Testing Web 2.0 applications with HP Functional Testing software

Develop toolkit support sets faster with the HP Extensibility Accelerator for Functional Testing

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Executive summary

The advent of Web 2.0 applications has created unprecedented challenges for organizations that focus on automated functional testing. At HP, we are working to address these challenges by enhancing our HP Functional Testing software suite, a package that includes HP Quick Test Professional software and various add-ins that support different technologies. In particular, we are working to provide better out-of-the-box Web 2.0 test capabilities for HP QuickTest Professional software and to make it easier for users to extend the software’s capabilities to support new Web 2.0 toolkits that are not supported out of the box.

Web extensibility in the HP Functional Testing package is enabled via HP QuickTest Professional Web Add-in Extensibility. This extensibility capability enables you to provide high-level support for third-party and custom web controls that are not supported out of the box by the HP QuickTest Professional Web Add-in.

Extensibility is further enhanced and accelerated with the new HP Extensibility Accelerator for Functional Testing software, which provides an environment that speeds the development of Web Add-in Extensibility toolkit support sets that are not supported out of the box. HP Extensibility Accelerator for Functional Testing is a separate utility that can be used on a machine with or without an installed copy of HP Functional Testing.

By providing a dedicated utility to accelerate support for Web 2.0 controls, HP is demonstrating its commitment to leadership in the testing of Web 2.0 applications.

Web 2.0 brings new technologies and new testing challenges.

The rapid adoption of Rich Internet Application (RIA) technologies and Web 2.0 innovations has significant implications for both web users and the teams involved in the functional testing of web-enabled applications.

Viewed from an end-user perspective, Web 2.0 technologies deliver a richer, faster user experience by enabling web pages to be updated in a dynamic, asynchronous manner. Portions of web pages can now be refreshed automatically to give users updates on sports scores, stock quotes, and the current activities of people they connect with via social networking sites. One application can now be a mash-up of several applications to deliver an enriched user experience.

In a Web 2.0 world, users have more control than ever before. Via sites such as iGoogle, users can now create their own home pages that bring together information and content from across the web, including stock quotes, local weather forecasts, headlines from prominent news outlets, and videos from YouTube. This is all great from a user perspective, but troublesome from a functional test standpoint.

For functional test teams, Web 2.0 technologies create unprecedented challenges. Web 2.0-enabled applications can leverage various technologies on the client side and through web browsers. With Web 2.0, the client side of the application processes more scripted code and rich presentation frameworks than in traditional environments. This shift of processing to the client side challenges the capabilities of all toolsets designed for the functional testing of web-enabled applications.

These functional testing tools must now be able to test diverse toolkits, such as those that leverage Adobe® Flex/Flash, Microsoft® Silverlight™, and the wide range of Ajax offerings, including Dojo Toolkit, Yahoo! User Interface (YUI), ASP.NET AJAX, and Google® Web Toolkit (GWT)—each of which has different web controls with different behaviors. While they do not change most of the underlying web infrastructure, these new technologies create a whole new set of challenges and risks for engineers responsible for functional testing.
For example, today’s currently available testing products don’t automatically identify all Web 2.0 controls—it would be all but impossible to identify all the available Web 2.0 controls, which are growing every day. Other examples of testing challenges include the dynamic nature of data in a Web 2.0 environment and the sharing of data between applications, all of which complicates testing.

In short, with the arrival of Ajax, Flex/Flash, Silverlight, and other RIA technologies and frameworks, testing enters a new, more challenging realm. HP has taken a leadership role in addressing these challenges, in terms of both functional testing—the subject of this paper—and performance testing.

How HP helps you address your Web 2.0 functional test challenges

At HP, we recognized long ago that our customers would need advanced tools to test Web 2.0 technologies with HP Functional Testing. We worked to respond to this need through both tactical and strategic approaches.

Providing out-of-the-box technology support

From a tactical perspective, we include out-of-the-box support for targeted technologies and very commonly used toolkits. Today, HP Functional Testing ships with support for a growing range of toolkits that enable Web 2.0 technologies, including Microsoft Silverlight and the most commonly used Ajax toolkits—Google Web Toolkit (GWT), Yahoo! User Interface (YUI), ASP.NET AJAX, and the Dojo Toolkit.

Supporting Web 2.0 extensibility

From a strategic perspective, we designed our open software architecture to allow our users and partners to create their own extensibility assets to extend HP QuickTest Professional to support technologies and toolkits that are not supported out of the box, including homegrown toolkits and customized controls, Web 2.0 or otherwise. We enable these efforts with the HP Extensibility Accelerator for Functional Testing.

The HP Extensibility Accelerator builds on our strategic approach by providing tools that enable faster, easier extensibility. In a time when there are hundreds of toolkits available for Web 2.0 technologies and frameworks, and additional ones coming online each month, the HP Extensibility Accelerator represents an important step forward for organizations using HP QuickTest Professional. Let’s take a closer look at the capabilities of these Web 2.0 extensibility tools.
The HP Functional Testing Web Add-in provides built-in support for a number of commonly used web controls. You can use the HP Functional Testing Web Add-in Extensibility capability to extend that support and enable HP QuickTest Professional to recognize additional web controls. For example, this extensibility capability enables you to provide high-level support for third-party and custom web controls that are not supported out of the box by the Web Add-in.

When HP QuickTest Professional learns an object in an application, it recognizes the object as belonging to a specific test object class. This determines the identification properties and test object operations of the test object that represent the application's object in HP QuickTest Professional.

When HP QuickTest Professional learns the controls on a web page without extensibility, it ignores certain types of elements and does not create test objects to represent the controls they define.

For other web controls that are not supported out of the box by the existing Web Add-in, HP QuickTest Professional creates a generic WebElement test object. This type of test object might not have certain characteristics that are specific to the web control you are testing. Therefore, when you try to create test steps with this test object, the available identification properties and test object operations might not be sufficient.

For example, consider a custom web control that is a special type of table that HP QuickTest Professional recognizes as a plain WebElement. WebElement test objects do not support GetCellData operations. To create a test step that retrieves the data from a cell in the table, you would need to create test objects to represent each cell in the table, and create a complex test that accesses the relevant cell's test object to retrieve the data.

By creating support for a web control using the Web Add-in Extensibility capability, you can direct HP QuickTest Professional to recognize the control as belonging to a specific test object class, and you can specify the behavior of the test object. You can also extend the list of available test object classes that HP QuickTest Professional is able to recognize. This enables you to create tests that fully support the specific behavior of your custom web controls.

Once you have developed a custom toolkit support set, you can deploy it throughout your HP QuickTest Professional environment. To do so, you simply place all of the files you created in the correct locations on a computer with HP QuickTest Professional installed, enabling the application to recognize the controls in the toolkit and run tests on them.

HP Extensibility Accelerator for Functional Testing

HP Extensibility Accelerator for Functional Testing builds on the Web Add-in Extensibility capabilities. It provides a development environment designed to facilitate and accelerate the development of Web Add-in Extensibility toolkit support sets. This environment enables you to create extensibility more easily and with fewer technical capabilities.

The HP Extensibility Accelerator provides a user interface that helps you define new test object classes, map those test object classes to the controls in your application, and instruct HP QuickTest Professional in how to identify the controls, perform operations on the controls, and retrieve their properties.

The HP Extensibility Accelerator integrated development environment (IDE) automatically creates the required extensibility XML files. By making it faster and easier to create the files you need, the HP Extensibility Accelerator allows you to focus your main efforts on the development of the JavaScript™ functions that will enable HP QuickTest Professional to work with your custom web controls.
HP Extensibility Accelerator also offers simplified deployment capabilities. You can create a toolkit on a machine without HP QuickTest Professional and then automatically deploy your new toolkit support set on a system that has HP QuickTest Professional installed. Or you can package your toolkit in a manner that allows you to share it with other HP QuickTest Professional users.

In the following section, we will take a closer look at the key capabilities of the HP Extensibility Accelerator.

**Key capabilities in HP Extensibility Accelerator for Functional Testing**

HP Extensibility Accelerator helps you with the following key steps in the process of creating support for a custom toolkit for HP QuickTest Professional. The toolkit support set includes XML configuration files and JavaScript functions.

**Planning how you want HP QuickTest Professional to operate on your controls**

This is a preliminary stage that you perform by using HP QuickTest Professional on your application and determining what aspects of the software’s behavior you would like to customize.

**Creating and defining the test object classes, operations, properties, and settings**

The HP Extensibility Accelerator IDE simplifies the process of creating and editing the XML files required for a toolkit support set. This is accomplished by providing designers in which you specify the relevant information. This enables you to invest your main efforts in the development of the JavaScript functions.

The HP Extensibility Accelerator IDE also takes care of other time-consuming work. It maps the test object class to your control and application, and it automatically identifies the rules that will teach HP QuickTest Professional how to recognize the test object class in your application.

**Writing and debugging JavaScript implementation functions**

The JavaScript functions that you write as part of the toolkit support set enable HP QuickTest Professional to work with your custom web controls. The HP Extensibility Accelerator creates the necessary JavaScript files and adds stubs for the functions you must implement. In addition, the HP Extensibility Accelerator provides JavaScript editing capabilities and debugging tools to facilitate the writing of these functions.

**Deploying the toolkit support so it can be used with HP QuickTest Professional**

The HP Extensibility Accelerator deployment capabilities enable you to automatically deploy your new toolkit support set to HP QuickTest Professional or to package it so you can share it with other HP QuickTest Professional users.
Figure 1: HP Extensibility Accelerator

The wizard-like graphical HP Extensibility Accelerator utility defines, edits, and deploys extensibility assets faster than ever before.

Accelerating success with HP Functional Testing

With the HP Extensibility Accelerator for Functional Testing, we’re making it easy for our users and partners to create their own extensibility assets and extend our software to support web controls that are not supported out of the box. With the hundreds of Ajax toolkits in use today and new ones coming out each month, the HP Extensibility Accelerator provides an extremely important set of tools for your organization.

The software itself can be installed and used on a machine that does not have HP QuickTest Professional on it. Custom toolkits developed with the software can then be deployed on one or more systems that are running HP QuickTest Professional. What’s more, since the HP Extensibility Accelerator is a separate stand-alone utility, HP encourages the online community to develop and share extensibility assets that are needed and constantly evolving.

Ultimately, by providing a dedicated utility to accelerate support for Web 2.0 controls, HP is demonstrating its commitment to leadership in the testing of Web 2.0 applications.
For more information

To learn more about our offerings for testing Web 2.0 applications with HP Functional Testing software, visit any of these sites:
HP software: www.hp.com/go/functionaltesting
Software download link: www.hp.com/go/TestWeb2