Load and Performance Load Testing

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Introduction

WebLOAD is an enterprise-scale performance and load testing tool, offered since 1993 by RadView Software. Leading organizations depend on WebLOAD to load test web and mobile applications, including GoDaddy, eBay, Ebix, ConnocoPhillips, Ellucian, DeVry University, as well as other leading financial institutions, retail and manufacturing companies and universities.

WebLOAD is both easy to use and powerful enough to handle the most complex testing challenges. It simulates heavy load in a broad range of web, mobile, and cloud environments, is designed as an open framework platform to integrate with any tool and technology, and provides actionable intelligence to rapidly identify and resolve bottlenecks.

Many of our customers have switched from LoadRunner in order to take advantage of the enhanced productivity, better support and reduced costs.

We are committed to your success and would appreciate helping you take your performance testing to the next level.
Key Components and Architecture

WebLOAD includes four key components.

- The **Integrated Development Environment (IDE)** enables generating load test scenarios via recording and scripting, using the native JavaScript scripting language. The WebLOAD IDE includes a rich set of tools for handling correlation, parameterization, response validation, messaging, scripting and debugging.

- The **WebLOAD Console** creates test definitions and executes tests while charting results in real time, querying server performance data, and saving measurements for analysis and reporting.

- **WebLOAD Analytics** charts results in a coherent report that communicates what happened during a test. The charts support many forms of analysis including root cause. Analytics ships with 80 preconfigured report templates. Users can create their own temporary or permanent templates and can be published in a variety of formats.

- The **Web Dashboard** is an embedded web server that allows multiple stakeholders to share and examine test results. It is particularly useful for Continuous Integration (CI) and Continuous Delivery (CD) workflows involving multiple teams. The Dashboard can display test results while a test is running or at a later time as needed.
Creating Load Tests

Using the WebLOAD IDE, you can build load test scenarios easily and efficiently. In addition, you can take advantage of:

- Recording
- Correlation
- Drag-and-drop building blocks
- Parameterization
- Script debugger

Then, extend and enhance your script with any logic and integrations, using WebLOAD’s native JavaScript scripting language.

Recording

Record your actions on your target application and WebLOAD automatically translates your actions into a test script. Recording is transparent and automatic with any web technology, including HTTP/HTTPS (SSL, TLS), WebSocket, AJAX, SOAP, HTML5, WebDAV and others.

WebLOAD generates a test script in JavaScript, which provides the flexibility to add any logic, call Java classes and add integrations – with a scripting environment that’s familiar to any web developer.
Dynamic Values Correlation
WebLOAD automatically identifies and replaces dynamic values that are unique for each run of the script, such as session IDs, time, and others. While other load testing tools may require manually editing 1000 lines of code with correlation parameters, WebLOAD generates a dozen blocks of codes that can be fine-tuned within minutes.

Drag-and-Drop Building Blocks
Accelerate load scenario development by dragging and dropping elements into your script. Select from load test commands (sleep, transaction, timers, exceptions, synchronizations, etc.), Web protocol actions (ftp, smtp, pop, db, etc), actions for database, mobile, multimedia, WebSockets, as well as validation points.
Parameterization

Parameterize your script to simulate real-life users, replace hard-coded values, and avoid caching effect. WebLOAD’s parameterization wizard lets you replace dynamic values in your script with parameters for date, time, random numbers/strings and input files.

Response Validation

Insure that script playback stays in sync with the server state. If a validation fails, a message can be sent, the round can end, the entire test can be stopped, or WebLOAD can run any JavaScript function.
Web Services/REST
WebLOAD lets you test RESTful web services, offering built-in support for SOAP, Rest, XML, JSON, WebDAV. You can effectively record and replay any service, with WebLOAD supporting the full range of HTTP commands.

WebLOAD supports WebDAV (Web-based Distributed Authoring and Versioning), the HTTP protocol extension which enables the collaborative editing and management of files on remote web servers. It seamlessly records and replays WebDAV requests and commands such as Copy, Move, Lock, etc. In many Web Services it is common to transfer parameters to the service via form data. WebLOAD presents such parameters within the script as part of the form data, making it easy to manipulate values.

XML and JSON objects can be presented in a string or in a JavaScript object, making it easy to manipulate the values according to your needs. Using the JSON and XML parser you can easily convert between the raw Web Services request and a JavaScript object. Finally, WebLOAD identifies dynamic values in XML and JSON values and performs automatic correlation, which you can easily edit.

Script Debugging
Validate your test script to confirm it runs accurately after you complete your script editing. Identify all issues and errors early on, using breakpoints, Watch and Step elements, and don’t waste valuable time during your full load test runs.
Mobile Load Testing

WebLOAD provides several ways to load test your system with mobile device usage. You can create mobile test scripts by:

- Recording native mobile apps or browser-based apps directly from the mobile handset
- Recording from a desktop browser, simulating the mobile browser
- Record a desktop script and modify the settings to simulate a mobile browser

No matter how you create the scripts, you can edit them just like any other test in the WebLOAD editor to add parameters, validation and logic.

During test execution, you can simulate realistic test scenarios by selecting a variety of different browsers, devices and capabilities. We recommend that you mix browser types and connection speeds in the same run in order to better simulate mobile environment.

Perfecto Mobile Integration

WebLOAD integrates with Perfecto Mobile, allowing you to measure the actual experience on a real mobile device while generating virtual user load on your system. You can:

- Test the user experience using different mobile devices and networks
- View combined statistics of both backend load and real mobile device
- Execute Perfecto Mobile test scripts from within WebLOAD
Test Execution

WebLOAD can simulate your virtual user requirements, from hundreds to millions, in the full range of internet protocols. Virtual users are designed with a small footprint to optimize hardware usage and can be distributed across an unlimited number of machines, on premises or on the cloud, with WebLOAD managing the distribution of scripts and collecting all the data.

WebLOAD supports local or remote load generators on Windows or Linux, as well as load generation on Amazon web services, or other cloud providers.

The WebLOAD Console
The WebLOAD Console lets you manage scenario execution and virtual user distribution.

Create Realistic Load Scenarios
WebLOAD lets you simulate realistic and varied load conditions for an unlimited number of users. You can define a variety of scripts, browsers, and network characteristics in a single test run. Through the scheduler, you can control the load build-up in different ways that mimic real-life conditions, including linear, steps, and increments. You can change the load size during execution using the throttle control feature, stop for analysis and restart any time.
Goal-Oriented Testing
To ensure that your application meets agreed upon SLAs, you can define a performance goal and let WebLOAD put it to the test. For example, you can define a goal of response time less than three seconds, and WebLOAD will design and run a scenario to test that goal. After execution, WebLOAD reports how well your application held up.

Cloud Load testing
WebLOAD lets you run performance testing from the cloud by generating virtual user load from Amazon EC2 within minutes. With zero installation or setup you can:

- Generate load from multiple locations in the world
- Distribute load between cloud and on premise machines
- Pay Amazon directly, based on your usage.

WebLOAD provides a pre-configured public Amazon Machine Image (AMI), which lets you quickly generate virtual user load with minimal setup using your own Amazon account. Your cloud load testing costs are based solely on actual performance test usage, WebLOAD automatically terminates the cloud test machines upon completion of test sessions.

You can distribute load between on premise machines and geographically distributed Amazon cloud machines – to create a real-life scenario that matches your needs or simply to lower your costs.
Collect Client and User Experience Data
During test execution, the load generator collects detailed client-side statistics. It enables you to track low-level data or complete transactions. Client-side data is averaged in order to provide meaningful load analytics. In addition, a special virtual user called a Probing Client gives you a full picture of the individual user experience rather than generalized application performance.

Monitoring server performance under load
WebLOAD collects server-side performance data from operating systems, web servers, application servers, and database servers to help you identify the root-cause of problems. WebLOAD Performance Measurements Manager enables the direct correlation of your load scenario with data such as CPU, memory, capacity, processes, disk I/O, and queue data, you can quickly track down bottlenecks and pinpoint the weak links in your system.
Server side data is displayed in real time as part of WebLOAD’s results analytics reports. This simple example presents memory degradation as the load size is increased.

WebLOAD’s monitoring does not require the server-side installation of an agent. It can be configured to handle secure servers located behind a firewall, supports:

- The import of server-side statistics from 3rd party monitoring tools
- The export of monitoring data to external systems.

**Built-in server monitoring**

WebLOAD provides out-of-the-box monitoring for a range of operating systems, web servers, application servers databases. For the full list, see the [Supported Technologies](#) web page.

In addition, WebLOAD supports standard APIs through which servers expose performance data – such as JMX, SNMP, RSTATD, Windows Performance Monitor, SSH, and JDBC.

**Root-cause Analysis using APM tools**

WebLOAD’s built-in integration with application performance management (APM) tools, such as Dynatrace™ and AppDynamics™, helps you take root cause analysis one step further. Once you identify a performance issue using WebLOAD you can switch to your APM tool and directly relate the WebLOAD transaction to the server-side event. You can accurately identify events behind bottlenecks and quickly resolve issues.
Analytics

Actionable Intelligence
WebLOAD provides you with actionable intelligence to help you identify performance bottlenecks in your system. Combining performance metrics with data collected by server monitors, it provides you with 80 out-of-the-box reports and graphs that let you drill down at any angle and granular level to pinpoint problems.

Customizable Reports
Customizable reports enable you to identify specific areas and to compare metrics across load sessions. You can choose from a variety of templates and apply filters, change the design, and save your choices.

Following your load test session, WebLOAD Analytics automatically generates a set of reports and indicates places where threshold violations occurred so you can drill down on problem areas immediately. Once WebLOAD Analytics has launched, your default charts are automatically opened, and threshold rules are applied. Charts with threshold violations are marked in the report view. At a glance, you can see flags such as connection issues and slow page times. Clicking on a chart shows the details.
Web Analysis Dashboard

The Web Dashboard improves the efficiency of your test analysis and resolution process by providing access to performance test results from any web browser or mobile device.

Share and communicate results such as Response/transaction time, throughput and errors between multiple team members and report performance issues to management.

You can:

- Customize your own views of results and graphs
- View real-time result of tests as they are running
- Share a customized report view with colleagues
- View results from tablets and smartphones
Integrating WebLOAD with other Tools

WebLOAD provides several built-in integrations to help incorporate load testing into your application lifecycle. This includes:

- Jenkins™ plugin to support test automation and Continuous Integration (CI) workflows.
- Selenium™ integration for incorporating real browser performance testing.
- Perfecto Mobile™ integration for running mobile performance testing.
- APM (Application Performance Monitoring) tools integration (Dynatrace™ and AppDynamics™) for root cause analysis.

Selenium Performance Testing

WebLOAD’s integration with Selenium, the open source testing tool for web browser applications, lets you integrate real web browsers that perform real activity, into your performance test scenarios and accurately identify issues.

Using the integration, you can stress your system using WebLOAD’s virtual users to generate the load, and simultaneously run Selenium web browsers that measure actual client behavior. WebLOAD collects all test metrics from both the Selenium WebDriver and the backend servers, to provide you with a complete test analysis report. You can record a script in Selenium and then, using WebLOAD’s Selenium plugin, export the script to be used in WebLOAD. Alternatively, you can also code a Selenium script directly in the WebLOAD IDE.

WebLOAD provides built-in commands to add accurate performance measurements into the functional operations of the Selenium script. You can measure end-to-end timing of web activities as well as measure timing-related statistics for all pages navigated or for a specific web page.

![Graph showing performance metrics](image-url)
DevOps and Continuous Integration

WebLOAD lets you automate performance testing and smoothly incorporate it into your Continuous Delivery and Continuous Integration (CI) processes for faster and more efficient software deployment.

Developers, QA groups and DevOps personnel can collaborate and:

- **Orchestrate automatic tests** against every build in the pipeline, using WebLOAD’s Jenkins™ plugin. Unlike functional testing, performance testing success/failure is not always clear cut. With WebLOAD, you can define success/failures criteria based on many factors such as failure of the entire session, errors and warning, validations, performance measurements, etc. This provides the flexibility to adjust and determine how changes in performance will affect the next step in your continuous delivery pipeline.

- **Share performance data and track root cause** via the web dashboard and WebLOAD’s built-in integration with APM tools such as AppDynamics and Dynatrace.

- **Manage test data** in a Git shared repository together with software versions.

Supported Technologies

WebLOAD supports a wide range of web technologies, servers, protocols, operating systems, databases and enterprise software systems. For an up-to-date list please refer to the Supported Technologies web page.