameters.
4. Right-click a Post Data parameter node and select **Substitute Variable** from the shortcut menu.
 - If you have already defined custom variables in the script, select the variable name to substitute for the Post Data parameter and click **Finish**.
 - If you have not already defined custom variables in the script, select **Create new script variable** and click **Next**.

The Search for Value panel lists the navigation(s) that contain the post data value. If there are more than one navigation that contain the post data value, select the navigation where you want to substitute a variable. When you select a navigation, the data for that navigation appears below with the specific source highlighted along with a suggested Regular Expression.

- Specify the Regular Expression to use for the substitute variable for the Post Data parameter and click **Next**.
- Click **Test** to verify the Regular Expression locates the correct data value to substitute.
- If the Regular Expression locates the correct data value to substitute, click **Next** to continue. If the Regular Expression does not return the correct data value, modify and test the Regular Expression until the desired data value is located and click **Next** to continue.
- Enter a name for the substitute variable.
- If you want to add the variable as a variable rule in a correlation library, click **Add to library** and specify the rule information. If not, click **Finish** to insert the substitute script variable into the script

In the Tree View, the script variable appears in place of the recorded value as `{{variableName,recordedValue}}`.

In the Java Code view, the script variable appears as `variableName,Regular Expression` parameters in the `http.solve` method:

```
http.solve("MY_VAR", "<INPUT id=login name=login value=\"(.+?)\">", null,
false, Source.Html, 0);
```

6.5.12 Adding a Cookie to a Script

To add a cookie to a script:

1. Open or create a script project.
2. Select the script node where you want to add the cookie.
3. Select the **Script** menu and then select **Other** from the **Add** sub menu.
4. Expand the Cookie node and select **Add Cookie**.

This dialog box lets you add a cookie to a script.

5. Enter a valid cookie string.

- Cookie String: Specifies the cookie string to add
 - Cookie String Charset: Specifies the character set to use for the cookie string
6. Click **OK**. The Cookie node is added to the script tree.
 7. In the Java Code view, the `http.addCookie` method will be added to the script code:

```
http.addCookie("cookieString", "charset");
```

Example:

```
http.addCookie("username=testCookie", "ASCII");
java.util.List <Cookie> cookies =
http.getBrowser().getCookieJar().getAllCookies();
for (Cookie cookie : cookies) {
    getLogger().info(cookie.getUrl());
    getLogger().info(cookie.getCookieString());
}
```

6.5.13 Removing a Cookie From Script

To remove a cookie from a script:

1. Open or create a script project.
2. Select the script node where you want to place the remove cookie node.
3. Select the **Script** menu and then select **Other** from the **Add** sub menu.
4. Expand the Cookie node and select Remove Cookie.
5. Enter the cookie string to remove.
6. Click **OK**. The Remove Cookie node is added to the script tree.
7. In the Java Code view, the `http.removeCookie` method will be added to the script code:

```
http.removeCookie("cookieString");
```

6.5.14 Adding a User Agent to a Script

To add a user agent to a script:

1. Open or create a script project.
2. Select the script node where you want to add the user agent.
3. Select the **Script** menu and then select **Other** from the **Add** sub menu.
4. Expand the HTTP node and select **Set User Agent**.
5. Enter the user agent details.
6. Click **OK**. The user agent node is added to the script tree.
7. In the Java Code view, the `http.setUserAgent("agent");` method will be added to the script code:

```
http.setUserAgent("Mozilla/4.0 (compatible; MSIE 6.0; Windows NT 5.1; SV1; .NET CLR 1.1.4322; InfoPath.1; .NET CLR 2.0.50727)");
```

6.6 Adding Navigation

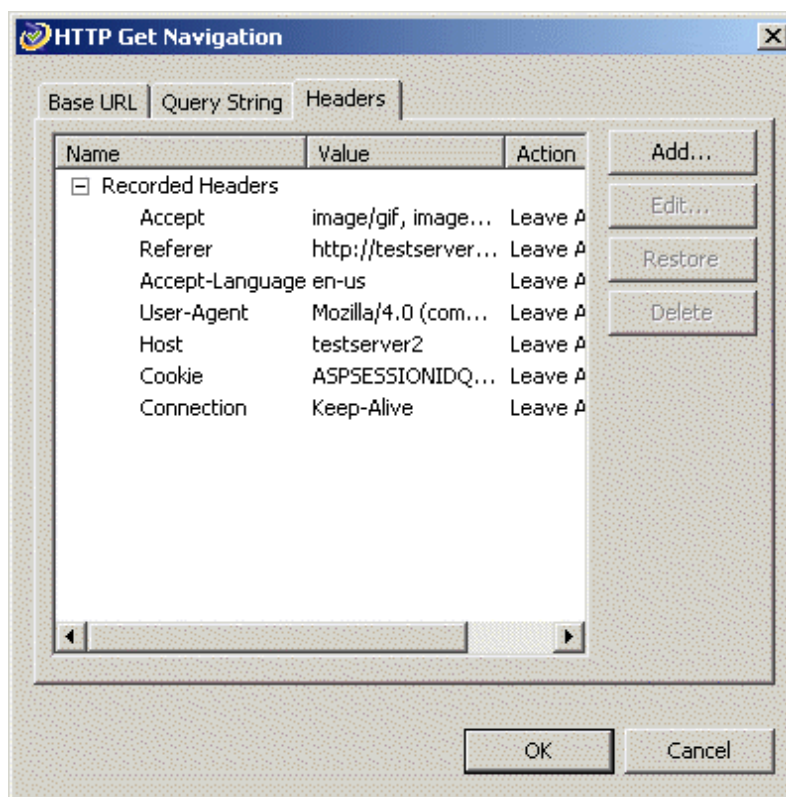
The HTTP Module allows you to view and edit all recorded navigations and related parameters (headers, post data, etc.) in either the script GUI Tree view or the Code View. It also enables you to view and edit any default correlation/parameterization of dynamic navigations and apply your own correlation to handle dynamic navigations.

6.6.1 Understanding Navigation Editing (Correlation)

You can use the Navigation Editing GUI View to configure the navigations you want to parameterize and the correlation rules you want to apply. The GUI allows viewing and editing properties for different types of navigations (for both Web/HTTP applications and non-Web/HTTP applications) and data inputs.

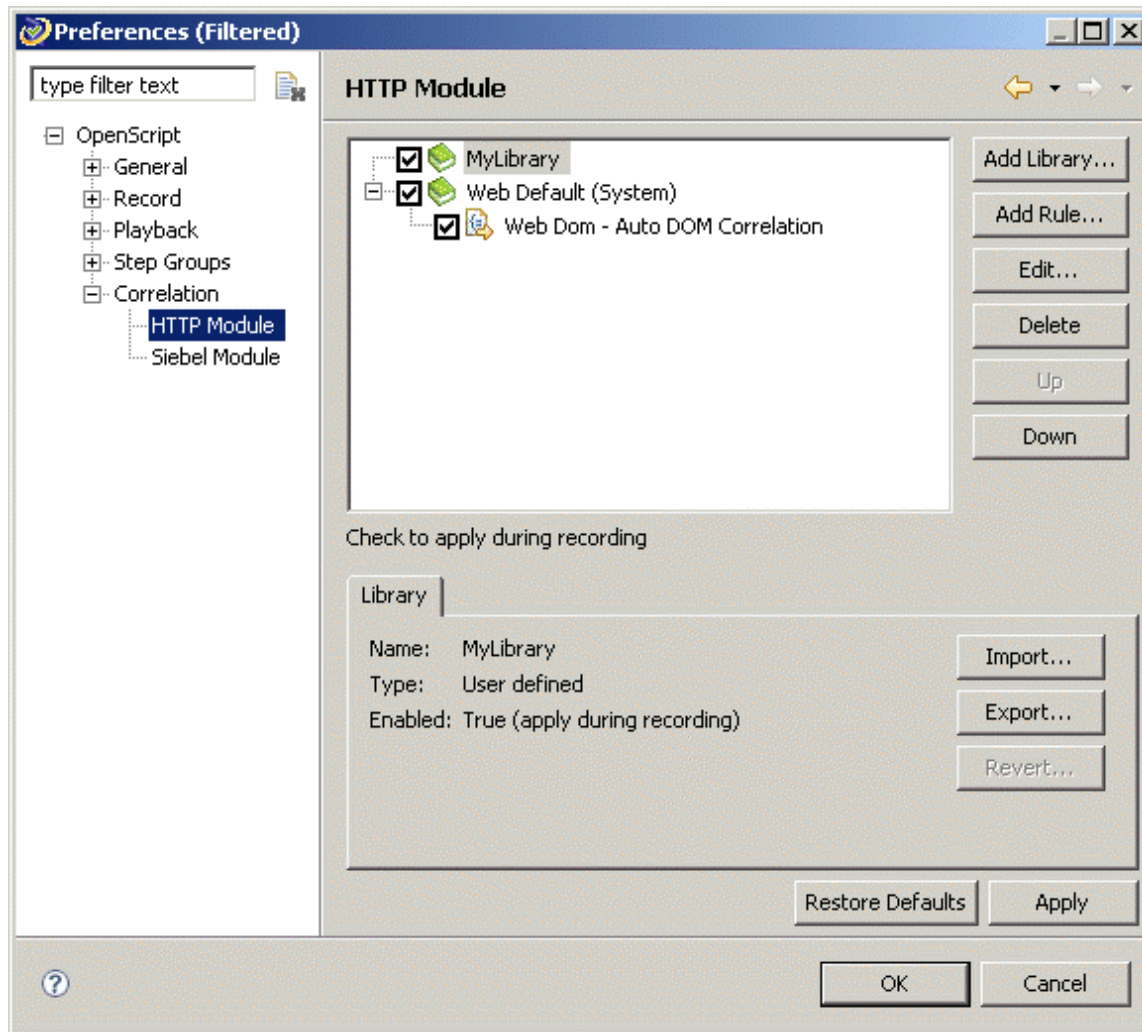
The Display & Editing for Recorded Navigations view includes recorded navigations and any navigation parameters like headers, etc. It also provides a mechanism for users to edit/add/delete navigations including dynamic parameter sources/targets.

Figure 6–2 *Display & Editing for Recorded Navigations view*



The Display & Editing for Correlation Rules Library & Editing view includes a list of all default correlation rules included in the module(s), listed by application type. It also provides a mechanism for adding, editing or deleting correlation rules.

Figure 6–3 The Display & Editing for Correlation Rules Library & Editing view



You can specify the navigations you want to parameterize and the data source you want to drive the inputs from through navigation editing commands in the code view. These commands map to the navigation editing GUI view.

```
beginStep("[2] Home", 3266);
{
    http.post(4, "http://testserver2/fmstocks/{{FORMACTION_0,default.asp}}",
        null,
        http.postdata(http.param("login", "{{INPUT_0,ta616}}"),
            http.param("password", "{{INPUT_1,ta}}"),
            http.param("LoginButton", "{{INPUT_2,Login}}")),
        null, true, "ASCII", "ASCII");
    {
        http.solveXPath("LINK_1_3", ".//A[text()='research a
            company']/@href", "TickerList.asp", 0);
        http.solveXPath("LINK_1_2", ".//A[text()='Logout']/@href",
            "logout.asp", 0);
    }
}
endStep();
```


6.6.2 Adding HTTP Get Navigation

To add an HTTP Get Navigation to an HTTP script:

1. Record an HTTP script as described in ["Recording a New HTTP Script"](#) on page 6-10.
2. Select the **Run** node.
3. Select the **Script** menu, then select **HTTP Get Navigation** from the **Add** sub menu.
4. On the **Base URL** tab, specify the following:
 - **Path:** The base URL path to use for the navigation.
 - **Request charset:** The character set to use for the request.
 - **Response charset:** The character set to use for the response.
 - **Encode strings:** When selected, control and special characters in string are encoded to the Character entity references. When cleared, control and special characters in string are not encoded.
5. On the **Query String** tab, use the **Add** button to add the requested name/value pairs to the Base URL. Note that you can use the Up and Down buttons to move the selected query string parameter up or down one place in the search order.
6. On the **Headers** tab, use the **Add** button to add name/value pairs and actions to the Base URL.
7. Click **OK** to add the HTTP Get Navigation node to the script tree.
8. In the Java Code view, the HTTP Get Navigation consists of the code executed in the `http.Get` method (line breaks and spacing added for clarity):

```
http.Get(1, "http://testserver2",
        http.querystring(http.param("QueryString1", "QueryValue1"),
                        http.param("QueryString2", "QueryValue2"),
                        http.param("QueryString3", "QueryValue3")),
        http.headers(http.header("HeaderString1", "HeaderValue1NoActions",
                                Header.HeaderAction.Add),
                    http.header("HeaderString2", "HeaderValue2SetIfNotSet",
                                Header.HeaderAction.SetIfNotSet),
                    http.header("HeaderString3", "HeaderValue3ApplytoAll",
                                Header.HeaderAction.GlobalAdd),
                    http.header("HeaderString4", "HeaderValue4BothActions",
                                Header.HeaderAction.GlobalSetIfNotSet)),
        false, "ASCII", "ASCII");
```

6.6.3 Adding HTTP Post Navigation

To add an HTTP Post Navigation to an HTTP script:

1. Record an HTTP script as described in ["Recording a New HTTP Script"](#) on page 6-10.
2. Select the **Run** node.
3. Select the **Script** menu and then select **Other** from the **Add** sub menu.
4. Select the HTTP Post Navigation node and click **OK**.
5. On the **Base URL** tab, specify the following:
 - **Path:** The base URL path to use for the navigation.
 - **Request charset:** The character set to use for the request.

- **Response charset:** The character set to use for the response.
 - **Encode strings:** When selected, control and special characters in string are encoded to the Character entity references. When cleared, control and special characters in string are not encoded.
6. On the **Query String** tab, use the **Add** button to add the requested name/value pairs to the Base URL. Note that you can use the Up and Down buttons to move the selected query string parameter up or down one place in the search order.
 7. On the **Post Data** tab, use the **Add** button to add name/value pairs to the Base URL.
 8. On the **Headers** tab, use the **Add** button to add name/value pairs and actions to the Base URL.
 9. Click **OK** to add the HTTP Post Navigation node to the script tree.
 10. In the Java Code view, the HTTP Post Navigation consists of the code executed in the `http.Post` method (line breaks and spacing added for clarity):

```
http.Post(12, "http://testserver2",
    http.querystring(http.param("QueryString1", "QueryValue1"),
        http.param("QueryString2", "QueryValue2"),
        http.param("QueryString3", "QueryValue3")),
    http.postdata(param("PostString1", "PostValue1"),
        http.param("PostString2", "PostValue2"),
        http.param("PostString3", "PostValue3")),
    http.headers(http.header("HeaderString1", "HeaderValue1NoActions",
        Header.HeaderAction.Add),
        http.header("HeaderString2", "HeaderValue2SetifNotSet",
        Header.HeaderAction.SetIfNotSet),
        http.header("HeaderString3", "HeaderValue3ApplytoAll",
        Header.HeaderAction.GlobalAdd),
        http.header("HeaderString4", "HeaderValue4BothActions",
        Header.HeaderAction.GlobalSetIfNotSet)),
    true, "ASCII", "ASCII");
```

6.6.4 Adding an HTTP Multipart Post Navigation

To add an HTTP Multipart Post Navigation to an HTTP script:

1. Record an HTTP script as described in ["Recording a New HTTP Script"](#) on page 6-10.
2. Select the **Run** node.
3. Select the **Script** menu and then select **Other** from the **Add** sub menu.
4. Expand the HTTP Multipart Navigation node and select the Multipart Post Navigation node and click **OK**.
5. On the **Base URL** tab, enter the following:
 - **Path:** The base URL path to use for the navigation.
 - **Boundary:** Specify the boundary to use to identify parts of a multipart form input navigation (file navigations). The boundary is used within the Content-Type: multipart/form-data; boundary="" response sent by the user agent. The specified boundary should not occur in any of the file data.
 - **Request charset:** The character set to use for the request.
 - **Response charset:** The character set to use for the response.

- **Encode strings:** Select this option so that control and special characters in string are encoded to the Character entity references. When cleared, control and special characters in string are not encoded
- 6. On the **Query String** tab, use the **Add** button to add name/value pairs to the Base URL.
- 7. On the **Post Data** tab, use the **Add** button to add postdata to the Base URL. You can specify standard Postdata name/value pairs or postdata files. If you select **File**, specify the path, filename, and content type for each postdata file parameter.
- 8. On the **Headers** tab, use the **Add** button to add name/value pairs and actions to the Base URL.
- 9. Click **OK** to add the HTTP Multipart Post Navigation node to the script tree.
- 10. In the Java Code view, the HTTP Multipart Post Navigation consists of the code executed in the `http.multipartPost` method (line breaks and spacing added for clarity):

```
http.multipartPost(13, "http://testserver2",
    http.querystring(http.param("QueryString1", "QueryValue1"),
        http.param("QueryString2", "QueryValue2"),
        http.param("QueryString3", "QueryValue3")),
    http.postdata(http.param("PostDataString1", "PostDataValue1Standard"),
        http.param("PostDataString2", "PostDataValue2FilePath",
            "PostDataValue2FileName", "ASCII"),
        http.param("PostDataString3",
            "C:\\Oracle\\OFT\\DataBank\\fmstocks_data.csv",
            "C:\\Oracle\\OFT\\DataBank\\fmstocks_data.csv", "CSV")),
    http.headers(http.header("HeaderString1", "HeaderValue1NoActions",
        Header.HeaderAction.Add),
        http.header("HeaderString2", "HeaderValue2IfNotSet",
            Header.HeaderAction.SetIfNotSet),
        http.header("HeaderString3", "HeaderValue3ApplytoAll",
            Header.HeaderAction.GlobalAdd),
        http.header("HeaderString4", "HeaderValue4Both",
            Header.HeaderAction.GlobalSetIfNotSet)),
    "boundary", false, "ASCII", "ASCII");
```

6.6.5 Adding an HTTP XML Post Navigation

To add an HTTP XML Post Navigation to an HTTP script:

1. Record an HTTP script as described in ["Recording a New HTTP Script"](#) on page 6-10.
2. Select the **Run** node.
3. Select the **Script** menu and then select **Other** from the **Add** sub menu.
4. Expand the XML Post Navigation node and select the XML Post Navigation node and click **OK**.
5. On the **Base URL** tab, specify the following:
 - **Path:** The base URL path to use for the navigation.
 - **Request charset:** The character set to use for the request.
 - **Response charset:** The character set to use for the response.

- **Encode strings:** When selected, control and special characters in string are encoded to the Character entity references. When cleared, control and special characters in string are not encoded.
6. On the **Query String** tab, use the **Add** button to add the requested name/value pairs to the Base URL. Note that you can use the Up and Down buttons to move the selected query string parameter up or down one place in the search order.
 7. On the **Post Data** tab, enter the XML post data to add to the Base URL.
 8. On the **Headers** tab, use the **Add** button to add name/value pairs and actions to the Base URL.
 9. Click **OK** to add the HTTP XML Post Navigation node to the script tree.
 10. In the Java Code view, the HTTP XML Post Navigation consists of the code executed in the `http.xmlPost` method (line breaks and spacing added for clarity):

```
http.xmlPost(0, "http://xmltest2",
    http.querystring(http.param("xmlQueryString1", "xmlQueryValue1"),
        http.param("xmlQueryString2", "xmlQueryValue2"),
        http.param("xmlQueryString3", "xmlQueryValue3")),
    "xmlPostDataString",
    http.headers(http.header("xmlHeaderString1", "xmlHeaderValue1NoAction",
        Header.HeaderAction.Add),
        http.header("xmlHeaderString2", "xmlHeaderValue2IfNotSet",
            Header.HeaderAction.SetIfNotSet),
        http.header("xmlHeaderString3",
            "xmlHeaderValue3ApplytoAll", Header.HeaderAction.GlobalAdd),
        http.header("xmlHeaderString4", "xmlHeaderValue4Both",
            Header.HeaderAction.GlobalSetIfNotSet)),
    false, "ASCII", "ASCII");
```

6.6.6 Using the HTTP Module API

The Web Functional Module includes a script Application Programming Interface (API) specific to Web HTTP protocol testing. The HTTP Module recorder creates the Java code that corresponds to the Tree View and displays the HTTP commands in the Java Code view using easy-to-understand function names. The Java Code view commands correspond to the Tree View and you can edit your scripts in either view.

You can use the HTTP API to enhance recorded scripts with additional testing functionality. Commands that are specific to the HTTP Module are part of the "http" class. You can also leverage other commands from other enabled classes (services) or general Java commands in your scripts.

Some examples of the HTTP Module API include:

- Adding authentication
- Adding and removing cookies
- Adding HTTP navigation (Get and Post)
- Adding HTTP Multipart Post navigation
- Adding HTTP Multipart name/value pairs
- Adding name/value pairs
- Adding XML Post navigation

- Setting the user agent

Many API methods can be added using the HTTP Module Tree View. Additional methods can be added using the Java Code view.

Using the Oracle Forms Functional Test Module

This chapter provides instructions on configuring and using the OpenScript Oracle Forms Functional Test Module, which provides support for functional testing of Oracle Forms web applications.

7.1 About the Oracle Forms Functional Test Module

The Oracle Forms Functional Test Module provides support for functional testing of Oracle Forms web applications. The Oracle Forms Functional Test Module is an extension to the Web Functional Test Module.

The Oracle Forms Functional Test Module is an extension module to the OpenScript Web Functional Test Module that extends the Web testing with Oracle Forms Functional Test recording and playback capabilities. The Oracle Forms Functional Test Module is fully integrated with the OpenScript platform including the Results view, Details view, Properties view, Console/Problems views, Preferences, Step Groups, Script Manager, and Workspace Manager.

The Oracle Forms Functional Test recorder displays commands in the Tree View in easy-to-understand commands. By default, script commands are grouped into Steps Groups by the Web page on which they were performed. Each Step Group contains one or more script commands corresponding to recorded actions that were performed on the page. The default name for the Step Group is the Web page Title (as specified in the "Title" tag).

OpenScript shows the results of Oracle Forms Functional Test script playback in the Results view. The Results view shows results for each script command (including duration and summary for failures). The Results Report compiles the same information into an HTML Results Report. Results can be exported from the OpenScript GUI in standard format (CSV / HTML). Results are also generated for unattended playback through the command line.

The Oracle Forms Functional Test Module API includes a "forms" class that provides additional programming functionality.

7.1.1 Key Features of the Oracle Forms Functional Test Module

- Supports Oracle E-Business Suite Release 12 (Forms 10g) running on Sun JRE and E-Business Suite Release 11i (Forms 6i) running on Jinitiator.
- Records Forms actions in the applet.

- Plays back recorded Forms actions/commands which consist of an event plus object identified by its attributes (for example: `forms.textField(28, "//forms:textField[(@name='DIST_LIST_NAME_0')]").input("LOREM IPSUM")`).
- Provides full script code view integration to support script generation for the Oracle Forms Functional Test Module. The Oracle Forms Functional Test Module includes an additional API to support Oracle Forms Functional Test protocol code scripting.
- Allows users to parameterize user inputs to Oracle Forms Functional Test scripts and drive those inputs from an external data file (Databank).
- Allows users to insert Tests to validate Oracle Forms content on playback.
- Provides additional automation of all Oracle Forms GUI components using options/settings that are specific to Oracle Forms Functional Test scripts within the Oracle Forms Functional Test categories in the preferences interface.
- Reports playback results for Oracle Forms Functional Test scripts in the Results and Console views.
- The Oracle Forms Functional Test Script Module API. The Oracle Forms Functional Test Application Programming Interface include Java code methods specific to functional testing of Oracle Forms applications.

The New Project wizard (Select **New** from the **File** menu) includes an "Oracle EBS/Forms" option in the Functional Test group to use when creating Oracle Forms functional testing projects in OpenScript. The Oracle Forms Functional Test Script Module records Oracle Forms applications using Object Identification. OpenScript captures user actions and records them to the OpenScript script nodes in a highly readable sequence of navigations and actions.

7.1.2 Prerequisites

The Oracle Forms Functional Test Module recorder has the following prerequisites:

- Internet Explorer browser for recording with OpenScript. OpenScript installs a Browser Helper Object inside IE 6 and 7.
- Before recording any script in Forms Functional Test Module, you must run the Forms/EBS application at least once before attempting to record a script with OpenScript on that machine. This ensures that required JRE/Jinitiator has been installed and also verifies that forms applications can run successfully on that machine inside of Internet Explorer.
- .NET 2.0 Framework (automatically installed)

7.2 Recording Oracle EBS/Forms Functional Tests

The Oracle Forms Functional Test Module records standard Oracle Forms components for Oracle E-Business Suite Release 12 (Forms 10g) running on Sun JRE and E-Business Suite Release 11i (Forms 6i). The Recorder creates functional and regression test scripts for automating testing of Oracle Forms applications.

Oracle Forms are applet based controls and the Oracle Forms Functional Test Module provides the object/attribute information for OpenScript to record interactions with those controls. Actions will be captured in the test script as OpenScript "forms" commands. Other components are standard Web controls which are captured as standard OpenScript "web" commands using Web Functional Test object attributes.

Object Identification attributes can later be modified by users through the Preferences global settings for new scripts or for already recorded commands in the tree view or code view. Recording can be configured through Internet Explorer only as the Oracle Forms Functional Test Module does not support Firefox.

The Oracle Forms Functional Test Module provides a record toolbar button that lets you initiate the Oracle Forms recorder and capture Web/Oracle Forms page actions to the script view. The record toolbar includes start and stop recording toolbar buttons. OpenScript recorders also open a floating toolbar that can be used while recording without having to switch between the browser and OpenScript.

7.2.1 Setting Oracle Forms Functional Test Record Preferences

To set Oracle Forms Functional Test record preferences:

1. Start OpenScript.
2. Select **OpenScript Preferences** from the **View** menu.
3. Expand the OpenScript node and the Record category.
4. Select **Oracle EBS/Forms Functional**.
5. Click the **General** tab and set the general recording preferences as follows:
 - **Miscellaneous**: Specifies if screenshots are captured.
 - **Capture screenshots**: When selected, screenshots are captured during recording.
6. Click the **Object Identification** tab and use **Add** or **Edit** to customize the object identification elements or attributes.
7. Click **OK**.

7.2.2 Adding/Editing Object Identifiers

The Oracle Forms Functional Test Module uses object identification to specify attributes used to identify Oracle Forms objects. The Oracle Forms Functional Test Module uses the same predefined path attributes for common Web objects as the Web Functional Test Module; however, Oracle Forms Test Automation provides additional attributes to identify forms controls. Object paths are specified in XPath format. For example the object identification path appears as follows in Java code commands:

```
//forms:textField[(@name='DIST_LIST_NAME_0')]
```

You can set the default Web object attributes in the Oracle Forms Functional Test Module Record Preferences. You can also edit object attributes in recorded scripts in the tree view or the code view.

In addition to the predefined object identification, you can add an Object Library to the script to record paths into a library file. Object Library files may be shared and reused across other scripts. The Object Library files provide a more convenient "short name" for objects to provide for more convenient programming.

The Oracle Forms Functional Test Module includes object identifiers that specify how the recorder identifies Browser objects. You can add object identifiers or edit the existing object identifiers in the Record preferences.

To add or edit an object identifier:

1. Select the **OpenScript Preferences** from the **View** menu.

2. Expand the Record node and select Forms Functional Test.
3. Click the **Object Identification** tab. This tab lets you specify the Oracle Forms object identification attributes, as follows:
 - Name:** shows the name(s) of the defined Oracle Forms object identifiers.
 - Attributes:** shows the pattern(s) specified for the defined Oracle Forms object identifiers.
 - Add:** opens a dialog box for specifying a new Oracle Forms object identifier.
 - Edit:** opens a dialog box for editing the selected Oracle Forms object identifier.
 - Delete:** deletes the selected Oracle Forms object identifier.

For each object element, you specify a name (typically a Oracle Form object attribute), an operator, a value and a value type. As you add object elements, OpenScript builds the object identifier using logical OR between each object identifier element. Click **Edit** to change between logical OR and AND.
4. Click **Add** or select an existing object identifier and click **Edit**.
5. If adding a new object identifier, enter a name for the object identifier.
6. Add or edit object elements for the object identifier.

See the Web Functional Test Module for additional information about adding and editing Object Identifiers.
7. Click **OK**. The object identifier is added to the record preferences.

7.2.3 Recording Oracle EBS/Forms Functional Test Scripts

To record Oracle EBS/Forms Functional Test scripts:

1. Start OpenScript.
2. Set the Oracle Forms Functional Test Recording preferences.
3. Select **New** from the **File** menu.
4. Expand the Functional Testing group.
5. Select **Oracle EBS/Forms** (The Oracle EBS/Forms script combines both Web and Oracle Forms technologies as part of the same script).
6. Click **Next**.
7. Select the Repository and Workspace.
8. Enter a script name.
9. Click **Finish**. A new Script tree is created in the Script View.
10. Select **Record** from the **Script** menu. The browser automatically opens when you start recording.
11. Load the web page where you want to start recording into the browser.
12. Navigate the web site to record page objects, actions, and navigations. The page objects, actions, and navigations will be added to the **Run** node of the script tree.
13. When finished navigating pages, close the browser.
14. Select **Stop** from the **Script** menu or click the Stop button on the OpenScript toolbar.

15. Expand the **Run** node of the script to view the page objects, actions, and navigation nodes in the script tree.

You can customize the script using the menu options or the Code View for specific testing requirements.

Note: Do not close the script editor view or script project while recording or playing back scripts. Doing so could result in unpredictable behavior in the OpenScript application.

7.3 Playing Back Scripts

OpenScript plays back recorded Oracle Forms actions/commands which consist of an event plus an object identified by its attributes (for example: `forms.textField(28, "//forms:textField[(@name='DIST_LIST_NAME_0')]").input("LOREM IPSUM")`). The actions used for playback will either be those that are recorded or specified manually in the Java Code view. Playback can be configured through IE only as the Oracle Forms Functional Test Module does not support Firefox. Unattended playback is supported through Oracle Test Manager for Web Applications or third-party tools using OpenScript's command line interface. Oracle Forms Functional Test scripts do not play in Oracle Load Testing for Web Applications.

The Oracle Forms Functional Test Module provides playback and iterate toolbar buttons that allows users to start the script playback for either a single playback through the script or multiple iterations using data from a databank file. Playback results for Oracle Forms Functional scripts can be viewed in the Results and Console views.

7.3.1 Setting Oracle Forms Functional Test Playback Preferences

To set Oracle Forms Functional Test Playback preferences:

1. Start OpenScript.
2. Select **OpenScript Preferences** from the **View** menu.
3. Expand the OpenScript node and the Playback category.
4. Select **Forms Functional Test**.
5. Expand the **Event Timeout** group and set the preferences as follows:
 - **Forms Startup Timeout(S):** specifies the maximum number of seconds OpenScript should wait for a form to appear before considering the form not found. This is the default timeout when waiting for a form to appear before invoking an action against it. This is also the default timeout when waiting for a form to appear before continuing the script.
6. Expand the **Action Settings** group and set the preferences as follows:
 - **Retry Times:** specifies how many times to retry an action before timing out or reporting a failure.
7. Expand the **Replay Port** group and set the preferences as follows:
 - **Port:** specifies the port number to use to communicate with the agent machine.
8. Click **OK**.

7.3.2 Playing Back Oracle EBS/Forms Functional Scripts

To play back Oracle EBS/Forms Functional scripts:

1. Start OpenScript.
2. Open the Oracle Forms Functional script to play back.
3. Select **Playback** from the **Script** menu or click the toolbar button.

You can view the progress of the script playback in the Console View. You can review the results of script playback in the Results View.

7.3.3 Playing Back Oracle EBS/Forms Functional Scripts with Iterations

To play back Oracle Forms Functional scripts with iterations:

1. Start OpenScript.
2. Open the Oracle Forms Functional script to play back.
3. Select **Iterate** from the **Script** menu or click the toolbar button.
4. Set the iteration count.
5. Select which databank file to use, if necessary.
6. Set the starting record for the selected databank in the Databank Settings section.
7. Click **OK**.

You can view the progress of the script playback in the Console View. You can review the results of script playback in the Results View.

7.4 Modifying Scripts

Once a script has been created/recorded, you can make modifications to customize the script for your specific testing needs.

7.4.1 Adding Forms Actions

The Oracle Forms Module includes actions for Oracle Forms objects that can be added to a script.

To add Forms actions to a script:

1. Record a EBS/Forms Functional Test script.
2. Select the script node where you want to add the action.
3. Select the **Script** menu and then select **Other** from the **Add** sub menu.
4. Expand the Forms Action node.
5. Expand an action node and select the action.
6. Click **OK**.
7. Enter the object identification path for the object. You can use the **Capture** or **Select** menu options to capture or select an object path.
8. Enter any required values to use for the object action.
9. Click **OK**. The action node is added to the script tree.

In the Java Code view, a `forms.object(objectId).action()` method will be added to the script code:

```
forms.textField(27, "//forms:textField[(@name='DIST_LIST_APPLICATION_0')]").openDialog();
```

The Forms Action node includes actions for objects such as BlockScroller, Button, Calendar, CheckBox, ChoiceBox, EditBox, EditorDialog, FlexWindow, HelpDialog, InfoBox, List, ListOfValues, Notification, Calculator, RadioGroup, ResponseBox, TabbedRegion, TextField, Tree, TreeList, SpreadTable, SchedulingDataClient. Other object actions have corresponding Java code methods.

7.4.2 Using the Oracle Forms Functional Test Module API

The Oracle Forms Functional Test Module includes a script Application Programming Interface (API) specific to Oracle Forms functional testing. The Oracle Forms Functional Test Module recorder creates the Java code that corresponds to the Tree View and displays the Oracle Forms Functional Test commands in the Java Code view using easy-to-understand function names. The Java Code view commands correspond to the Tree View and you can edit your scripts in either view.

You can use the Oracle Forms Functional Test API to enhance recorded scripts with additional testing functionality. Commands that are specific to the Oracle Forms Functional Testing Module are part of the "forms" class. Additional functional test methods are available in the "web" and "ft" classes. You can also leverage other commands from other enabled classes (services) or general Java commands in your scripts.

Some examples of the Oracle Forms Testing Module API include:

- Forms Action
- Button
- Calendar
- Checkbox
- Choice Box
- Edit Box
- Editor Dialog
- Flex Window
- Form Window
- HelpDialog
- Info Box
- List
- ListOfValues
- Notification
- RadioGroup
- ResponseBox
- TabbedRegion
- TextField
- Tree
- TreeList

- SpreadTable
- SchedulingDataClient

Many API methods can be added using the Oracle Forms Functional Test Module Tree View. Additional methods can be added using the Java Code view.

Using the Oracle Forms Load Test Module

This chapter provides instructions on configuring and using the OpenScript Oracle Forms Load Test Module, which provides support for load testing of Oracle Forms web applications.

8.1 About the Oracle Forms Load Test Module

The Oracle Forms Load Test Module is an extension module to the OpenScript HTTP Module that extends the Web testing with Oracle Forms Load Test recording and playback capabilities. The Oracle Forms Load Test Module is fully integrated with the OpenScript platform including the Results view, Details view, Properties view, Console/Problems views, Preferences, Step Groups, Script Manager, and Workspace Manager. The Oracle Forms Load Test Module provides the following features:

The Oracle Forms Load Test recorder displays commands in the Tree View in easy-to-understand commands. By default, script commands are grouped into Steps Groups by the Web page on which they were performed. Each Step Group contains one or more script commands corresponding to recorded actions that were performed on the page. The default name for the Step Group is the Web page Title (as specified in the "Title" tag).

OpenScript shows the results of Oracle Forms Load Test script playback in the Results view. The Results view shows results for each script command (including duration and summary for failures). The Results Report compiles the same information into an HTML Results Report. Results can be exported from the OpenScript GUI in standard format (CSV / HTML). Results are also generated for unattended playback through the command line.

The Oracle Forms Load Test Module API includes a "nca" class that provides additional programming functionality.

8.1.1 Key Features of the Oracle Forms Load Test Module

- The Oracle Forms Load Test Script Module. The New Project wizard (**New** from the **File** menu) includes an "Oracle EBS/Forms" option in the Load Test Group to use when creating Oracle Forms load testing projects in OpenScript. The Oracle Forms Load Test Script Module records Oracle Forms applications at the protocol level. OpenScript captures user actions and records them to the OpenScript script based upon HTTP requests and post data or query strings.
- Correlation Library. The Oracle Forms Load Test Module includes an Oracle forms-specific library of correlation rules for parameterizing scripts.
- Test Cases (Validation). The Oracle Forms Load Test Module includes a Status Bar test for validating Oracle Forms application content on playback.

- Oracle Forms-Specific Application Programming Interface (API). The Oracle Forms Load Test Module includes a Oracle Forms Load Test Module API Specification that can be used to customize Oracle Forms-specific scripts.

8.1.2 Prerequisites

The Oracle Forms Load Test Module recorder has the following prerequisites:

- Internet Explorer browser for recording with OpenScript. OpenScript installs a Browser Helper Object inside IE 6 and 7.
- Before recording any script in Forms Functional Test Module, you must run the Forms/EBS application at least once before attempting to record a script with OpenScript on that machine. This ensures that required JRE/Jinitiator has been installed and also verifies that forms applications can run successfully on that machine inside of Internet Explorer.
- .NET 2.0 Framework (automatically installed)

8.2 Recording Oracle EBS/Forms Load Tests

The Oracle Forms Load Test Module records standard Oracle Forms components for Oracle E-Business Suite Release 12 (Forms 10g) running on Sun JRE and E-Business Suite Release 11i (Forms 6i). The Recorder creates load test scripts for automating testing of Oracle Forms applications.

Oracle Forms are applet based controls and the Oracle Forms Load Test Module provides the object/attribute information for OpenScript to record interactions with those controls. Actions will be captured in the test script as OpenScript "nca" commands. Other components are standard Web controls which are captured as standard OpenScript "http" navigation commands. Correlation rules can be modified by users through the Preferences settings for new scripts. Recording can be configured through Internet Explorer only as the Oracle Forms Load Test Module does not support Firefox.

The Oracle Forms Load Test Module provides a record toolbar button that lets you initiate the Oracle Forms recorder and capture Web/Oracle Forms page actions to the script view. The record toolbar includes start and stop recording toolbar buttons. OpenScript recorders also open a floating toolbar that can be used while recording without having to switch between the browser and OpenScript.

When an recording Oracle forms script determining the type of communication is important. Oracle Forms client can communicate with the server using the following modes:

- Socket Mode: All the communication exchanged between the server and client is performed at a socket level therefore the proxy recorder will not capture any transactions that occur between the server and client.
- HTTP Mode: All the communication happens over the HTTP protocol and gets captured by both the proxy recorder and the Oracle Forms Load Test module. The duplication of HTTP requests is filtered out by the Oracle Forms Load Test module and the message log only retains the requests captured by Oracle Forms Load Test module and not the request captured by proxy recorder.
- HTTPS Mode: This mode the communication is very similar to that of HTTP except the connection is made over the HTTP protocol on port 443 using SSL.

8.2.1 Setting Oracle Forms Load Test Record Preferences

To set Oracle Forms Load Test record preferences:

1. Start OpenScript.
2. Select **OpenScript Preferences** from the **View** menu.
3. Expand the OpenScript node and the Record category.
4. Select **Oracle EBS/ Forms Load Test**.
5. Set the Applet parameters as follows:
 - **Applet Parameters:** Specifies the Forms Applet Class property to use to record Forms applications.
 - **EBS Forms:** When selected, the OpenScript Applet Class property `oracle.forms.engine.main` is used to record EBS/Forms applications.
 - **Custom Forms:** When selected, the specified Applet Class property is used to record custom non-Web deployed Forms applications.
6. Click **OK**.

8.2.2 Recording Oracle EBS/Forms Load Test Scripts

To record Oracle EBS/Forms Load Test scripts:

1. Start OpenScript.
2. Set the Oracle Forms Load Test Correlation preferences.
3. Set the Oracle Forms Load Test Recording preferences.
4. Select **New** from the **File** menu.
5. Expand the Load Testing group.
6. Select **Oracle EBS/Forms** (The Oracle EBS/Forms script combines both HTTP and Oracle Forms technologies as part of the same script).
7. Click **Next**.
8. Select the Repository and Workspace.
9. Enter a script name.
10. Click **Finish**. A new Script tree is created in the Script View.
11. Select **Record** from the **Script** menu. The browser automatically opens when you start recording.
12. Load the web page where you want to start recording into the browser.
13. Navigate the web site to record page objects, actions, and navigations. The page objects, actions, and navigations will be added to the **Run** node of the script tree.
14. When finished navigating pages, close the browser.
15. Select **Stop** from the **Script** menu or click the Stop button on the OpenScript toolbar.
16. Expand the **Run** node of the script to view the page objects, actions, and navigation nodes in the script tree.

You can customize the script using the menu options or the Code View for specific testing requirements.

Note: Do not close the script editor view or script project while recording or playing back scripts. Doing so could result in unpredictable behavior in the OpenScript application.

8.3 Playing Back Scripts

OpenScript plays back recorded Oracle Forms actions/commands which consist of an object identified by its attributes (for example:

`nca.treeList("handlerName").selectByIndex(0);`). The actions used for playback will either be those that are recorded or specified manually in the Java Code view. Playback can be configured through IE only as the Oracle Forms Load Test Module does not support Firefox. Unattended playback is supported through Oracle Test Manager for Web Applications or third-party tools using OpenScript's command line interface.

The Oracle Forms Load Test Module provides playback and iterate toolbar buttons that allows users to start the script playback for either a single playback through the script or multiple iterations using data from a databank file. Playback results for Oracle Forms Load scripts can be viewed in the Results and Console views.

8.3.1 Setting Oracle Forms Load Test Playback Preferences

To set Oracle Forms Load Test playback preferences:

1. Start OpenScript.
2. Select **OpenScript Preferences** from the **View** menu.
3. Expand the OpenScript node and the Playback category.
4. Select **Oracle EBS/Forms Load Test**.
5. Select or clear the capture playback log option:
 - **Capture Playback Log:** Specifies if forms message logs are captured during playback. Message playback logs can be used to compare the recorded vs. played back forms messages to troubleshoot script problems.
6. Click **OK**.

8.3.2 Playing Back Oracle EBS/Forms Functional Scripts

To play back Oracle EBS/Forms Load scripts:

1. Start OpenScript.
2. Open the Oracle EBS/Forms Load script to play back.
3. Select **Playback** from the **Script** menu or click the toolbar button.

You can view the progress of the script playback in the Console View. You can review the results of script playback in the Results View.

8.3.3 Playing Back Oracle EBS/Forms Functional Scripts with Iterations

To play back Oracle EBS/Forms Load scripts with iterations:

1. Start OpenScript.
2. Open the Oracle EBS/Forms Load script to play back.

3. Select **Iterate** from the **Script** menu or click the toolbar button.
4. Set the iteration count.
5. Select which databank file to use, if necessary.
6. Set the starting record for the selected databank in the Databank Settings section.
7. Click **OK**.

You can view the progress of the script playback in the Console View. You can review the results of script playback in the Results View.

8.4 Modifying Scripts

Once a script has been created/recorded, you can make modifications to customize the script for your specific testing needs.

8.4.1 Adding Forms Actions

The Oracle Forms Module includes actions for Oracle Forms objects that can be added to a script.

To add Forms actions to a script:

1. Record a EBS/Forms Functional Test script.
2. Select the script node where you want to add the action.
3. Select the **Script** menu and then select **Other** from the **Add** sub menu.
4. Expand the Forms Load Action node.
5. Expand an action node and select the action.
6. Click **OK**.
7. Enter the object identification path for the object. You can use the **Capture** or **Select** menu options to capture or select an object path.
8. Enter any required values to use for the object action.
9. Click **OK**. The action node is added to the script tree.

In the Java Code view, a `nca.object(handlerName).action()` method will be added to the script code:

```
nca.treeList("handlerName").selectByIndex(0);
```

The Forms Load Action node includes actions for objects such as Application, Button, CheckBox, ChoiceBox, List Item, List of Values, Pop List Item, Radio Button, Tab, Text Field, Window, Generic Client, and Alert Dialog. Other object actions have corresponding Java code methods.

8.4.2 Converting Forms Actions to XML Messages

In some cases, you may want to convert EBS/Forms actions recorded to the script into the raw XML client messages to troubleshoot playback issues. For example, the script recorder creates actions in the script tree such as `Activate window ("WindowName")`. The Java code for the action would be similar to `nca.window(id, "WindowName").activate()`.

However, the actual XML message traffic between the application server and the Web client is more verbose. For example, the message traffic for a window activate action could be similar to the following:

```
<Messages>
  <ClientMessage Object="HEADER">
    <Message mActionString="MSG_UPDATE" mActionCode="2" mHandlerClassId="0"
      mHandlerId="170">
      <Property actionString="WINDOW_ACTIVATED" action="247"
        type="java.lang.Boolean" value="true"/>
    </Message>
  </ClientMessage>
  <ClientMessage Object="HEADER_ORIGINATING_BAL_SEG_VALUE_0">
    <Message mActionString="MSG_UPDATE" mActionCode="2" mHandlerClassId="0"
      mHandlerId="566">
      <Property actionString="CURSOR_POSITION" action="193"
        type="java.lang.Integer" value="0"/>
    </Message>
  </ClientMessage>
</Messages>
```

If you need to troubleshoot specific script actions, you can convert the script action to the raw XML messages and try playing back the script again to see if the XML messages resolve the issue.

To convert EBS/Forms actions to XML client messages:

1. Right-click the script node you want to convert and select **Properties**. The Form Window opens with the following options:
 - **Automatically generate the Forms client messages:** When selected, the script uses the recorded Forms action on playback.
 - **Path:** Shows the recorded Forms action path.
 - **Send recorded Forms client messages:** When selected, the script uses the recorded raw XML client messages on playback.
 - **Description:** Shows a description of the client messages.
 - **Recorded Messages:** Shows the raw XML client and server messages generated between the application server and the web client during recording.
2. Select the **Send recorded Forms client messages** option. If necessary, you can edit the raw XML messages.
3. Click **OK**.

Note: Converting the script action to XML messages cannot be undone unless you close the script without saving.

The script node changes to a *Send Message action* action. The Java Code for the action will change to a method in the following form:

```
nca.sendMessage(id, "description", "<Messages>XML string</Messages>");
```

The raw XML message string can be very long and can increase script size.

8.4.3 Using the Oracle Forms Load Test Module API

The Oracle Forms Load Test Module includes a script Application Programming Interface (API) specific to Oracle EBS/Forms load testing. The Oracle Forms Load Test Module recorder creates the Java code that corresponds to the Tree View and displays the Oracle Forms Load Test commands in the Java Code view using easy-to-understand function names. The Java Code view commands correspond to the Tree View and you can edit your scripts in either view.

You can use the Oracle Forms Load Test API to enhance recorded scripts with additional testing functionality. Commands that are specific to the Oracle Forms Functional Testing Module are part of the "nca" class. Additional functional test methods are available in the "http" class. You can also leverage other commands from other enabled classes (services) or general Java commands in your scripts.

Some examples of the Oracle Forms Testing Module API include:

- Application
- Alert Dialog
- Button
- CheckBox
- ChoiceBox
- Generic Client
- List Item
- List of Values
- Pop List Item
- Radio Button
- Tab
- Text Field
- Window

Many API methods can be added using the Oracle EBS/Forms Load Test Module Tree View. Additional methods can be added using the Java Code view.

8.5 Setting Oracle Forms Load Test Correlation Preferences

To set Setting Oracle Forms Load Test Correlation preferences:

1. Start OpenScript.
2. Select **OpenScript Preferences** from the **View** menu.
3. Expand the OpenScript node and the Correlation category.
4. Expand the Oracle Forms Load Test library.
5. Select or clear the check boxes to enable or disable specific rules.
6. Click the **Add** or **Edit** buttons to modify rules in the library.
7. Click **OK**.

8.6 Oracle Forms Load Test Correlation Library

The Oracle Forms correlation library defines the correlation rules for Oracle Forms-based applications. The correlation rules specify the variable names and regular expressions to use to replace dynamic data in Oracle Forms applications and navigations. The default Oracle Forms correlation library provided with the OpenScript Oracle Forms Load Test Module includes the following correlation rules:

- **ICX Ticket 11i - Variable Substitution** - this rule locates text in the HTML matching the Regular Expression pattern `icx_ticket=(.+?)` and replaces it with the variable name `formsload:icx_ticket_11i` in all locations.
- **ICX Ticket R12 - Variable Substitution** - this rule locates text in the HTML matching the Regular Expression pattern `icx_ticket&gv15=(.+?)&` and replaces it with the variable name `formsload:icx_ticket_r12` in all locations.
- **Web Default Correlation - DOM Correlation** - this rule implements the default Web Document Object Model correlation rules for Oracle Forms applications.
- **Correlate Headers - Correlate Headers** - this rule implements the default Correlate Headers correlation rules for Oracle Forms applications that use dynamic headers.
- **Correlate Referer Headers - Correlate Headers** - this rule implements the default Correlate Headers correlation rules for Oracle Forms applications that use dynamic Referer Headers. This rule adds a `http.solveRefererHeader` method to store the requested url for referer headers in later navigations to use.
- **LoginSubmitButton - Variable Substitution** - this rule locates text in the HTML matching the Regular Expression pattern `FORM_SUBMIT_BUTTON': '(.+?)'` and replaces it with the variable name `formsweb:loginsubmit` in all locations.
- **OAS - Variable Substitution** - this rule locates text in the HTML matching the Regular Expression pattern `oas=(.+?)\.\.` and replaces it with the variable name `oas` in all locations.
- **TI - Variable Substitution** - this rule locates text in the HTML matching the Regular Expression pattern `&_ti=(.+?)&` and replaces it with the variable name `formsweb:ti` in all locations.
- **FormsLT Global Substitution - Oracle Forms Variable Substitution** - this rule adds the appropriate Connect Statement for Forms implementations running in HTTP mode. Substitute Forms URL transform and ICX Ticket transform.

8.7 Troubleshooting Oracle EBS/Forms Load Test Scripts

The following are key concepts, tools, and functions you can use when debugging Oracle EBS/Forms Load Test scripts recorded during recording as well as playback.

8.7.1 Debugging Using the Message Log

This section explains how to use the Message Log for debugging Oracle EBS/Forms Load Test Scripts.

8.7.1.1 During Recording

When recording EBS/Forms Load scripts, the Oracle Forms Load Test module generates a complete log of messages that were exchanged between the forms server and the client browser. The log is generated for all types of communication (See Recording Oracle EBS/Forms Load Tests):

- Socket Connection - numerically identified by a 0
- HTTP Connection - numerically identified by a 1
- HTTPS Connection - numerically identified by a 2

This recorded log is located in

```
<installdir>/OFT/<ScriptName>/recordedData/FormsLT_Recorded_
FormsMessage_Logs/RecordedMessages.log.
```

8.7.1.2 Format of the Recorded Log

The format in the log is as follows:

- MESSAGE FROM CLIENT: indicates a Message sent from client to server, followed by an XML string representation of the message object.
- TERMINAL MESSAGE FROM CLIENT: indicates a Terminal Message sent from client to server, followed by an XML string representation of the terminal message object.
- MESSAGE FROM SERVER: indicates a response message sent from the server to client, followed by an XML string representation of the message object.
- TERMINAL MESSAGE FROM SERVER: indicates a Terminal Message indicating the end of a response sent from the server to the client, followed by an XML string representation of the terminal message object.

8.7.1.3 During Playback

If a script fails during playback, you can enable the message log for debug purposes.

To enable the message log:

1. Open the Oracle EBS/Forms load test script.
2. Enable the **Capture Playback Log** option in the EBS/Forms Playback Preferences.

After enabling message logging, click the play button to run the script. During script play back, all forms messages exchanged between server and the client are printed to the console window in OpenScript.

This is a rather large log of messages and using the recorded log as a reference, compare the messages being sent to the server by OpenScript. Check for messages that appear in the recorded log but not in the playback log. It is normal to have messages such as OUTERSIZE, LOCATION missing. The reason for this is because the EBS/Forms load script recorder was designed keeping in mind that the user should see actions being recorded in the script instead of messages.

8.7.1.4 After Playback

Message playback logs can be used to compare the recorded vs. played back forms messages to troubleshoot script problems. Select a result in the Results view and compare the recorded vs. playback messages in the Comparison tab of the Details view.

The Details view for EBS/Forms load scripts can have the following tabs:

- **Object Details Tree:** Shows a text-based representation of the property names and values of an EBS/Forms object in a tree hierarchy. You can right click a property to add a Text Matching test.
- **Screenshot:** Shows an image of the EBS/Forms window for visual identification. The Screenshot is taken on Window Activate actions.

- **Messages:** Shows the raw XML EBS/Forms messages recorded for the selected script node.
- **Message Tree:** Shows the XML EBS/Forms message parameters and values for the selected script node in a tree hierarchy.
- **Comparison:** Shows a comparison of the recorded vs. playback XML EBS/Forms messages or object details for the selected item in the Results view. Select the comparison type from the **Compare** list.

8.7.2 Analyzing Message Logs

Messages to check for when analyzing recorded and playback logs are as follows:

- **FOCUS messages:** Make sure the correct component has focus. The script cannot execute an action on a component without correctly setting a focus on it. For example, a text field component contains a button which displays a list of values dialog when pressed. This button is not enabled until the focus is correctly set on the text field. In this case, if OpenScript tries to execute a press button action and the focus is not correct, you will encounter an error such as "Component not available".
- **WINDOW_ACTIVATED messages:** Make sure the correct window is the currently active windows for the script action on a component. If the correct window is not currently active, the script will not be able to execute any actions on the components within that window.

8.7.3 Troubleshooting Forms ifError Messages

When playing the script in HTTP mode, the server can respond with error messages in plain/text which would require special handling by the VU. The following are the most common types of `ifError` messages returned by the server.

ifError Messages

These messages are returned as a response of any forms request against the server when playing the script in HTTP mode. The response content type for these messages is 'plain/text' and the response code is '200 OK'

ifError:3

The client does not handle cookies. Enable cookie handling for that virtual user.

ifError:4

The server was unable to create an Oracle Forms process. Problem exists on the server-side.

ifError:5

The server was unable to start the Oracle Forms process. Problem exists on the server-side.

ifError:6

The Oracle Forms session was aborted and the VU is unable to communicate with the server. In most cases this would occur when the server is experiencing a heavy load or if there is a problem with the script.

ifError:7

The server is currently busy, re-try the request later. The VU will re-try this request <n> number of times where <n> is a value specified in Forms Load Test playback preferences before it throws an error/stops playback.

ifError:11/<n>

The server is busy, re-try the request in <n> milliseconds. This type of message will not be displayed to the user, the VU will automatically re-try this request after <n> milliseconds.

Using the Web Services Module

This chapter provides instructions on using the OpenScript Web Services Module, which supports testing of Web Services.

9.1 About the Web Services Module

The Web Services Module is an application module that supports testing of Web Services. The Web Services Module is an extension to the HTTP Module. The OpenScript Web Services module includes the following features:

- The Web Services Module. The New Project wizard (select **New** from the **File** menu) includes a "Web Services Script" option to use when creating Web Services scripts in OpenScript.
- Support for SOAP Protocols. The Web Service Module supports the SOAP 1.1 and 1.2 protocols.
- Support for multiple parsers. The Web Service Module supports the multiple WSDL parsers. In addition to the default OpenScript and Oracle parsers, OpenScript can also be configured to use apache AXIS and .Net parsers.
- WSDL Manager. The OpenScript WSDL Manager lets you import and store Web Services Definition files for creating Web Services scripts. Using the WSDL Manager, you add Web Services methods to the OpenScript tree.
- XML Editor. The OpenScript XML Editor lets you edit Web Services requests to include either static values or variables.
- Web Services-specific Application Programming Interface (API). The Web Services Module includes a Web Services Module API Specification that can be used to customize Web Services scripts.

9.1.1 Key Features of the Web Services Module

The Web Services Module is an extension module to HTTP Module that extends the platform with Web Services testing capabilities. The Web Services Module is fully integrated with the OpenScript platform including the Results view, Details view, Properties view, Console/Problems views, Preferences, Step Groups, Script Manager, and Workspace Manager.

The Web Services methods are added to the Script tree using the WSDL Manager. Web Services method postdata parameters can be edited using the XML Editor features of the Details View.

OpenScript shows the results of Web Services script playback in the Results view. The Results view shows results for each script command (including duration and

summary for failures). The Results Report compiles the same information into an HTML Results Report. Results can be exported from the OpenScript GUI in standard format (CSV / HTML). Results are also generated for unattended playback through the command line.

The Web Services Module API includes a "ws" class that provides additional programming functionality.

9.2 Creating Web Services Scripts Using WSDL Manager

Creating Web Services scripts using WSDL Manager involves the following major steps:

1. Create a Web Services script tree.
2. Add WSDL files to the WSDL Manager view.
3. Add methods from the WSDL Manager to the script tree.
4. Edit method parameters in the Details view.

The following sections explain each of the major steps.

9.2.1 Creating the Web Services Script Tree

To create a Web Services script tree:

1. Start OpenScript.
2. Select **New** from the **File** menu.
3. Expand the General group and select **Web Services**.
4. Click **Next**.
5. Select the Repository and Workspace.
6. Enter a script name.
7. Click **Finish**. A new Script tree is created in the Script View and the WSDL Manager view appears.

9.2.2 Adding WSDL Files to the WSDL Manager View

To add files to the WSDL Manager view:

1. Click the Add icon in the WSDL Manager view.
2. Enter the URL to a the WSDL file or click **Browse** to select a local file.
3. Select the parser to use and set the **Roll over** option.
4. Click **Next**. The parsed methods appear.
5. Click **Finish** to add the parsed methods to the WSDL Manager view.

9.2.3 Adding Methods to the Script Tree

To add WSDL file methods from the WSDL Manager view to the script tree:

1. Expand the WSDL file tree in the WSDL Manager view.
2. Right-click the method to add and select **Add to script** from the shortcut menu. The method will be added to the **Run** node of the script tree.

In the Java Code view, a `ws.method(method)/ws.endMethod()` group with a `ws.post()` method will be added to the script code, as follows:

```
ws.method("findApprovedPatientsByLastName");
{
  ws.post(2, "http://server:7011/medrec-jaxws-services/PatientFacadeService",
    "<?xml version='1.0' encoding='UTF-8' standalone='no'?>
    <soapenv:Envelope
      xmlns:soapenv='http://schemas.xmlsoap.org/soap/envelope/'
      xmlns:med='http://www.oracle.com/medrec'>\r\n
      <soapenv:Header/>\r\n
      <soapenv:Body>\r\n
        <med:findApprovedPatientsByLastName>\r\n
          <!--Optional:-->\r\n
          <arg0>String</arg0>\r\n
        </med:findApprovedPatientsByLastName>\r\n
      </soapenv:Body>\r\n
    </soapenv:Envelope>", null, true, null, null);
}
ws.endMethod();
```

9.2.4 Editing Method Parameters in the Details View

To edit WSDL file methods in the Details View:

1. Expand the **Run** node in the Script tree view.
2. Expand the WSDL method node in the Script tree view.
3. Select an XML post data node in the Script tree view.
4. Open the Details view and select the XML Tree tab.
5. Click a value in the right column of the XML Tree tab to edit the value.

or

Right-click a parameter in the left column of the XML Tree tab and select **Substitute Variable** to select a variable name or Databank value to substitute for the parameter value. If you parameterize a value with a Databank, the databank variable appears as `{{db.databankFileName.field,recordedValue}}` in the SOAP parameters. For example, the optional argument `<arg0>` in the above postdata example would appear as

```
<arg0>{{db.customer.LastName,String}}</arg0>\r\n.
```

The XML source in the XML tab is not decoded by default. Right-click the XML source in the XML tab and select **Format** to format the contents. When you format the xml contents, the inner text of an element will be decoded. The following is an example of the inner text of an element before formatting:

```
<soapenv name="google&quot;">google&quot;</soapenv>
```

The following is an example of the inner text of an element after formatting:

```
<soapenv name="google&quot;">google</soapenv>
```

9.3 Modifying Scripts

Once a script has been created/recorded, you can make modifications to customize the script for your specific testing needs.

9.3.1 Adding a Web Services Post Navigation

To add a Web Services Post Navigation to a script:

1. Create a Web Services script.
2. Select the **Run** node.
3. Select the **Script** menu and then select **Other** from the **Add** sub menu.
4. Expand the HTTP node.
5. Select the Web Services Post Navigation node from the Web Services group and click **OK**.
6. On the **Base URL** tab, enter the URL, request and response charsets, and set the **Encode strings** option.
7. On the **Post Data** tab, enter the SOAP protocol postdata XML.
8. On the **Headers** tab, use the **Add** button to add name/value pairs and actions to the Base URL.
9. Click **OK** to add the Web Services Post Navigation node to the script tree.

In the Java Code view, the Web Services Post Navigation consists of the code executed in the `ws.Post` method (line breaks and spacing added for clarity):

```
ws.post(2, "http://testserver2/EmployeeLookup/EmployeeLookup.asmx",
  "<?xml version=\"1.0\" encoding=\"utf-8\"?>\r\n\r\n
  <soapenv:Envelope
    xmlns:soapenv=\"http://schemas.xmlsoap.org/soap/envelope/\"
    xmlns:xsi=\"http://www.w3.org/2001/XMLSchema-instance\"
    xmlns:xsd=\"http://www.w3.org/2001/XMLSchema\"
    xmlns:web=\"http://oracle.com/webservices\"> \r\n
  <soapenv:Header/> \r\n
  <soapenv:Body> \r\n
    <web:findEmployee soapenv:
      encodingStyle=\"http://schemas.xmlsoap.org/soap/encoding/\"> \r\n
    <criteria xmlns:enc=\"http://oracle.com/webservices/encodedTypes\"
      xsi:type=\"enc:SearchCriteria\"> \r\n
      <FirstName xsi:type=\"xsd:string\">string</FirstName> \r\n
      <LastName xsi:type=\"xsd:string\">string</LastName> \r\n
      <EmployeeID xsi:type=\"xsd:int\">3</EmployeeID> \r\n
    </criteria> \r\n
    </web:findEmployee> \r\n
  </soapenv:Body> \r\n
</soapenv:Envelope>",
  http.headers(http.header("Content-Type", "text/xml",
    Header.HeaderAction.Modify),
    http.header("SOAPAction", "\"http://oracle.com/webservices/findEmployee\"",
      Header.HeaderAction.Add)),
  false, "UTF-8", "UTF-8");
```

9.3.2 Adding a Text Matching Test

You can use Text Matching Tests to report an error and/or abort the script if a request does not match the Text Matching Test criteria.

To add a Text Matching Test to a Web Services script:

1. Create a Web Services script.
2. Expand the **Run** node.

3. Select the Web Services postdata node where you want to add the Text Matching test.
4. Select the **Script** menu and then select **Other** from the **Add** menu.
5. Select **Text Matching Test** from the Validation group.
6. Enter a name for the test.
7. Enter the Text to Match.
8. Enter any error message text to log if the test fails.
9. Select the source location to look for the text to match: HTML or Response Header.
10. Select the **Pass when** setting.
 - **Selected text is present:** the test case passes if the **Text to Match** string is found in the selected source.
 - **Selected text is absent:** the test case passes if the **Text to Match** string is not found in the selected source.
11. Select the **Regular Expression** option if the Text to Match is a Regular Expression. Clear the **Regular Expression** option if the Text to Match is plain text.
12. Click **OK** to add the Text Matching Test node to the script tree.

In the Java Code view, the Text Matching Test consists of the code executed in the `http.match` method (line breaks and spacing added for clarity):

```
http.match("Test name", "Text to Match", "Error Message",
          Source location = Source.Html | Source.ResponseHeader,
          pass when present = false | pass when absent = true,
          is not RegExp = false | is RegExp = true);
```

Example:

```
http.match("MyTXTMatch", "Login", "Could not find login", Source.Html, false,
false);
```

Set the default Error recovery setting for the HTTP Text Matching test in the OpenScript playback preferences.

9.3.3 Adding Security Extensions

You can add security extensions to Web Services scripts.

To add security extensions to a Web Services script:

1. Create a Web Services script.
2. Expand the **Run** node.
3. Select the Web Services method node where you want to add the security and attachments.
4. Select the **Script** menu and then select **Other** from the **Add** menu.
5. Expand the HTTP node.
6. Select **Web Services Security Attachments** from the Web Services group and click **OK**.
7. If necessary click the **WS-Security** tab.

8. Enter a URL. If you selected a Web Services navigation node in the script tree, the URL will be automatically entered.
9. Select **User Username Token**
10. Enter the user name and password.
 - **Username:** specifies the user name to use for the Username Token in the XML request.
 - **Password:** specifies the password to use for the Username Token in the XML request.
 - **Confirm Password:** confirms the password.
11. Select the password type: Password Text or Password Digest.
 - **Password Text:** when selected, the password in the XML request is included as plain text. The URI attribute for the <wsse:Password> element is set to #PasswordText.
 - **Password Digest:** when selected, the password is encrypted. The URI attribute for the <wsse:Password> element is set to #PasswordDigest.
12. Select or clear the **Add Created Header**, **Add Nonce** and **Add Timestamp** options.
 - **Add Created Header:** when selected, a creation timestamp is included in the Username Token of the XML request for use in setting the server cache limit of used nonces.
 - **Add Nonce:** when selected, a cryptographically random nonce value is included in the Username Token of the XML request to provide a countermeasure for replay attacks.
 - **Add Timestamp:** when selected, a timestamp value is included in the Web Services security element of the XML request. The timestamp includes both Created and Expires elements. Specify the **Valid For** number of seconds.
13. Click **OK** to add the Security Attachment node to the script tree.

In the Java Code view, the Security Attachment consists of the code executed in the `ws.addSecurityAttachments` method (line breaks and spacing added for clarity), as follows:

```
ws.addSecurityAttachments("url",
    ws.security("userName", deobfuscate("password"), addCreatedHeader,
        addNonce, addTimestamp, validFor), null);
```

If you add security and file attachments together, the `ws.addSecurityAttachments` method includes both the `ws.security` and `ws.attachments` methods (line breaks and spacing added for clarity), as follows:

```
ws.addSecurityAttachments("url",
    ws.security("userName", deobfuscate("password"), true, true, true, 10),
    ws.attachments(AttachmentMechanism.transferType,
        ws.attachment("filename", "attachmentPart")));
```

9.3.4 Adding Attachments

You can add file attachments to Web Services scripts.

To add file attachments to a Web Services script:

1. Create a Web Services script.

2. Expand the **Run** node.
3. Select the Web Services method node where you want to add the security and attachments.
4. Select the **Script** menu and then select **Other** from the **Add** menu.
5. Select **Web Services Security Attachments** from the Web Services group.
6. If necessary click the **WS-Security** tab.
7. Enter a URL. If you selected a Web Services navigation node in the script tree, the URL will be automatically entered.
8. Click the **Attachments** tab.
9. Select the **Transfer Type**.
 - **DEFAULT** - uses the default transfer type specified by the Content-Type header.
 - **SWA** - Security SOAP Messages with Attachments
 - **MTOM** - SOAP Message Transmission Optimization Mechanism
 - **DIME** - Direct Internet Message Encapsulation
10. Click **Add**.
11. Enter the path and file name or click **Browse** to select a file.
12. If the Web Services method includes any Attachment Part object identifiers, select an Attachment Part from the list. If the Web Services method does not include any Attachment Part object identifiers, the list will be empty.
13. Click **OK** to add the Security Attachment node to the script tree.

In the Java Code view, the Security Attachment consists of the code executed in the `ws.addSecurityAttachments` method (line breaks and spacing added for clarity) as follows:

```
ws.addSecurityAttachments("url", null,
    ws.attachments(AttachmentMechanism.transferType,
        ws.attachment("filename", "attachmentPart")));
```

If you add security and file attachments together, the `ws.addSecurityAttachments` method includes both the `ws.security` and `ws.attachments` methods (line breaks and spacing added for clarity), as follows:

```
ws.addSecurityAttachments("url",
    ws.security("userName", deobfuscate("password"), true, true, true, 10),
    ws.attachments(AttachmentMechanism.transferType,
        ws.attachment("filename", "attachmentPart")));
```

The following example Web Services script method shows the `ws.addSecurityAttachments` method with a `ws.post` postdata method used to upload a file. The `ws.post` method specifies the SOAP Envelope postdata, Content-Type, and SOAP Action.

```
ws.method("upload");
{
    ws.addSecurityAttachments("http://myurl.com:8080/services/MTOMService",
        ws.security("username", deobfuscate("5blNah5kX/XuZnepYwInFw=="),
            true, true, true, 20),
        ws.attachments(AttachmentMechanism.MTOM,
            ws.attachment("C:\\OracleATS\\OFT\\test.txt", "<upload>776598931581")));
```

```
ws.post(15, "http://myurl.com:8080/services/MTOMService",
"<soapenv:Envelope
  xmlns:soapenv=\"http://schemas.xmlsoap.org/soap/envelope/\"
  xmlns:ser=\"http://service.interop.mtom.sample\">\r\n
<soapenv:Header/>\r\n
<soapenv:Body>\r\n
  <ser:upload>\r\n
    <!--Optional:-->\r\n
    <ser:fileName>string</ser:fileName>\r\n
    <!--Optional:-->\r\n
    <ser:contents>cid:776598931581</ser:contents>\r\n
  </ser:upload>\r\n
</soapenv:Body>\r\n
</soapenv:Envelope>",
http.headers(http.header("Content-Type", "text/xml;charset=UTF-8",
Header.HeaderAction.Modify),
http.header("SOAPAction", "\"urn:upload\"",
Header.HeaderAction.Modify)),
true, null, null);
}
ws.endMethod();
```

9.4 Recording Web Services Scripts

If you have a Web Services client application written already that communicates over HTTP and which communicates through a proxy, you can record the traffic using the OpenScript HTTP recorder.

9.4.1 Setting Web Services Record Preferences

To set Web Functional Test record preferences:

1. Start OpenScript.
2. Select **OpenScript Preferences** from the **View** menu.
3. Expand the OpenScript node and the Record category.
4. Select **Web Services**.
5. Click the tabs and set the preferences.
6. Click **OK**.

9.4.2 Recording Web Services Scripts

To record Web Services script:

1. Start OpenScript.
2. Set the Web Services Recording preferences.
3. Select **New** from the **File** menu.
4. Expand the General group and select **Web Services**.
5. Click **Next**.
6. Select the Repository and Workspace.
7. Enter a script name.

8. Click **Finish**. A new Script tree is created in the Script View and the WSDL Manager view appears.
9. Select **Record** from the **Script** menu. The browser automatically opens when you start recording.
10. Load the web page where you want to start recording into the browser.
11. Navigate the web site to record navigations. The navigations will be added to the **Run** node of the script tree.
12. When finished navigating pages, close the browser.
13. Select **Stop** from the **Script** menu or click the Stop button on the OpenScript toolbar.
14. Expand the **Run** node of the script to view the page navigation nodes in the script tree.

You can customize the script using the menu options or the Code View for specific testing requirements.

Note: Do not close the script editor view or script project while recording or playing back scripts. Doing so could result in unpredictable behavior in the OpenScript application.

Using the Siebel Functional Test Module

This chapter provides instructions on configuring and using the OpenScript Siebel Functional Test Module, which tests Siebel applications by accessing objects through the Document Object Model (DOM) of the Web browser and the Siebel test automation framework.

10.1 About the Siebel Functional Test Module

The Siebel Functional Test Module provides support for functional testing of Siebel web applications. The Siebel Functional Test Module is an extension module to the OpenScript Web Functional Test Module that extends the Web testing with Siebel Functional Test recording and playback capabilities. The Siebel Functional Test Module is fully integrated with the OpenScript platform including the Results view, Details view, Properties view, Console/Problems views, Preferences, Step Groups, Script Manager, and Workspace Manager.

10.1.1 Key Features of the Siebel Functional Test Module

The Siebel Functional Test Module includes the following features:

- Records Standard Siebel High Interactivity (HI) and Standard Interactivity (SI) components for Siebel versions 7.7, 7.8, 8.0 and 8.1 through integration with Siebel Test Automation CAS Library.
- Plays back recorded Siebel actions/commands which consist of an event plus object identified by its attributes (for example: `GotoScreenlink pageTabs("SiebePageTabs") Accounts Screen`).
- Provides full script code view integration to support script generation for the Siebel Functional Test Module. The Siebel Functional Test Module includes an additional API to support Siebel Functional Test protocol code scripting.
- Allows users to parameterize user inputs to Siebel Functional Test scripts and drive those inputs from an external data file (Databank).
- Allows users to insert Tests to validate Siebel HI and SI content on playback.
- Provides additional options/settings that are specific to Siebel Functional Test scripts within the Siebel Functional Test categories in the preferences interface.
- Reports playback results for Siebel Functional Test scripts in the Results and Console views.
- The Siebel Functional Test Script Module API. The Siebel Functional Test Application Programming Interface include Java code methods specific to functional testing of Siebel applications.

The New Project wizard (select **New** from the **File** menu) includes a "Siebel Functional Test Script" option to use when creating Siebel functional testing projects in OpenScript. The Siebel Functional Test Script Module records Siebel applications using the Siebel test automation framework. OpenScript captures user actions and records them to the OpenScript script nodes in a highly readable sequence of navigations and actions.

10.2 Functional Testing Siebel Applications

The following is an outline of the procedures and best practices used to perform functional testing of Siebel applications with the OpenScript application.

10.2.1 Prerequisites

The instructions in this document assume the following prerequisites:

- Testing hardware/environment is available.
- The Siebel applications are installed on a Siebel Server.
- The Oracle Application Testing Suite applications have been installed on a testing machine.
- The test machine can access the Siebel applications.
- Some steps may require system administrator level privileges for the Siebel Server.
- License for Siebel Test Automation required.

10.2.2 Setting up the Siebel Test Environment

The functional test environment should approximate as closely as possible a working Siebel deployment environment. However, hardware cost constraints may be a limiting factor. This section provides recommendations about the basic test system configuration. Additional test system configurations can be used based upon hardware and network availability.

The basic *n*-tier configuration should consist of the following systems:

- Web Server
- Siebel Server
- Database Server
- Database Storage

See the *Siebel Installation Guide* in the in the Siebel document bookshelf for information about hardware and Siebel installation requirements.

Notes:

- Siebel applications can contain High-Interactivity (HI) components, which use ActiveX controls, and Standard-Interactivity (SI) applications, which use standard HTML. Applications may also use a combination of HI and SI components. Testing methods vary depending upon the type of components being tested. See the "Automating Functional Tests" chapter in the *Testing Siebel eBusiness Applications* document in the Siebel document bookshelf for a description of the component types.

- In general, Siebel applications are more memory intensive than CPU intensive. If trade-offs need to be made in test hardware decisions, memory should be given higher consideration than CPU speed.
- Siebel web applications use Cookies to maintain the state information.

10.2.3 Enabling Siebel Test Automation

The Siebel test automation framework must be activated on the Siebel server for OpenScript to access it. Changing the Siebel configuration file may require system administrator level privileges for the Siebel server. A license is also required to use the Siebel Test Automation framework. Contact your account representative for additional information about licence requirements.

10.2.3.1 Siebel 7.x

To enable the test automation framework in Siebel 7.x:

1. Open the .CFG file for the Siebel application on the Siebel server.
2. Set the `EnableAutomation` and `AllowAnonUsers` switches in the [SWE] section as follows:

```
[SWE]
EnableAutomation = TRUE
AllowAnonUsers = TRUE
...
```

See the *Siebel Testing Siebel eBusiness Applications* documentation if you need to set up secure access to the Siebel Test Automation framework.

3. Restart the Siebel Server.

10.2.3.2 Siebel 8.0

To enable the test automation framework in Siebel 8.0:

1. Log into Siebel as Administrator.
2. Go to "Site Map".
3. Go to "Administration - Server Configuration".
4. Select "Call Center Object Manager" (provided you want to enable automation for Call Center).
5. Under list of Components, click the Parameters tab.
6. Find `EnableAutomation` and `AllowAnonUsers` parameters and set both to TRUE.
7. Restart the Siebel Server.

10.2.4 Script Creation Techniques

The following are tips and techniques to use when creating Siebel load test scripts using the OpenScript application:

- Disable browser caching to make sure the pages are returned from the server rather than the browser cache.
- Record actions from login through logout to make sure parameters are passed properly between page navigations.

- Record actions slowly in the Siebel environment to make sure the recorder records all actions to the OpenScript script. If possible, watch as the OpenScript script pages are added to the script tree.
- Siebel Popup windows may initially appear incorrect. Resize the window slightly to refresh the page in the popup window.
- Do not insert Siebel Tests in Siebel popup windows unless the test is necessary.
- Save the script in OpenScript using Save As on the File menu. When you save a Siebel proxy-recorded script, OpenScript automatically creates a Java Agent versions of the script in the workspace. Depending upon the size of the script, the file save operation may take some time.

10.2.5 Setting Browser Options

When recording and playing back scripts to test an application, you want to make sure the pages returned are from the server and not the browser cache. To verify or change the browser settings:

1. Open Internet Options from the Control Panel.
2. Click **Settings** in the **Temporary Internet files** section.
3. Select **Every visit to the page**.
4. Click **View Objects** in the **Temporary Internet files folder** section.
5. Verify that the downloaded Program files directory does not contain multiple versions of the Siebel High Interactivity Framework and Siebel Test Automation programs installed.
6. If necessary, remove the duplicate or older versions.
7. Close the Downloaded Program Files window.
8. Click **OK** to close the Temporary Settings.
9. Click **OK** to close the Internet Properties.

10.2.6 Starting the Siebel Application

When you start the Siebel application in the browser, the URL must include the Siebel Web Engine (SWE) command to generate the test automation framework information. The `AutoOn` Siebel Web Engine command (SWECmd) is added to the URL as follows (SWECmd is case-sensitive):

```
http://hostname/application/start.swe?SWECmd=AutoOn
```

where *hostname* is the machine name or IP address of the Siebel server and *application* is the name of the Siebel application. For example, *application* could be `callcenter` or `callcenter_enu` depending upon the Siebel version.

Enter the start URL and command into the browser address. for example:

```
http://siebelServer/callcenter_enu/start.swe?SWECmd=AutoOn
```

As you navigate pages, OpenScript records page navigation to the OpenScript script tree.

10.2.7 Determining a Siebel Component Type

Siebel applications can include High-Interactivity (HI) object and Standard-Interactivity (SI) object types. You can use the Inspect Path feature of OpenScript to determine the type of an object in an application.

1. Click the Inspect Path toolbar button or the Capture button to open the Select Object dialog box.
2. Move the mouse cursor over the page in the Siebel application to view the component type. The current component is highlighted in the OpenScript browser and the path appears in the Select Element dialog box. Siebel HI component types are indicated by `/siebelft:cas[ClassName=` in the **Path/Object** fields:
3. The path to HI component types is also referred to as the Object Descriptor String (ODS) and is used in OpenScript to recognize applets used with the Siebel application.
SI component types are indicated by `/web:window[index='0']...` in the **Path** field.
4. Press F10 to capture the object path. You can copy the path from the dialog box using Ctrl-C and paste using Ctrl-V.

The following are examples of complete object paths (line breaks added for clarity):

High-Interactivity (HI) Path.

```
/siebelft:cas[ClassName='SiebApplication' and
  RepositoryName='Siebel Universal Agent']
/siebelft:cas[ClassName='SiebScreen' and
  RepositoryName='Web Call Center Home Screen']
/siebelft:cas[ClassName='SiebView' and
  RepositoryName='Home Page View (WCC)']
/siebelft:cas[ClassName='SiebApplet' and
  RepositoryName='Sales Message Alert List Applet Tiny']
/siebelft:cas[ClassName='SiebList' and
  RepositoryName='SiebList']
```

Standard-Interactivity (SI) Path:

```
/web:window[index='0']
/web:document[index='10']
/web:span[text='Search' or index='1']
```

or

```
/web:window[index='0']/web:document[index='10']
/web:form[index='0' or name='SWEForm1_0']
/web:input_text[id='s_1_1_16_0' or name='s_1_1_16_0' or index='1']
```

10.3 Recording Siebel Functional Test Scripts

The Siebel Functional Test Module records standard Siebel High Interactivity (HI) and Standard Interactivity (SI) components for Siebel versions 7.7, 7.8, 8.0 and 8.1 through integration with Siebel Test Automation CAS Library. Siebel Test Automation must be enabled on the Siebel server side in order to successfully record these events. The Recorder creates functional and regression test scripts for automating testing of Siebel applications.

Siebel HI components are Active-X based controls and Siebel Test Automation provides the object/attribute information for OpenScript to record interactions with

those controls. Actions on HI controls will be captured in the test script as OpenScript "siebelFT" commands. Siebel SI components are standard Web controls which are captured as standard OpenScript "web" commands using Web Functional Test object attributes; however, Siebel Test Automation may provide additional attributes to identify SI controls which take precedence over standard Web object/attributes. Object Identification attributes can later be modified by users through the Preferences global settings for new scripts or for already recorded commands in the tree view or code view. Recording can be configured through Internet Explorer only as Siebel does not support Firefox.

The Siebel Functional Test Module provides a record toolbar button that lets you initiate the Siebel recorder and capture Web/Siebel page actions to the script view. The record toolbar includes start and stop recording toolbar buttons. OpenScript recorders also open a floating toolbar that can be used while recording without having to switch between the browser and OpenScript.

Before recording Siebel Functional test scripts, make sure the Siebel test automation framework is activated on the Siebel server. See Functional Testing Siebel Applications for details about Prerequisites and the Siebel Test Environment.

10.3.1 Setting Siebel Functional Test Record Preferences

To set Siebel Functional Test record preferences:

1. Start OpenScript.
2. Select **OpenScript Preferences** from the **View** menu.
3. Expand the OpenScript node and the Record category.
4. Select **Siebel Functional Test**.
5. Set the Object Identification preferences.
6. Click **OK**.

10.3.2 Adding/Editing Object Identifiers

The Siebel Functional Test Module uses object identification to specify attributes used to identify High Interactivity (HI) and Standard Interactivity (SI) Web objects. The Siebel Functional Test Module uses the same predefined path attributes for common Web objects as the Web Functional Test Module; however, Siebel Test Automation may provide additional attributes to identify HI controls which take precedence over standard Web objects/attributes. Object paths are specified in XPath format. For example, for HI controls, the object identification path appears as follows in Java code commands:

```
/siebelft:cas[@ClassName='SiebApplication' and  
             @RepositoryName='Siebel Universal Agent']  
/siebelft:cas[@ClassName='SiebPageTabs' and  
             @RepositoryName='SiebPageTabs']")
```

and for SI Web objects, the object identification path appears as follows in Java code commands:

```
/web:window[@index='0']  
  /web:document[@index='0']  
    /web:form[@index='0' or @name='SWEEntryForm']  
      /web:input_password[@id='s_swepi_2' or @name='SWEPassword' or @index='0']
```

The Siebel Functional Test Module includes object identifiers that specify how the recorder identifies Browser and Siebel objects. You can set the default Siebel SI object attributes in the Siebel Functional Test Module Record Preferences. You can add object identifiers or edit the existing object identifiers in the Record preferences. The HI control identification is provided by the Siebel Test Automation CAS Library. You can also edit object attributes in recorded scripts in the tree view or the code view.

In addition to the predefined object identification, you can add an Object Library to the script to record paths into a library file. Object Library files may be shared and reused across other scripts. The Object Library files provide a more convenient "short name" for objects to provide for more convenient programming.

To add or edit an object identifier:

1. Select the **OpenScript Preferences** from the **View** menu.
2. Expand the Record node and select Siebel Functional Test.
3. Click the **Object Identification** tab.
4. Click **Add** or select an existing object identifier and click **Edit**.
5. If adding a new object identifier, enter a name for the object identifier.
6. Add or edit object elements for the object identifier.

For each object element, you specify a name (typically a Siebel object attribute), an operator, a value and a value type. As you add object elements, OpenScript builds the object identifier using logical OR between each object identifier element. Click **Edit** to change between logical OR and AND.

7. Click **OK**. The object identifier is added to the record preferences.

See the *Using the Web Functional Test Module* chapter for additional information about adding and editing Object Identifiers.

10.3.3 Recording Siebel Functional Test Scripts

To record Siebel Functional Test Scripts:

1. Start OpenScript.
2. Select **New** from the **File** menu.
3. Select **Siebel Functional Test Script**.
4. Click **Next**.
5. Select the Repository and Workspace.
6. Enter a script name.
7. Click **Finish**. A new Script tree is created in the Script View.
8. Select **Record** from the **Script** menu. The browser automatically opens when you start recording.
9. Load the Siebel application using the AutoOn Siebel Web Engine command (`?SWECmd=AutoOn`) in the URL into the browser.
10. Log in and navigate the web site to record page objects, actions, and navigations. The page objects, actions, and navigations will be added to the **Run** node of the script tree.
11. When finished navigating pages, log out and close the browser.

12. Select **Stop** from the **Script** menu or click the Stop button on the OpenScript toolbar.
13. Expand the **Run** node of the script to view the page objects, actions, and navigation nodes in the script tree.

You can customize the script using the menu options or the Code View for specific testing requirements.

Note: Do not close the script editor view or script project while recording or playing back scripts. Doing so could result in unpredictable behavior in the OpenScript application.

10.4 Modifying Scripts

Once a script has been created/recorded, you can make modifications to customize the script for your specific testing needs.

10.4.1 Adding Siebel Actions

The Siebel Functional Test Module includes actions for Siebel objects that can be added to a script.

To add Siebel actions to a script:

1. Record a Siebel Functional Test script.
2. Select the script node where you want to add the action.
3. Select the **Script** menu and then select **Other** from the **Add** sub menu.
4. Expand the Siebel Functional Test node.
5. Expand an action node and select the action.
6. Click **OK**.

The Siebel action dialog boxes let you define the action to perform during playback of a Siebel Functional Test script. This dialog box is used for most Siebel actions including Application, Button, Calculator, Calendar, Checkbox, Communications Toolbar, Currency, List, Menu, Page Tabs, PDQ, Rich Text, Screen Views, Task Assistant, Text, Text Area, Threadbar, Toolbar, Tree, and View Applets. Specific values may be required for specific actions.

- **Action:** Shows the action to perform. Additional values for variables or attributes may be required depending upon the action to perform.
 - **Path:** Specify the object ID of the Siebel or Web object on which to perform the action. You can use the **Capture** or **Select** menu options to capture or select an object path.
 - **Value(s):** Specify the variables or attributes as required for the specific action on an object.
7. Enter the object identification path for the object.
 8. Enter any required values to use for the object action.
 9. Click **OK**. The action node is added to the script tree.

In the Java Code view, a `siebelFT.object(objectId).action()` method will be added to the script code:

```
siebelFT.menu(100, "/siebelft:cas[@ClassName='SiebApplication'  
    and @RepositoryName='Siebel Universal Agent']  
/siebelft:cas[@ClassName='SiebMenu'  
    and @RepositoryName='SiebMenu']").select("File\\\\\\\\File - Logout");
```

The Siebel Functional Test node includes actions for objects such as Application, Calculator, Calendar, Communications Toolbar, Page Tabs, Task Assistant, Threadbar, and View Applets, etc. Other object actions have corresponding Java code methods.

Using the Siebel Load Test Module

The Siebel Load Test Module provides support for load testing of Siebel web applications. The Siebel module is an extension to the HTTP Module. The OpenScript Siebel Load Test module includes the following features:

- The Siebel Load Test Script Module. The New Project wizard (Select **New** from the **File** menu.) includes a "Siebel Load Test Script" option to use when creating Siebel load testing projects in OpenScript. The Siebel Load Test Script Module records Siebel applications at the protocol level. OpenScript captures user actions and records them to the OpenScript script based upon HTTP requests and post data or query strings.
- Siebel-Specific Correlation Library. The Siebel module includes a transform library for automatically finding dynamic values inside recorded Siebel pages and substituting them into the appropriate Siebel HTTP requests.
- Siebel-Specific Correlation Rules. These rules define various transform rules for automatically finding/substituting Siebel parameters into a navigation. The Siebel rules are specified in a Siebel-specific correlation library that is added to the OpenScript correlation preferences.
- Siebel-Specific Application Programming Interface (API). The Siebel module includes a Siebel Module API Specification that can be used to customize Siebel-specific scripts.

11.1 Load Testing Siebel Applications

The following is an outline of the procedures and best practices used to load test Siebel applications with the OpenScript application.

11.1.1 Prerequisites

The instructions in this document assume the following prerequisites:

- Testing hardware/environment is available.
- The Siebel applications are installed on a Siebel Server.
- The Oracle Application Testing Suite have been installed on a testing machine.
- The test machine can access the Siebel applications.
- Some steps may require system administrator level privileges for the Siebel Server.

11.1.2 Setting Up Siebel Load Test Environments

The load test environment should approximate as closely as possible a working Siebel deployment environment. However, hardware cost constraints may be a limiting factor. The following sections provide recommendations about basic test system configurations. Additional test system configurations can be used based upon hardware and network availability.

11.1.2.1 Basic Configuration

The basic *n*-tier configuration should consist of the following systems:

- Web Server
- Siebel Server
- Database Server
- Database Storage

See the *Siebel Installation Guide* in the in the Siebel document bookshelf for information hardware and Siebel installation and any licensing requirements.

Note: In general, Siebel applications are more memory intensive than CPU intensive. If trade-offs need to be made in test hardware decisions, memory should be given higher consideration than CPU speed.

11.1.2.2 Floating Load Balancing Test Server

In addition to the basic tier configuration, various load balancing tests should include another system that can be configured on a single system as a movable server between tiers. The floating load balancing server can be used to test fail-over of clustered servers and recovery of servers if one server (on any one of the tiers) in a multiple server configuration goes down.

A floating Server could be configured as Web Server, Siebel Server, and Database Server on the same machine.

11.1.2.3 Clustered Web Server Configuration

The clustered Web server configuration tests two or more Web servers accessing a single Siebel server. This configuration is used to test how Siebel and the database server handles load balancing from multiple users accessing from multiple Web browsers and systems.

11.1.2.4 Clustered Siebel Servers Configuration

The clustered Siebel server configuration tests two or more Siebel servers handing Web traffic and accessing a single database server. This configuration is used to test Web traffic load balancing on clustered Siebel servers and how the database server handles load balancing from multiple Siebel servers accessing from multiple systems.

11.1.2.5 Clustered Database Server Configuration

The clustered database server configuration tests two or more database servers handing Siebel data and accessing the database storage. This configuration is used to test Siebel data load balancing on clustered database servers and how the database storage handles load balancing from multiple database servers accessing from multiple systems.

Notes:

- Siebel web applications use Cookies to maintain the state information.
- Each User must be logged into the same Siebel Application Server as first logged into.
- Do not use round robin load-balancing for clustered Siebel servers

11.1.3 Siebel Correlation Library

OpenScript includes a Siebel Test Automation library that Oracle Application Testing Suite applications can communicate with when creating Scripts. The Siebel Correlation Library is installed automatically as part of the OpenScript installation.

11.1.4 Script Creation Techniques

The following are tips and techniques to use when creating Siebel load test scripts using the Oracle Functional Testing for Web Applications application:

- Disable browser caching to make sure the pages are returned from the server rather than the browser cache.
- Record actions from login through logout to make sure parameters are passed properly between page navigations.
- Record actions slowly in the Siebel environment to make sure the recorder records all actions to the OpenScript script. If possible, watch as the script pages are added to the script tree.
- Close the external browser window after recording.
- Save the script. When you save a Siebel proxy-recorded script, OpenScript automatically creates a Java Agent version of the script in the workspace. Depending upon the size of the script, the file save operation may take some time.

11.1.5 Recording Scripts for Load Tests

Siebel load testing scripts are recording in an external browser window using the OpenScript proxy recorder. When you record a Siebel Load Test Script, OpenScript automatically starts the proxy recorder and opens an external browser window when you click the Record button on the toolbar. Once the external browser opens, you can load your Siebel application and start recording page navigation.

OpenScript does not support record and playback of the CTI Toolbar. URLs with the `SWECmd=WaitForCmd` are filtered out by default.

11.1.6 Starting the Siebel Application

Start the Siebel application in the browser using the start URL:

```
http://hostname/application/start.swe
```

where *hostname* is the machine name or IP address of the Siebel server and *application* is the Siebel application to start. For example:

```
http://siebelserver/callcenter_enu/start.swe
```

Enter the start URL and command into the browser address. As you navigate pages, the OpenScript proxy recorder records page navigation to the Script tree. You can view the nodes in the script tree and in the Java code.

11.1.7 Playing Back Scripts

OpenScript playback provides a convenient way to test and verify the page navigation recorded to the script.

1. Open a Siebel load test script in OpenScript.
2. Select **Playback** from the **Script** menu or click the toolbar button to verify the script plays back correctly.
3. Select items in the Results view and review the tabs in the Details view to check for any errors. Click the Headers tab to view request and response header data.
4. Verify that the response headers do not contain content or data value errors. One type of content error to check for is a "204 No Content" error. For example:

```
HTTP/1.1 100 Continue
Server: Microsoft-IIS/5.0
Date: Fri, 20 Mar 2009 15:51:47 GMT
X-Powered-By: ASP.NET
HTTP/1.1 200 OK:
Server: Microsoft-IIS/5.0
Date: Fri, 20 Mar 2009 15:51:47 GMT
X-Powered-By: ASP.NET
content-language: en
cache-control: no-cache
content-type: text/html;charset=UTF-8
content-length: 3762
```

See the *Troubleshooting Load Testing Issues* section in the *Testing Siebel eBusiness Applications* documentation in the Siebel document bookshelf for additional examples of common issues to resolve for load test scripts.

11.1.8 Resolving Script Issues

Each navigation node in the script tree shows the URL, Post Data, Recorded Headers, and Custom Dynamic values recorded to the script.

Expand nodes in the script tree to view the navigation sequence.

The `postData` node shows the Siebel entities included in the page navigation. OpenScript Siebel Load Testing recorder automatically recognizes and parameterizes Siebel entities for Load testing. Playing back a script verifies that the recorder parameterized the Siebel entities properly.

The tree view nodes show the automatically created dynamic value names and Siebel path for parameters required for the *next* page. The name and Siebel path are shown as variable nodes under the post data node. It also shows automatically parameterized Siebel functions in curly braces, for example:

```
SWEC={{@SWECCount}}
```

If a script does not playback correctly, or has errors, you may need to add custom dynamic values for Siebel parameters.

Check the `postData` name/value pairs for the page navigation to verify the Siebel entities have been properly parameterized during recording. Any Siebel parameters that pass dynamic data from one page to the next should have custom dynamic values.

The `postData` on the next page shows the destination of the dynamic values passed from the previous page.

11.1.8.1 Siebel Entities to Parameterize

The following table shows some common Siebel commands that may appear in the PostData of the page navigation:

Siebel Command	Name
SWEACn	Application Count
SWEBMC	Bookmark
SWEBRS	Browser Retry Sequence
SWEBID	Browser ID
_sn	Cookie
SWEFI	Form ID
SWEVLC	View Layout Cache
SWETS	Timestamp
SWEC	SWE Count
SWERowId, SWERowIds	Row IDs
s_#_#_#_#	Record Data

See the *SWE API* section of the *Siebel Portal Framework Guide* in the Siebel document bookshelf for additional information about Siebel Web Engine (SWE) commands, methods, and arguments.

11.1.9 Using Data Banks with Siebel

Data values in Siebel post data strings can be parameterized in a script and connected to a Data Bank file that provides input data for data-driven tests. The OpenScript script editing options let you specify additional Siebel method names that use parameterized data.

1. Record or open a Siebel script in OpenScript.
2. Select **Find/Replace** from the **Edit** menu.
3. Type `SWEMethod` and click **Find**.
4. Continue clicking **Find** until you locate the `SWEMethod` that requires databanked values.

For example, the PostData in a script page may contain the following record data name=value pair:

```
s_1_2_49_0=doctest
```

The `SWEMethod` that posts the data is `SWEMethod=Mirror Add GotoView`.

To use Databank parameters for the data values:

1. Select **Configure Databanks** from the **Script** menu.
2. Click **Add**.
3. Set the Repository location and then click **Browse**.
4. Select the Databank file to add and click **Open**.
5. Click **OK** to add the Databank file.

6. Click **OK** to close the Databank configuration.
7. Right click the node in the script tree that you want to substitute with a databank variable and select **Substitute Variable**.
8. If necessary expand the Databanks node and select the databank field you want to use as the input parameter data.
9. Click **Finish**.
10. The script node name/value pair changes to show the Databank alias name, field name, and recorded value as a variable value. For example:

```
SWEUserName={{siebel_data.login,sadmin}}
```
11. Click the Playback toolbar button to playback the script once to verify the it plays back correctly.
12. Click the Iterate toolbar button to playback the script with a Databank.
13. Set the Iteration count, starting record, and data usage and click **OK**.
14. Verify the script plays back correctly.
15. Save the script.
16. In the Oracle Load Testing for Web Applications application, add the script to the Scenario.
17. Double-click the script name in the Scenario to define the Scenario details for the script.
18. Make sure Java Client is selected as the User mode.
19. Set the **Use Data Bank** setting is set to `True` (if the **Use Data Bank** setting is not shown, open the Scenario Details and set the option in the **Main** section).
20. Click **Run Test** and run the load test.

See the following sections of this document for details about defining ServerStats metrics and running tests in the Oracle Load Testing for Web Applications console. See the *Oracle Load Testing for Web Applications User's Guide* for additional information about using the features and options in the Oracle Load Testing for Web Applications application.

11.1.10 Preparing the Siebel Server Manager Commands

The Oracle Load Testing for Web Applications ServerStats uses the Siebel Server Manager program to retrieve statistics from the Siebel Server while running Virtual Users in a load test. The ServerStats Metrics need to be configured to run the Siebel Server Manager with input commands from a batch file and a file containing the input commands. The batch file and command input file must be created and placed on the Siebel Server where the ServerStats Metrics can access and run the batch file. This section explains the basic requirements of the batch file and command input file.

Note: Starting the Siebel command-line server-monitoring program may require system administrator level privileges for the Siebel server. The Oracle Load Testing for Web Applications system testing the Siebel server needs the required user permissions to access the Siebel server and run the Siebel Server Manager program from the local host.

11.1.10.1 Creating the Batch File

Use any ASCII editor to create a batch file and a commands file to run the Siebel Server Manager program. The batch file name will be referenced in the Oracle Load Testing for Web Applications ServerStats metrics. You can use any name for the batch file (for example `srvrmgr_cmds.txt`).

Use the following syntax to specify the command in the batch file to start the Siebel Server Manager program:

```
\\machine IP\path to Siebel server bin\srvrmgr -g gateway -e enterprise -u
username p password -i input_File
```

Parameter	Description
<i>machine IP</i>	The machine name or IP address or the Siebel Server.
<i>path to Siebel server bin</i>	The drive and directory path to the Siebel Server Manager program on the Siebel server.
<i>gateway</i>	The Network address of the Siebel Gateway Name Server machine.
<i>enterprise</i>	Siebel Enterprise Server name.
<i>username</i>	Siebel Server administrator username.
<i>password</i>	Siebel Server administrator password.
<i>input_File</i>	The name of a file containing commands to run in the Server Manager program.

For additional information about using the Siebel command-line server-monitoring program (`srvrmgr`) and command line flags, see the *Siebel System Administration Guide Version 7.7* (or newer) documentation in the Siebel document bookshelf.

The following is an example of a command in a batch file to start the Siebel Server Manager:

```
\\10.16.111.00\c$\sea77\siebsrvr\bin\srvrmgr -g gateway -e siebel -u sadmin -p
sadmin -i srvrmgr_cmds.txt
```

11.1.10.2 Creating the Command Input File

The command input file contains the commands to run in the Siebel Server Manager program. The command input file will be automatically run by the batch file at each Oracle Load Testing for Web Applications ServerStats Collection Interval. The example in the previous section uses the file name `srvrmgr_cmds.txt` as the input file in the `srvrmgr` command. You can use any file name as long as the batch command matches the file name of the input file.

`srvrmgr_cmds.txt` is a text file that contains the sequence of commands to run in the Siebel Server Manager program. The following is an example of an input file with Server Manager commands:

```
configure list statistics show STAT_ALIAS, CURR_VAL
list statistics
quit
```

The `configure list statistics` show `STAT_ALIAS`, `CURR_VAL` command specifies which Siebel Statistics to return from the `svrmgr` program. `STAT_ALIAS`, `CURR_VAL` are the column names of the data values to return. `STAT_ALIAS` is the alias for the Statistic name. `CURR_VAL` is the current value for the statistic. `quit` closes the Siebel Server Manager session.

The `list statistics` command returns the statistics to Siebel Server terminal. The Oracle Load Testing for Web Applications Data Collector uses the Regular Expressions defined in the `ServerStats` metrics to extract specific data from the statistics returned from the `svrmgr` program.

You can configure the `svrmgr` commands to provide any of the available statistics data that can be returned by the `svrmgr` program. See the *Siebel System Administration Guide Version 7.7* (or newer) documentation in the Siebel document bookshelf for additional information about Siebel Server Manager commands.

11.1.10.3 Siebel Statistics

The `svrmgr` program returns the following statistics:

Name	Alias	Description
Average Connect Time	AvgConnTime	Average connect time for Object Manager sessions
Average Reply Size	AvgRepSize	Average size of reply messages (in bytes)
Average Request Size	AvgReqSize	Average size of request messages (in bytes)
Average Requests Per Session	AvgReqs	Average number of requests per Object Manager session
Average Response Time	AvgRespTime	Average Object Manager response time
Average Think Time	AvgThinkTime	Average end-user think time between requests
Avg SQL Execute Time	AvgSQLExecTime	Average time for SQL execute operations (in seconds)
Avg SQL Fetch Time	AvgSQLFetchTime	Average time for SQL fetch operations (in seconds)
Avg SQL Parse Time	AvgSQLParseTime	Average time for SQL parse operations (in seconds)
CPU Time	CPUTime	Total CPU time for component tasks (in seconds)
Elapsed Time	ElapsedTime	Total elapsed (running) time for component tasks (in seconds)
Maximum Peak Memory Usage	MaxPeakMemory	Peak Mem used by task. Rolls up differently from MinPeakMemory
Minimum Peak Memory Usage	MinPeakMemory	Peak Mem used by task. Rolls up differently than MaxPeakMemory
Num of DBConn Retries	NumDBConnRtrs	Number of Retries due to DB Connection Loss

Name	Alias	Description
Num of DLRbk Retries	NumDLRbkRtrs	Number of Retries due to Deadlock Rollbacks
Num of Exhausted Retries	NumExhstRtrs	Number of Times All Retries are Exhausted
Number of SQL Executes	SQLExecs	Total number of SQL execute operations
Number of SQL Fetches	SQLFetches	Total number of SQL fetch operations
Number of SQL Parses	SQLParses	Total number of SQL parse operations
Number of Sleeps	Sleeps	Total number of sleeps for component tasks
Object Manager Errors	Errors	Number of errors encountered during Object Manager session
Reply Messages	RepMsgs	Number of reply messages sent by the server
Request Messages	ReqMsgs	Number of request message received by the server
SQL Execute Time	SQLExecTime	Total elapsed time for SQL execute operations (in seconds)
SQL Fetch Time	SQLFetchTime	Total elapsed time for SQL fetch operations (in seconds)
SQL Parse Time	SQLParseTime	Total elapsed time for SQL parse operations (in seconds)
Sleep Time	SleepTime	Total amount of sleep time for component tasks (in seconds)
Tasks Exceeding Configured Cap	TskXcdCfgCpt	Number of tasks stated that exceeded configured capacity
Tests Attempted	TestsAttempted	Number of tests that were started
Tests Failed	TestsFailed	Number of tests that failed
Tests Successful	TestsSuccessful	Number of tests that were successful
Total Database Response Time	DBRespTime	Total Database Response/Processing Time (milliseconds)
Total Reply Size	RepSize	Total size (in bytes) of reply messages
Total Request Size	ReqSize	Total size (in bytes) of request messages
Total Response Time	RespTime	Total Object Manager response time (in seconds)
Total Tasks	TotalTasks	Total number of tasks completed for server components

Name	Alias	Description
Total Think Time	ThinkTime	Total end-user think time (in seconds)

For additional information about monitoring Siebel servers, see the *System Monitoring and Diagnostics Guide for Siebel eBusiness Applications Version 7.7* (or newer) documentation in the Siebel document bookshelf.

11.1.10.4 Batch File Location

Once you create the batch file and command input file, copy the files to the Oracle Load Testing for Web Applications local host in the C:\Oracle\DataCollector directory.

11.1.11 Defining ServerStats Metrics

Oracle Load Testing for Web Applications ServerStats metrics are used to collect the data from the Siebel Server Manager program. This section explains how to set up Virtual Agents in ServerStats (Oracle Load Testing for Web Applications) to run the Siebel Server Manager program (srrvmgr) from the command-line interface.

1. Start the Oracle Load Testing for Web Applications application.
2. Select **ServerStats** from the **Tools** menu.
3. Select the Metrics node to view the metric categories.
4. Click **New**.
5. Enter a name for the metric.
6. Enter a description for the metric.
7. Select **Virtual Agent** as the Metric type.
8. Click **Next**.
9. Enter the name of the batch file you created to run the srrvmgr program in the **Command Line** field.
10. Enter a Regular expression to parse the data returned from the srrvmgr program in the **Matching Regexp** field. For the Server Manager srrvmgr program commands:

```
configure list statistics show STAT_ALIAS, CURR_VAL
list statistics
quit
```

use the following format for the Regular Expression:

```
/aliasName\s+([0-9]+)/
```

For example, for the server statistic Average Connect Time, the Regular Expression would be as follows:

```
/AvgConnTime\s+([0-9]+)/
```

11. Enter the Key of value to use to parse the Regular Expression. The key of value specifies which set of parenthesis in the Regular Expression is the value to return. For Siebel statistics using the above Regular Expression, set the value to 1.

12. Enter the Sample Multiplier value. The following window shows a metric configured to retrieve the Average Connect Time.
13. Click the **Test** button to get to the Test Setup window:
14. Click **OK** to start the test.
15. Verify the results returned the correct data value for the statistic from the Siebel Server Manager program and did not return any errors.

Note: Manually run the `srvrmgr` program and list statistics on the Siebel Server to verify the Regular Expression returns the correct data value/format.
16. Click **Close**.
17. Click **Finish**. The New metric appears in the Metrics tree under the User Defined node.
18. Repeat steps 4-17 to configure additional Siebel metrics in ServerStats.

For additional information about monitoring Siebel servers, see the *System Monitoring and Diagnostics Guide for Siebel eBusiness Applications Version 7.7* (or newer) documentation in the Siebel document bookshelf.

11.1.12 Defining a ServerStats Configuration

Oracle Load Testing for Web Applications ServerStats configurations are used to specify which metrics to include when collecting the data from the Siebel Server Manager program and update Oracle Load Testing for Web Applications graphs and reports. You can also create a metric profile for Siebel metric and use the profile as part of the configuration. This section explains how to define a ServerStats configuration and add metrics to the configuration.

1. If necessary, start Oracle Load Testing for Web Applications and select **ServerStats** from the **Tools** menu.
2. Click the Configurations node to view existing configurations.
3. Click **New**.
4. Enter a name for the configuration.
5. Enter a description for the configuration.
6. Click **Save**. The configuration window adds new options for adding and updating monitors:
7. Click **Add a new monitor**.
8. Expand the User defined node and select a Siebel metric.
9. Click **Next**.
10. Set the monitored system, data collector, and collection interval.
11. Click **Next**. The metric is added to the list of monitors in the configuration.
12. Click **Finish**.
13. Repeat steps 7-12 to add additional metrics to the configuration.
14. Click **Test**.
15. Verify the results returned the correct data values for the statistics from the Siebel Server Manager program and did not return any errors.
16. Click **Close**.

17. Click **Update**.

11.1.13 Importing Pre-Configured Metrics and Profiles to Oracle Load Testing for Web Applications

If you have pre-configured files for Siebel metrics and metric profiles, you can import the files into Oracle Load Testing for Web Applications rather than manually configure the metrics and profiles.

1. If necessary, start the Oracle Load Testing for Web Applications application.
2. Select **Import File** from the **Tools** menu.
3. Select the File Type. The ServerStats file types are as follows:

Type	Extension
ServerStats Metric	.metric
ServerStats Metric Profile	.hwm
ServerStats Configuration	.config

4. Click **Browse** to select the file location.
5. Select the drive and directory location.
6. Select the file to import.
7. Click **Open**.
8. Click **Upload**.
9. Click **OK**.
10. Repeat steps 4-9 for each file to upload.

11.1.14 Running Load Tests in the Oracle Load Testing for Web Applications Console

Select the script or a user-defined profile from the **Select scripts & user-defined profiles** list.

1. Select a script.
2. Click **Add to scenario**.
3. Set the **# VUs**.
4. Set the **System** to use to test.
5. Set the **User Mode** to Java Client.
6. Set the **Iteration Delay** to 1.
7. Set the **VU Pacing (Think Time)** to Recorded.
8. Click **Add to Autopilot**.
9. Set the **Start** and **Stop** test options.
10. Set the **Virtual User Rampup**.
11. Select the ServerStats configuration you defined earlier.
12. Click the **Run Test** button.
13. Specify the Session to Save.

14. Click **OK**.

11.1.14.1 Viewing VU Grid

The Virtual User grid lets you view the progress of the script playback for each virtual user. If necessary, click the **Watch VU Grid** tab to switch to the grid.

11.1.14.2 Viewing ServerStats

The ServerStats display lets you view the Siebel Server statistics in real time using the ServerStats display window. Select **ServerStats Display** from the **Tools** menu to open the ServerStats display.

11.1.15 Generating Graphs and Reports Using Oracle Load Testing for Web Applications

You can generate graphs from Virtual User and ServerStats data during run time and for post testing analysis.

11.1.15.1 Creating Custom Runtime Graphs

The **View Run Graphs** tab lets you generate custom graphs during test runtime.

1. While the load test is running, click the **View Run Graphs** tab.
2. Click **New Graph**. A new blank graph tab is added to the **Reports and Graphs** section.
3. Scroll down to the **Filters** section.
4. Enter a graph name.
5. Expand **ServerStats Monitors** in the **Available Data Series** tree.
6. Select the data series to add to the graph.
7. Click **Add Data Series**.
8. Repeat to add other monitors to the data series.
9. Specify the **Plot Data Series** and **Y-Axis Scaling** options.
10. Click **Generate Graphs**. The custom graph appears as a new tab in the **Reports and Graphs** section.

11.1.15.2 Creating Custom Reports

The **Create Reports** tab lets you generate custom reports and graphs after the test for post-testing analysis.

1. Click **Create Reports** tab.
2. Click **New Graph**.
3. Select the ServerStats session as the **Available Data Series**.
4. Expand **Available Data Series** tree.
5. Select the data series to add to the graph.
6. Click **Add Data Series**.
7. Click **Generate Graph**. The custom graph appears as a new tab in the **Reports and Graphs** section.

You can export the graph to Adobe PDF, Microsoft Excel, or Comma Separated Value formats.

The **Create Reports** tab also lets you retrieve session performance reports after the test for post-testing analysis.

1. If necessary, click **Create Reports** tab.
2. Click the **Sessions** tab in the Reports and Graphs section.
3. Select the Session. The report appears in the Reports and Graphs section.

You can export or print the session report.

11.2 Setting Siebel Correlation Preferences

To set Setting Siebel Correlation preferences:

1. Start OpenScript.
2. Select **OpenScript Preferences** from the **View** menu.
3. Expand the OpenScript node and the Correlation category.
4. Expand the Siebel 7.7 library.
5. Select or clear the check boxes to enable or disable specific rules.
6. Click the **Add** or **Edit** buttons to modify rules in the library. See "[Siebel Correlation Library](#)" on page 11-14 for a list of correlation rules.
7. Click **OK**.

11.3 Siebel Correlation Library

The Siebel correlation library defines the correlation rules for Siebel 7.7. The correlation rules specify the variable names and regular expressions to use to replace dynamic data in Siebel applications and navigations.

The default Siebel correlation library provided with the OpenScript Siebel Module includes the following correlation rules:

- **Siebel SWEACn - Variable Substitution** - this rule locates text in the HTML matching the Regular Expression pattern `SWEACn= (\d+)` and replaces it with the variable name `SWEACn` in all locations.
- **Siebel SWEACn - Function/Text Substitution** - this rule locates text in the HTML matching the Regular Expression pattern `SWEACn= ((\d+)`) and replaces it with the function `{{SWEACn}}` in the specified location.
- **Siebel SN - Variable Substitution** - this rule locates text in the HTML matching the Regular Expression pattern `_sn= ((.+?)) &` and replaces it with the variable name `siebel_sn` in the specified location. The variable name `siebel_sn` uses the Regular Expression pattern `name= "_sn" value= " (.+?) "`.
- **Siebel SN - Variable Substitution** - this rule locates text in the HTML matching the Regular Expression pattern `_sn= ((.+?)) &` and replaces it with the variable name `siebel_sn` in the specified location. The variable name `siebel_sn` uses the Regular Expression pattern `_sn= ((.+?) "`.
- **Siebel SN - Variable Substitution** - this rule locates text in the HTML matching the Regular Expression pattern `_sn= ((.+?)) &` and replaces it with the variable name `siebel_sn` in the specified location. The variable name `siebel_sn` uses the Regular Expression pattern `_sn= ((.+?) &`.

- **Siebel SWEBID - Variable Substitution** - this rule locates text in the HTML matching the Regular Expression pattern `SWEBID=(\d+)` and replaces it with the variable name `SWEBID` in the specified location. The variable name `SWEBID` uses the Regular Expression pattern `navigator.id = ([0-9]+?)`;
- **Siebel SWEBID - Variable Substitution** - this rule locates text in the HTML matching the Regular Expression pattern `SWEBID=(\d+)` and replaces it with the variable name `SWEBID` in the specified location. The variable name `SWEBID` uses the Regular Expression pattern `navigator.id = "([0-9]+?)"`;
- **Siebel SWEBMC - Variable Substitution** - this rule locates text in the HTML matching the Regular Expression pattern `SWEBMC=((|%3d|%3D)\d+([\&|%]|\$|\s))` and replaces it with the variable name `SWEBMC` in the specified location. The variable name `SWEBMC` uses the Regular Expression pattern `SWEBMC(?:=|%3d|%3D)(\d+) [?\&?%]`.
- **Siebel SWEBS - Variable Substitution** - this rule locates text in the HTML matching the Regular Expression pattern `SWEBS=((|%3d|%3D)\d+([\&|%]|\$|\s))` and replaces it with the variable name `SWEBS` in the specified location. The variable name `SWEBS` uses the Regular Expression pattern `<input type = "hidden" name="SWEBS" \s+?value="(\d+?)">`;
- **Siebel SWEFI - Variable Substitution** - this rule locates text in the HTML matching the Regular Expression pattern `SWEFI=((|%3d|%3D)\d+([\&|%]|\$|\s))` and replaces it with the variable name `SWEFI` in the specified location. The variable name `SWEFI` uses the Regular Expression pattern `(.)SWEFI\1(\d+)\1`.
- **SWETS - Function/Text Substitution** - this rule locates text in the HTML matching the Regular Expression pattern `SWETS=(\d{13,})` and replaces it with the function `{@timestamp}` in the specified location.
- **SWSECancelID - Function/Text Substitution** - this rule locates text in the HTML matching the Regular Expression pattern `SWSECancelID=(|%3d|%3D)(\d{10,})` and replaces it with the function `{@timestampsecs}` in the specified location.
- **Siebel Correlation Rule** - this rule locates all Siebel SWEC and RowIDs.
- **currentDate - Substitute Recorded Date** - this rule locates the date the script was recorded and replaces it with the function `{@today(M/dd/YYYY)}`.

Using the Utilities Module

This chapter provides instructions on using the OpenScript Utilities Module, which provides commonly used testing functions.

12.1 About the Utilities Module

The Utilities Module provides commonly used testing functions. The Utilities Module is an extension to the Basic Module. The OpenScript Utilities module includes the following features:

12.1.1 Key Features of the Utilities Module

- **Text File Processing.** Read values from text files including CSV and XML files as well as copy and move files in the file system.
- **Databases.** Read values from various databases such as Oracle as well as other JDBC-ODBC Compliant databases
- **XML XPath Expressions.** Generate XPath expressions from valid XML files.

You can use the Utilities Module API to enhance recorded scripts with additional testing functionality. Commands that are specific to the Utilities Module are part of the "utilities" class.

12.2 Using Text File Processing

You can use the `utilities` API to read values from text files including CSV and XML. The following sections explain how to use the utilities API.

12.2.1 Reading Lines of Text from a File

The Utilities API includes a method for reading lines of text from a file.

To add code that reads text from a file:

1. Record a Web Functional Test script.
2. Open the Java Code view.
3. Add the `readLines()` method to specify the file to read. The following example shows how to parse the lines of text in a file and print to the OpenScript console view:

```
String[] lines = utilities.getFileService().readLines("C:/Sample.txt");
for (String line : lines) {
    getLogger().info(line);
}
```

```
}
```

12.2.2 Reading Text from a CSV File

The Utilities API includes a method for reading text from a Comma Separated Value text file.

To add code that reads text from a .CSV file:

1. Record a Web Functional Test script.
2. Open the Java Code view.
3. Add the `loadCSV` method to specify the file to read. For this example the file, "C:\customer.csv" contains this data:

```
FirstName,LastName,MiddleInitial  
John,James,R  
Mary,Simpson,J
```

The following example shows how to parse a table of text in a .CSV file and print values to the OpenScript console view:

```
Table table = utilities.loadCSV("C:/customer.csv");  
Row row = table.getRow(0);  
getLogger().info(row.get("LastName"));
```

12.2.3 Reading Text from an XML File

The Utilities API includes a method for reading text from a XML formatted text file.

To add code that reads text from a .XML file:

1. Record a Web Functional Test script.
2. Open the Java Code view.
3. Add the `loadXML` method to specify the file to read. For this example the file, "C:\oceans.xml" contains this data:

```
<?xml version="1.0" encoding="utf-8"?>  
<Oceans>  
  <ocean name="Artic"/>  
  <ocean name="Atlantic"/>  
  <ocean name="Indian"/>  
  <ocean name="Pacific"/>  
  <ocean name="Southern"/>  
</Oceans>
```

The following example shows how to parse a table of text in a .XML file and print values to the OpenScript console view:

```
XML xml = utilities.loadXML("C:/oceans.xml");  
XML root = xml.getChildren()[0];  
getLogger().info(root.getTagName());  
XML[] oceans = root.getChildren();  
  
for (XML ocean : oceans){  
  getLogger().info(ocean.getAttribute("name"));  
}
```


12.3 Getting Values from a Database

Getting values from a database requires a database definition, a database SQL query or SQL execute and a disconnect from the database.

To get values from a database:

1. Open or create a Web Functional Test script project.
2. Select the node where you want to add the database definition.
3. Select the **Script** menu and then select **Other** from the **Add** sub menu.
4. Expand the Database node and select Database Definition.
5. Click **OK**.
6. Specify the database definition information.
7. Click **Test** to verify a successful connection.
8. Click **OK**.
9. Select the node where you want to add the database connection. The OpenScript database connect method is optional. The database connect is invoked automatically when calling execute or query methods
10. Select the **Script** menu and then select **Other** from the **Add** sub menu.
11. Expand the Database node and select Connect.
12. Select the database alias and click **OK**.
13. Select the node where you want to add the database query or execute statement.
14. Select the **Script** menu and then select **Other** from the **Add** sub menu.
15. Expand the Database node and select SQL Query or SQL Execute.
16. Specify the SQL statement to query or execute and click **Add**.
17. Specify a data type and define a name for the parameter.
18. Click **OK**.
19. Click **OK**.
20. Select the node where you want to add the database disconnect.
21. Select the **Script** menu and then select **Other** from the **Add** sub menu.
22. Expand the Database node and select Disconnect.
23. Select the database alias and click **OK**.

In the Java Code view, the `utilities.getSQLService()` methods will be added to the script code for each database script action:

```
utilities.getSQLService().define("oracledb ",
    "oracle.jdbc.driver.OracleDriver", "00.000.000.000", "myuserID",
    decrypt("ZgEQLMIUx8EVDAhfAenvyg=="));
utilities.getSQLService().connect("oracledb ");
utilities.getSQLService().query("oracledb ",
    "SELECT * FROM Users", list("testdb"));
utilities.getSQLService().execute("oracledb ",
    "SELECT * FROM Users", list("sql executel"));
utilities.getSQLService().disconnect("oracledb ");
```

12.4 Using the XPath Generator

The Utilities Module includes an XPath generator utility that you can use to generate an XPath Expression to a selected element from a valid XML file.

To use the XPath Generator:

1. Create an XML file that contains the tags and values to use to generate the XPath expression. The following is an example of a simple XML file that can be used with the XPath Generator:

```
<?xml version="1.0" encoding="utf-8"?>
<Oceans>
  <ocean name="Arctic"/>
  <ocean name="Atlantic"/>
  <ocean name="Indian"/>
  <ocean name="Pacific"/>
  <ocean name="Southern"/>
</Oceans>
```

2. Create and record a test script. The **Tools** menu appears on the OpenScript menu bar for functional and load test scripts.
3. Select **XPath Generator** from the **Tools** menu.
4. Click **Browse** and select the XML file to load.
5. Expand the XML tree under the Tags section of the XML file.
6. Select the XML tag to use to generate the XPath. The generated XPath appears in the XPath Expression field in a form similar to `/Oceans/ocean[1]/@name`.
7. Use the Ctrl+C and Ctrl+V keyboard combinations to copy and paste the generated XPath to a method in the Java Code tab of the script view.

The XPath Expression can be used in the utilities `findByXPath` API method, as follows:

```
utilities.loadXML("filePath").findByXPath(xpath, xml)
```

Using the Shared Data Module

This chapter provides instructions on using the OpenScript Shared Data Module, which allows data to be passed between scripts using a shared data queue.

13.1 About the Shared Data Module

The Shared Data Module is an extension module to the OpenScript Basic Module that extends the other testing modules with message queue and hash map capabilities.

The "Shared Data" is in memory space that resides in the Oracle Load Testing for Web Applications server and is managed by a "Shared Data Manager". The Shared Data Service supplies methods for users to store/retrieve data in a memory space that resides in Oracle Load Testing for Web Applications. The methods send messages to the Shared Data Manager in Oracle Load Testing for Web Applications through the JMS server. There are two JMS topics configured in a JMS configuration file for WebLogic that are used for the communication: "topic/requestSharedData" and "topic/responseSharedData". They are created by the WebLogic server startup process and destroyed once the server is stopped.

The scripts or java agents send messages to the "topic/requestSharedData" and receive messages from the "topic/responseSharedData". The Shared Data Manager sends to the "topic/responseSharedData" and receives from "topic/requestSharedData". The messages are serializable java objects. Agents send request messages that request data or request to store data. The Shared Data Manager sends response messages that contain the requested data.

Shared Data is typically used to pass data between load testing scripts running as Virtual Users in Oracle Load Testing for Web Applications. The Shared Data can also be used to pass data between functional testing scripts running from the command line.

13.1.1 Key Features of the Shared Data Module

The Shared Data module provides the following features:

- Preferences - shared data connection preferences can be set under the OpenScript Playback preferences.
- Message Queue Manipulation - create, peek, and poll message queues.
- Hash Map Manipulation - create, put, and get hash maps.
- Shared Data Module API - The Shared Data Module API includes a "sharedData" class that provides additional programming functionality.

13.2 Setting Shared Data Preferences

To set Shared Data preferences:

1. Start OpenScript.
2. Select **OpenScript Preferences** from the **View** menu.
3. Expand the OpenScript node and the Playback category.
4. Select **Shared Data**.
5. Set the Shared Data Preferences as follows:
 - **OATS Credential:** Specifies the authentication credentials to use to establish the communication between the shared queue and the Virtual User.
 - **Address:** Specifies the address of the Oracle Load Testing for Web Application server to use for the shared data service.
 - **User name:** Specifies the user name to use for authentication. The default name is `oats` unless changed in the Oracle Application Testing Suite configuration.
 - **Password:** Specifies the password to use for authentication. This should be the same password specified in the Encryption setting of the General preferences if the **Encrypt script data** setting is selected.
 - **Actions on Shared Data:** Specifies actions on shared data.
 - **Timeout:** Specifies the maximum number of seconds to wait for actions on shared data to occur before timing out.
6. Click **OK**.

13.3 Using the Shared Data Service

This section describes how to enable and use the Shared Data Service.

13.3.1 Enabling the Shared Data Service

To enable the Shared Data Service:

1. Start OpenScript.
2. Open an existing script or create and record a new script.
3. Select **Script Properties** from the **Script** menu.
4. Select the Modules category.
5. Select the **Shared Data** module.
6. Click **OK**. The Shared Data Service will be added to the script class in the Java Code as follows.

```
@ScriptService oracle.oats.scripting.modules.sharedData.api.SharedDataService  
sharedData;
```

Once you have enabled the Shared Data service, you can set the password encryption and the connection parameters and then use the Shared Data API to manipulate message queues or hash maps. You use the `sharedData` class in the Java code view to create manipulate message queues and hash maps.

13.3.2 Setting the Password Encryption

The Password encryption is set in the General Preferences. To set the password encryption:

1. Select **OpenScript Preferences** from the **View** menu.
2. Expand the OpenScript node and the General category.
3. Select **Encryption**.
4. Select **Obfuscate script data** or **Encrypt script data** to make sure the connection to the Shared Data Service uses an obfuscated or encrypted password.
5. If you select **Encrypt script data**, enter a password.
6. Click **OK**.

13.3.3 Setting the Connection Parameters

The connection parameters specify the Oracle Load Testing for Web Applications server to use for the Shared Data Service and the authentication settings. To set the connection parameters:

1. Make sure the Shared Data Service is enabled and the password encryption is specified as previously described.
2. Select the script node where you want to set the connection parameters.
3. Select **Add** from the **Script** menu and then select **Other**.
4. Expand the Shared Data folder.
5. Select **Set Connection Parameters** and click **OK**.
6. Set the connection parameters as follows:
 - **Address:** Specify the address of the machine to use for the Shared Data Service. For example: `t3://localhost:8088` or `t3://machinename.us.oracle.com:8088`.
 - **User Name:** Specify the user name to use for authentication. The default name is `oats` unless changed in the Oracle Application Testing Suite configuration.
 - **Password:** Specify the password to use for authentication.
7. Click **OK**. A Connection Parameters node will be added to the script tree.
8. In the Java Code view, the Connection Parameters consist of the code executed in the `sharedData.setConnectionParameters` procedure:

```
sharedData.setConnectionParameters("t3://localhost:8088", "oats",
    decrypt("L4I57b+KpnI2BQSRKPG88w=="));
```

After setting the connection parameters, you can use the Shared Data API in the Java Code view to manipulate data in message queues and hash maps.

13.3.4 Using The Shared Data API

The Shared Data Module includes a script Application Programming Interface (API) for Shared Data actions. You can use the Shared Data API to pass data between load testing scripts running as Virtual Users in Oracle Load Testing for Web Applications. The Shared Data can also be used to pass data between functional testing scripts running from the command line. Commands that are specific to the Shared Data Module are part of the "sharedData" class. The Shared Data service must be enabled

separately for use with other types of scripts. You can also leverage other commands from other enabled classes (services) or general Java commands in your scripts.

Some examples of the Shared Data Module API include:

- clearMap
- clearQueue
- createMap
- createQueue
- getFromMap
- getKeysOfMap
- getLengthOfQueue
- offerFirst
- offerLast
- peekFirst
- peekLast
- pollFirst
- pollLast
- putToMap
- removeFromMap
- setConnectionParameters
- waitFor

The setConnectionParameters API method can be added using the script Tree View. Additional methods can be added using the Java Code view.

Command Line Reference

This appendix lists the parameters for running OpenScript scripts from the command line. All OpenScript scripts may be run from the command line assuming that:

- All resources that the script depends on, including databank files, object library files, and other scripts it runs, must be accessible from the machine where the script is run.
- The installed version of OpenScript or agent is newer or the same as the version used to create the script.

To run a script from the command line, type:

```
[OpenScript Install Dir]\runScript.bat Path\ScriptName.jwg  
[options]
```

If OpenScript is not installed, but the OATS agent is installed, type:

```
[OATS Install Dir]\agent\runScript.bat Path\ScriptName.jwg  
[options]
```

Path is the full drive and directory path of the file location.

[options] may consist of any number of agent command line settings.

A.1 Specifying Command Line Settings

This section describes how to use the command line settings.

- Zero or more agent command line settings may be specified using the following format:

```
-settingId settingValue
```

Example:

```
runScript -jwg  
"C:\OracleATS\OpenScript\DefaultRepository\Default!\script1\script1.jwg"  
-iterations 5 -iterationDelay 5
```

- If a *settingValue* contains spaces, the value may be enclosed inside double-quotation marks.
- If a setting specifies a boolean true/false value, and no *settingValue* is specified, then a true value is assumed.
- Except where specifically noted, all *settingId* values are NOT case-sensitive. For example, `-iterations 10` means the same thing as `-ITERATIONS 10`.

- It is possible to view all settings passed to a script by typing the following code inside an OpenScript script:

```
info(getSettings().toString());
```

- Custom settings may be used in a script and specified on the command line. For example, consider a script with a setting "todaysURLToTest":

```
public void run() throws Exception {
    info("Today we will test the URL " + getSettings().get("todaysURLToTest"));
}
```

The setting may be specified on the command line using:

```
-todaysURLToTest "http://www.oracle.com/"
```

- The `runScript` program can only accept 9 command line arguments. Use the `-propertiesPath` setting to specify a file containing a larger number of properties.

A.2 Supported Agent Command Line Settings

Certain settings only apply to scripts that have a particular module applied. For example, HTTP load test script settings do not apply to Web functional test scripts.

A.2.1 General Settings

The following table lists the General command line settings.

Setting	Description
<code>-dboptions</code> <code>alias:index:mode, alias:index:mode, ...</code>	<p>Specify which databank records to use when playing back the script. Use</p> <pre>-dboptions alias:index:mode, alias:index:mode, ...</pre> <p>where <i>alias</i> is a databank alias, <i>index</i> is the first databank record to retrieve (first record is 1), and <i>mode</i> is one of the following strings:</p> <ul style="list-style-type: none"> <code>FIRST_RECORD_ONLY</code> - The Virtual User will only use the first record assigned to it. <code>USE_ALL_RECORDS</code> - Stop after all records are used. <code>STOP_AFTER_LAST_RECORD</code> - Stop after the last record in the databank file is used. <code>LOOP_FOREVER</code> - Loop over all records for as many iterations are specified in <code>-iterations</code>. This is the default mode if no mode is specified. <p>Regardless of the databank setting, the VU will never run for more iterations than specified in the <code>-iterations</code> setting.</p> <p>For example, to loop over records starting at the 5th row in the databank with alias "fmstocks_data", use:</p> <pre>-dboptions fmstocks_data:5:LOOP_FOREVER</pre>

Setting	Description
<code>-delayPercentage mode</code>	<p>Specify how long to delay between steps in a script. Depending on the <i>mode</i>, this setting may be used in conjunction with other settings. <i>mode</i> should be one of the following numbers:</p> <ul style="list-style-type: none"> -2 No Delay. 1 Use Recorded Delay. Optionally specify a minimum and maximum amount of delay using <code>-delayMinSeconds n</code> and <code>-delayMaxSeconds m</code>, where <i>n</i> and <i>m</i> are given in seconds. If unspecified, the default minimum and maximum amount of delay to use are 0 and 5 seconds, respectively. -1 Delay for a random number of seconds. Optionally specify a minimum and maximum amount of delay using <code>-delayMinSeconds n</code> and <code>-delayMaxSeconds m</code>, where <i>n</i> and <i>m</i> are given in seconds. If unspecified, the default minimum and maximum amount of delay to use are 0 and 5 seconds, respectively. 0 Delay for a random number of seconds using a percentage threshold range around the recorded delay. Optionally specify a lower and upper percentage delay range using <code>-delayLower p</code> and <code>-delayUpper q</code>, where <i>p</i> and <i>q</i> are a decimal value between 0 and 1. If unspecified, 0 will be used for the percentage threshold, resulting in the actual recorded delay being used.
<code>-iterationDelay n</code>	Pause for <i>n</i> seconds between iterations.
<code>-iterations n</code>	Run <i>n</i> iterations of the script.
<code>-loglocalvudisplay true false</code>	Create VUDisplay.txt and VUDisplay.csv result output files in the folder from which the agent was launched. The Virtual User Display output is not supported by functional test modules. The <code>loglocalvudisplay</code> setting is case-sensitive and must be exactly <code>loglocalvudisplay</code> .
<code>-noReport true false</code>	Set to true to disable generation of the results report. The default is false.
<code>-preserveVariables true false</code>	Set to true to preserve variables between iterations, false to clear variables between iterations. Variables refer to variables set using the Variables service, i.e. <code>getVariables().set()</code> , not local Java code variables.
<code>-propertiesPath path</code>	<p>Specify the full path of a Java .properties file containing additional command line setting name=value pairs to add.</p> <p>Example usage:</p> <pre>-propertiesPath "C:\additionalSettings.properties"</pre>

Setting	Description
<code>-resultReportFolder path</code>	Specify the output folder for all result report files. If it is not specified, the default output folder will be: <code>[script folder]\SessionId</code> Example usage: <code>-resultReportFolder "C:\result"</code> The output folder would be: <code>C:\result\SessionId</code>
<code>-reportName name</code>	Override the file name used when generating the result report HTML file. Specify the name of the report including an extension, but excluding any path information. For example: <code>-reportName results.html</code> If not specified, OpenScript will determine a meaningful name for the result report HTML file based on the type of script being run. For example, an HTTP load test script calls its report <code>httpReport.htm</code> . A functional test script such as a Web functional test script calls its report <code>FTReport.htm</code> .
<code>-stopVUserOnFailure true false</code>	Specify whether or not the virtual user will continue running more iterations after a fatal error. Use the Error Recovery settings to control which errors should be fatal.
<code>-repository repositoryString</code>	Specify the physical locations of one or more named repositories. <code>repositoryString</code> takes the form <code>repositoryName=fullPathToRepository, repositoryName2=fullPathToRepository2, ...</code> . This setting is useful if a script contains a <code>runScript</code> command that references a script by its repository name. Always specify the <code>repositoryString</code> inside double-quotes. Example usage: <code>-repository "Default=D:\OracleATS\OFT, SharedRepository=X:\OurScripts"</code>

A.2.2 Browser Settings

The following table lists the Browser command line settings.

Setting	Description
<code>-browser.type type</code>	Specify the browser type to use for script playback where <code>type</code> is one of the following (use exact case and no spaces): <ul style="list-style-type: none"> InternetExplorer FireFox The default is InternetExplorer.
<code>-browser.startupTimeout n</code>	Specify <code>n</code> seconds to wait for the browser to start before timing out. The default is 15 seconds.

Setting	Description
<code>-browser.overridePath path</code>	<p>OpenScript automatically detects where Internet Explorer and Firefox browser processes physically exist in the file system. In case the path to one of these browsers is incorrect, specify an alternative path to use when launching the specified browser type. This setting is not intended to be used to specify the path to an unsupported browser.</p> <p>Example usage:</p> <pre>-browser.pathOverride "D:/Programs/Firefox/firefox.exe"</pre>
<code>-browser.extraArgs args</code>	<p>Specify any additional startup arguments that OpenScript should use when launching the browser process on playback. The default is no additional arguments other than what OpenScript may require internally.</p>
<code>-browser.hide true false</code>	<p>For Internet Explorer browser only, specify <code>true</code> to hide the browser during playback. This setting has no effect on Firefox. If certain actions in the script require the browser to be visible, such as key presses and physical mouse clicks, the script will not playback correctly. The default is <code>false</code>; browser is visible.</p>

A.2.3 HTTP Settings

The following tables list the HTTP command line settings.

A.2.3.1 Proxy

The following table lists the proxy command line settings.

Setting	Description
<code>-http.proxyHost host</code>	<p>Set the proxy host to the specified <i>host</i>. If no proxy host is specified, then no proxy is used.</p> <p>Example usage:</p> <pre>-http.proxyHost "proxyserver.mycompany.com"</pre>
<code>-http.proxyPort port_number</code>	<p>Set the proxy port to the specified <i>port_number</i>.</p> <p>Example usage:</p> <pre>-http.proxyPort 1234</pre>
<code>-http.proxyUsername username</code>	<p>If the proxy host requires authentication, provide the <i>username</i>. Ignored if <code>http.proxyHost</code> and <code>http.proxyPort</code> are not set.</p>
<code>-http.proxyPassword password</code>	<p>If the proxy host requires authentication, provide the <i>password</i>. Ignored if <code>http.proxyHost</code> and <code>http.proxyPort</code> are not set. The password is <i>not</i> encrypted when provided on the command line.</p>

Setting	Description
<code>-http.nonProxyHosts <i>hostsList</i></code>	Specify a list of host names that the agent should <i>not</i> forward through the specified proxy defined by <code>http.proxyHost</code> and <code>http.proxyPort</code> . Separate multiple host names by a <code> </code> delimiter. The host name must match the host being requested, as seen in the Host HTTP request header.

A.2.3.2 Compression

The following table lists the compression command line settings.

Setting	Description
<code>-http.useGzip true false</code>	Enable GZIP compression. The client will add <code>gzip</code> to every <code>Accept-Encoding</code> HTTP request header. If the server responds with GZIP-compressed data, OpenScript will decompress it. The default value is <code>true</code> .
<code>-http.useDeflate true false</code>	Enable Deflate compression. The client will add <code>deflate</code> to every <code>Accept-Encoding</code> HTTP request header. If the server responds with Deflate-compressed data, OpenScript will decompress it. The default value is <code>false</code> .

A.2.3.3 Headers

The following table lists the header command line settings.

Setting	Description
<code>-http.userAgentHeader</code>	Browser Emulation. Specify the <code>User-Agent</code> header string to use when making requests. It is not required and harmless to include the <code>User-Agent :</code> prefix in the value itself. Most OpenScript scripts override this setting with the <code>User-Agent</code> header value found during recording. Example usage: <code>-http.userAgentHeader "Mozilla/4.0 (compatible; MSIE 6.0; Windows NT 5.0)"</code>
<code>-http.language <i>language</i></code>	Set the value of the <code>Accept-Language</code> HTTP header. If no value specified, the agent tries to determine the language header by looking at the system language.
<code>-http.version <i>version</i></code>	Specify the HTTP version string to append to each request, i.e. <code>HTTP/1.1</code> or <code>HTTP/1.0</code> . If no value specified, agent will use <code>HTTP/1.1</code>
<code>-http.accept <i>acceptString</i></code>	Specify the HTTP <code>Accept</code> header to send by default for all requests.

A.2.3.4 Connections

The following table lists the connection command line settings.

Setting	Description
<code>-http.useKeepAlive true false</code>	Specify whether or not to keep HTTP connections alive after using them. Default is <code>true</code> to enable keep-alive connections.
<code>-http.maxKeepAliveRequests n</code>	Specify an integer <i>n</i> number of requests to make before closing a keep-alive connection. Must be used together with <code>http.useKeepAlive</code> .
<code>-http.maxConnections n</code>	Specify an integer <i>n</i> maximum number of connections a single virtual user may have open concurrently before blocking (waiting) for a new connection to become available. This setting only applies in OpenScript when concurrent sections are used in the script. The default value if not set is 2 connections per virtual user.
<code>-http.connectionSpeed n</code>	Specify the number of bytes/sec <i>n</i> to limit the download speed. For example, to download at 56KBps, specify 56000. If no value specified, or an empty string is specified, this method assumes true line speed should be used.

A.2.3.5 Other

The following table lists other HTTP command line settings.

Setting	Description
<code>-http.ignoredUrls list_of_urls</code>	Specify a comma-separated list of case-insensitive URLs not to request during playback. The URLs only need to be the ENDS of URLs, not the entire URLs. Example usage: <code>-http.ignoredUrls ".jpg,.gif,.css."</code>
<code>-http.cacheEmulation mode</code>	Specify if/how the browser should cache downloaded contents. Each virtual user maintains its own cache. The <i>mode</i> value is one of the following values: <ul style="list-style-type: none"> ■ 1 - Repeat User; use a cache and do not clear the cache after each iteration. ■ 2 - First Time User; use a cache and clear the cache after each iteration. ■ 3 - Do Not Cache; do not cache any contents. The default value is 3, do not cache.
<code>-http.useCookies true false</code>	Specify whether or not to allow the browser to remember and use session or persistent cookies during playback. The default value is <code>true</code> , use cookies.
<code>-http.downloadLocalFiles true false</code>	Specify whether or not the agent should download files that exist in the local file system. When local files are not downloaded, the contents are not displayed in the Oracle Load Testing Virtual User Display, and it is not possible to solve variables against the contents, for example. The default value is <code>false</code> , do not download local files.

Setting	Description
<code>-http.preserveCookies</code> <code>true false</code>	Set to <code>true</code> if cookies should be preserved between iterations. Set to <code>false</code> if cookies will be cleared between iterations. The default value is <code>false</code> , do not preserve cookies between iterations.
<code>-http.preserveConnections</code> <code>true false</code>	Set to <code>true</code> if the browser should attempt to reuse any open browser connections if possible between iterations. Each virtual user maintains its own set of connections that it never shares with other virtual users. The default value is <code>true</code> , preserve connections between iterations.
<code>-http.maxContentSize</code> <i>n</i>	Specify the maximum number of kilobytes (KB) to download from a server for a given request. Set to <code>-1</code> to mean unlimited download size. The default value is <code>-1</code> , unlimited.
<code>-http.socketTimeout</code> <i>n</i>	Specify the socket timeout in <i>n</i> seconds. The default value is 120 seconds.

A.2.4 Functional Test Settings

The following table lists the functional test command line settings.

Setting	Description
<code>-ft.smartMatch</code> <code>true false</code>	When <code>true</code> , the OpenScript Smart Match object identification ranking feature is enabled. The default value is <code>true</code> , enabled.

A.2.5 Oracle EBS/Forms Functional Test Settings

The following table lists the Oracle EBS/Forms functional test command line settings.

Setting	Description
<code>-formsft.startup_timeout</code> <i>n</i>	Specify <i>n</i> seconds to wait for the Forms applet to start up before failing the script due to a timeout. The default value is 30 seconds.
<code>-formsft.action_timeout</code> <i>n</i>	Specify <i>n</i> seconds to wait when trying to play an action before timing out because the object required could not be found. The default value is 30 seconds.
<code>-formsft.capture_screenshot</code> <code>true false</code>	Set to <code>true</code> to capture screenshots of the Forms applet during playback. The default value is <code>true</code> .
<code>-formsft.replay_port</code> <i>n</i>	Specify the port used for communication between the Forms applet and the agent. The default value is 44444.

A.2.6 Shared Data Settings

The following table lists the shared data command line settings.

Setting	Description
<code>-ENCRYPTION_PROPERTIES_FILE path\encryption.properties</code>	Specify the full path and file name to use for encrypted password authentication. The file name is C:\Documents and Settings\ <i>username</i> \osworkspace\.metadata\.plugins\oracle.oats.scripting.utilities\encryption.properties. Set the password encryption to Encrypt script data in the General Encryption Preferences. Generate the encrypted password by selecting Add from the Script menu, expanding the Shared Data folder and selecting Set Connection Parameters . Specify the connection parameters then specify the path and file name in your command line settings.
<code>-sharedData.actionTimeout timeout</code>	Specify the maximum time in seconds to wait for the requested data to return.
<code>-sharedData.Address address</code>	Specify the address of the Oracle Load Testing for Web Application server to use for the shared data service. For example: t3://localhost:8088 or t3://machinename.us.oracle.com:8088.
<code>-sharedData.Password password</code>	Specify the password to use for authentication. Note that this is a clear text password that is not secure.
<code>-sharedData.encryptedPassword encryptedPassword</code> <code>-ENCRYPTION_PROPERTIES_FILE path\encryption.properties</code>	Specify the encrypted password to use for authentication. Set the password encryption to Encrypt script data in the General Encryption Preferences. Generate the encrypted password by selecting Add from the Script menu, expanding the Shared Data folder and selecting Set Connection Parameters . Specify the connection parameters then copy the encrypted password from the Java Code view to your command line settings similar to the following example: <code>-sharedData.encryptedPassword gLM7NB+n7Yba0FlspMDX8A== -ENCRYPTION_PROPERTIES_FILE path encryption.properties</code>
<code>-sharedData.obfuscatedPassword obfuscatedPassword</code>	Specify the obfuscated password to use for authentication. Set the password encryption to Obfuscate script data in the General Encryption Preferences. Generate the obfuscated password by selecting Add from the Script menu, expanding the Shared Data folder and selecting Set Connection Parameters . Specify the connection parameters then copy the obfuscated password from the Java Code view to your command line settings similar to the following example: <code>-sharedData.obfuscatedPassword RG5CE6b1u8cG9VzbbnW6cQ==</code>
<code>-sharedData.UserName name</code>	Specify the user name to use for authentication. The default name is <code>oats</code> unless changed in the Oracle Application Testing Suite configuration.

A.2.7 Web Functional Test Settings

The following table lists the Web functional test command line settings.

Setting	Description
<code>-web.event_time_out n</code>	Specify the Object Timeout <i>n</i> in seconds. If an object cannot be found in <i>n</i> seconds, the action will fail. The default value is 60.
<code>-web.capture_html true false</code>	Specify whether or not to capture the browser HTML during playback.
<code>-web.capture_screenshot true false</code>	Specify whether or not to capture screenshots during playback.
<code>-web.clear_cookies true false</code>	Specify whether or not to clear browser cookies between iterations.
<code>-web.clear_cache true false</code>	Specify whether or not to clear the browser cache between iterations.
<code>-web.webdom_proxy_port n</code>	Specify the port used for communication between the web browser and the agent. The default value is 7666.
<code>-web.capture_screenshot_interval n</code>	Specify the number of milliseconds to wait after a new page is detected and the screenshot is captured. The default value is 500.
<code>-web.date_format date_format_string</code>	Specify a date format string to override the default date format string used when performing date validation tests.

A.2.8 Error Recovery Settings

All Error Recovery settings are specified using the form:

`-errorRecoverySettingId action`

action is one of the following constants (case-sensitive):

- Ignore - proceed with the script as if the error did not occur. The error will still be logged to the console/log file.
- Warn - report the error, but continue running the script.
- Fail - report the error and fail the current iteration of the script.

A.2.8.1 General

The following table lists the general error recovery settings.

Setting	Description
<code>err.basic.VARIABLE_NOT_FOUND</code>	Variable Not Found.
<code>err.basic.CREATE_VARIABLE_ERROR</code>	Create Variable Failed
<code>err.basic.FILE_NOT_FOUND</code>	File Not Found
<code>err.basic.SEGMENT_PARSER_ERROR</code>	Segment Parser Failed
<code>err.basic.BINARY_DECODING_EXCEPTION</code>	Binary Decode Failed
<code>err.basic.ENCRYPTION_SERVICE_NOT_INITIALIZED</code>	Encryption Service Not Initialized
<code>err.basic.GENERAL_SCRIPT_EXCEPTION</code>	Unexpected Script Error

A.2.8.2 Functional Testing

The following table lists the functional testing error recovery settings.

Setting	Description
<code>err.functionalTest.FT_MATCH_ERROR</code>	Text Matching Test failed
<code>err.functionalTest.OBJECT_TEST_ERROR</code>	Object Test failed
<code>err.functionalTest.TABLE_TEST_ERROR</code>	Table Test failed

A.2.8.3 HTTP

The following table lists the HTTP error recovery settings.

Setting	Description
<code>err.http.ZERO_LENGTH_DOWNLOAD</code>	Zero Length Downloads
<code>err.http.MATCH_ERROR</code>	Text Matching Test failed
<code>err.http.RESPONSE_TIME_ERROR</code>	Response Time error
<code>err.http.SOLVE_ERROR</code>	Solve Variable failed
<code>err.http.HTML_PARSING_ERROR</code>	HTML Parsing error
<code>err.http.INTERNET_INVALID_URL</code>	Invalid URL
<code>err.http.INVALID_HTTP_RESPONSE_CODE</code>	Invalid HTTP Response Code
<code>err.http.KEYSTORE_LOAD_ERROR</code>	Client Certificate Keystore error

A.2.8.4 Oracle EBS/Forms Functional Testing

The following table lists the Oracle EBS/Forms Functional Testing error recovery settings.

Setting	Description
<code>err.formsFT.FORMS_FT_ERROR</code>	Oracle Forms Error

A.2.8.5 Oracle EBS/Forms Load Testing

The following table lists the Oracle EBS/Forms Load Testing error recovery settings.

Setting	Description
<code>err.formsLT.CONNECT_ERROR</code>	Forms Connect Error
<code>err.formsLT.IO_ERROR</code>	Forms Input/Output Communication Error
<code>err.formsLT.MATCH_ERROR</code>	Forms Content Match Failed
<code>err.formsLT.PLAYBACK_ERROR</code>	Forms Playback Error
<code>err.formsLT.COMPONENT_NOT_FOUND</code>	Forms Component Not Found

A.2.8.6 Web Functional Testing

The following table lists the Web Functional Testing error recovery settings.

Setting	Description
<code>err.webdom.RESPONSE_TIME_ERROR</code>	Response Time Error
<code>err.webdom.WEBDOM_SOLVE_ERROR</code>	Solve Variable Failed

A.2.8.7 Utilities

The following table lists the Utilities error recovery settings.

Setting	Description
<code>err.utilities.SQL_ERROR</code>	SQL Execute Error
<code>err.utilities.XML_PARSING_ERROR</code>	XML Parsing Error
<code>err.utilities.CSV_LOADING_ERROR</code>	CSV Loading Error

Error Message Reference

This appendix lists the error messages for the OpenScript Workbench Platform and HTTP and Siebel Modules.

B.1 Basic Module Error Messages

This section list the Error messages for the OpenScript Workbench Basic Module.

B.1.1 General Script Exceptions

Error Message	Description
File not found: {0}	The file was not found. Error Component ID: oracle.oats.scripting.modules.basic.api Error Code ID: ERR_FILE_NOT_FOUND
Failed to create variable {0}, path={1}	Failed to create the specified variable. Error Component ID: oracle.oats.scripting.modules.basic.api Error Code ID: ERR_CREATE_VARIABLE_ERRORCODE
An unexpected exception occurred in the script. Script section: {0}.	Represents an unexpected exception in the user's script code. Error Component ID: oracle.oats.scripting.modulesbasic.api Error Code ID: ERR_GENERIC_ERROR_CODE

B.1.2 Binary Decoding Exceptions

Error Message	Description
Failed to decode character at offset {1} in string "{0}"	This exception may be thrown while converting a string into binary using the <code>@link oracle.oats.scripting.modules.basic.api.utilities.BinaryUtil#hexString2Binary(String)</code> method. Error Component ID: oracle.oats.scripting.modules.basic.api Error Code ID: ERR_BINARY_DECODE

B.1.3 Script Creation Exceptions

Error Message	Description
Could not find script "{0}" in workspace "{1}" in repository "{2}"	Indicates that the specified script could not be found in the indicated workspace and repository. Error Component ID: oracle.oats.scripting.modules.basic.api Error Code ID: SCRIPT_NOT_FOUND
Script not found: {0}	Indicates that the specified script could not be found in the path. Error Component ID: oracle.oats.scripting.modules.basic.api Error Code ID: SCRIPT_PATH_NOT_FOUND
Exception occurred while reading script {0}.	An exception occurred while reading the specified script. Error Component ID: oracle.oats.scripting.modules.basic.api Error Code ID: EXCEPTION_READING_SCRIPT
Failed to load script class {0}. Class not found.	Indicates that a script class failed to load. Error Component ID: oracle.oats.scripting.modules.basic.api Error Code ID: FAILED_TO_LOAD_SCRIPT_CLASS_NOT_FOUND
Failed to load virtual user class {0}.	Indicates that a virtual user class failed to load. Error Component ID: oracle.oats.scripting.modules.basic.api Error Code ID: FAILED_TO_LOAD_VUSER_CLASS
Failed to create instance of virtual user class {0}.	Indicates that an instance of a virtual user class failed to be created. Error Component ID: oracle.oats.scripting.modules.basic.api Error Code ID: FAILED_TO_CREATE_VUSER_INSTANCE
Failed to load script class {0}. {1}	Indicates that a script class failed to load. Error Component ID: oracle.oats.scripting.modules.basic.api Error Code ID: FAILED_TO_LOAD_SCRIPT_CLASS
Failed to create instance of script "{0}".	Indicates that an instance of script class failed to be created. Error Component ID: oracle.oats.scripting.modules.basic.api Error Code ID: FAILED_TO_CREATE_SCRIPT_INSTANCE

B.1.4 Segment Parser Exceptions

Error Message	Description
Parameter missing: {0}	<p>Indicates that a parameter was not found when parsing {{ }} syntax calling <code>Transforms.transform(String, Variables)</code></p> <p>Error Component ID: oracle.oats.scripting.modules.basic.api</p> <p>Error Code ID: PARAMETER_NOT_FOUND</p>
Unknown segment type: {0}	<p>Indicates that a parameter was not recognized when parsing {{ }} syntax calling <code>Transforms.transform(String, Variables)</code></p> <p>Error Component ID: oracle.oats.scripting.modules.basic.api</p> <p>Error Code ID: UNKNOWN_SEGMENT_TYPE</p>
Unexpected end of string found while parsing string "{0}"	<p>Indicates that an end of string was not recognized when parsing {{ }} syntax calling <code>Transforms.transform(String, Variables)</code></p> <p>Error Component ID: oracle.oats.scripting.modules.basic.api</p> <p>Error Code ID: UNEXPECTED_END_OF_STRING</p>
Unexpected parent segment type {0} found while parsing string "{1}"	<p>Indicates that a parent type was not recognized when parsing {{ }} syntax calling <code>Transforms.transform(String, Variables)</code></p> <p>Error Component ID: oracle.oats.scripting.modules.basic.api</p> <p>Error Code ID: UNEXPECTED_PARENT_SEGMENT</p>
Unexpected end of function found near character offset {0} while parsing string "{1}"	<p>Indicates that a function was not recognized when parsing {{ }} syntax calling <code>Transforms.transform(String, Variables)</code></p> <p>Error Component ID: oracle.oats.scripting.modules.basic.api</p> <p>Error Code ID: UNEXPECTED_END_OF_FUNCTION</p>
Function name not registered: {0}.	<p>Indicates that a function was not registered. Use <code>SegmentParser.addCustomTransformFunction(oracle.oats.scripting.main.CustomFunction <i>functionName</i>)</code> to register custom transform functions.</p> <p>Error Component ID: oracle.oats.scripting.modules.basic.api</p> <p>Error Code ID: UNREGISTERED_FUNCTION</p>
The following characters cannot be escaped: {0}	<p>Indicates that a invalid characters were found when parsing {{ }} syntax.</p> <p>Error Component ID: oracle.oats.scripting.modules.basic.api</p> <p>Error Code ID: INVALID_CHARACTERS_IN_SEGMENT</p>

B.1.5 Script Service Exceptions

Error Message	Description
Failed to create script service {0}	Indicates that the specified script service failed. Error Component ID: oracle.oats.scripting.modules.basic.api Error Code ID: FAILED_TO_CREATE_SCRIPT_SERVICE

B.1.6 URL Encoding Exceptions

Error Message	Description
Failed to URL-encode string "{0}"	Indicates that the specified URL encoding failed. Error Component ID: oracle.oats.scripting.modules.basic.api Error Code ID: URL_ENCODING_EXCEPTION

B.1.7 Variable Exceptions

Error Message	Description
Variable not found: {0}	Indicates that a variable could not be found when evaluating a string containing curly brace {{ }} formatted data. This exceptions is typically thrown when {@link oracle.oats.scripting.modules.basic.api.Transforms#transform(String, oracle.oats.scripting.modules.basic.api.Variables)} is invoked using a string that references a non-existent variable. Error Component ID: oracle.oats.scripting.modules.basic.api Error Code ID: ERR_VARIABLE_NOT_FOUND
Variable "{0}" not found for string: {1}	Indicates that a variable could not be found when evaluating a string containing curly brace {{ }} formatted data. This exceptions is typically thrown when {@link oracle.oats.scripting.modules.basic.api.Transforms#transform(String, oracle.oats.scripting.modules.basic.api.Variables)} is invoked using a string that references a non-existent variable. Error Component ID: oracle.oats.scripting.modules.basic.api Error Code ID: VARIABLE_NOT_FOUND_FOR_STRING

B.2 Platform Error Messages

This section lists the error messages for the OpenScript Workbench platform.

B.2.1 Browser Exceptions

Error Message	Description
Exception parsing NTLM response: {0}	<p>Indicates an error parsing the NTLM response authentication protocol.</p> <p>Error Component ID: oracle.oats.lbrowser</p> <p>Error Code ID: BROWSER_NTLM_EXCEPTION</p>
Cache look-up error.	<p>Could not find document with host {0}, file {1} in the local browser cache. Indicates an error looking for a document in the browser cache.</p> <p>Error Component ID: oracle.oats.lbrowser</p> <p>Error Code ID: BROWSER_CACHE_LOOKUP_ERROR</p>
Too many redirects.	<p>Browser will not redirect more than {0} times. Comparable WinInet error code: Error 12156: Redirect Failed. The redirection failed because either the scheme changed (for example HTTP to FTP) or all attempts to redirect failed (default is five attempts).</p> <p>Error Component ID: oracle.oats.lbrowser</p> <p>Error Code ID: BROWSER_TOO_MANY_REDIRECTS</p>

B.2.2 SSL Exceptions

Error Message	Description
Error creating new SSL session.	<p>Indicates an error creating a Secure Socket Layer session.</p> <p>Error Component ID: oracle.oats.lbrowser</p> <p>Error Code ID: ERROR_CREATING_SSL_SESSION</p>
Failed to prepare SSL socket factory.	<p>Indicates an error preparing a Secure Socket Layer socket factory.</p> <p>Error Component ID: oracle.oats.lbrowser</p> <p>Error Code ID: FAILED_TO_PREPARE_SOCKET_FACTORY</p>

B.2.3 TCP Exceptions

Error Message	Description
The server name {0} could not be resolved.	<p>Comparable WinInet error code: Error 12007: Name Not resolved. The server name could not be resolved. This happens when Java throws an UnknownHostException.</p> <p>Error Component ID: oracle.oats.lbrowser</p> <p>Error Code ID: ERROR_INTERNET_NAME_NOT_RESOLVED</p>

Error Message	Description
The attempt to connect to the server {0} on port {1} failed.	Comparable WinInet error code: Error 12029: Cannot Connect. The attempt to connect to the server failed. Error Component ID: oracle.oats.lbrowser Error Code ID: ERROR_INTERNET_CANNOT_CONNECT
The request to the proxy was invalid.	Comparable to WinInet error code: Error 12033: Invalid Proxy Request. The request to the proxy was invalid. Error Component ID: oracle.oats.lbrowser Error Code ID: ERROR_INTERNET_INVALID_PROXY_REQUEST
Invalid response received from proxy server: {0}.	Comparable to WinInet error code: Error 12033: Invalid Proxy Request. The request to the proxy was invalid. Error Component ID: oracle.oats.lbrowser Error Code ID: ERROR_INTERNET_INVALID_PROXY_RESPONSE
The connection with the server has been terminated.	Comparable to WinInet error code: Error 12030: Connection aborted. The connection with the server has been terminated. Error Component ID: oracle.oats.lbrowser Error Code ID: ERROR_INTERNET_CONNECTION_ABORTED
Timeout occurred while sending request to server.	Comparable to WinInet error code: Error 12002: Timeout. The request has timed out. Error Component ID: oracle.oats.lbrowser Error Code ID: ERROR_INTERNET_REQUEST_TIMEOUT
Timeout occurred while waiting for server response.	Comparable to WinInet error code: Error 12002: Timeout. The request has timed out. Error Component ID: oracle.oats.lbrowser Error Code ID: ERROR_INTERNET_RESPONSE_TIMEOUT
SSL exception occurred while connecting to {0} on port {1}. {2}	Indicates a Secure Socket Layer exception while connecting to the indicated server and port. Error Component ID: oracle.oats.lbrowser Error Code ID: SSL_CONNECT_EXCEPTION
Failed to bind socket to local port {0}	Indicates a failure to bind to the socket on the indicated local port. Error Component ID: oracle.oats.lbrowser Error Code ID: FAILED_TO_BIND

B.2.4 HTTP Exceptions

Error Message	Description
The URL is invalid.	Comparable to WinInet error code: Error 12005: Invalid URL. The Uniform Resource Locator (URL) is invalid. Error Component ID: oracle.oats.lbrowser Error Code ID: ERROR_INTERNET_INVALID_URL
Failed to write HTTP request header: {0}.	Comparable to WinInet error code: Error 12030: Connection Aborted. The connection with the server has been terminated. Error Component ID: oracle.oats.lbrowser Error Code ID: WRITE_REQUEST_EXCEPTION_HEADER
Failed to write request HTTP postdata: {1}.	Comparable to WinInet error code: Error 12030: Connection Aborted. The connection with the server has been terminated. Error Component ID: oracle.oats.lbrowser Error Code ID: WRITE_REQUEST_EXCEPTION_POSTDATA
Failed to read HTTP response header from server.	Comparable to WinInet error code: Error 12152: Invalid Server Response. The server response could not be parsed. Error Component ID: oracle.oats.lbrowser Error Code ID: ERROR_READING_HTTP_RESPONSE_HEADER
Failed to read HTTP response contents from server.	Comparable to WinInet error code: Error 12152: Invalid Server Response. The server response could not be parsed. Error Component ID: oracle.oats.lbrowser Error Code ID: ERROR_READING_HTTP_RESPONSE_CONTENTS

B.3 HTTP Error Messages

This section lists the error messages for the HTTP Module.

B.3.1 HTTP Service Exceptions

Error Message	Description
Comparable to WinInet error code: Error 12005: Invalid URL. The Uniform Resource Locator (URL) is invalid.	Indicates a failure when attempting to validate the contents of a Siebel page. Error Component ID: oracle.oats.scripting.modules.http.api Error Code ID: ERROR_INTERNET_INVALID_URL

Error Message	Description
Invalid HTTP response code: {0}	<p>The HTTP Service browser returns this error if an HTTP response is received from a web server containing a response code greater than or equal to 400.</p> <p>Error Component ID: oracle.oats.scripting.modules.http.api</p> <p>Error Code ID: ERROR_INVALID_HTTP_RESPONSE_CODE</p>
Error parsing HTML. {0}	<p>Indicates an unexpected parsing failure in the HTTP service while parsing HTML.</p> <p>Error Component ID: oracle.oats.scripting.modules.http.api</p> <p>Error Code ID: HTML_PARSING_ERROR</p>
Failed to solve variable {0}	<p>Indicates a failure during a match() operation. See oracle.oats.scripting.modules.http.api.ThinIteratingVUserScript#match(String, String, String, oracle.oats.scripting.modules.http.api.ThinIteratingVUserScript.Source, boolean, boolean). The actual error message is defined by the script. The error message shown is an example default error message.</p> <p>Error Component ID: oracle.oats.scripting.modules.http.api</p> <p>Error Code ID: MATCH_ERROR</p>

B.4 Oracle Forms Load Test Error Messages

This section lists the error messages for the Oracle Forms Load Test Module.

B.4.1 Connect Errors

Error Message	Description
Connection Error (Generic): "{0}"	<p>Indicates a failure when attempting connect to the Oracle Forms server.</p> <p>Error Component ID: oracle.oats.scripting.modules.formsLT.api</p> <p>Error Code ID: CONN_ERROR_GENERIC</p>
Connection Error: Failed to connect to forms server at URL "{0}"	<p>Indicates a failure when attempting connect to the Oracle Forms server at the specified URL.</p> <p>Error Component ID: oracle.oats.scripting.modules.formsLT.api</p> <p>Error Code ID: CONN_ERROR_HTTP_CONNECT_EXCEPTION</p>
Connection Error: Failed to connect to forms server over socket at "{0}:{1}".	<p>Indicates a failure when attempting connect to the Oracle Forms server over the specified socket.</p> <p>Error Component ID: oracle.oats.scripting.modules.formsLT.api</p> <p>Error Code ID: CONN_ERROR_SOCKET_CONNECT_EXCEPTION</p>

Error Message	Description
Connection Error: No servlet session id found.	<p>Indicates the session ID for a servlet was not found.</p> <p>Error Component ID: oracle.oats.scripting.modules.formsLT.api</p> <p>Error Code ID: CONN_ERROR_NOSERVLETSESSIONID</p>
Connection Error: Invalid Session Cookie found.	<p>Indicates the session cookie was invalid.</p> <p>Error Component ID: oracle.oats.scripting.modules.formsLT.api</p> <p>Error Code ID: CONN_ERROR_NEED_COOKIE</p>
Connection Error: Unable to initialize runtime process.	<p>Indicates the runtime process for the forms server could not be initialized.</p> <p>Error Component ID: oracle.oats.scripting.modules.formsLT.api</p> <p>Error Code ID: CONN_ERROR_FAILED_TO_INITIALIZE_PROCESS</p>
Connection Error: Runtime process has unexpectedly terminated.	<p>Indicates an unexpected runtime process termination.</p> <p>Error Component ID: oracle.oats.scripting.modules.formsLT.api</p> <p>Error Code ID: CONN_ERROR_PROCESS_STARTUP_TERMINATED</p>
Connection Error: Session migration in progress.	<p>Indicates the JSessionID you are using to post forms navigations to the server is incorrect.</p> <p>EBS/Forms module plays back a script which is a combination of HTTP/Forms navigations. After playing the HTTP navigations successfully a JSessionID captured from the navigation right before the Forms Connect statement is used as the URL to send Forms navigations to the server. If this URL is not correlated correctly you will see the error string.</p> <p>The most common way to fix this issue is to revert script to recorded and re-correlate it. This should automatically correlate the Connect statement.</p> <p>Error Component ID: oracle.oats.scripting.modules.formsLT.api</p> <p>Error Code ID: CONN_ERROR_SESSION_MIGRATION_IN_PROGRESS</p>
Connection Error: Cannot connect to OID server.	<p>Indicates a failure connecting to the Oracle Internet Directory server.</p> <p>Error Component ID: oracle.oats.scripting.modules.formsLT.api</p> <p>Error Code ID: CONN_ERROR_OID_CONNECTION_ERROR</p>
Connection Error: The user does not have proper credentials for OID.	<p>Indicates the user does not have proper authentication credentials to connect to the Oracle Internet Directory server.</p>

Error Message	Description
Connection Error: SSO user information is invalid.	<p>Error Component ID: oracle.oats.scripting.modules.formsLT.api</p> <p>Error Code ID: CONN_ERROR_OID_AUTHENTICATION_ERROR</p> <p>Indicates the user Single Sign On authentication credentials are not valid.</p>
Connection Error: Multiple Sessions are disallowed in this transaction.	<p>Error Component ID: oracle.oats.scripting.modules.formsLT.api</p> <p>Error Code ID: CONN_ERROR_INVALID_SSO</p> <p>Indicates that multiple session are not allows for the transaction attempted.</p>
Connection Error: Could not create the runtime process.	<p>Error Component ID: oracle.oats.scripting.modules.formsLT.api</p> <p>Error Code ID: CONN_ERROR_MULTIPLE_SESSIONS</p> <p>Indicates a failure to create a runtime process on the Forms server.</p>
	<p>Error Component ID: oracle.oats.scripting.modules.formsLT.api</p> <p>Error Code ID: CONN_ERROR_RUNTIME_PROCESS_CREATION_ERROR</p>

B.4.2 I/O Errors

Error Message	Description
Unexpected exception occurred while serializing a Forms Message.	<p>Indicates an error occurred while transferring an Oracle Forms message between the client and the server.</p> <p>Error Component ID: oracle.oats.scripting.modules.formsLT.api</p> <p>Error Code ID: IO_ERROR_MESSAGE_SERIALIZATION_EXCEPTION</p>
Failed to read more than 10 server messages.	<p>Indicates failed to read server message after ten tries.</p> <p>Error Component ID: oracle.oats.scripting.modules.formsLT.api</p> <p>Error Code ID: IO_ERROR_FAILED_TO_READ_TEN_DATA_STREAMS</p>
Forms input/output exception occurred.	<p>Indicates an unexpected input/output exception occurred.</p> <p>Error Component ID: oracle.oats.scripting.modules.formsLT.api</p> <p>Error Code ID: IO_ERROR</p>
Forms encryption exception occurred.	<p>Indicates an encryption exception occurred.</p> <p>Error Component ID: oracle.oats.scripting.modules.formsLT.api</p>

Error Message	Description
Communication with server is broken. Check nohup logs for detailed error.	<p>Error Code ID: IO_ERROR_ENCRYPTION_EXCEPTION</p> <p>Indicates a communication problem with the server. Run the nohup (no hang up) command and view the error log.</p> <p>Error Component ID: oracle.oats.scripting.modules.formsLT.api</p> <p>Error Code ID: IO_ERROR_COMM_BROKEN</p>
Throttling requested with a non-integer value "{0}".	<p>Indicates Bandwidth throttling (limiting quantity of data) was requested using a non-integer value.</p> <p>Error Component ID: oracle.oats.scripting.modules.formsLT.api</p> <p>Error Code ID: IO_ERROR_THROTTLING_NUMBER_FORMAT_EXCEPTION</p>
Failed to read message from server.	<p>Indicates an exception occurred when trying to read an Oracle Forms message from the server.</p> <p>Error Component ID: oracle.oats.scripting.modules.formsLT.api</p> <p>Error Code ID: IO_ERROR_MESSAGE_READ_EXCEPTION</p>
Failed to read terminal message from server.	<p>Indicates an exception occurred when trying to read an Oracle Forms terminal message from the server.</p> <p>Error Component ID: oracle.oats.scripting.modules.formsLT.api</p> <p>Error Code ID: IO_ERROR_TERMINAL_MESSAGE_READ_EXCEPTION</p>

B.4.3 Match Errors

Error Message	Description
Text Matching Test "{0}" failed. Failed to match "{1}".	<p>Indicates a Text Matching Test failure and shows the test name and the text to match.</p> <p>Error Component ID: oracle.oats.scripting.modules.formsLT.api</p> <p>Error Code ID: MATCH_ERROR_TEXT_FAILED_TO_MATCH</p>
StatusBar Text Matching Test "{0}" failed. Failed to match "{1}".	<p>Indicates a Status bar Text Matching Test failure and shows the test name and the text to match.</p> <p>Error Component ID: oracle.oats.scripting.modules.formsLT.api</p> <p>Error Code ID: MATCH_ERROR_STATUSBAR_FAILED_TO_MATCH</p>

B.4.4 Component Not Found Errors

Error Message	Description
Component "{0}" does not exist.	Indicates an Oracle Forms component does not exist. Error Component ID:oracle.oats.scripting.modules.formsLT.api Error Code ID: COMPONENT_DOES_NOT_EXIST
Component with handler ID "{0}" does not exist.	Indicates an Oracle Forms component with the specified handler ID does not exist. Error Component ID: oracle.oats.scripting.modules.formsLT.api Error Code ID: MATCH_ERROR_STATUSBAR_FAILED_TO_MATCH
Component with handler ID "{0}" does not exist. Last seen alert message: "{1}".	Indicates an Oracle Forms component with the specified handler ID does not exist and shows the last alert message. Error Component ID: oracle.oats.scripting.modules.formsLT.api Error Code ID: COMPONENT_ID_DOES_NOT_EXIST_WITH_STATUS

B.4.5 Playback Errors

Error Message	Description
Control "{0}" not initialized.	Indicates that control between client and server could not be initialized. Error Component ID:oracle.oats.scripting.modules.formsLT.api Error Code ID: CONTROL_INITIALIZE_ERROR
Cannot send forms messages. Not connected to forms server.	Indicates no connection to the Oracle Forms server. Error Component ID:oracle.oats.scripting.modules.formsLT.api Error Code ID: NOT_CONNECTED_ERROR
Invalid state exception.	Indicates an invalid state. Error Component ID:oracle.oats.scripting.modules.formsLT.api Error Code ID: INVALID_STATE_EXCEPTION
Invalid state exception. Server sent the client a CREATE message for a component that was already created. Component handler ID is "{0}".	Indicates an invalid state because the server sent the client a CREATE message for a component that was already created and shows the handler ID. Error Component ID:oracle.oats.scripting.modules.formsLT.api Error Code ID: INVALID_STATE_EXCEPTION_COMPONENT_ALREADY_EXISTS

Error Message	Description
Malformed Forms message exception. Forms could not parse the message, "{0}".	Indicates an incorrectly formed Oracle Forms message stream and could not parse the message, "<Message... />" XML. Error Component ID:oracle.oats.scripting.modules.formsLT.api Error Code ID: MALFORMED_MESSAGE_EXCEPTION
Unexpected error occurred. {0}.	Indicates any other exception error. Error Component ID:oracle.oats.scripting.modules.formsLT.api Error Code ID: UNEXPECTED_ERROR

B.5 Shared Data Error Messages

This section lists the error messages for the Shared Data Module.

B.5.1 Shared Data Exceptions

Error Message	Description
CreateDataException	Indicates a failure when attempting to create a new queue. Error Component ID: oracle.oats.scripting.modules.sharedData.api Error Code ID: CREATE_QUEUE_EXCEPTION
CreateDataException	Indicates a failure when attempting to create a new hash map. Error Component ID: oracle.oats.scripting.modules.sharedData.api Error Code ID: CREATE_MAP_EXCEPTION
OATSCredentialException	Indicates a failure when the OATS credential is incorrect or not provided. Error Component ID: oracle.oats.scripting.modules.sharedData.api Error Code ID: OATS_CREDENTIAL_EXCEPTION
PutDataException	Indicates a failure when adding items to a queue. Error Component ID: oracle.oats.scripting.modules.sharedData.api Error Code ID: PUT_TO_QUEUE_EXCEPTION
PutDataException	Indicates a failure when adding items to a hash map. Error Component ID: oracle.oats.scripting.modules.sharedData.api Error Code ID: PUT_TO_MAP_EXCEPTION
SharedDataServiceInitException	Indicates a failure when initializing the service.

Error Message	Description
RequestDataException	<p>Error Component ID: oracle.oats.scripting.modules.sharedData.api</p> <p>Error Code ID: SHARED_DATA_INITIALIZE_EXCEPTION</p> <p>Indicates a failure when retrieving data/info from a queue.</p>
RequestDataException	<p>Error Component ID: oracle.oats.scripting.modules.sharedData.api</p> <p>Error Code ID: REQUEST_DATA_FROM_QUEUE_EXCEPTION</p> <p>Indicates a failure when retrieving data/info from a hash map.</p>
RequestDataException	<p>Error Component ID: oracle.oats.scripting.modules.sharedData.api</p> <p>Error Code ID: REQUEST_DATA_FROM_MAP_EXCEPTION</p>

B.6 Siebel Error Messages

This section lists the error messages for the Siebel Module.

B.6.1 Siebel Exceptions

Error Message	Description
Siebel content failure. {0}	<p>Indicates a failure when attempting to validate the contents of a Siebel page.</p> <p>Error Component ID: oracle.oats.scripting.modules.siebel.api</p> <p>Error Code ID: SIEBEL_CONTENT_FAILURE</p>

B.7 Web Error Messages

This section lists the error messages for the Web Functional Test Module.

B.7.1 Web Service Exceptions

Error Message	Description
Invalid object path: {0}.	<p>Indicates the object identification path is invalid, where {0} is the full path to the object.</p> <p>Error Component ID: oracle.oats.scripting.modules.webdom.api</p> <p>Error Code ID: ERR_INVALID_PATH</p>

Error Message	Description
Object not found: {0}.	<p>Indicates the object identified by {0} was not found.</p> <ol style="list-style-type: none"> 1. Select OpenScript Preferences from the View menu. 2. Expand OpenScript and the Playback section. 3. Select Web Functional and increase the Object Timeout value. <p>-or-</p> <p>Verify that object path is correct.</p> <p>Some <code>window.close()</code> actions may be triggered by a previous action and playback of a previous action may close the window automatically. You may need to remove the <code>window.close()</code> manually from the Java Code.</p> <p>Error Component ID: oracle.oats.scripting.modules.webdom.api</p> <p>Error Code ID: ERR_OBJECT_NOT_FOUND</p>
Timeout occurred waiting for page to load.	<p>Indicates a timeout occurred waiting for any page or specific page.</p> <ol style="list-style-type: none"> 1. Select OpenScript Preferences from the View menu. 2. Expand OpenScript and the Playback section. 3. Select Web Functional and increase the Object Timeout value. <p>-or-</p> <p>Change <code>web.brower("<path>").waitForPage(null)</code> to a specific duration. For example, <code>web.brower("<path>").waitForPage(120)</code> means wait for 120 seconds. Modify the <code><path></code> to a specific path or set it to use wait for any page.</p> <p>Error Component ID: oracle.oats.scripting.modules.webdom.api</p> <p>Error Code ID: ERR_TIMEOUT_WAITING_FOR_PAGE</p>
Cannot playback the {0} action on this element.	<p>Indicates the action is not supported by the element identified by {0}.</p> <p>Error Component ID: oracle.oats.scripting.modules.webdom.api</p> <p>Error Code ID: INVALID_ACTION_ON_ELEMENT</p>
Failed to playback: {0}.	<p>Indicates a failure to execute an action on the object identified by {0}.</p> <p>Error Component ID: oracle.oats.scripting.modules.webdom.api</p> <p>Error Code ID: FAIL_TO_PLAYBACK</p>
Failed to get a response after sending the message: {0}.	<p>Indicates a failure to get a playback result from the browser after sending the request identified by {0}.</p> <p>Error Component ID: oracle.oats.scripting.modules.webdom.api</p>

Error Message	Description
Launch browser timeout after {0} seconds.	<p>Error Code ID: FAIL_TO_GET_RESULT</p> <p>Indicates a failure to find a browser within the duration of 'Startup Timeout' setting ({0} seconds) in the browser preferences.</p> <ol style="list-style-type: none"> 1. Select OpenScript Preferences from the View menu. 2. Expand OpenScript and the General section. 3. Select Browsers and increase the Startup Timeout value. <p>-or-</p> <p>Check if the "Oracle Application Testing Suite Helper Service" is running, or restart it.</p> <p>-or-</p> <p>Close all browsers (IE, FF), run <installdir>\OpenScript\UninstallBrowserHelpers.bat and InstallBrowserHelpers.bat.</p>
Fail to build message: {0}.	<p>Error Component ID: oracle.oats.scripting.modules.webdom.api</p> <p>Error Code ID: FAIL_TO_GET_RESULT</p> <p>Indicates a failure to build a message specified by {0}. The attributes or Identification of a custom DOM element is not correct.</p> <p>Error Component ID: oracle.oats.scripting.modules.webdom.api</p> <p>Error Code ID: ERR_BUILD_MESSAGE</p>

Troubleshooting

This chapter provides information and possible solutions to known issues in OpenScript.

C.1 Installation

In some instances, the OpenScript Internet Explorer and/or FireFox browser plug-ins fail to install properly. You can manually install and uninstall Internet Explorer and/or FireFox browser plug-ins using batch files provided with OpenScript to resolve the issue.

The following batch files are located in `<installdir>\OpenScript`

- `InstallBrowserHelpers.bat`
- `UninstallBrowserHelpers.bat`

Usage: `file.bat installation path [install | uninstall] [IE | FF | both]`

The following example shows the usage and default values:

```
InstallBrowserHelpers.bat C:\OracleATS\OpenScript\ install both
```

Note: On Windows 2000 systems, the `InstallBrowserHelpers.bat` installation does not detect that the .NET Framework 2.0 is installed and will attempt to reinstall it, which may cause an installation failure for the .NET Framework 2.0. However, the .NET Framework 2.0 is installed during the initial OpenScript installation and should be present on the system. Check Add/Remove Programs in the Control Panel to verify the .NET Framework 2.0 installation.

See the remarks in the batch files for additional information.

C.2 OpenScript Script Execution in Oracle Test Manager for Web Applications

The following additional steps are required in order to run the following types of OpenScript scripts from Oracle Test Manager for Web Applications:

- Siebel Functional
- Oracle Forms Functional
- Web Functional scripts that rely on system input events, such as key press or mouse click

It is necessary to run these scripts using an interactive desktop of a named Windows user account that is always logged in.

1. For Siebel and Oracle Forms, the named user's account must have visited the Siebel or Oracle Forms site at least once to ensure that all necessary ActiveX controls and plug-ins are installed in the named user's browser.
2. On the Oracle Test Manager for Web Applications agent machine that will run the scripts, stop the "Oracle Agent Starter Service" and configure it to start manually.
3. On the Oracle Test Manager for Web Applications agent machine, login as the named Windows user account that will run the scripts. From a command prompt, run:

```
C:\OracleATS\agentmanager\bin\AgentManagerService.exe -c
C:\OracleATS\agentmanager\bin\AgentManagerService.conf
```

where C:\OracleATS is the OATS installed folder.

4. The named user account must remain logged into the system at all times that scripts will be run.

C.3 Manual Installation of FireFox Extension

In some cases, if Firefox was installed by upgrading from previous version, when recording scripts of Web Functional Test with Firefox, Firefox is launched but Firefox does not have the Web DOM extension and Web navigation actions are not recorded. In this case, you may have to install the extension manually/separately.

The FireFox extension is located in

```
"<installdir>\OpenScript\plugins\oracle.oats.scripting.modules.webdom.firefoxExtension_2.3.0.0400\xpi"
```

To install the FF extension by manually:

1. Go to the extension directory of the FireFox profile "default". (Usually C:\Documents and Settings\<username>\Application Data\Mozilla\Firefox\Profiles\9iusc98z.default\extensions
2. Create a file named "webdom@openscript" in the extension directory.
3. Copy the path of the FireFox extension ("*installdir*\OpenScript\plugins\oracle.oats.scripting.modules.webdom.firefoxExtension_2.3.0.0400\xpi") as the content of file "webdom@openscript".

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Vincent Rijmen's AES Encryption

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