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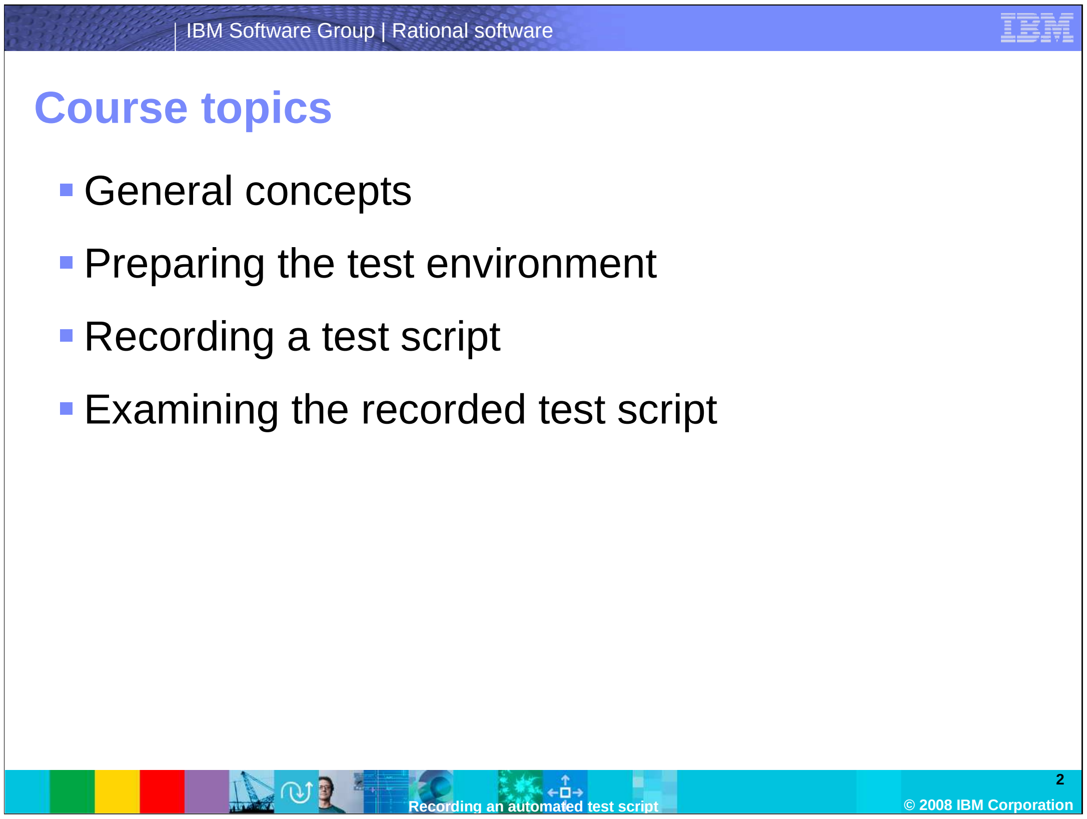
IBM® Rational® Functional Tester for Java™

Recording an automated test script

Updated July 23, 2008

This module will provide an overview of recording an automated test script using IBM Rational Functional Tester version 7.0. It will explain the steps a tester needs to take before recording the automated script.

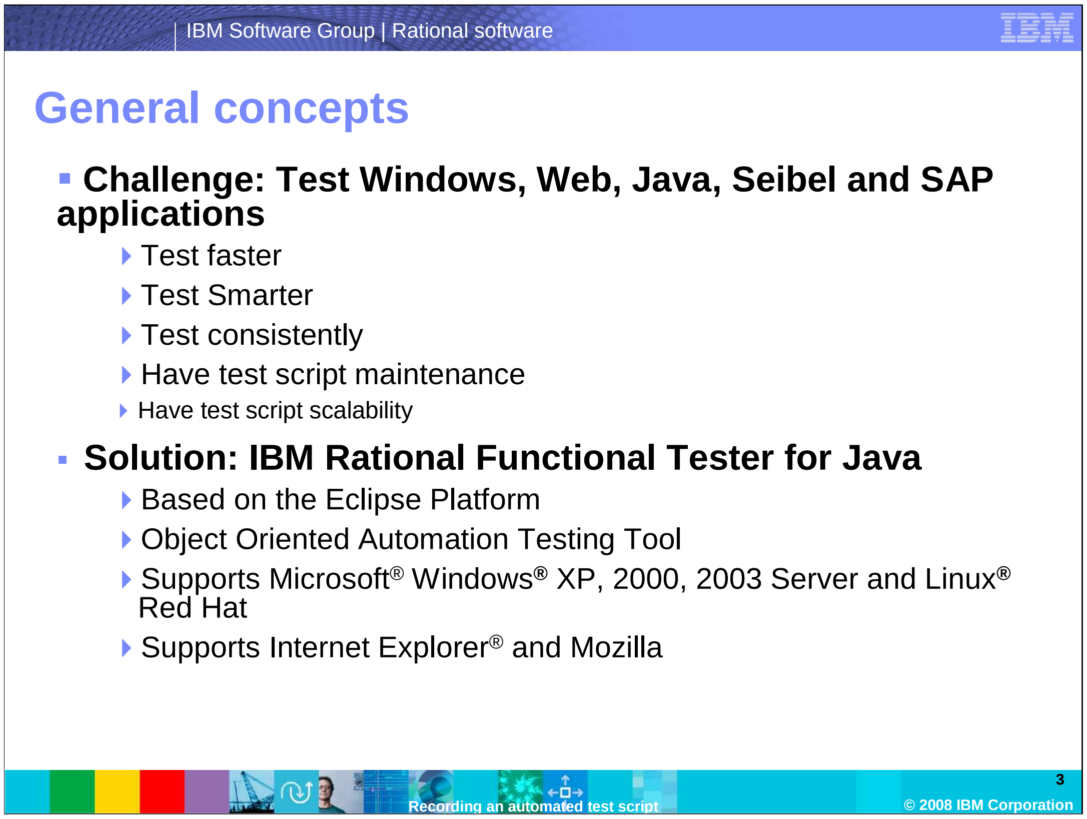


Course topics

- General concepts
- Preparing the test environment
- Recording a test script
- Examining the recorded test script

The objective of this course is to cover the primary topics for generating an automated test script.

After a brief introduction to IBM Rational Functional Tester, you will go through the steps of creating a test project, which entails enabling the environment for testing, then configuring the application that will be tested. Next, you will learn about starting the recorder and recording a script, and, in the process, create a verification point and a data pool. After the script has been recorded, you will examine the script and review the object map created by functional tester, the verification point, the data pool, and the helper super class.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General concepts

- **Challenge: Test Windows, Web, Java, Seibel and SAP applications**
  - Test faster
  - Test Smarter
  - Test consistently
  - Have test script maintenance
  - Have test script scalability
- **Solution: IBM Rational Functional Tester for Java**
  - Based on the Eclipse Platform
  - Object Oriented Automation Testing Tool
  - Supports Microsoft® Windows® XP, 2000, 2003 Server and Linux® Red Hat
  - Supports Internet Explorer® and Mozilla

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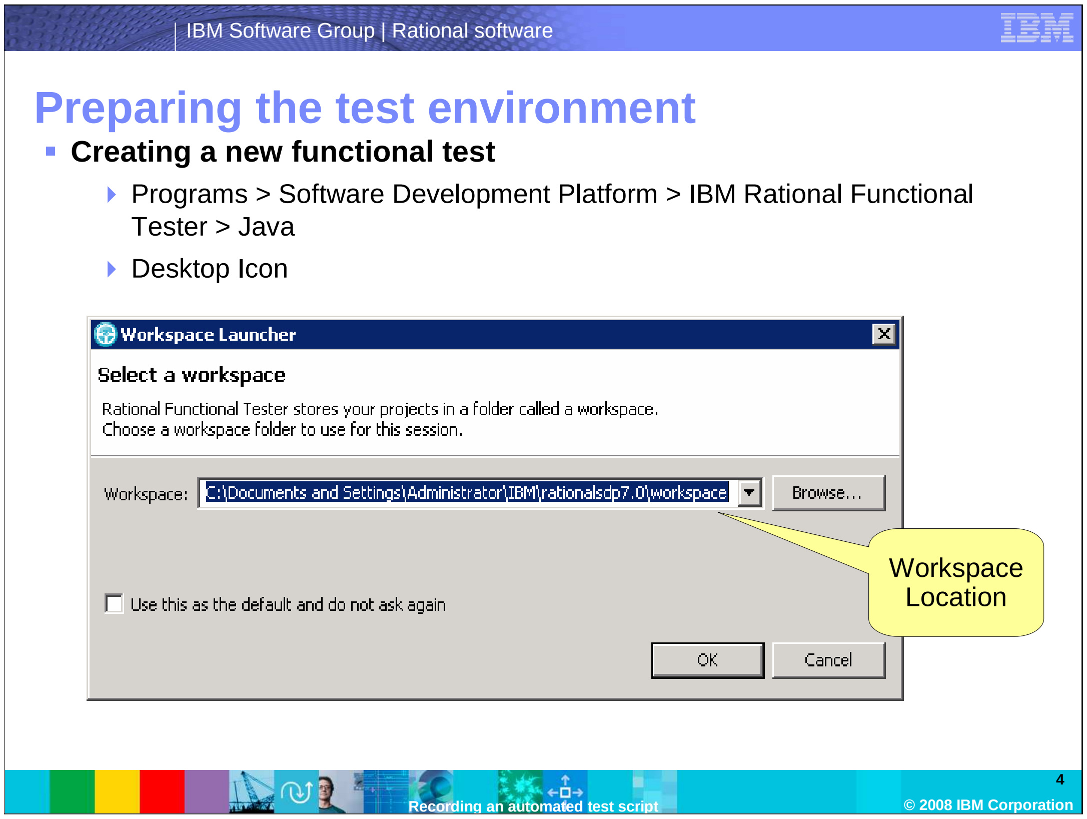
In today's IT world, software applications are increasingly more complex and are richer in features. The task of testing these applications can be daunting. A tester faces many challenges in testing these applications, and is continuously expected to test an application more quickly and precisely. The tests created should be consistent, scalable, and maintainable.

IBM Rational Functional Tester for Java is a test automation tool that addresses these challenges. It is based on the open source Eclipse Platform. Test scripts in Functional tester are created using Object Oriented methodologies. Functional Tester supports Microsoft Windows XP, Windows 2000, Windows 2003 Server, and Red Hat Linux. It also supports Internet Explorer and Mozilla Web browsers.



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Preparing the test environment

- **Creating a new functional test**
  - Programs > Software Development Platform > IBM Rational Functional Tester > Java
  - Desktop Icon

Workspace Launcher

Select a workspace

Rational Functional Tester stores your projects in a folder called a workspace.
Choose a workspace folder to use for this session.

Workspace: C:\Documents and Settings\Administrator\IBM\rationalsdp7.0\workspace

☐ Use this as the default and do not ask again

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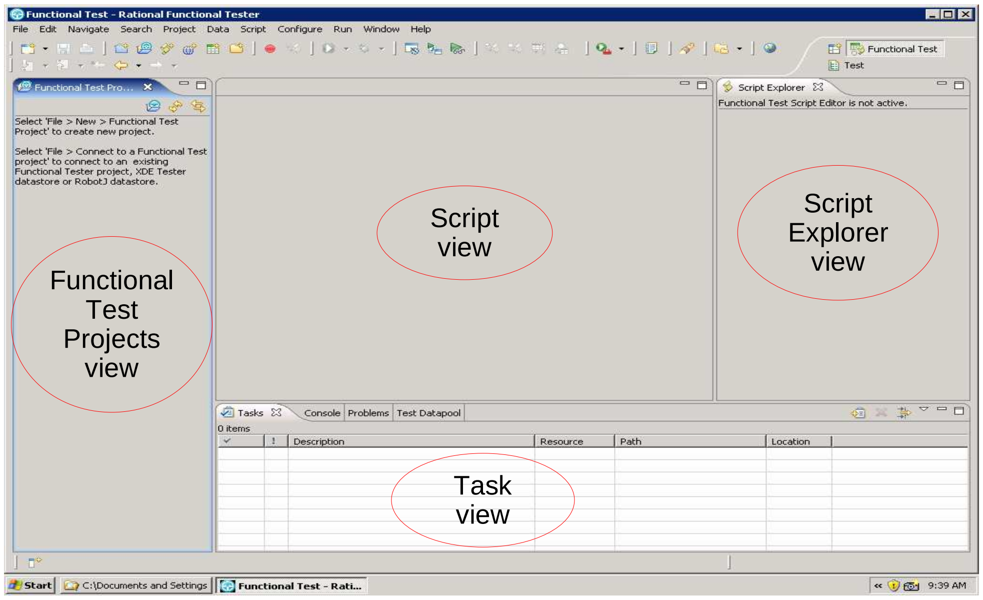
In Functional Tester, to start recording scripts against your applications, you must begin by creating a project, configuring your test environments, and configuring the application that is going to be tested.

If you accepted the defaults during installation, the program is located in the IBM Software Development Platform group.

Start Functional Tester from the start menu. Go to Programs, Software Development Platform, IBM Rational Functional Tester, Java. Otherwise, you can start the program from the alternate location you installed it to, or, you can start it from a desktop icon.

During startup, a location for a workspace needs to be specified in the Workspace Launcher window. By default, the location is set to the folder located at Documents and Settings > Administrator > IBM > rationalsdp7.0. Users have an option to change this to another location by clicking the Browse button. When finished, click OK.

Preparing the test environment


Functional Test - Rational Functional Tester
File Edit Navigate Search Project Data Script Configure Run Window Help
Functional Test
Test
Functional Test Pro...
Script Explorer
Tasks
Console
Problems
Test Datapool
0 items
Description
Resource
Path
Location
Functional Test Projects view
Script view
Script Explorer view
Task view
Start
C:\Documents and Settings
Functional Test - Rati...
9:39 AM

Select 'File > New > Functional Test Project' to create new project.

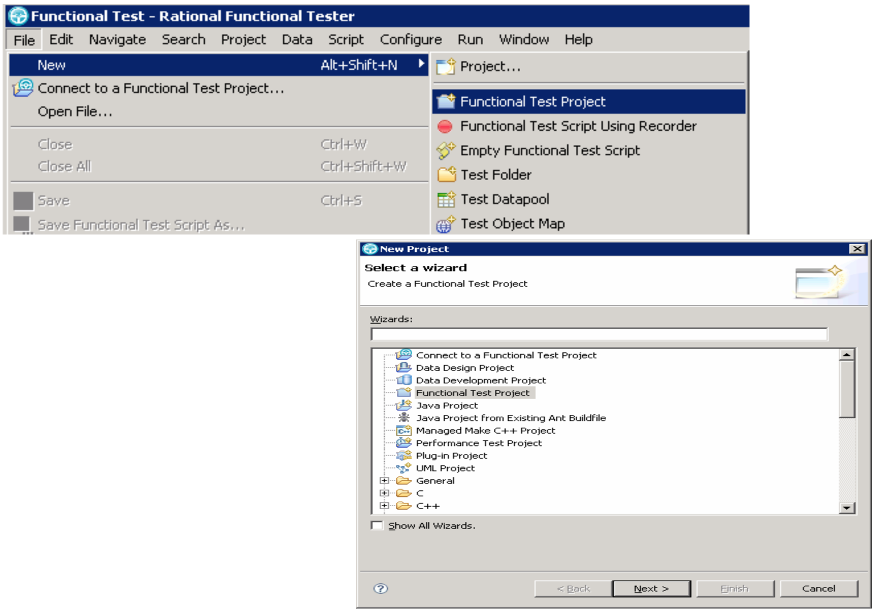
Select 'File > Connect to a Functional Test project' to connect to an existing Functional Tester project, XDE Tester datastore or RobotJ datastore.

Functional Test Script Editor is not active.

Recording an automated test script

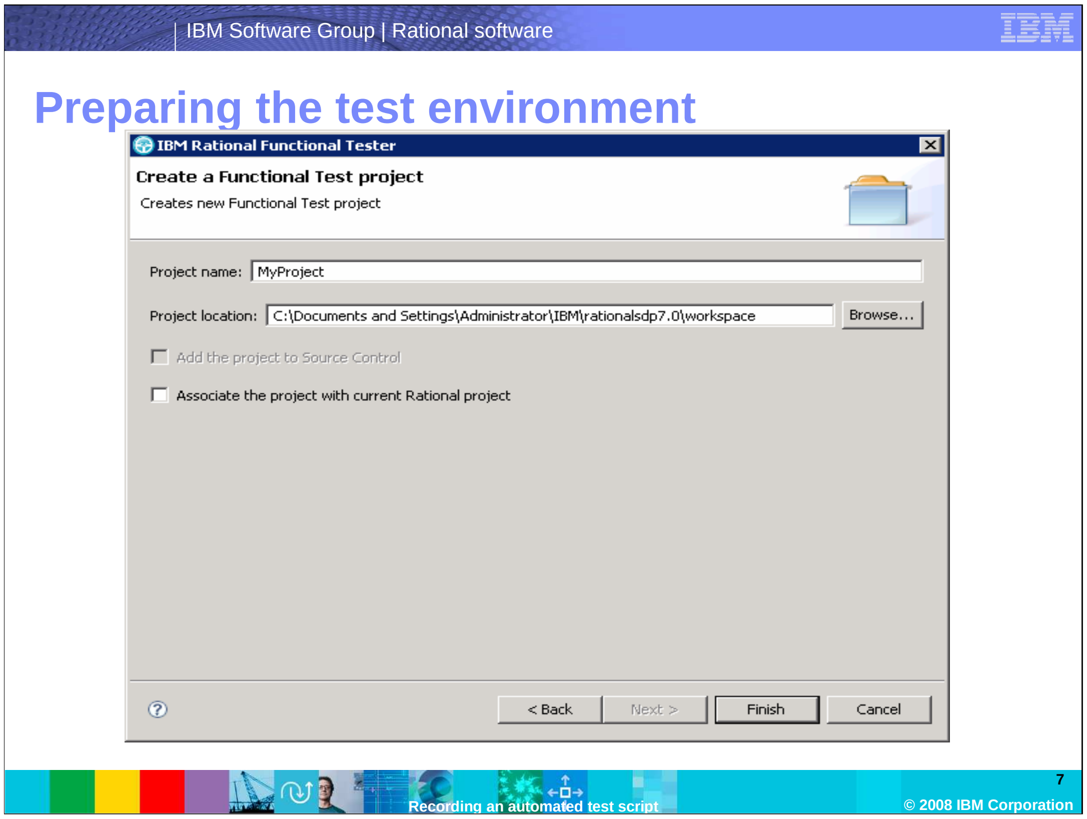
The Functional Tester perspective is a collection of views. The Functional Test Projects view, which is the left pane of the Functional Test perspective, lists the Projects, Scripts, and Logs. The Tasks view displays errors, warnings, or other information that is automatically generated by the compiler. A sub view within the Tasks view shows the Data pool. The Script view shows the script. When you double-click a script in the Functional Test Project View, it opens in the Script view. The Script Explorer view lists the script helper, helper superclass, test data pool, verification points, and test objects for the current script.

Preparing the test environment



A Functional Test project can be created by using the File menu.

From the File menu, select New > Functional Test Project. A New Project window will appear. Select Functional Test Project, and click Next.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Preparing the test environment

IBM Rational Functional Tester

Create a Functional Test project

Creates new Functional Test project

Project name: MyProject

Project location: C:\Documents and Settings\Administrator\IBM\rationalsdp7.0\workspace

☐ Add the project to Source Control

☐ Associate the project with current Rational project

Recording an automated test script

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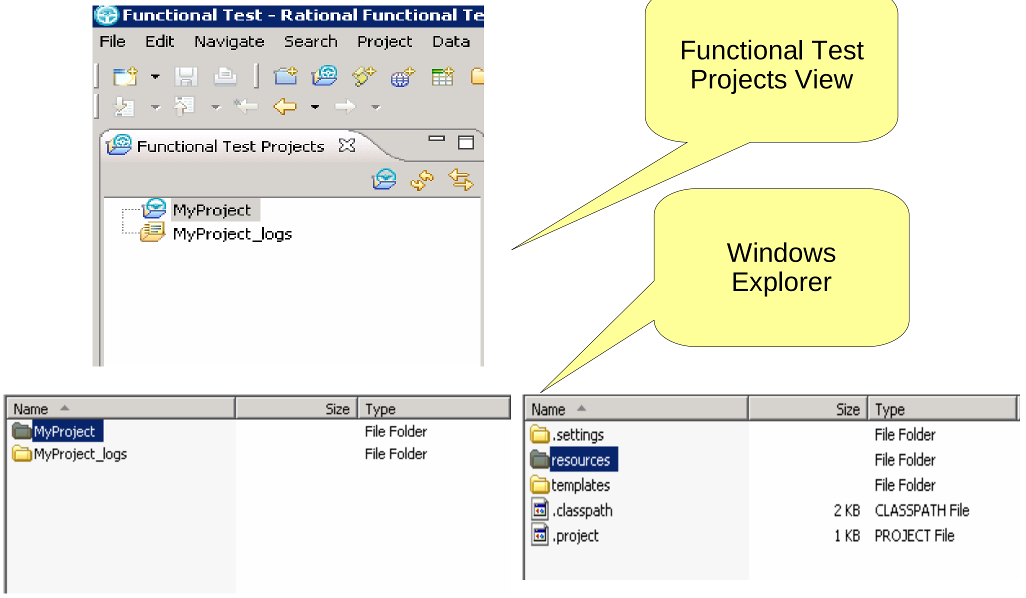
A window labeled “Create a Functional Test project” will appear.

In the Project name field, type the name of the new project. Project names cannot contain certain special characters like back or forward slashes, open or closed brackets, asterisks, colons, or question marks.

In the Project location field, type the data path for this project. By default, the location points to the Workspace folder. It is not necessary to create a project in the workspace folder; the workspace and the project can be in different locations. Click the Browse button to change the project location.

If you are using Rational ClearCase, and intend to check-in your scripts into a ClearCase VOB, select the “Add the project to Source Control” check box. If you are using Rational TestManager, and intend to associate the Functional Tester project to a TestManager project, select the “Associate the project with current Rational project” check box. These check boxes will not be available if the corresponding product is not installed on the machine. When complete, click Finish.

Preparing the test environment


Functional Test - Rational Functional Te
File Edit Navigate Search Project Data
Functional Test Projects
MyProject
MyProject_logs
Functional Test Projects View
Windows Explorer

Name	Size	Type
MyProject		File Folder
MyProject_logs		File Folder

Name	Size	Type
.settings		File Folder
resources		File Folder
templates		File Folder
.classpath	2 KB	CLASSPATH File
.project	1 KB	PROJECT File

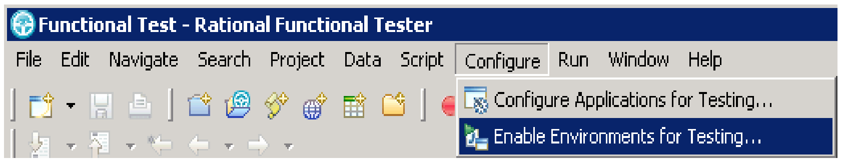
Two new entries are created in the Functional Test Projects view. One is for the test artifacts, such as test scripts and shared object maps, and the other is for the Results logs.

If you go to your workspace folder in Windows Explorer, you will see the same two entries. If you open the project folder, you will see a resources folder that holds the object maps, verification points, data pools, a settings folder, and two configuration files, named .project and .classpath. There is also is a templates folder that holds the script templates. The scripts themselves are stored directly in the project folder.

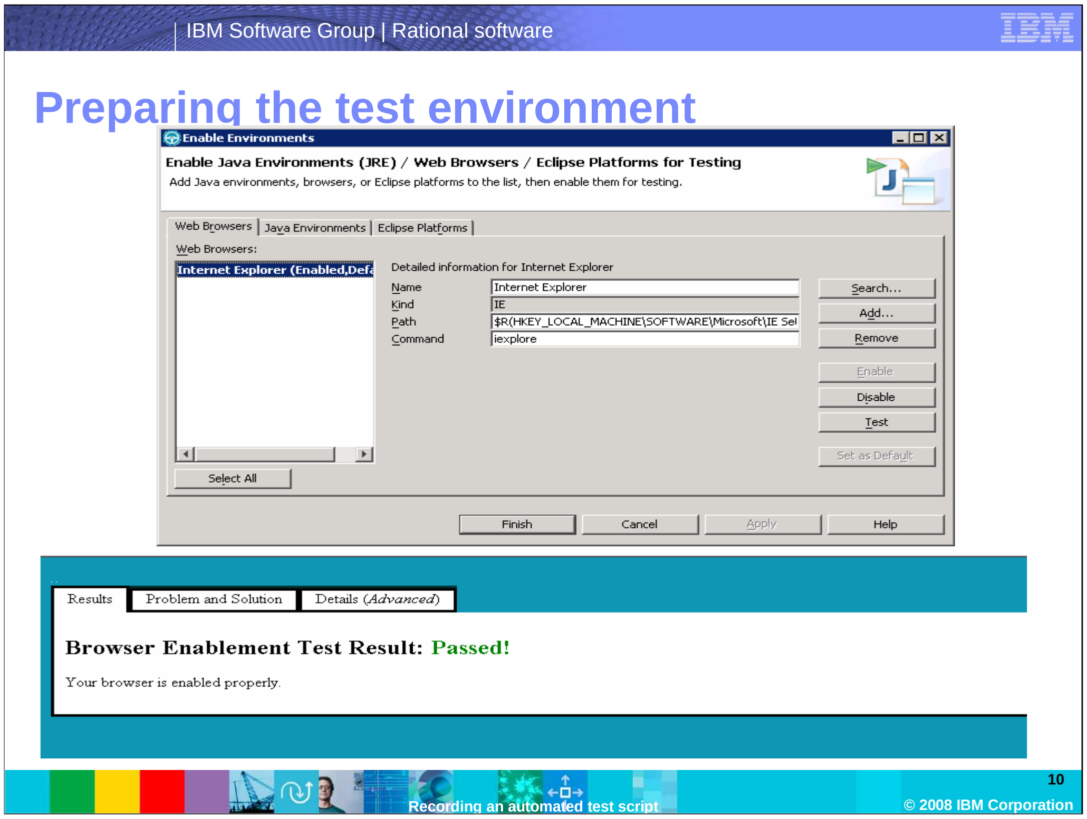
Preparing the test environment

- **Enabling the test environment**

Configure>Enable Environment for Testing


Functional Test - Rational Functional Tester
File Edit Navigate Search Project Data Script Configure Run Window Help
Configure Applications for Testing...
Enable Environments for Testing...

After creating the project, you need to enable the test environment. This allows Functional Tester to see inside the runtime to identify objects within the application under test. From the Configure menu, select the "Enable Environments for Testing…" sub menu.



Preparing the test environment

Enable Environments

Enable Java Environments (JRE) / Web Browsers / Eclipse Platforms for Testing

Add Java environments, browsers, or Eclipse platforms to the list, then enable them for testing.

Detailed information for Internet Explorer

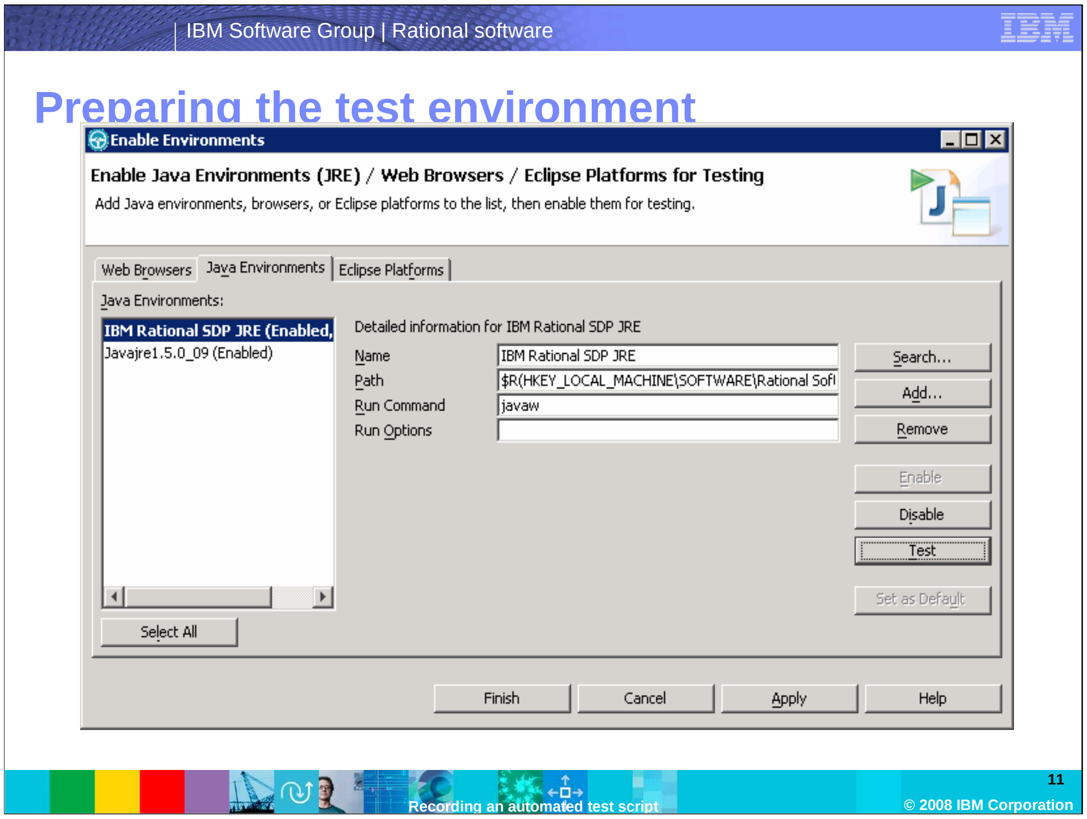
Name	Internet Explorer
Kind	IE
Path	$R(HKEY_LOCAL_MACHINE\SOFTWARE\Microsoft\IE Se
Command	iexplore

Browser Enablement Test Result: Passed!

Your browser is enabled properly.

The Enable Environments window will appear. This window will help you enable three different domains depending on the type of application you
are testing. This window consists of three tabs which will be reviewed individually.

The first tab is the Web Browsers tab. If you are testing a Web application, you should make sure the Web browser you are going to use is enabled. If the browser is not already listed in the Web browsers section, click the Add button, browse to its location, and add it. This window has other buttons, as well. The Search button searches for all of the installed browsers on the machine. Remove will remove a Browser from the list. Enable will enable a browser, and Disable will disable a browser. The Test button lets you test the browser. Test the browser before recording scripts.



Preparing the test environment

Enable Environments

Enable Java Environments (JRE) / Web Browsers / Eclipse Platforms for Testing

Add Java environments, browsers, or Eclipse platforms to the list, then enable them for testing.

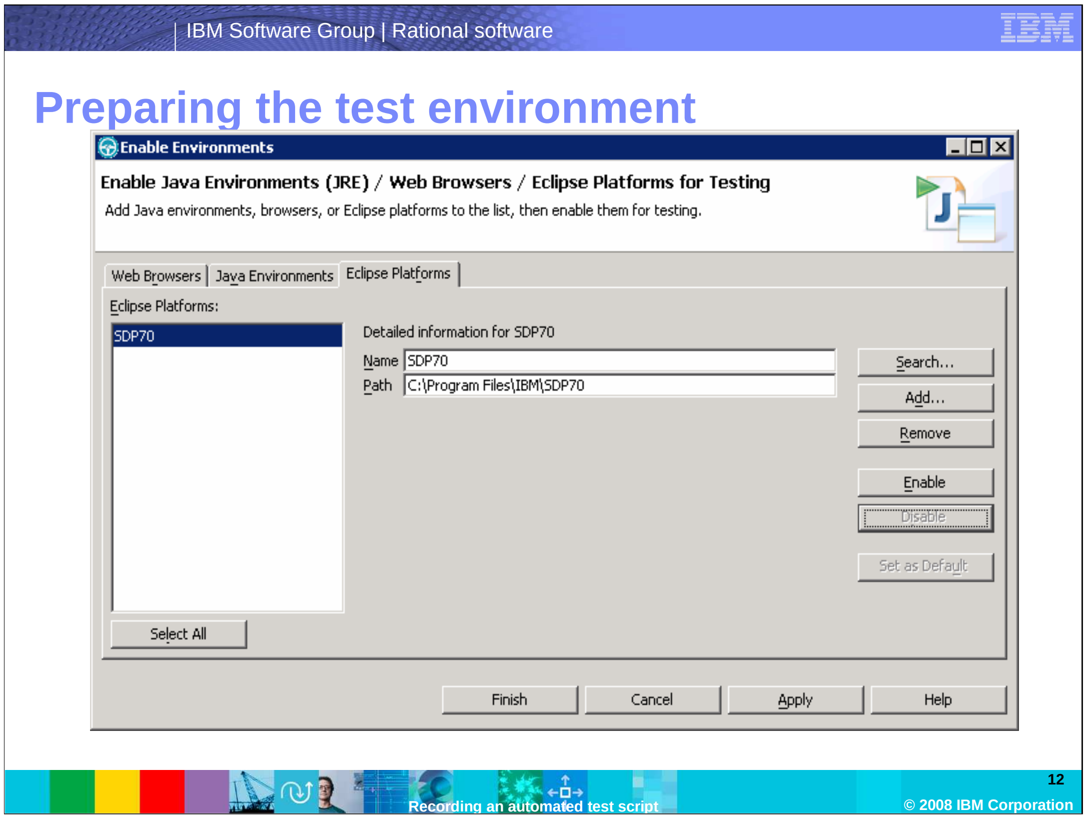
Java Environments:

IBM Rational SDP JRE (Enabled,
Javajre1.5.0_09 (Enabled)

Detailed information for IBM Rational SDP JRE

Name	IBM Rational SDP JRE
Path	$R(HKEY_LOCAL_MACHINE\SOFTWARE\Rational Soft
Run Command	javaw
Run Options	

The next tab is the Java Environments. On this tab, you can add and enable a JRE of your choice. The IBM Rational SDP JRE is the default JRE used to test Java applications, and is enabled for testing by Functional Tester. If the application uses another JRE, enable your JRE through this interface. This tab, like the Web Browser tab, has the search, add, remove, enable, disable and test buttons.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Preparing the test environment

Enable Environments

Enable Java Environments (JRE) / Web Browsers / Eclipse Platforms for Testing

Add Java environments, browsers, or Eclipse platforms to the list, then enable them for testing.

Detailed information for SDP70

Name SDP70

Path C:\Program Files\IBM\SDP70

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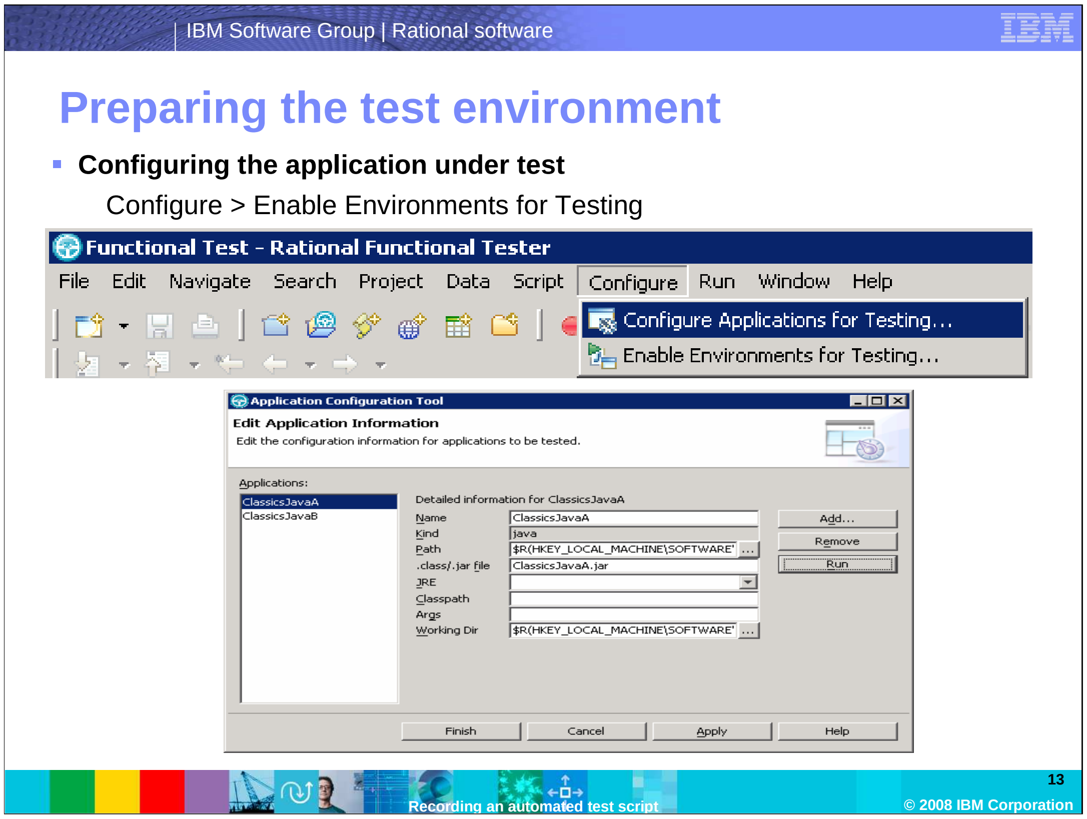
Functional Tester can test Eclipse based plug-ins and Rich Client Platform applications. If you have additional Eclipse platforms installed, you can enable them for testing on the Eclipse Platforms tab. The available button options on this tab are similar to the other two tabs.



Preparing the test environment

- **Configuring the application under test**

  Configure > Enable Environments for Testing

Functional Test - Rational Functional Tester
File Edit Navigate Search Project Data Script Configure Run Window Help
Configure Applications for Testing...
Enable Environments for Testing...

Application Configuration Tool

Edit Application Information

Edit the configuration information for applications to be tested.

Applications:
ClassicsJavaA
ClassicsJavaB

Detailed information for ClassicsJavaA

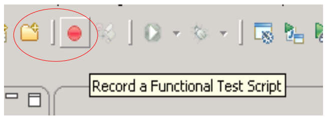
Name	ClassicsJavaA
Kind	java
Path	$R(HKEY_LOCAL_MACHINE\SOFTWARE'
.class/.jar file	ClassicsJavaA.jar
JRE	
Classpath	
Args	
Working Dir	$R(HKEY_LOCAL_MACHINE\SOFTWARE'

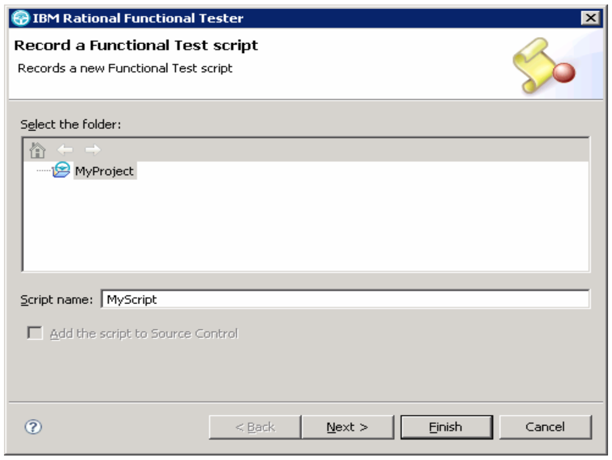
After enabling the test environment, you should configure the application that you are going to test. This creates a shortcut in the Functional Tester environment that makes it easier to launch the application and makes the tests more portable to other test machines.

From the Configure menu, select the “Configure Applications for Testing” sub menu. The Application Configuration Tool window will appear. A list of applications that have been configured for testing will be displayed on this window. You can use the Add button on this window to add your application. Functional Tester comes with a sample Java Swing application called ClassicsJava. You will be using this application to record a script. Click Apply, then click Finish.

Recording a test script

- **Start the recorder**





Record a Functional Test script

Records a new Functional Test script

Select the folder:

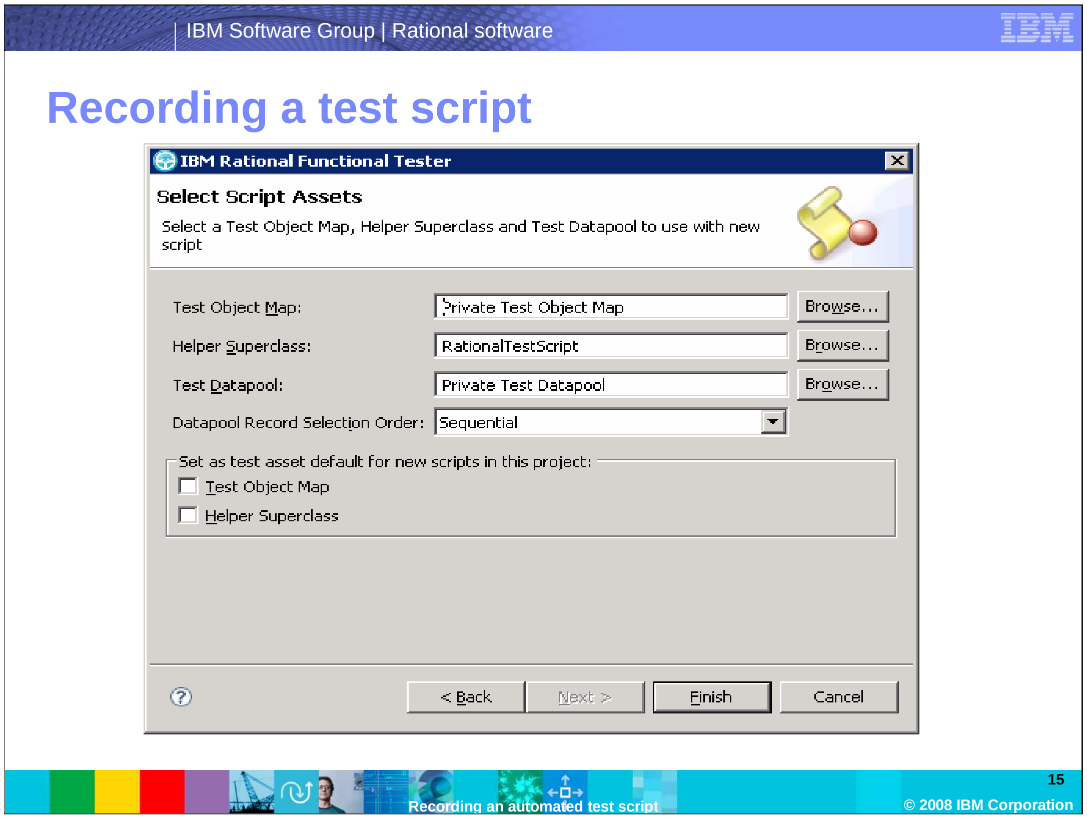
MyProject

Script name: MyScript

☐ Add the script to Source Control

To start recording a script, click the red button on the toolbar. Clicking on the red button will open the “Record a Functional Test script” window.

On this window, you can select the project in which you want to record the script if you have multiple projects. You can specify a name for the script in the script name field. Click Next.



Recording a test script

IBM Rational Functional Tester

Select Script Assets

Select a Test Object Map, Helper Superclass and Test Datapool to use with new script

Test Object Map:	Private Test Object Map
Helper Superclass:	RationalTestScript
Test Datapool:	Private Test Datapool
Datapool Record Selection Order:	Sequential

Set as test asset default for new scripts in this project:

- [ ] Test Object Map
- [ ] Helper Superclass

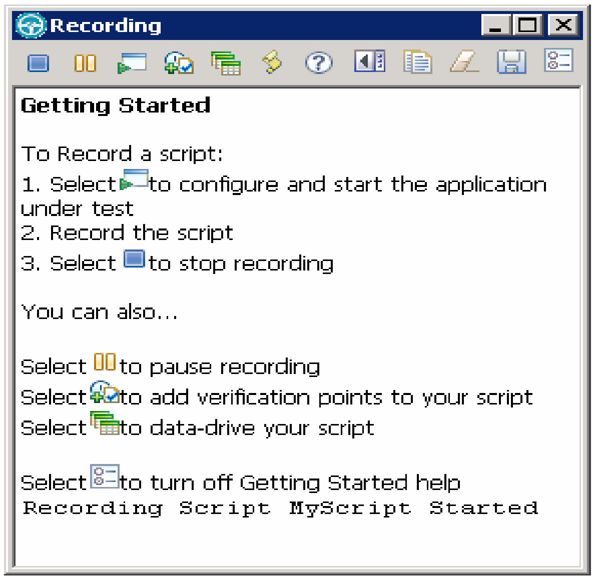
The Select Script Assets window lets you choose a Test Object Map, Helper Superclass and a test data pool. These fields are populated with default values. You can click on the Browse buttons and select a different value for each of the fields. For example, if you are going to use a shared object map, then you select it by clicking on the browse button next to the Test Object Map field.

The Datapool Record Selection Order selection box lets you define the order in which you want Functional Tester to select the rows in a .

The Test Object Map and Helper Superclass check boxes let you set as the default the Object Map and Superclass you selected for this script for all future script recordings in this project.

When complete, click Finish.

Recording a test script



Getting Started

To Record a script:
1. Select to configure and start the application under test
2. Record the script
3. Select to stop recording

You can also...

Select to pause recording
Select to add verification points to your script
Select to data-drive your script

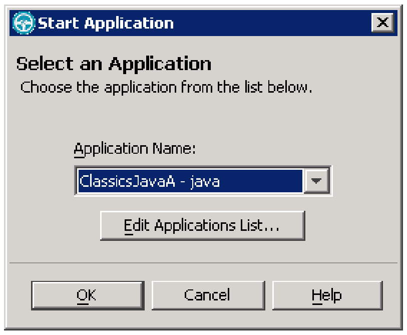
Select to turn off Getting Started help

```
Recording Script MyScript Started
```

The Functional Tester window will minimize and the Recording window will appear. The Recording window has a variety of icons. The main section of this window gives a description of each icon. While recording a script, the code that is generated is visible in the main section of this window. To begin recording, click the Start Application icon, which is the third option from the left.

Recording a test script

- **Record an automation script**

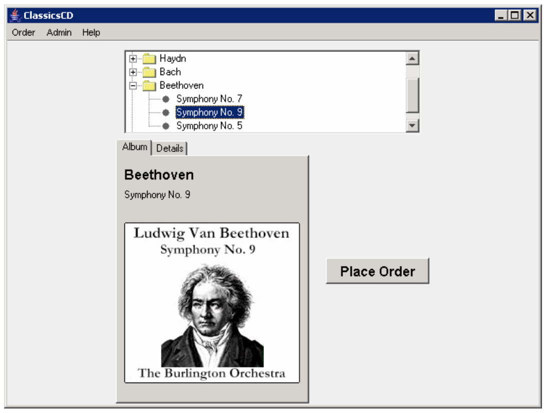


Start Application

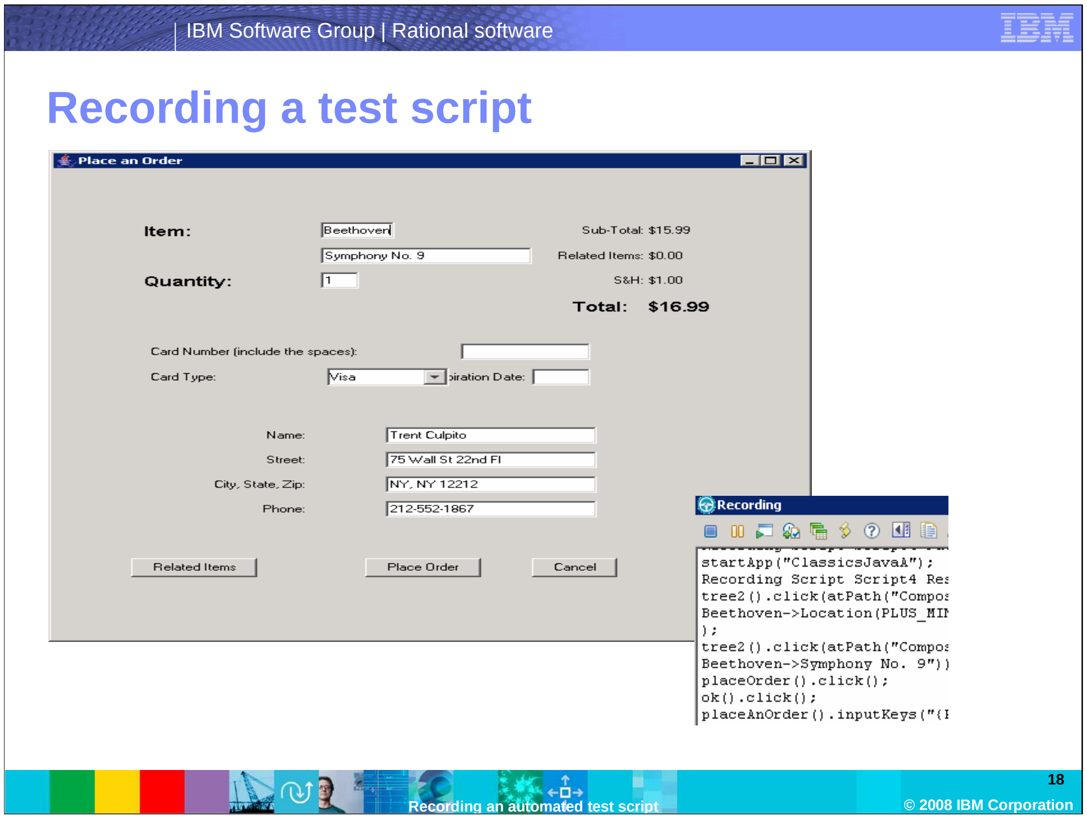
Select an Application

Choose the application from the list below.

Application Name: ClassicsJavaA - java



The Start Application window will appear. The “Application Name:” drop-down box lists all of the applications added from the Configure menu in Functional Tester. Alternately, you can click the “Edit Applications List…” button, and add the application you are going to test. You are going to use the ClassicsJavaA sample application that is installed along with Functional Tester. You will go through the process of ordering a CD.



Recording a test script

Place an Order

Item:	Beethoven	Sub-Total:	$15.99
	Symphony No. 9	Related Items:	$0.00
Quantity:	1	S&H:	$1.00
		Total:	$16.99

Card Number (include the spaces):

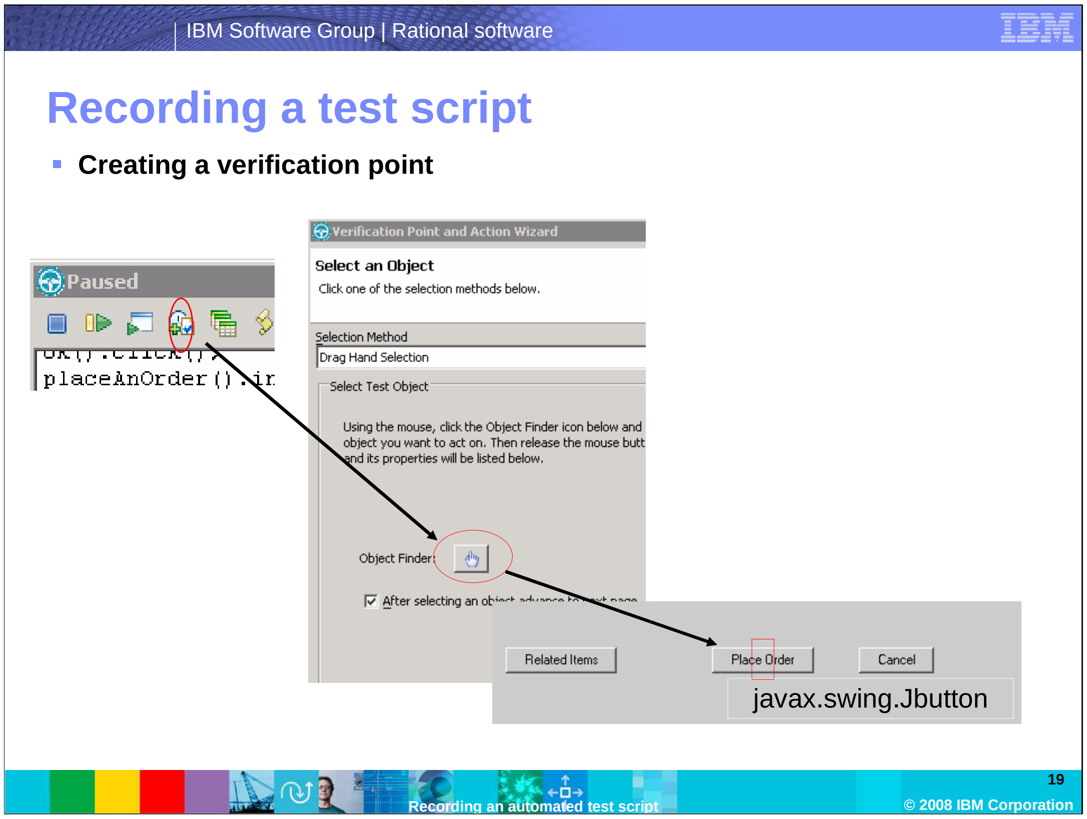
Card Type: Visa ⸻piration Date:

Name:	Trent Culpito
Street:	75 Wall St 22nd Fl
City, State, Zip:	NY, NY 12212
Phone:	212-552-1867

```
startApp("ClassicsJavaA");
Recording Script Script4 Res
tree2().click(atPath("Compos
Beethoven->Location(PLUS_MIN
);
tree2().click(atPath("Compos
Beethoven->Symphony No. 9"))
placeOrder().click();
ok().click();
placeAnOrder().inputKeys("{I
```

Start entering values in the boxes on the “Place an Order” screen.

By default, all keyboard entries are captured in the test script. The advantage in doing so is that the same test procedure can be used over and over with different sets of varied data, enabling you to reuse common tests and greatly reducing the time and effort involved in creating repetitive tests.



Recording a test script

- **Creating a verification point**

Paused
```
ok().click();
placeAnOrder().in
```
Verification Point and Action Wizard
Select an Object
Click one of the selection methods below.
Selection Method
Drag Hand Selection
Select Test Object
Using the mouse, click the Object Finder icon below and object you want to act on. Then release the mouse butt and its properties will be listed below.
Object Finder:
After selecting an object advance to next page
Related Items
Place Order
Cancel
javax.swing.Jbutton

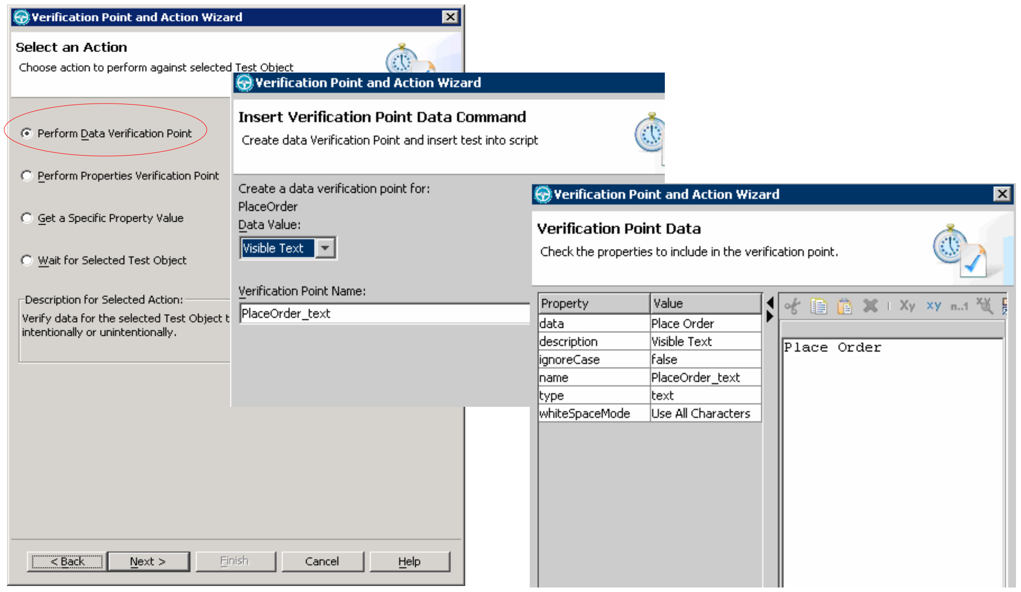
When you are testing an application, check to see if the application is working as expected. You want to make sure that the error messages are displayed when they are supposed to, that the data displays correctly, and that the properties of a particular object are correct.

You can include those checks in your script by using verification points. A verification point is a point in a script that you create to confirm the state of the application being tested across builds or runs.

On the Recording window, select the fourth icon from the left. A “Verification Point and Action Wizard” window will appear. This window has a button with a hand symbol on it.

Put your mouse pointer on this button, and, with the left mouse button pressed down, drag the hand button to the location where you want to create the verification point. In this case, you will put the Place Order button on the Place an Order window, and then release the left mouse button.

Recording a test script



Verification Point and Action Wizard

Select an Action

Choose action to perform against selected Test Object

- [✓ Perform Data Verification Point]
- Perform Properties Verification Point
- Get a Specific Property Value
- Wait for Selected Test Object

Description for Selected Action:
Verify data for the selected Test Object t
intentionally or unintentionally.

< Back | Next > | Finish | Cancel | Help

Verification Point and Action Wizard

Insert Verification Point Data Command

Create data Verification Point and insert test into script

Create a data verification point for:
PlaceOrder
Data Value: Visible Text

Verification Point Name: PlaceOrder_text

Verification Point and Action Wizard

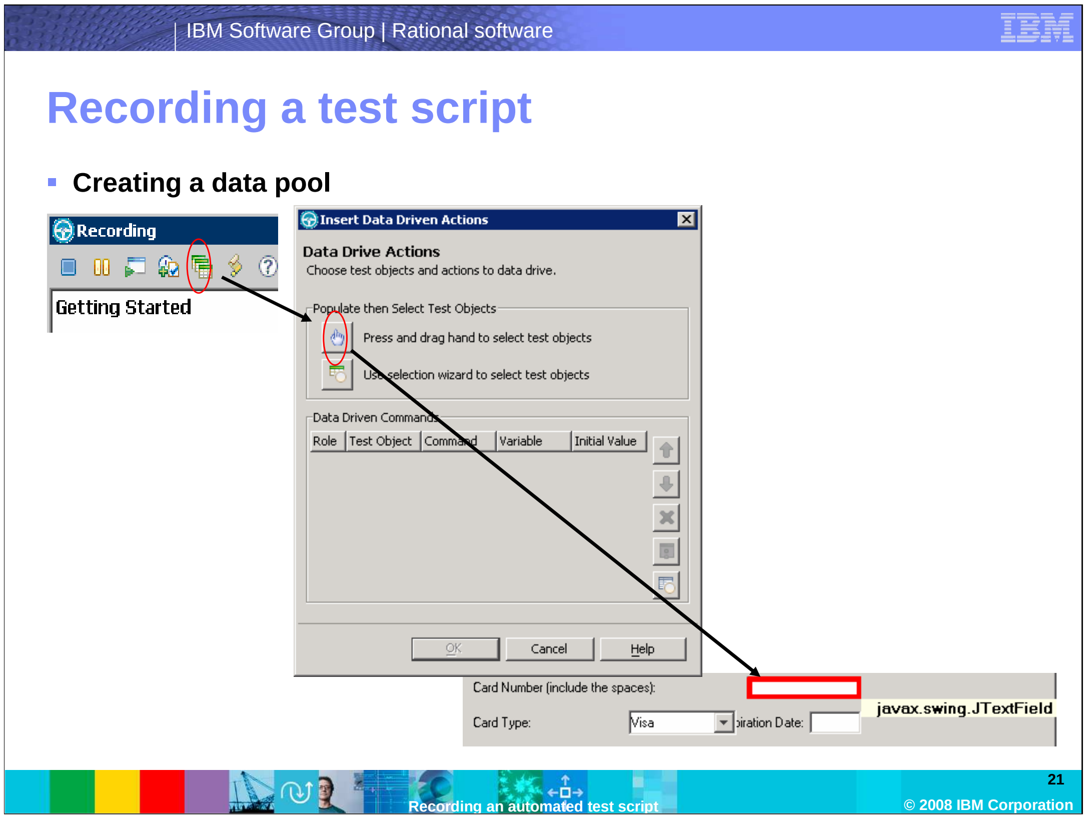
Verification Point Data

Check the properties to include in the verification point.

Property	Value
data	Place Order
description	Visible Text
ignoreCase	false
name	PlaceOrder_text
type	text
whiteSpaceMode	Use All Characters

```
Place Order
```

The Verification Point and Action Wizard will give the options to create four kinds of verification points. In this module, you will create a data verification point by selecting the first option. This verification point helps in making sure that the data is accurate. When you click the Next button, the windows that appear show the data that was captured. In this case, it is the label on the button you previously selected.



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Recording a test script

- **Creating a data pool**

Recording
Getting Started
Insert Data Driven Actions
Data Drive Actions
Choose test objects and actions to data drive.
Populate then Select Test Objects
Press and drag hand to select test objects
Use selection wizard to select test objects
Data Driven Commands
Role
Test Object
Command
Variable
Initial Value
OK
Cancel
Help
Card Number (include the spaces):
javax.swing.JTextField
Card Type:
Visa
Expiration Date:

Recording an automated test script

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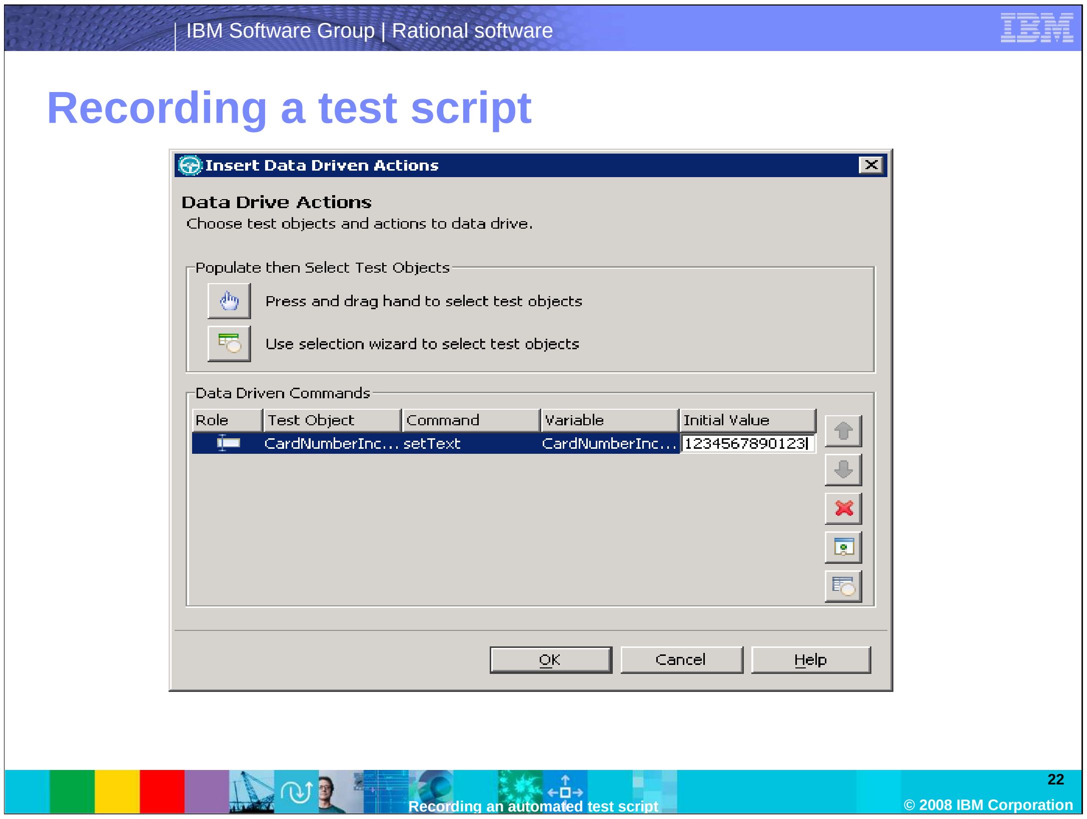
When you record a script using literal values, that data is hard-coded into the script. A script with hard-coded data executes only one test case or one set of valid test inputs, and it is difficult to maintain and use. The way to get around this is to create data driven test scripts.

In data driven testing, you separate the data from the test script. Instead of hard-coding data into the script, the script is coded to accept variable data from an external source. Because data is separated from the test script, you can modify test data without affecting the test script and share the test data among many test scripts.

In Functional Tester, the data sheet that holds the data values is called a data pool.

On the Recording window, select the fifth icon from the left. An “Insert Data Driven Actions” window will appear. This window has a button with a hand symbol on it. Put your mouse pointer on this button, and, with the left mouse button pressed down, drag the mouse pointer and place the hand on the object where you want to create the data pool. In this case, you will put the card number field on the Place an Order window, and then release the left mouse button.



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Recording a test script

Insert Data Driven Actions

Data Drive Actions

Choose test objects and actions to data drive.

Populate then Select Test Objects

Press and drag hand to select test objects

Use selection wizard to select test objects

Data Driven Commands

Role	Test Object	Command	Variable	Initial Value
	CardNumberInc…	setText	CardNumberInc…	1234567890123

Recording an automated test script

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In the Data Driven Commands section of the Insert Data Driven Actions window, a new row of data will be created. Each row has five columns.

The Role column indicates object type.

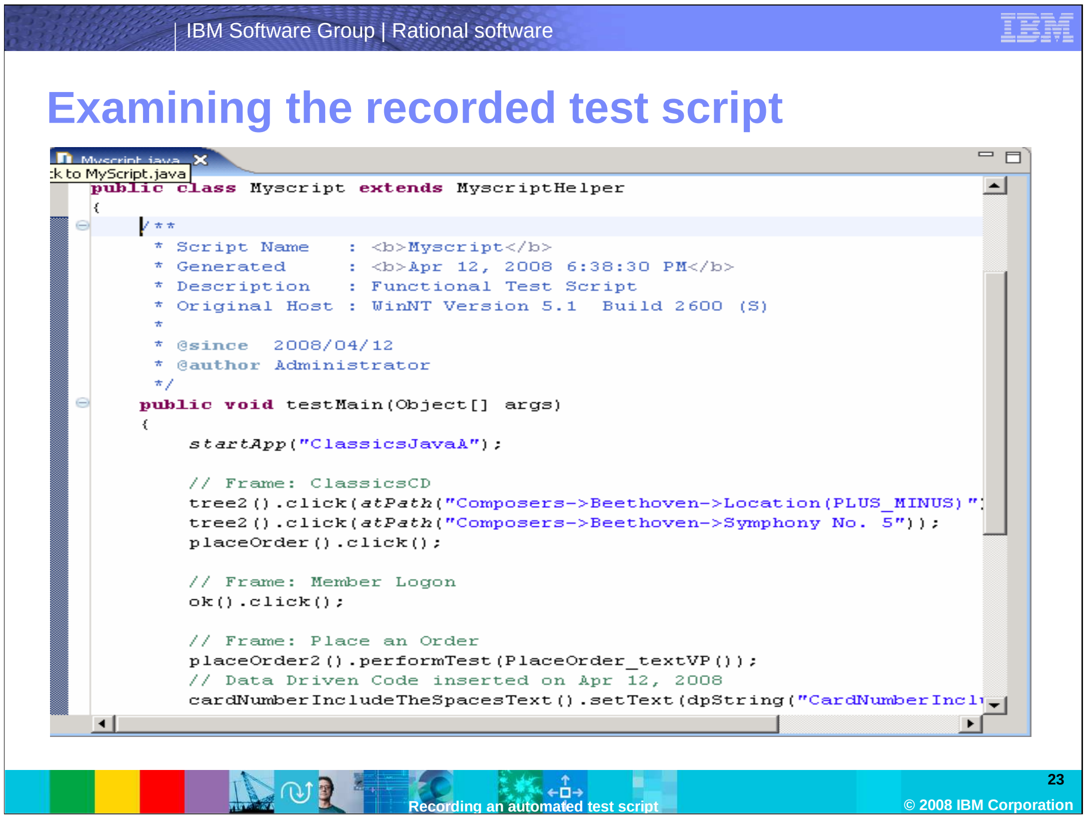
The Test Object column indicates the name of the object.

The Command column shows the command that is going to be used to set the value from the data pool into the field.

The Variable column indicates the variable name created for the object.

The Initial Value column indicates the initial value for the field.

Click the OK button, and then click the Stop icon in the Recording window.



Examining the recorded test script

```
public class Myscript extends MyscriptHelper
{
    /**
     * Script Name    : <b>Myscript</b>
     * Generated      : <b>Apr 12, 2008 6:38:30 PM</b>
     * Description    : Functional Test Script
     * Original Host : WinNT Version 5.1  Build 2600 (S)
     *
     * @since  2008/04/12
     * @author Administrator
     */
    public void testMain(Object[] args)
    {
        startApp("ClassicsJavaA");

        // Frame: ClassicsCD
        tree2().click(atPath("Composers->Beethoven->Location(PLUS_MINUS)"
        tree2().click(atPath("Composers->Beethoven->Symphony No. 5"));
        placeOrder().click();

        // Frame: Member Logon
        ok().click();

        // Frame: Place an Order
        placeOrder2().performTest(PlaceOrder_textVP());
        // Data Driven Code inserted on Apr 12, 2008
        cardNumberIncludeTheSpacesText().setText(dpString("CardNumberIncl
```

Now that you have stopped recording, go ahead and examine the script. When the recording is stopped, the Functional Tester main window comes up. In the script view, you will see the recorded script.

Notice that the script is Java Code. Functional Tester uses its default script templates to format and provide basic information when you create a script. You can customize the information and format by customizing the script templates. You can find the templates in the templates folder in your project folder.

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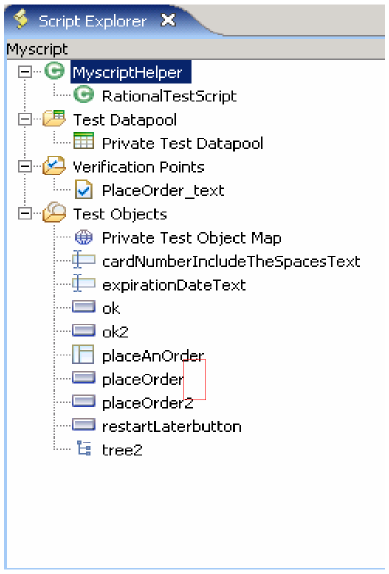
Test object map



```
Script Explorer
Myscript
⊟ MyscriptHelper
    RationalTestScript
⊟ Test Datapool
    Private Test Datapool
⊟ Verification Points
    PlaceOrder_text
⊟ Test Objects
    Private Test Object Map
    cardNumberIncludeTheSpacesText
    expirationDateText
    ok
    ok2
    placeAnOrder
    placeOrder
    placeOrder2
    restartLaterbutton
    tree2
```

Recording an automated test script

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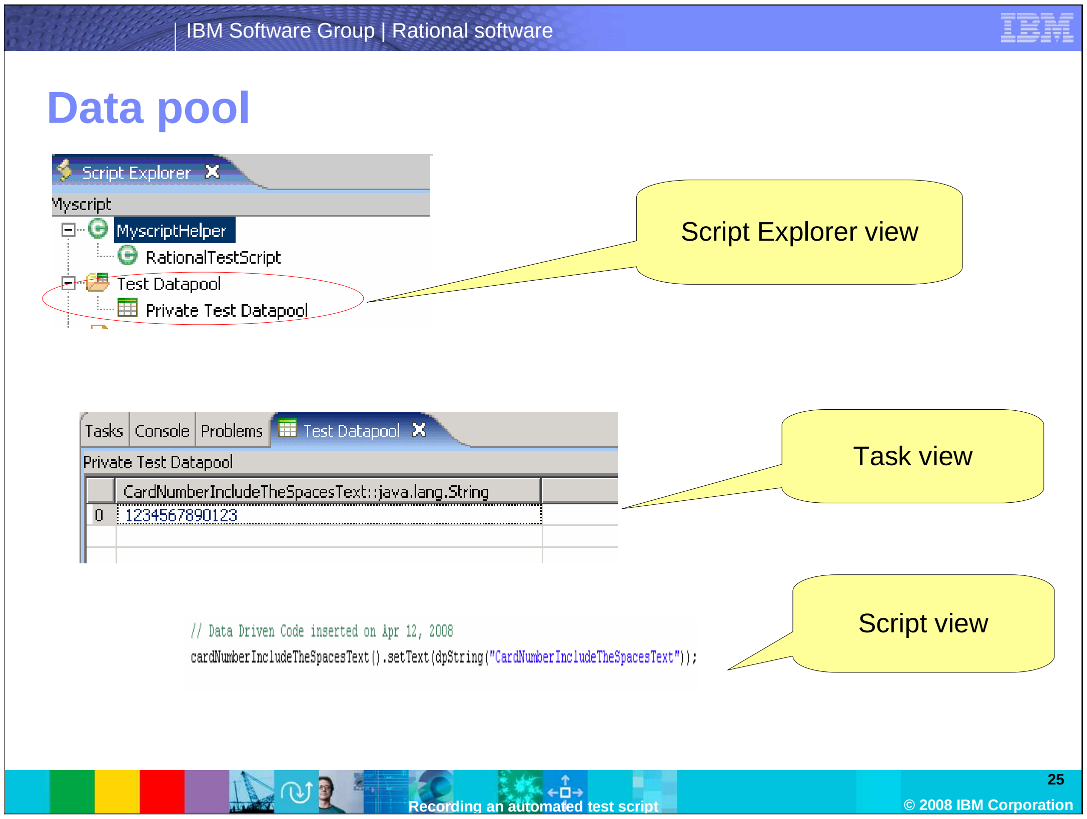
When you record a script, Functional Tester creates a test object map for the application under test. Each script is associated with a test object map file. The object map is like a repository of all the test objects in the application under test. It is a static view that describes test objects known to Functional Tester. When a script is played back, Functional Tester uses the object map to identify the objects it needs to access. It reads the objects in the script and tries to make a 1 to 1 match with the objects in the object map.

The Test Object Map is visible in the Script Explorer view in Functional Tester. A test object map can be shared among multiple scripts.

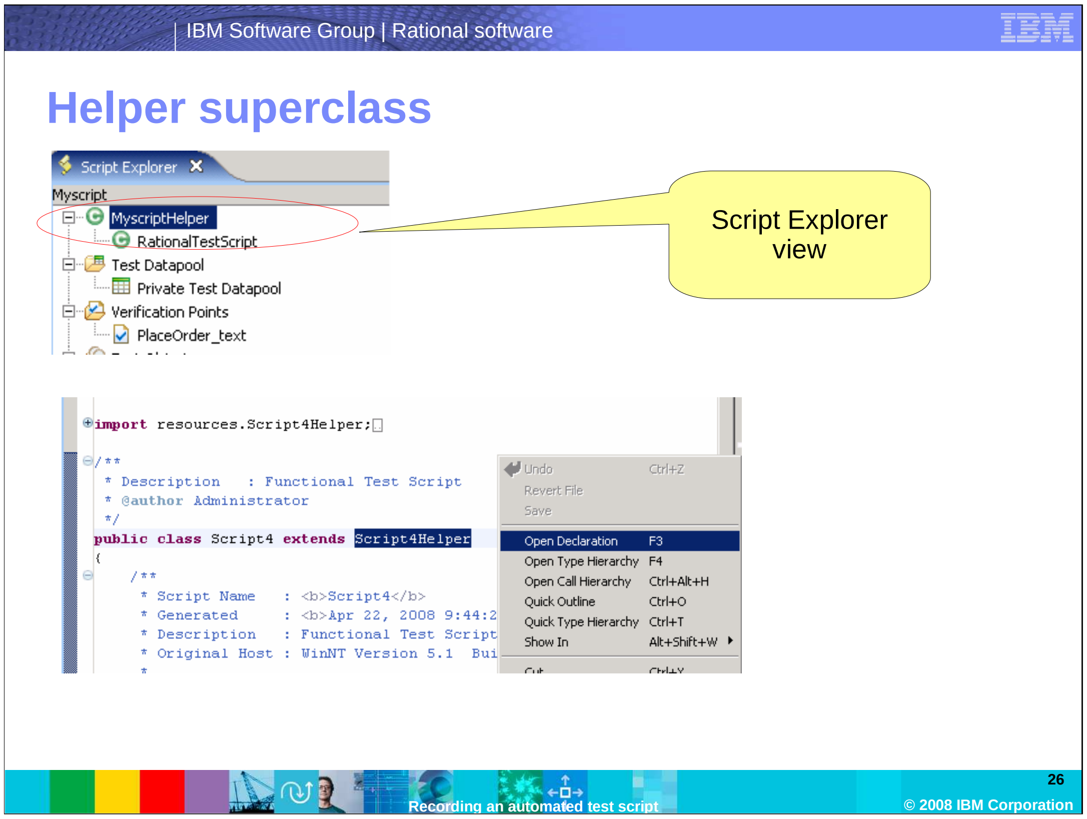


Data pool

	CardNumberIncludeTheSpacesText::java.lang.String
0	1234567890123

```
// Data Driven Code inserted on Apr 12, 2008
cardNumberIncludeTheSpacesText().setText(dpString("CardNumberIncludeTheSpacesText"));
```

When you create a data pool during the recording of a script, the data pool shows up in the Script Explorer view. When you double click it, a data pool sub view will open in the Task View area. Here you can add more rows of data. The Script View will show the line of script that was generated for the data pool.

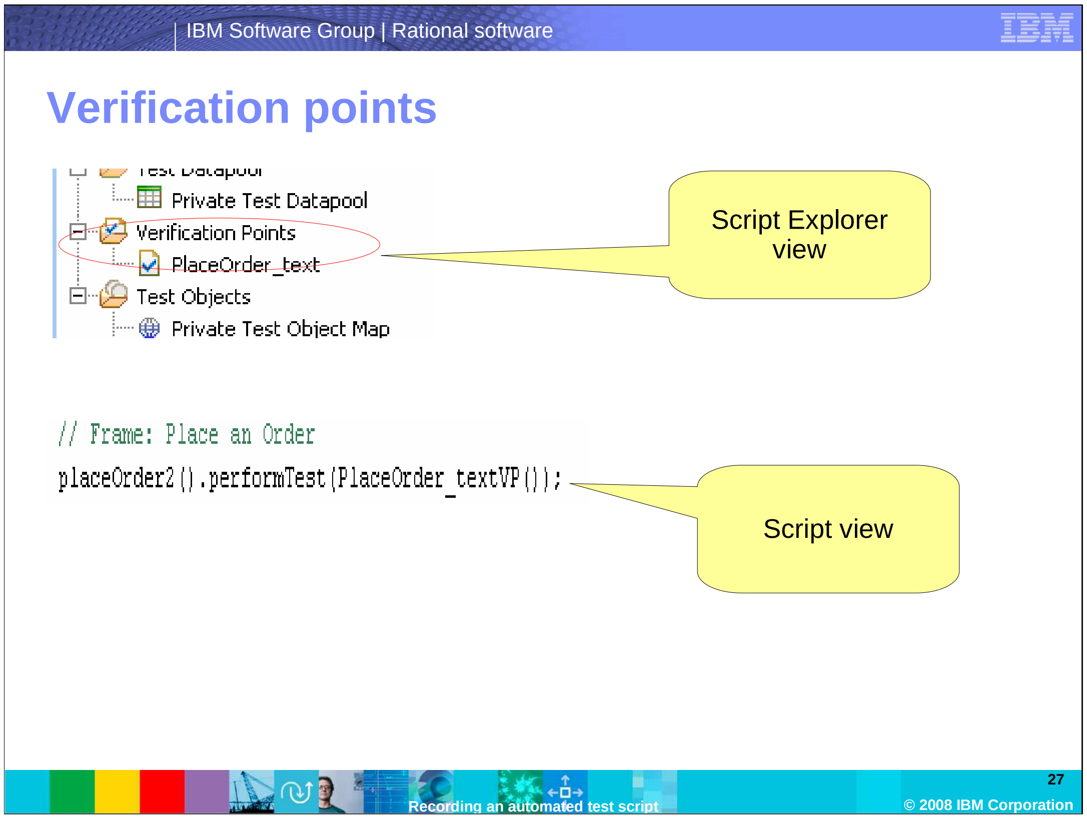


Helper superclass

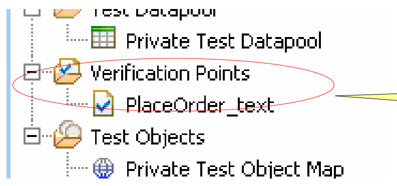
```
import resources.Script4Helper;

/**
 * Description   : Functional Test Script
 * @author Administrator
 */
public class Script4 extends Script4Helper
{
    /**
     * Script Name   : <b>Script4</b>
     * Generated     : <b>Apr 22, 2008 9:44:2
     * Description   : Functional Test Script
     * Original Host : WinNT Version 5.1  Bui
     *
```

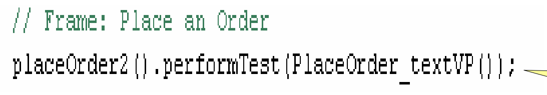
Functional Tester scripts use a Helper Superclass. By default, all Functional Tester scripts extend the RationalTestScript class, and thereby inherit several methods. You can create your own helper Superclass if you want to add additional methods or override the methods within RationalTestScript.

The Helper Superclass is visible in the Script Explorer view. In the Script view, you can highlight ScriptHelper, right-click, and select Open Declaration. The Helper Superclass will open in the Script view.



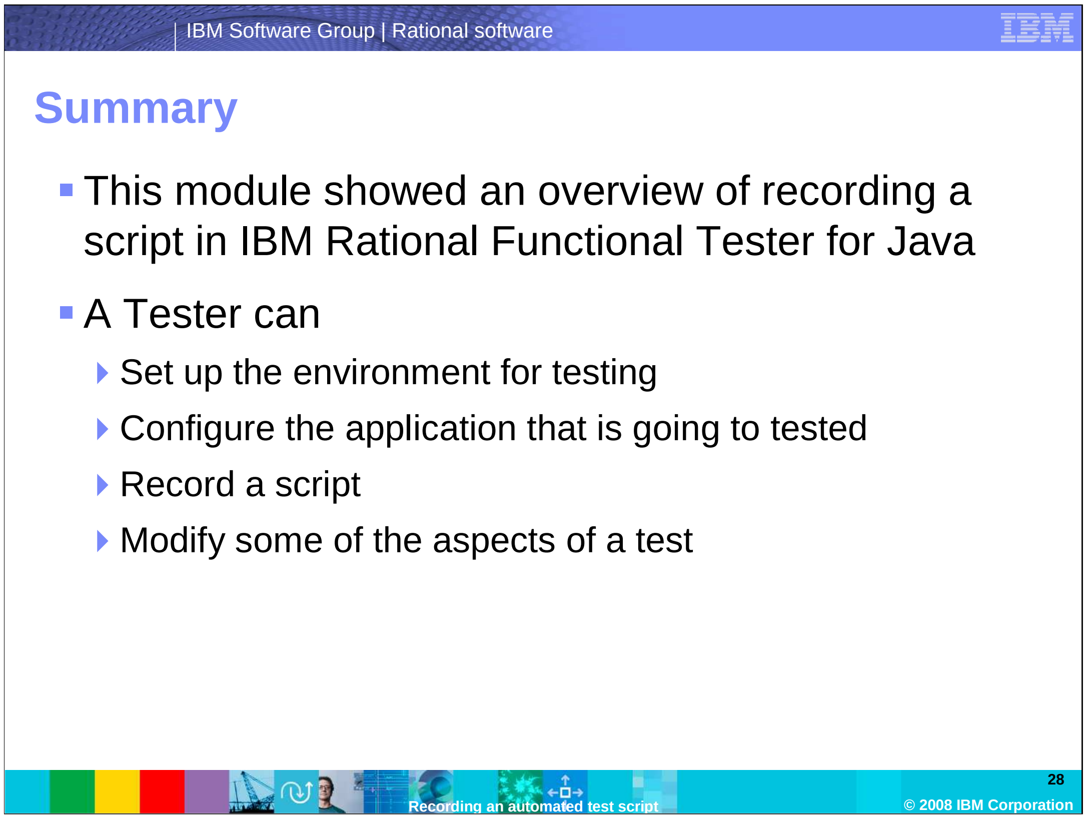
Verification points





```
// Frame: Place an Order
placeOrder2().performTest(PlaceOrder_textVP());
```

The verification point is also visible in the Script Explorer view. You can double-click it, open the Verification Point window, and make any modifications to the verification point you created. The Script view will show the line of script that was generated for the data pool.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Summary

- This module showed an overview of recording a script in IBM Rational Functional Tester for Java
- A Tester can
  - Set up the environment for testing
  - Configure the application that is going to tested
  - Record a script
  - Modify some of the aspects of a test

Recording an automated test script

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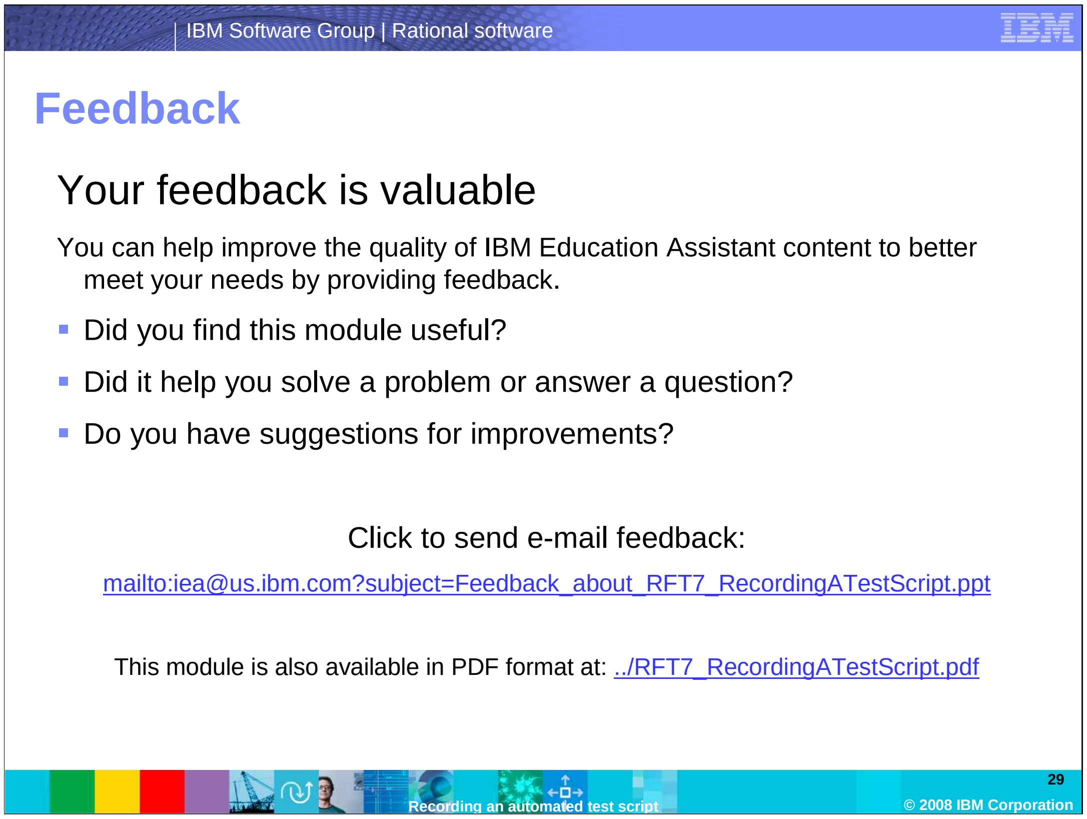
This module showed an overview of recording a script in IBM Rational Functional Tester for Java.

A Tester can set up the environment for testing, configure the application that is going to tested, and record a script. A tester can modify some of the aspects of a test, such as adding rows to a data pool, modifying the verification point that was created, or creating a customized Helper Superclass.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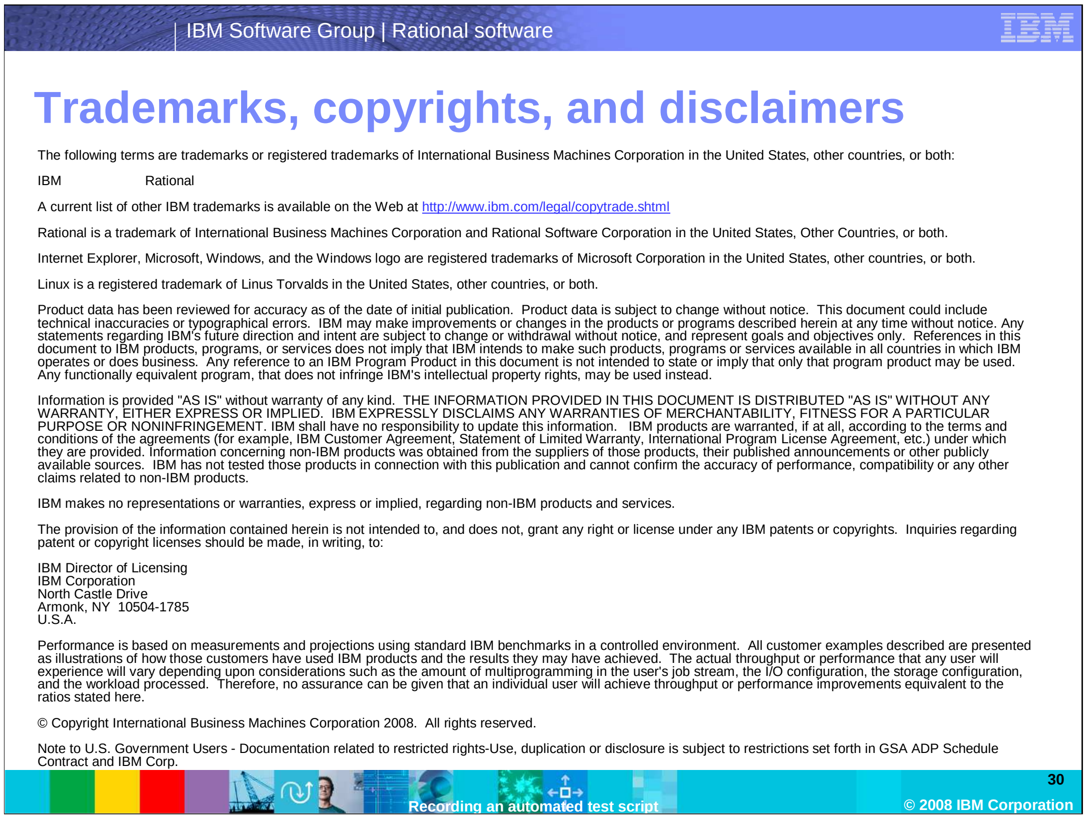

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