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# Using Silverlight in SharePoint

*A White Paper for Business Users*

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## Introduction

The past several years have demonstrated that the demand for new web application functionality has out-paced development platforms offered by most major vendors. In 2009, two of the greatest areas of demand involve enterprise collaboration and the need to expose enterprise data for heavy analysis and manipulation.

While recent desktop operating systems have made strong gains in graphics quality and processing capability, web browser innovations have been comparatively limited over the past decade. This is largely tied to the fact that current browsers are based on a programming model that was originally intended for static, read-only content. Many HTML-based web sites can offer read-only data in a series of flat grids and simple forms, but fail to allow for more advanced interactivity.

On the collaboration front, many products address only limited sets of features such as document management, web content management, or workflow. The need to integrate these features across an enterprise has touched off a frenzy of Service Oriented Architecture (SOA) initiatives. Many of these integration projects have proved costly or cumbersome.

This paper discusses two new technologies that help address both of the need for an integrated enterprise collaboration platform, as well as a platform for building interactive user interface features that make effective use of the data collected in the enterprise system.

## Two New Technologies Ignite the Market

### Silverlight

Since the debut of modern browsers in the mid 1990s, the demand for dynamic web content has been addressed by several technologies built upon the original "static-based" HTML stack. Some of these include DHTML and AJAX. Although these have somewhat helped bridge the gap between traditional browser and desktop applications, they have proved costly to implement, and final solutions often fall short in overall usability.

During the past few years, the concept of the "Rich Internet Application" or RIA has emerged. The RIA is based on new technologies that have been developed from the ground-up to take advantage of the graphical capabilities of modern operating systems and address the needs of dynamic, highly-interactive user interfaces. In October 2008, Microsoft released Silverlight 2, which is their latest development platform to enable Rich Internet Applications. Microsoft has aggressively pushed Silverlight 2 out into the marketplace with a goal to make it pervasive on the desktop OS in 2009.

### SharePoint

In 2007 Microsoft released the latest version of SharePoint. SharePoint 2007 integrates document management, content management, workflow, and data analysis under a unified, consistent and affordable platform.

SharePoint 2007 has been a great success in the marketplace due to the wide array of enterprise collaboration features, low cost, and tight integration with other popular Microsoft products. Other recent versions of Microsoft server products such as Project Server, Team Foundation Server, Groove, and PerformancePoint have all been built on the SharePoint 2007 platform.

## **Where Does Silverlight Fit Into SharePoint?**

SharePoint 2007 offers users an unparalleled feature set to collaborate, analyze, and interact with data on the Microsoft platform. SharePoint 2007 is also designed and built on the .NET 2.0 platform and integrates seamlessly with subsequent versions of .NET. Therefore, Silverlight is a natural extension to offer RIA functionality from within SharePoint.

Since SharePoint developers are already using the .NET platform to develop custom SharePoint components, they can apply their existing skill sets and work with familiar tools when creating Silverlight components for SharePoint applications.

SharePoint user interface screens are constructed from a series of reusable web controls called "web parts". Again, this model works well for Silverlight since it is often used for only a small section of a particular web page rather than for an entire web application.

## **Using Silverlight as a Line-of-Business Tool**

Unlike some previous technologies that have attempted to provide dynamic or interactive content, Silverlight offers solid support for true line-of-business applications.

Silverlight 2 includes several built-in controls to support viewing and editing data. Tight integration with web services and LINQ allow robust end-to-end communication and manipulation of hierarchical business data. When hosted in SharePoint, Silverlight applications can take advantage of built-in security and SOA web-services offered by the SharePoint platform to enable robust access to the collaboration data available in the portal.

## **Using Silverlight for Internet and Business-To-Consumer Sites**

When using Silverlight and SharePoint for internet and consumer-facing web sites, there are some distinct advantages and disadvantages that should be carefully considered.

On the positive side, Silverlight is fully supported on both the Windows and OS X operation systems. Silverlight is also supported by the most popular web browsers, including Internet Explorer, FireFox, and Safari.

Silverlight, however, is a relatively new technology and requires a distinct plug-in download to load Silverlight controls. Many users may become frustrated if they receive "download" pop-ups to direct them to install a new piece of software just to visit a particular web site. This may deter some users from visiting a site until Silverlight becomes pervasive in the marketplace.

In addition, content contained in Silverlight files is not automatically indexed by popular search engines. Although some workarounds can be applied to address indexing, public facing sites may not automatically be listed in search results.

Both cases above should be carefully considered before using Silverlight on a public-facing web site. In the case of a missing browser plug-in, Silverlight offers a built-in hook to display content when a Silverlight control cannot be rendered. For the Search Engine Optimization, a work-around can be applied which will download some additional HTML into pages that use Silverlight controls.

## **Business Benefits from Using a Silverlight Solution in SharePoint**

Silverlight offers business value in three key areas.

- Allows for new user interface features that make applications more distinct and efficient
- Reduces the time-to-market for highly interactive web applications
- Allows for easy incorporation of software development patterns, which reduces maintenance and total cost of ownership

## **Working with Data in Rich Internet Applications**

Since Silverlight was built to specifically address dynamic content and complex user interfaces, it allows for new features and data usage paradigms that were not practical with AJAX or DHTML.

In the past, some platforms have attempted to use AJAX to bridge the gap between static HTML application pages and functionality offered by richer desktop applications. Although AJAX has and continues to prove useful in some applications, there are still significant limitations to how data is presented to the user and how application state is managed. Development is generally limited to the standard controls supported by HTML, and layouts and themes are limited to how well the browser natively supports drawing those controls to the screen.

The Silverlight runtime loads and runs .NET assemblies inside of a web browser. Unlike traditional HTML-based applications, Silverlight applications inherently have strong support for client-side state and complex client-side operations. In addition, the Silverlight runtime features a powerful rendering engine that allows coders and designers to easily create animations, effects, and other UI paradigms that would be nearly impossible to create with traditional HTML/Javascript approaches.

Silverlight offers the ability to display data in more than just simple static grids and forms in a cost effective manner. Novel, clean, and efficient presentation of data can enable new features that make applications more relevant in the marketplace.

## **Easing Time-to-Market, Lowering Up-Front Costs, and Maintaining the Investment**

Silverlight is built on the popular .NET platform, and integrates with existing Microsoft development tools. Due to this tight integration Silverlight can allow for web applications to be developed much more quickly than comparable applications built using AJAX controls and frameworks.

Developers can work directly within the Visual Studio IDE and debugger when writing code, and they can work with languages and tools with which they are already familiar.

In addition, the Silverlight rendering engine can now render fillet corners, gradients, circles, etc. without the need for separate graphic files like .jpg, .png, etc. that would be provided by a designer.

The Expression Blend tool allows designers to collaborate with developers using the same file structure and source control system.

Since code can be written using fully object oriented .NET languages, Silverlight applications can be written using clean, modern design patterns. This allows developers to build components that are reusable and maintainable.

## Some Technical Approaches

### Getting SharePoint to Host Silverlight

With the business benefits illustrated above, the question remains of how to take advantage of Silverlight within SharePoint applications and features? With a few simple configuration changes and some straightforward code customization, SharePoint can host any Silverlight 2 application.

Since SharePoint is built on the ASP.NET 2.0 stack, it includes most of the functionality required to host a Silverlight application. However, the SharePoint web servers should also be configured to load .NET 3.5 and ASP.NET Silverlight components.

Using a custom web part, SharePoint can be quickly configured to host any Silverlight application. This web part can be pointed to a Silverlight application file that has been uploaded to a SharePoint document library.

Since the Silverlight application is essentially a SharePoint document, it can be versioned and redeployed by just uploading a new file to the SharePoint portal. The diagram below depicts an approach that can be used to host a Silverlight application in SharePoint.

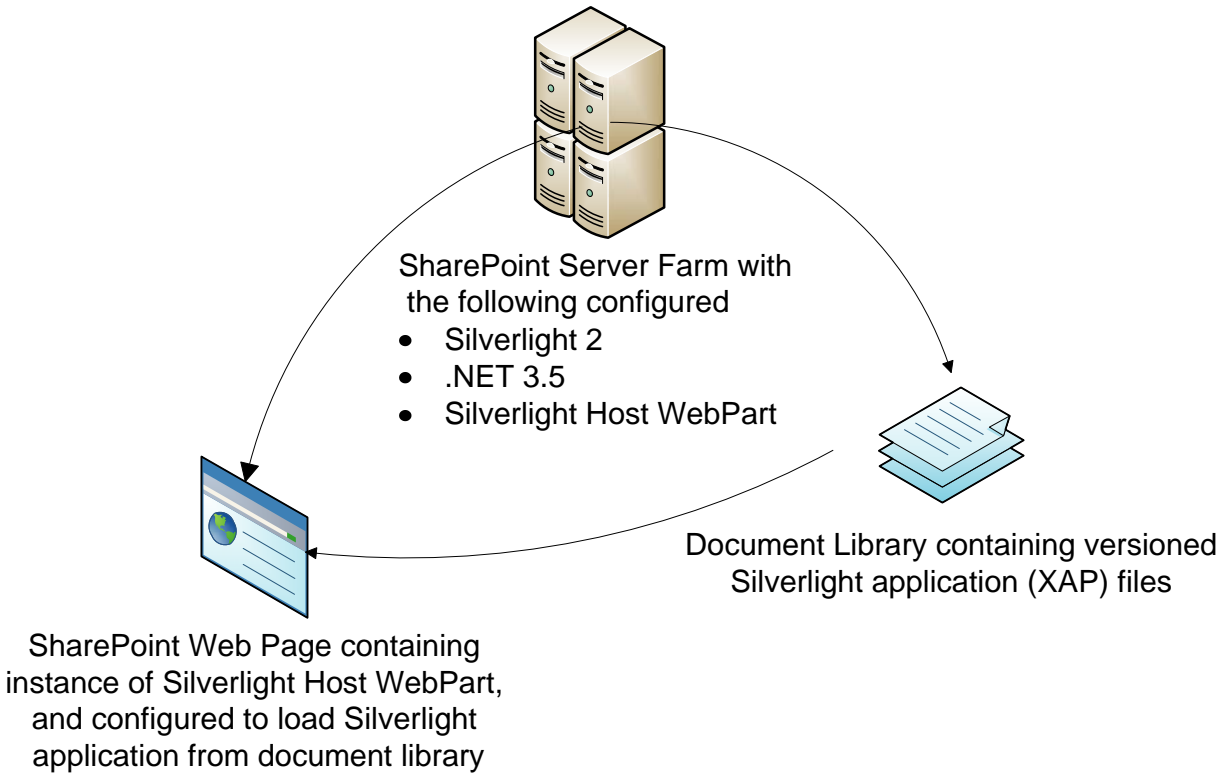


Figure 1: Using WebParts and Document Libraries to host Silverlight Applications in SharePoint

## Solving the Web Service Problem

Silverlight runs client-side only, so all communication with the SharePoint farm needs to be performed with web services.

When beginning a Silverlight implementation for SharePoint, the development team should be aware that they will not be able to use the rich SharePoint server-side object model directly from Silverlight, since Silverlight runs on the client machine.

Given this, an early decision should be made about how data will be passed from the SharePoint farm to the Silverlight clients. Two possibilities are:

- Use the out-of-the box web services offered by SharePoint
- Write custom web services that use the SharePoint object model on the server farm, but offer custom types in the web service interfaces.

Both of these approaches have advantages and drawbacks. The out-of-the-box SharePoint web services require no custom server-side coding or deployment, but they do require the developer to become familiar with the XML mark-up language CAML. The SharePoint web services also primarily return XML nodes, so the developer will be working heavily with the LINQ to XML libraries on the Silverlight client.

The custom web services allow for direct manipulation of the SharePoint object model on the server and for custom types to be passed through the services interfaces. However, these web services must be developed and deployed by hand, which may add complexity and development time to the project.

### **Security Concerns and Sites with Anonymous Access**

Silverlight 2 does not have support for setting Windows or Basic authentication credentials when making web service calls. In many cases this will not be an issue for SharePoint hosting, since the user is already authenticated against the SharePoint portal, and existing credentials will be passed along with HTTP requests using cookies or headers.

However, in the case of anonymous access or impersonation Silverlight leaves no options to provide a Windows or Basic authentication token that is required by the out-of-the-box SharePoint web services. In both of these cases, custom web services will need to be developed and deployed.

### **Summary**

Businesses that are able to make effective use of collaboration tools and empower their employees with data can remain at a competitive advantage even as the economy slows. Microsoft's foray into the enterprise web application space has now been seriously strengthened by the release and market acceptance of SharePoint 2007 and its surrounding suite of integrated products, including Project Server, Team Foundation Server, PerformancePoint, and Groove. Silverlight now offers a cost-effective option for businesses that are planning to offer cutting-edge user interfaces against their Microsoft-based enterprise platform. Silverlight builds upon the strong base of SharePoint 2007 and other enterprise server products from Microsoft to offer highly-interactive user interface features required by businesses that strive to gain a competitive advantage in the marketplace.

About Risetime:

Since 1984, Risetime has been serving the needs of organizations looking for a strong partner to provide business and technology solutions and services. Headquartered in Chicago and a Microsoft Gold Certified Partner, Risetime focuses on providing a wide range of IT consulting services as well as business process management, content management, and web solutions.

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