



MERCURY INTERACTIVE

Company Profile

Mercury Interactive offers automated testing and performance management products that help improve the scalability, availability and reliability of your Web applications and ensure a positive end user experience.

Mercury Interactive was founded in 1989 and went public in 1993. The company is based in Sunnyvale, California, with additional offices providing research and development, sales and support around the world.

# The Complete Testing Solution for E-business

From e-bookstores, e-malls and e-magazines to business-to-business Web applications, more and more companies are relying on electronic business as part of their day-to-day activities for generating a significant component of their revenue streams. In many cases, selling through the Web enables companies to reach new markets and customers, as well as provide new value. It also offers the means to deliver better customer service and increase sales to existing customers. To take advantage of this lucrative revenue source, companies are deploying e-business applications at record pace.

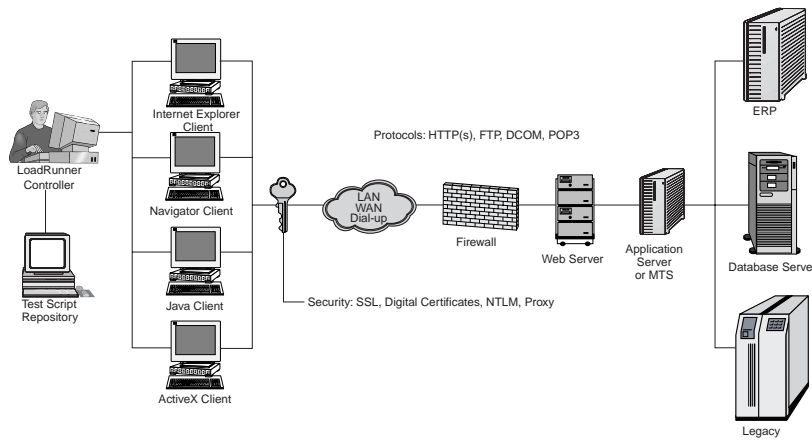
But what happens when customers wait for pages to load, can't find their requested information or discover that their transactions did not go through? Or even worse, what if the Web site is unavailable due to high traffic volumes? Recent Web site horror stories illustrate the painful cost of Internet downtime. With the competition only a mouse click away, customers expect pleasant user experiences and demand 24/7 access to your site. If you stumble, remember that they will leave your site as easily as they enter.

To maximize your investment in e-business and ensure that your site is ready for business, a mission-critical e-commerce application must be functional, scalable and perform flawlessly during peak customer traffic.

Mercury Interactive's integrated e-business testing solution is a set of industry-proven tools—LoadRunner®, WinRunner® and TestDirector®—that provide comprehensive testing for multi-tier, e-business systems. This is the only solution for testing an entire e-business architecture, including various types of application logic, security, presentation layer, application layer and network protocols. When used together, Mercury Interactive tools can test any e-business application—private intranets, extranets and public Internet sites—to predict system performance, test scalability, verify functionality, interoperability and application security.

## Functional and Regression Web Testing

The first step in e-business application testing is to verify the application's functionality. WinRunner is a testing tool that verifies an e-business application's logic and functionality to ensure positive end user experiences. While the user accesses the e-business application, WinRunner automatically translates user actions into test scripts. All interactions with the browser and its contents are automatically recorded. WinRunner drives an e-business application just as real users do, submitting new data for each application iteration and then verifying the application's functionality. All business process data is stored in an Excel-like spreadsheet, which can be edited easily to generate data-driven tests. The recorded transactions are then easily converted into multiple test cases that reflect real-life user actions.



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While recording a business process, you can insert checkpoints to verify the business logic as the application is driven with different test cases, transactions and data. WinRunner compares all values returned from the application with the expected values to make sure they contain the right information. By using verification checkpoints, you can make sure that only changes in the business process logic are being detected, while changes that affect the browser presentation layer, such as page layout, are disregarded.

WinRunner provides record, playback and script customization for a variety of environments. It offers full support for HTML frames and tables, as well as Java applets, links, DHTML, images, source code, JavaScript,

JavaBeans and ActiveX. Test scripts can also be re-used across different browsers and platforms.

After test scenarios are built using WinRunner, they can be stored in TestDirector's database and repeated using different configurations so you are assured that your application functions correctly. LoadRunner can also replay these same tests easily without modification for load, performance and scalability testing.

**Powerful Web Load Testing** Scalability, reliability and performance are the most important issues when deploying an e-business application. Since the volume of users and traffic levels can change in a matter of seconds, it is critical for you to preserve

your organization's competitive advantage and to ensure a positive experience for all end users.

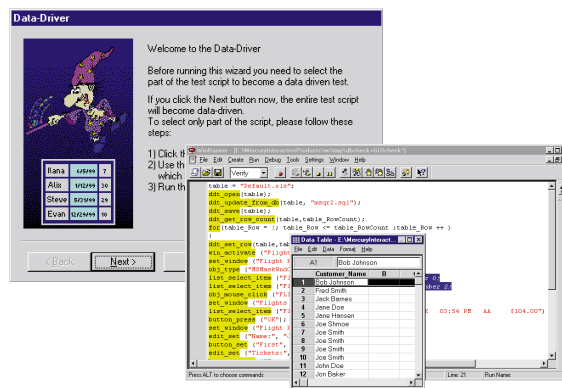
LoadRunner predicts system behavior and performance. It exercises an entire application by emulating the traffic of real users. Each of these users drives the application with real transactions while LoadRunner measures response times, network delays and both server and application performance. LoadRunner emulates the behavior of a real browser and can send HTTP or HTTPS requests along with DCOM, CORBA, JDBC, LDAP, Jolt, NCA and POP3 e-business protocol requests to your server to measure performance and response times.

As you integrate Web applications with other applications, you will need to verify Web server capacity and performance. Instead of relying on human users, LoadRunner tests your system using multiple virtual users. A virtual user emulates the browser by sending and receiving messages to and from the Web server to generate load on the entire system. LoadRunner's virtual users can be configured to behave like any browser type or version, connection (LAN, WAN or dial-up) or cache size. Each virtual user stores its own cookies and uses its own cache for downloaded information.

Using LoadRunner's Scenario Wizard, you can compose test scenarios to stress your application with hundreds or thousands of desktop, terminal or Web users. Alternatively, you can set up a scenario that shows different bandwidths to determine what type of response time a user will receive over a 56K-modem connection versus an ISDN or T1 connection.

Secure environments are the enabling technology for e-commerce, but they can greatly reduce performance

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.



and complicate application architectures. For customers deploying e-business applications with security requirements, LoadRunner provides complete support for SSL and digital certificates on both the client and server side as well as for NTLM authentication.

Since it's critical that you have a central point of control for all aspects of your load testing efforts, LoadRunner's Controller provides complete visibility of your tests and its virtual users. The Controller's easy-to-use graphical interface makes it easy to organize, drive and manage your test scenarios. It executes load tests by driving thousands of virtual users against real applications to generate production-level load using minimal hardware resources.

To look at an application's functionality from the end-user perspective and to ensure that Web page content is accurately delivered and displayed, testers can use LoadRunner's ContentCheck at any time during the load test. ContentCheck gives testers a real-time picture of the client application under test through a browser interface to expose functional failures that occur only under heavy load.

While detecting performance problems before deployment is an extremely important task, just knowing

that there is a problem is not enough. LoadRunner's integrated real-time monitors allow users to isolate performance bottlenecks by splitting the end-to-end transaction response time into separate components of the client, network and server. For example, the Server Monitor can locate the problems associated with the system servers, such as Web servers, application servers or database servers, as they become loaded. Similarly, the Network Delay Monitor isolates network performance problems by breaking down the network topology between the client and the server and measuring the network delay between these segments. SNMP and TUXEDO Monitors are used to find performance problems in SNMP-compliant system components and TUXEDO-based applications.

At the end of the testing process, you can use LoadRunner to create a series of graphs and reports that summarize your test results and present them in a clear and visual format.

### Integrated Test Management

To help track your overall testing efforts, TestDirector provides test planning, execution and defect tracking, along with an Open Test Architecture™ (OTA) and a central repository for your test scripts, results and documentation. TestDirector consolidates the entire testing process to determine your e-business application readiness.

TestDirector organizes manual and automated functional, regression and load test scenarios in the same visual, hierarchical test plan, making it easy to understand the full scope of the testing project. For each test case, it lists the sequence of user actions, case description, status and expected results, which can be used as a step-by-step checklist for all test case documentation.

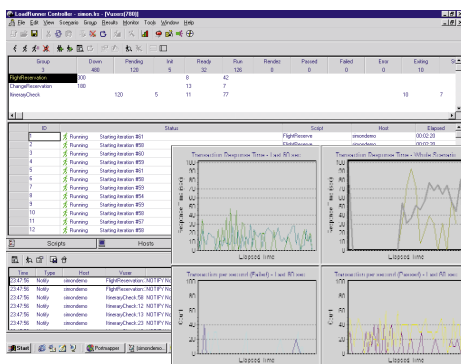
### Web Application Performance Management

Web sites that are unable to scale or those with functional problems risk driving consumers to other sites, turning your prospects into your competitors' customers. If customers don't come back to give your site a "second chance," a damaged reputation may change your competitive position. For these reasons, companies are implementing application performance management tools to monitor site performance, confirm site availability and anticipate problems.

Mercury Interactive's Topaz™ offers a revolutionary approach to real-time Web site monitoring. Unlike traditional performance monitoring tools that passively collect system data, Topaz proactively monitors and measures end-to-end response time of business transactions, giving IT managers meaningful real-time data on application performance and availability from the end-user's perspective.

Topaz ActiveWatch™ is a hosted version of Topaz. It operates on an infrastructure maintained by leading Internet Service Providers (ISPs). These companies provide the infrastructure and data centers at many geographical locations, enabling Topaz ActiveWatch to measure and report end-to-end response times of your site's most critical business transactions.

Topaz and the Topaz ActiveWatch service extend Mercury Interactive's expertise into post-deployment application performance.



The Controller features integrated monitors to help identify and isolate performance bottlenecks in real-time.

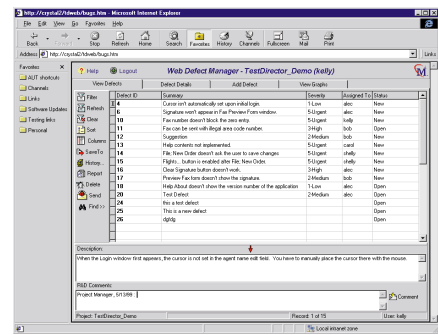
TestDirector jumpstarts the testing effort by creating a process for managing an entire e-business application's complexity and providing quick access to critical test information.

TestDirector offers a structured workflow for initially building and organizing test cases through an easy-to-use, collapsible subject tree. However, many testers begin the test planning process by creating their test plans in a word-processing software, such as Microsoft Word, without ever using a test management tool. Through TestDirector's unique MS Word integration, users can leverage their time invested in creating Word-based test plans by automatically inserting these plans into TestDirector's repository. TestDirector also links test documentation to attachments—supplemental MS Word, Excel, HTML or other files that further describe the test case.

To better utilize system resources, TestDirector's Scheduler can run automated tests anytime on any networked machine. For example, you can set Scheduler to run automated functional tests during low access periods, such as midnight to 5 a.m., for maximum efficiency.

After executing tests, project managers must interpret the test data and put this knowledge to work. When defects are discovered, responsibility for resolving the defects must be assigned and fixes need to be made for future testing cycles. TestDirector's defect management capabilities give complete information about tests and defects, including the exact way to reproduce the problem, when the problem occurred and who in development should be responsible for correcting the issue. TestDirector provides a management process for end-to-end defect tracking—from initial problem detection through fixing the defect and verifying the fix.

Since members of the same project team are often located across multiple sites, TestDirector features remote defect managing capability, allowing off-site users to access the defect-tracking module over the Web. Using TestDirector's Web Defect Manager, users can view, report and update defects, filter on the defect table and most importantly, analyze defect trends from a browser interface. No additional software is required to



TestDirector supports remote defect management, allowing off-site users to access the defect-tracking module via the Web.

access the Web Defect Manager. Users in all locations have full access to the latest defect reports and receive automatic notifications of the major system updates by simply going to a URL.

TestDirector offers a variety of pre-formatted and custom graphs and reports, as well as a complete range of analysis features, to help determine your application readiness. Using TestDirector's analysis engines, you can view WinRunner tests and LoadRunner scenarios at any time during test execution to take a snapshot of your testing process.

### Mercury Interactive's Astra Products

Astra® is a suite of tools that makes Web site testing fast and simple. Its integrated components, Astra LoadTest, Astra QuickTest™ and Astra SiteManager™, validate Web site content, reliability and performance to accelerate testing and optimize user experience.

Astra QuickTest is a revolutionary icon-based tool for testing dynamically changing Web applications. By mirroring end user behavior, Astra QuickTest creates interactive customizable tests that simplify and shorten the testing cycle.

Astra LoadTest is the easiest way to test scalability and performance of Web applications. With Astra LoadTest, you can emulate the traffic of thousands of real users to identify and isolate bottlenecks and optimize user experience.

Astra SiteManager is the comprehensive visual Web site management tool. It automatically schedules and performs scans of your entire Web site—highlighting functional areas with color-coded links and URLs—to create a complete visual map of your site.



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