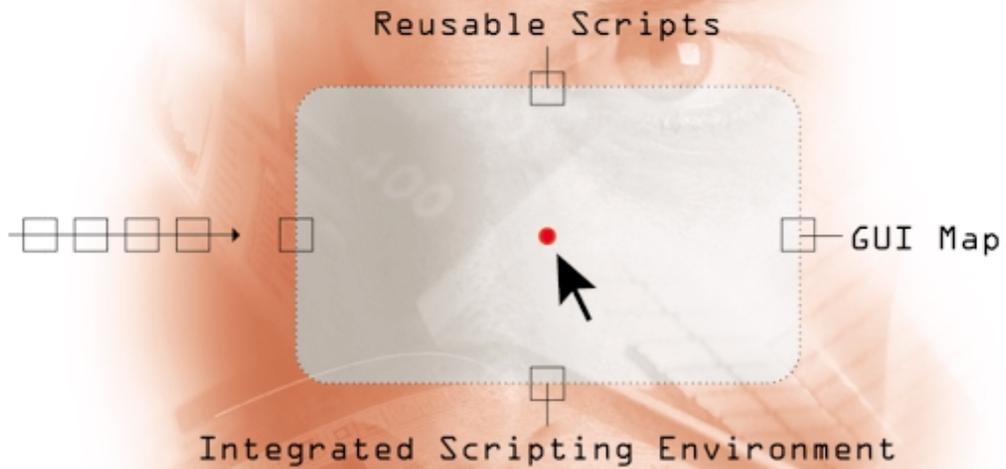




MERCURY INTERACTIVE

WinRunner® 6

Powerful Test Automation for the Enterprise



WinRunner® is an enterprise functional testing tool that verifies applications work as expected. By capturing, verifying and replaying user interactions automatically, WinRunner identifies defects and ensures that business processes, which span across multiple applications and databases, work flawlessly the first time and remain reliable.

Software systems are critical to the ultimate survival of today's businesses. They present tremendous new opportunities and unique competitive advantages. A growing number of companies are relying on information technology for more than just a part of their revenue stream—IT is a business in its own right. But software is also an immense source of risk.

Today's IT applications reach thousands of users, expose organizations' mission-critical systems to larger audiences and bear a higher risk of failure. Inadequate performance and poor quality of these systems can result in more than just a temporary slowdown, it can jeopardize the very existence of your business or forever change your competitive position in the industry. The increasing complexity and growing strategic importance of software systems dictate the need for their improved functionality, positive end user experiences, higher scalability and flawless performance.

Applications are deployed to enable organizations to focus on business issues. They automate mission-critical business processes to support the organization's day-to-day workflow. As these applications continue to grow in number and scope, change is becoming more frequent in order to respond to ever-changing business needs. In addition, since these applications work with integrated business processes, they, too, need to be integrated into

one seamless infrastructure. But how can your IT staff be responsible for testing all the different application environments, complex integrated infrastructure and increasing numbers of business users?

The reality is that most IT groups are understaffed when it comes to testing multiple applications with unique environments. Keeping up with QA demands, minimizing application test cycle times and ensuring application stability for the entire enterprise application lifecycle is no easy task. While manual testing can be sufficient for smaller and less-complex implementations, only repeatable, automated functional and regression testing can provide you with the confidence that your applications will work as expected and remain reliable.

WinRunner automates functional testing to ensure enterprise applications work correctly. It records business processes into test scripts, supports script enhancements as the application is developed or updated, executes scripts, reports results and enables script reusability. WinRunner offers the integrated functional testing solution for your entire enterprise.

Creating Test Scripts

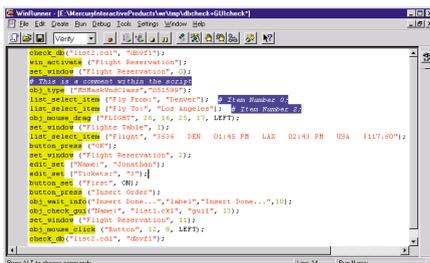
To create a test, you simply record a business process. WinRunner tests your application by operating it automatically, as though a human user was performing each step in a business process, such as ordering an item or creating a new vendor account. WinRunner records these business processes into readable scripts that can later be replayed for verification or reused with LoadRunner®—Mercury Interactive's load testing tool.

As part of its integrated scripting environment, WinRunner features two methods for creating tests—visual recording and programming. For most users, the visual recording method provides the fastest and easiest way

to create scripts. With a simple point-and-click on the GUI, even users with limited technical backgrounds can create robust tests with minimal learning curve. WinRunner also offers a programming method for power users who need the capability of editing test commands to meet complex test requirements. Only WinRunner combines visual recording and programming into a single test environment.

While recording a test script, users can insert checkpoints to compare expected outcomes with actual ones. WinRunner captures expected results and organizes them for easy viewing to help you investigate potential problems with your application. With a checkpoint in place, WinRunner collects a set of attributes that are verified when your test is run. This feature makes it easier to specify exactly what needs to be verified within your business process.

To ensure thorough testing of complex business processes that span across multiple applications, WinRunner provides record, playback and script customization in a variety of application environments. The wide range of supported applications combined with productive script development and database verification capabilities maximizes your single functional tool investment.



WinRunner provides the most powerful, productive and cost-effective solution for verifying enterprise application functionality.



With the new Add-in Manager, WinRunner provides selection, management and testing for multiple environments concurrently from a single installation.

WinRunner's ability to test multiple application environments is particularly important for the companies who are adopting the new trend known as Enterprise Application Integration (EAI). EAI represents the integration of multiple disparate applications into a single business process. Not only is it difficult to integrate multiple application environments into one seamless infrastructure, but it is even more challenging to test these new architectures. WinRunner's Add-in Manager addresses the EAI issue by supporting multiple environments simultaneously and managing testing across different applications with a single installation. When starting WinRunner, the user simply selects which environments to test within a particular WinRunner session. These settings can then be saved and automatically reused in future testing sessions.

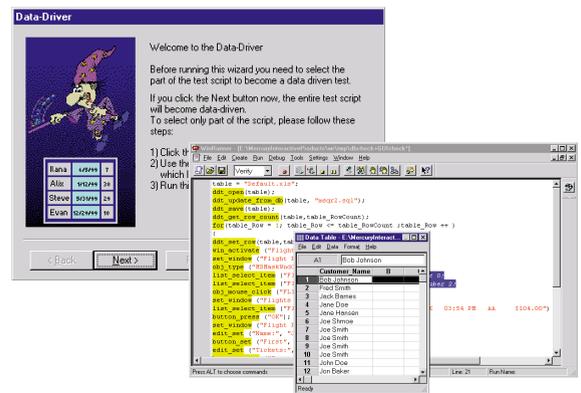
Thorough application testing requires more than a single test run. Continuous testing in different configurations is necessary to ensure that your application works correctly before deployment and remains reliable. For future test iterations, test cases can be exported to TestDirector®—Mercury Interactive's test management tool.

Enhancing Test Scripts

While capturing business processes during the test creation phase, WinRunner separates the business logic from the input data, so that you can vary selections and data entry based on a list of choices. For instance, real users can stress the application by creating new customer records as part of an order entry process. WinRunner's DataDriver™ Wizard easily converts a recorded business process into a data-driven test that reflects real-life actions of many users.

Users invoke the DataDriver Wizard when they want their applications to be tested with different sets of data. First, you need to identify which fields to parameterize. In the example of the order entry process, you may want to change hard-coded fields, such

WinRunner's DataDriver Wizard turns recorded or programmed scripts into multiple test scenarios automatically using a spreadsheet interface. The data records used in multiple test runs can then be manually inserted into the spreadsheet or automatically retrieved from a production database with the wizard.



as a part number or customer name, into variables which allow you to test you application with multiple values. To create these values, simply enter part numbers and customer names into an Excel-like spreadsheet or export them directly from a spreadsheet or database. This data-driven testing capability allows testers to yield a realistic analysis of the actual business process without requiring DBA or SQL skills.

For further script enhancement, WinRunner features the Function Generator—a visual tool that presents a quick and reliable way to add functions to your test script. Using the Function Generator, you can enhance your scripts by either pointing to a GUI object or by selecting a function from a list. This instant recall helps you quickly locate the function you need from a category list, visually input the parameters and insert the complete function into your test script.

Many of today's enterprise applications also use non-standard objects. Often typical record-and-replay tools require extensive coding for identifying unrecognizable application objects. WinRunner's Virtual Object Wizard eliminates special coding requirements for previously unknown objects. Through a simple point-and-click dialog, the Wizard offers users a complete set of WinRunner objects from which to associate non-standard objects. For script enhancement and readability, the Virtual Object Wizard automatically captures non-standard objects and gives them a name that can be easily recognized by a user.

Executing Test Scripts

After the scripts are built, verification checkpoints are inserted and enhancements are made, it is time to execute your tests. When you run a test, WinRunner interprets your test script, line by line. WinRunner provides multiple replay modes: verify mode (to check your application), debug mode (to debug your test script) and update mode (to update the expected results). Each test mode is specifically designed for script enhancement and easy maintainability as the application evolves.

Since you may not always anticipate certain conditions when building scripts for your business process, WinRunner includes exception handling to keep test execution on track in any situation. For example, how will your test behave when an email message alert interrupts script playback?

| Expected Data | | | | Actual Data | | | |
|---------------|--------------|-----------|------|--------------|--------------|-----------|------|
| Customer No. | Email No. | Order No. | Name | Customer No. | Email No. | Order No. | Name |
| 1 | John Johnson | 4218 | 9 | 1 | John Johnson | 4218 | 9 |
| 2 | Fred Smith | 4295 | 2 | 2 | Fred Smith | 4295 | 2 |
| 3 | Jack Barnes | 4232 | 8 | 3 | Jack Barnes | 4232 | 8 |
| 4 | Jane Doe | 3291 | 7 | 4 | Jane Doe | 3291 | 7 |
| 5 | Jane Hansen | 4214 | 10 | 5 | Jane Hansen | 4214 | 10 |
| 6 | Jane Shreve | 4218 | 6 | 6 | Jane Shreve | 4218 | 6 |
| 7 | Jane Smith | 1193 | 14 | 7 | Jane Smith | 1193 | 14 |
| 8 | Jane Smith | 1193 | 11 | 8 | Jane Smith | 1193 | 11 |
| 9 | Jane Smith | 1193 | 12 | 9 | Jane Smith | 1193 | 12 |
| 10 | John Doe | 4218 | 10 | 10 | John Doe | 4218 | 10 |
| 11 | John Doe | 4218 | 4 | 11 | John Doe | 4218 | 4 |
| 12 | John Doe | 4218 | 11 | 12 | John Doe | 4218 | 11 |
| 13 | John Doe | 4218 | 5 | 13 | John Doe | 4218 | 5 |
| 14 | John Doe | 4218 | 9 | 14 | John Doe | 4218 | 9 |
| 15 | | | | 15 | | | |

WinRunner can verify database values as an integrated part of the same test used for standard functional testing. Moreover, WinRunner automatically displays the results to show records that have been updated/modified, deleted, or inserted.

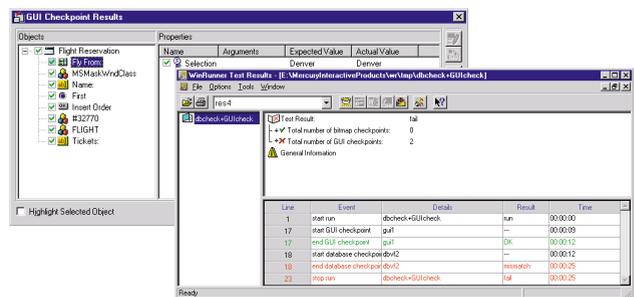
Verifying database values is critical to many functional testing efforts. Year 2000 testing has only exacerbated the requirement to verify that a database record remains consistent before and after running a business process. WinRunner can perform database verification for relational or legacy databases as an integrated part of your test creation and execution effort. During test creation, you define which database tables and records to check. Upon replay, your test script will verify the actual values in the database against the expected values. WinRunner will automatically display the verification results to show records that have been updated/modified, deleted, and inserted.

Testing distributed applications is often complex. Hardware resources may be distributed throughout your department or may be scarce. The combined functionality in WinRunner and TestDirector allow you to execute tests directly from TestDirector, either from a local network or a remote location. TestDirector helps you schedule functional tests with WinRunner during off-working hours on machines located throughout the enterprise.

Analyzing Test Results

Once tests are replayed you will need to analyze the results. WinRunner's interactive reporting tools help you interpret test results by providing detailed reports that list what errors were found in the

WinRunner's easy-to-read reports help you identify what errors were found in your tests and where they were located. You can zoom-in on any error for further script analysis.



tests and where they were located. They contain descriptions of the major events that occurred during the test run including errors and checkpoints. With the touch of button, WinRunner can drill down to greater detail on any error or mismatch uncovered by the test.

Maintaining Test Scripts

Building and executing powerful test scripts are only part of the testing process. Making sure that these scripts can be reused frequently ensures that your script creation investment will pay off later as your application evolves. WinRunner uses a GUI map for script maintainability. The GUI map represents a repository of application objects for each business process. It is created automatically when you record a test script. Each object within a test script has a minimum set of physical attributes that make it unique from other objects. As the GUI map is built, WinRunner captures application object information and organizes this hierarchically, window

by window. WinRunner also includes one-step verification dialogs that identify standard and non-standard attributes of each critical part of your application. Since development changes within an application, from version to version, can impact hundreds or thousands of scripts, users only need to make modifications to a single GUI map for future reusability instead of the numerous scripts.



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Supported Environments:

WinRunner supports out of the box testing of all the following enterprise application environments, tools and objects:

- Netscape & MS Internet Explorer
- Java applets & applications
- ActiveX
- PowerBuilder
- Visual Basic
- Forté
- Numerous OCX Controls
- C/C++
- SAP, Oracle Applications, PeopleSoft, Baan
- Oracle Developer
- Legacy Systems (mainframe, AS/400, character UNIX systems)
- Delphi

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