



SharePoint Impact Analysis

AgilePoint BPMS v5.0 R2

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Preface

Disclaimer of Warranty

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Use, duplication or disclosure by the U.S. Government is subject to restrictions set forth in the applicable license agreement and as provided in DFARS 227.7202-1(a) and 227.7202-3(a) (1995), DFARS 252.227-7013(c)(1)(ii) (Oct 1988), FAR 12.212(a) (1995), FAR 52.227-19, or FAR 52.227-14, as applicable.

Virus-free software policy

AgilePoint recognizes that viruses are a significant security consideration for our customers. To date, we have had no report of AgilePoint BPMS carries any virus. AgilePoint takes the following measures to ensure our software is free of viruses upon delivery:

- AgilePoint is built on top of Microsoft .NET framework. The pre-compiled executable is a .NET Common Language Runtime (CLR) application, not a native machine binary. As far as is known at this time, there are no viruses that infect .NET CLR executables.
- The virtual environment for the product packaging process is fully isolated and protected, and anti-virus software is installed and running during packaging.
- The deliverable package is scanned by anti-virus software before upload to our customer download site.

Document Revision Numbers

AgilePoint documentation uses the revision number format **rX.Y.Z**. The letters and numbers in this revision number can be interpreted as follows:

- **r** - Indicates "revision." This helps to differentiate the document *version* numbers, which start with **v**.
- **X** - The major version number for AgilePoint BPMS to which this document refers. For example, AgilePoint releases 5.0, 5.0 SP1, and 5.5 would all have an **X** value of **5**.
- **Y** - The major document revision number. This number typically changes only when either there is a new AgilePoint release, or there are major changes to the document.
- **Z** - The minor document revision number. This number is incremented each time the document is republished.

AgilePoint Documentation in PDF and HTML

AgilePoint documentation is provided in both print-friendly (PDF) and web-based (HTML) formats.

Advantages of HTML Documentation

- HTML is the **primary delivery format** for AgilePoint documentation.
- Unified, global **search** across all documentation. PDF documents allow you to search only within the context of a given PDF file.
- **All hyperlinks supported**. Links in PDFs are only supported in certain contexts.
- "One-stop shopping" for all information related to AgilePoint BPMS.
- The HTML documentation is updated more frequently than the PDF documentation. Web-based documentation is updated periodically between AgilePoint releases to address errors and omissions, but the PDF documentation is updated only at the time of a software release.

Advantages of PDF Documentation

PDFs can be more easily **printed**, **archived**, and **transferred** (such as by FTP or email) than HTML documentation.

For more information, see [Downloading Files and Sharing Links from the Documentation Library](#) in the [Documentation Library](#).

Opening the Documentation Library

To open the AgilePoint Documentation Library, do the following.

Prerequisites

You must have a valid account on the AgilePoint Support Portal.

Instructions

1. Log on to the AgilePoint Support Portal.
2. Click **Documentation**.
3. On the **Documentation** page, click the documentation library for your AgilePoint release.
 - For AgilePoint BPMS v5.0 SP1 and higher, the web-based documentation library opens in a new tab or window in your web browser.

- For releases prior to v5.0 SP1, a download starts for a Zip file with the PDF documentation for your release.

Finding Information in the Documentation Library

The information in this topic will help you to locate information in the AgilePoint Documentation Library.

Using the Table of Contents

The table of contents in the AgilePoint Documentation Library is divided by content areas. For example, the Installation section includes all the information you need to install AgilePoint BPMS. The AgilePoint API section includes information about the AgilePoint APIs.

You can use the Table of Contents to explore the AgilePoint documentation content and find the information you want.

Searching

The web-based documentation includes a centralized search for all documentation content. To search for information:

1. In the AgilePoint Documentation Library, click the **Search** tab. In the Search box, enter **1 search team**, and click **Search**.

The search results display in alphabetical order by topic title.

It is important to understand that the third-party software AgilePoint uses to generate web-based documentation allows only 1 search term. More than 1 search term will cause the search to fail.

AgilePoint recommends using a relatively unique search term to find the information you need. For example, entering a common term, such as "process," will return a high percentage of the total documentation topics in the search results.

2. Browse the list of topic titles to find the information you want.

Printing

The PDF documentation is provided mainly for the purpose of printing and archiving. To print a set of information:

1. Navigate to the main page of the Documentation Library from which you want to print.
2. In the list of documents, click the document name in the **PDF** column.
3. From your PDF reader software, print the portion of the document you want.

Downloading Files and Sharing Links from the Documentation Library

You can download and share files AgilePoint's documentation library as you would in any other web page. Note that if you send links to recipients, they must have a Support Portal login to view the file.

These procedures are common examples based on Internet Explorer with the Adobe Reader plug-in. Exact procedures may vary depending on your web browser, PDF viewer, and email client configuration.

Share a Link to an HTML Topic

1. Navigate to the topic you want to share.
2. Copy the URL in the Location box in your web browser.
3. Paste the URL in an email, IM client, etc.

Share a Link to a PDF Document

1. In Internet Explorer, navigate to the Documentation Library home page.
2. In the **PDF** column, right-click the name of the PDF file you want to share.
3. In the quick menu, click **Copy shortcut**.
4. Paste the URL in an email, IM client, etc.

Save a Copy of a PDF Document

1. In Internet Explorer, [open the Documentation Library home page](#).
2. In the **PDF** column, click the name of the PDF file you want to share.
3. In the Adobe Reader plug-in, click **Save** button.

Contacting AgilePoint Sales

AgilePoint is a leading Business Process Management System (BPMS) provider created by a team of driven people who strive to incorporate the principles of relentless innovation for the benefit of our customers. Our mission is to help companies of any size attain and sustain operational success through process excellence.

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International: For AgilePoint EMEA and AgilePoint Asia Pacific, please call the AgilePoint Corporate Office for contact information.

Contacting Customer Support

To contact AgilePoint Support, please submit a ticket on the AgilePoint Support Portal: <http://support.agilepoint.com/SupportPortal/>

If you do not have a Support Portal account, you can send an email to request one: support@agilepoint.com

SharePoint Impact Analysis

The purpose of this document is to help businesses conduct a Systems Impact Analysis for SharePoint after installing the AgilePoint Integration. This document provides guidance on how to make an assessment of the impact the AgilePoint Integration has on SharePoint performance.

Primary Objective

The primary objective of the AgilePoint Integration for SharePoint Impact Analysis is to provide stakeholders with information that supports an acceptable level of SharePoint performance given the AgilePoint Integration installed a SharePoint Server.

Scope

The scope of the performance testing is to determine the following:

- **Document Library File Upload Impact** - Average document upload times in seconds to upload a document to a SharePoint Document Library with and without AgilePoint, given a common file size.
- **Web Part Impact** - Page load times where a SharePoint List Web Part and the AgilePoint Task List Web Part are compared, given a similar amount of items present in the Web Part. For the AgilePoint Task List Web Part test, a number of running AgilePoint processes on the AgilePoint Server have been added to further present the impact based on load.
- **List Item Creation Impact** - Average list item upload times in seconds to create new list items in a SharePoint List with and without AgilePoint-enablement.

Test Environment

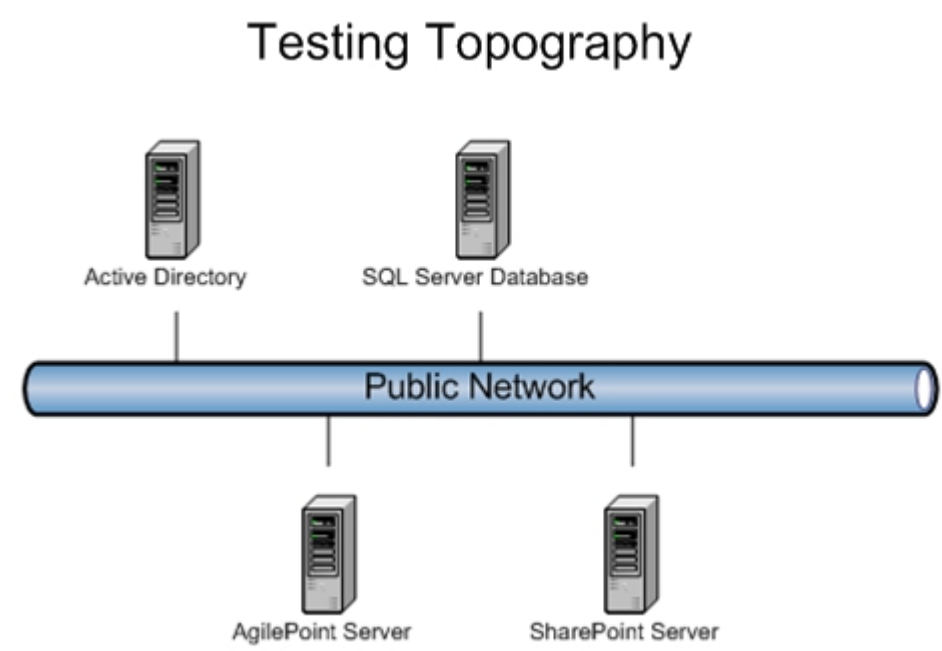
The following hardware and software specifications were used to test the application. The hardware and software specifications are representative of a typical Enterprise deployment.

4 Dell Servers:

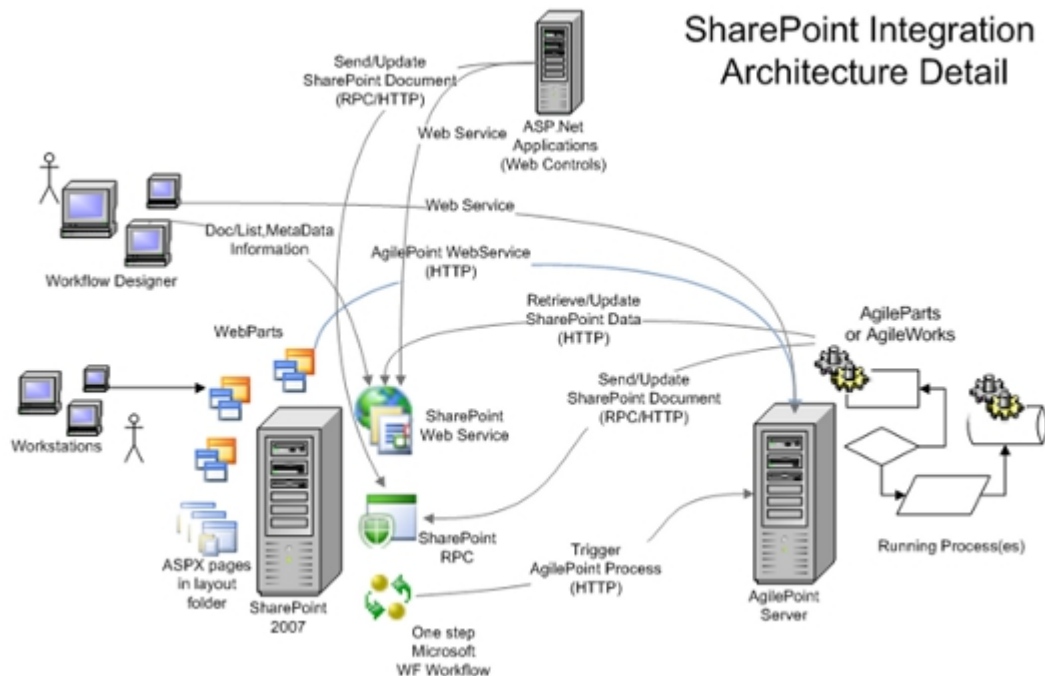
- Active Directory Server (2 CPUs with 4G RAM)
Software Installed: Windows Server 2003 Enterprise Edition R2 SP2
- MOSS 2007 (4 CPUs with 4G RAM)
Software Installed: MOSS 2007, AgilePoint SharePoint Integration v2, .NET 3.5 SP1
- AgilePoint Server (2CPUs with 3G RAM)
Software Installed: Windows Server 2003 Enterprise Edition R2 SP2, .NET 3.5 SP1, AgilePoint Server v4.6
- Database Server (4CPUs with 4G RAM)
Software Installed: Windows Server 2003 Enterprise Edition R2 SP2, SQL Server 2005 Enterprise Edition

Network Speed

Ethernet 1 Gb per second



Integration Architecture



Integration Components Defined

AgilePoint Server

AgilePoint Server is the Microsoft .NET based AgilePoint BPMS Suite component that hosts the AgilePoint Workflow Engine on the workflow server. The AgilePoint Server Process Engine is capable of directly executing the XML composite process models produced by AgilePoint Envision. It is composed of an ASP.NET Web application (containing several Web services), as well as some utility applications.

SharePoint 2007

This is a document management and collaboration system where the AgilePoint Integration is installed. SharePoint provides the main end-user interface for which end-users check their task list and perform work in the context of an AgilePoint process. Enterprises are using SharePoint for the native collaboration, portals, and content management, enhanced with the model-driven AgilePoint BPMS integration extension to realize an all inclusive, modern BPMS platform. The AgilePoint Integration lets you bind dynamic workflow solutions to almost any SharePoint entity such as:

- Sites
- Lists Items
- Document and Form Libraries
- Content Types

ASP.NET Applications

The ASP.NET applications can also access the SharePoint interface via RPC and Web services.

Workflow Designer

AgilePoint Envision is the process modeling component of the AgilePoint BPMS Suite that is used to build and deploy business process models to AgilePoint Server. AgilePoint Envision transforms Visio into a full lifecycle BPM productivity tool for the modeling, simulation, deployment, analysis, and improvement of process models in an environment with which most business users are already familiar.

Workstations

Application users can use their workstation Internet browsers to access SharePoint and perform their work and access other AgilePoint Integration features.

Impact Analysis on SharePoint Document Libraries

The following impact analysis results are based on activities performed in conjunction with uploading documents to a SharePoint Document Library.

Objective

The objective of this test case is to measure the impact on the time taken to upload files to a SharePoint document Library as compared to an AgilePoint-enabled SharePoint Document Library.

Volume Testing

Test Criterion

- Load per day is the number of list items that could be created per day (24 hrs).
- The results are based on a test conducted for one hour creating a proportional number of list items.
For example in the first test, for a 5K load, the results are based on one hour and ~200 list items.
Time will be measured for creating each list item and the average is calculated.
- This test has been conducted with a file size of 5KB and 1MB.

Test Method

AgilePoint has developed a tool called "SharePoint Testing Tool" to upload documents to SharePoint Document Libraries in batch and calculates the time taken to upload the files. The test compares the time taken to upload documents to a SharePoint Document Library as compared to an AgilePoint-enabled SharePoint Document Library.

Files have been uploaded to SharePoint using RPC.

Acceptable Performance

An overhead of up to 0.1 seconds per file is an acceptable time for a load up to 100K documents.

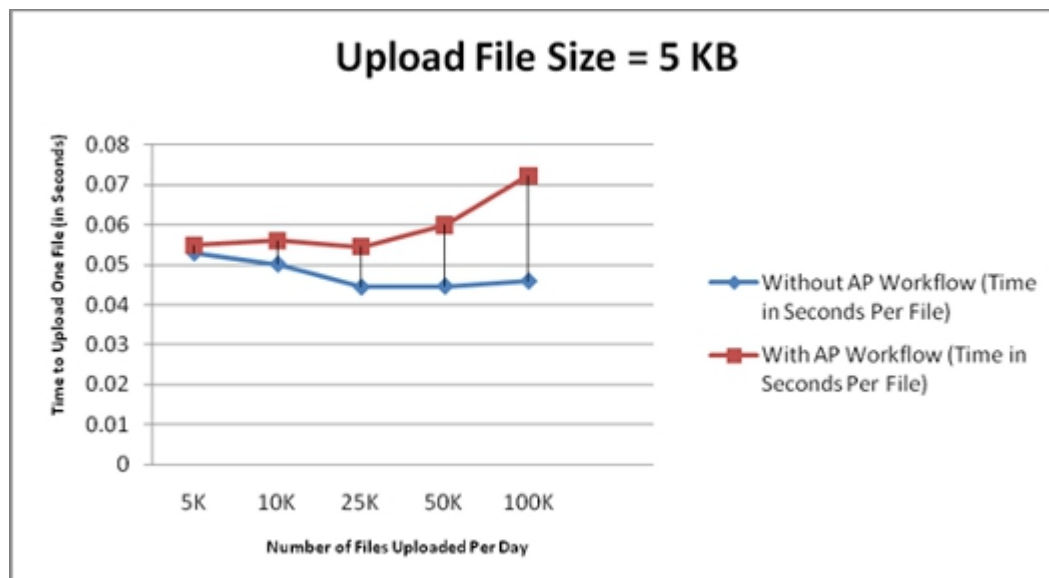
Results

* Size of file uploaded=5K

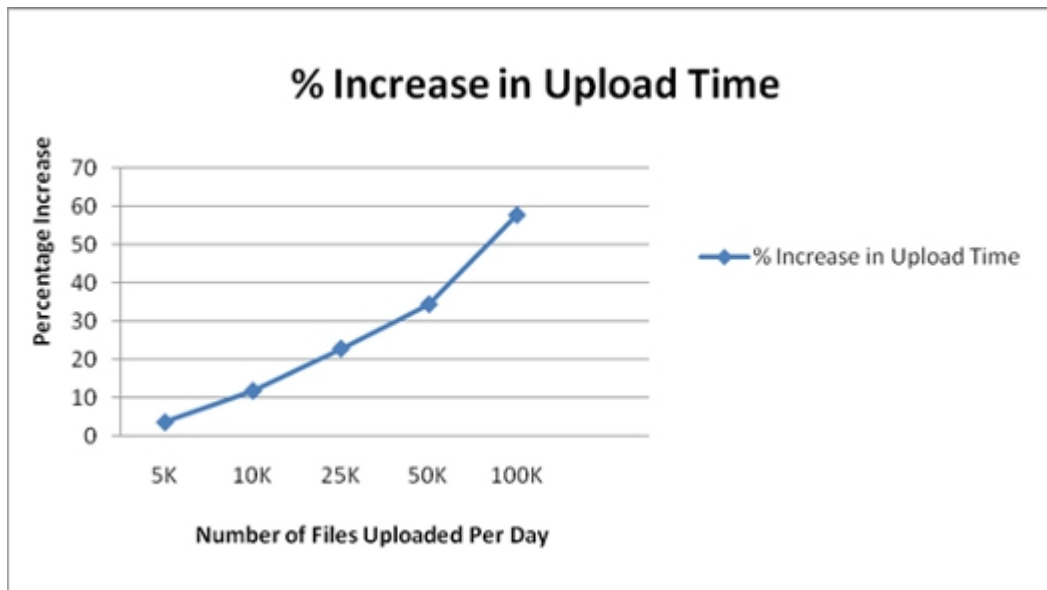
Duration of test is a sample over one hour

Load Per Day (Files Uploaded Per Day)	Average Upload Times Per File Without AP (In Seconds)	Average Upload Times Per File With AP (In Seconds)
5K	0.0529	0.05484
10K	0.0501	0.0560
25K	0.0443	0.0545
50K	0.0446	0.0599
100K	0.0458	0.0723

The following graph shows a comparison of the variation in the average upload times for a 5KB file to an AgilePoint-enabled SharePoint Document Library versus a SharePoint Document Library as the load increases.



The following graph shows that the percentage overhead for uploading a 1KB file within an AgilePoint-enabled SharePoint Document Library varies as the load increases.

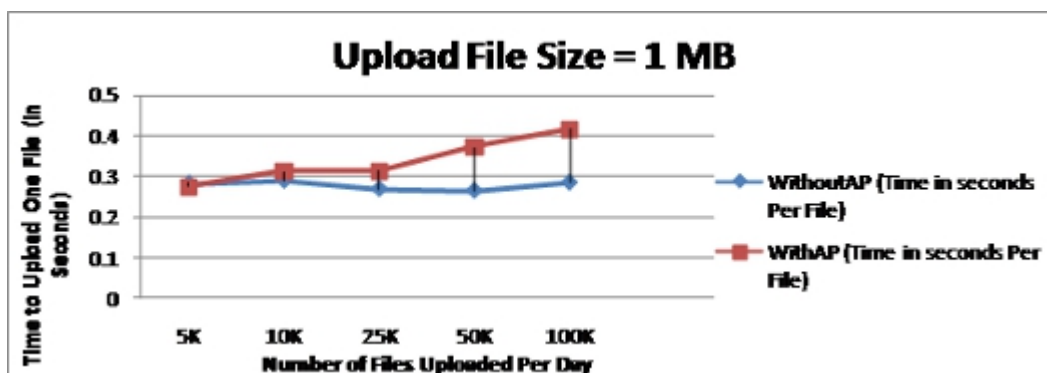


* Size of file uploaded = 1M

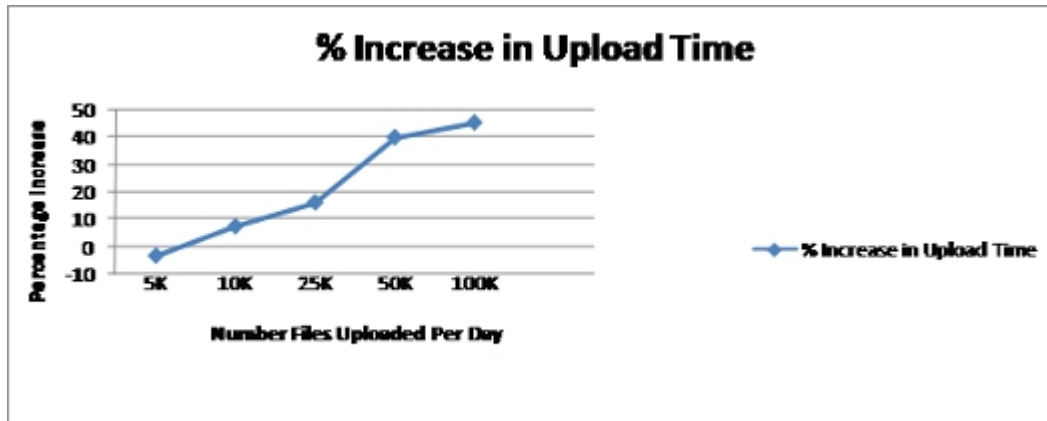
* Duration of test is a sample over one hour

Load Per Day (Files Uploaded Per Day)	Average Upload Times Per File Without AP (in seconds)	Average Upload Times Per File With AP (in seconds)
5K	0.2829	0.2735
10K	0.2898	0.3115
25K	0.2690	0.3127
50K	0.2646	0.3709
100K	0.2852	0.4152

The following graph shows the comparison of the variation in the average upload time for a 1MB file to an AgilePoint-enabled SharePoint Document library versus SharePoint Document Library as the load increases.



The following graph shows how the percentage overhead varies for uploading 1MB files to an AgilePoint-enabled SharePoint Document Library as the load increases.



Conclusion

An AgilePoint-enabled SharePoint Document Library provides optimum performance up to a load of 50K files per day. In absolute terms, the difference is very insignificant (i.e., 0.1 seconds up to 100K load).

Load Testing

Test Criterion

- Test was conducted with varying number of concurrent users. [15, 50, 100, and 15]
- The results are based on a test conducted for 2 minutes uploading documents of file size 100 KB.

Test Method

Microsoft Visual Studio Team Suite, Test Edition was used to conduct these tests. Web Test was created for a single unit [i.e., single file upload] and it was executed as part of a Load Test with varying concurrent users.

Acceptable Performance

An overhead of up to 0.1 seconds per list item is acceptable up to a load of 100K list items.

Results

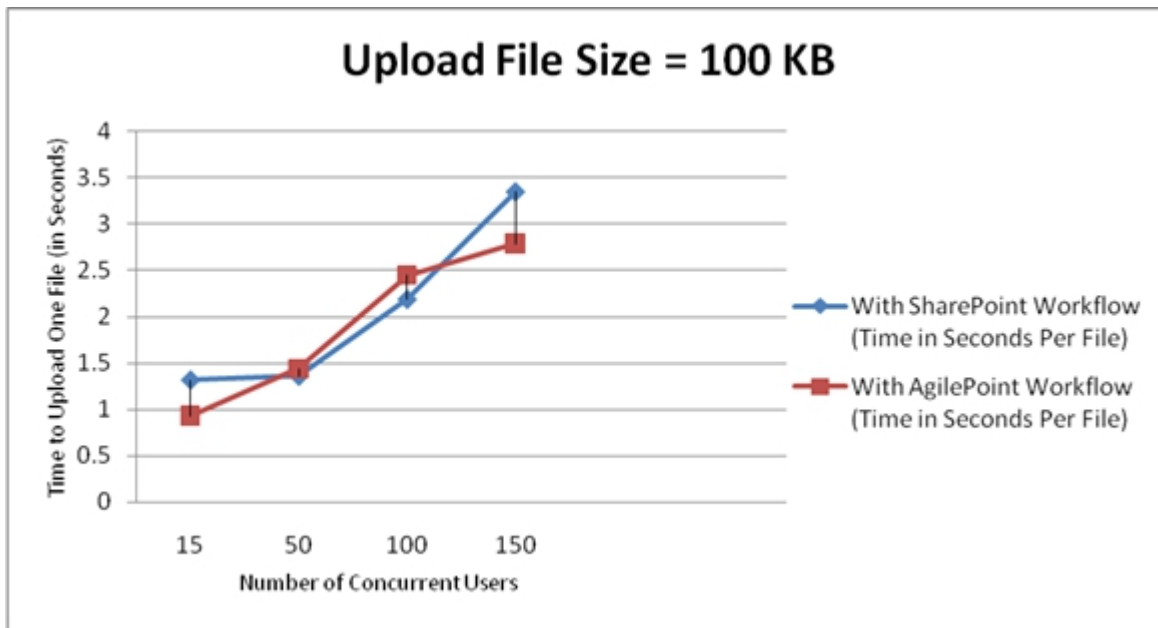
* Size of file uploaded = 100K

* Duration of test is 2 minutes

# Concurrent Users	With SharePoint Workflow			With AgilePoint Workflow		
	Average Upload	% Processor Time		Average Upload	% Processor Time	
		SharePoint	Client		SharePoint	Client

	Times per file (in seconds)			Times per file (in seconds)		
15	1.32	21.4%	7.98%	0.93	27.7%	7.22%
50	1.36	35.0%	9.18%	1.44	42.8%	11.3%
100	2.19	35.7%	13.4%	2.45	48.8%	13.4%
150	3.35	27.3%	12.2%	2.79	63.2%	19.5%

The following graph shows a comparison of the average upload times for a 5KB file to an AgilePoint-enabled SharePoint Document Library versus a SharePoint Document Library as the load increases.



Conclusion

An AgilePoint enabled SharePoint Document Library gives good performance, even when the number of concurrent users is 150. Also, the performance is comparable and linear with the time taken by a SharePoint workflow-enabled Document Library.

Impact Analysis on SharePoint Lists

The following impact analysis results are based on activities performed in conjunction with creating new list items in a SharePoint Custom List.

Objective

The objective of this test is to measure the average time spent for creating a new list item in a SharePoint List as compared to an AgilePoint-enabled SharePoint List.

Volume Testing

Test Criterion

- Load per day is the number of list items that can be created per day (24 hrs).
- The results are based on a test conducted for one hour creating a proportional number of list items. For example, in the first test, for a 5K load the results are based on one hour and ~200 list items. Time is measured for creating each list item, and the average is calculated.

Test Method

AgilePoint has developed a testing tool to create list items in a SharePoint List in batch and calculate the time taken for each list item to be created. The comparison is based on the average time taken to create the list items in a SharePoint List as compared to an AgilePoint-enabled SharePoint List.

List Items have been created using SharePoint Web Service API.

Acceptable Performance

An overhead of up to 0.5 seconds per list item is acceptable up to a load of 100K list items.

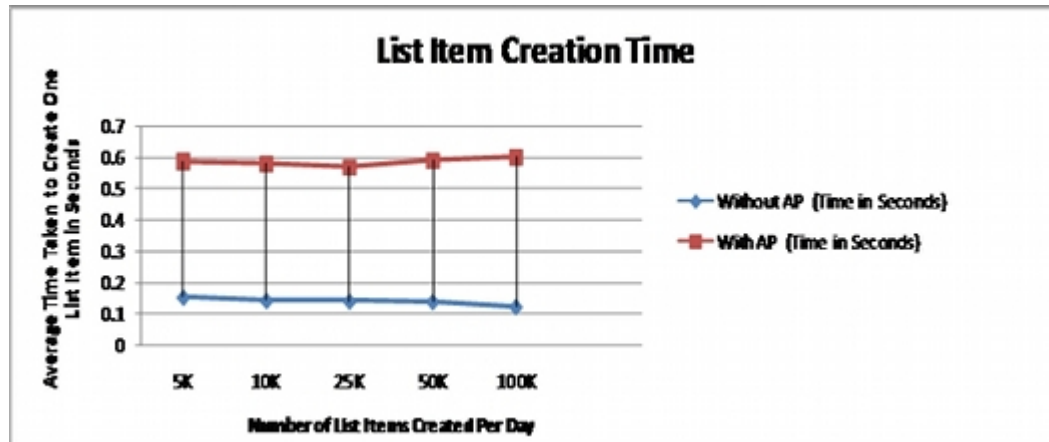
Results

* Duration of test is a sample over one hour

Load Per Day (List Items created per day)	Average Time for creating Item Without WF (In Seconds)	Average Time for creating Item With WF (In Seconds)
5K	0.1534	0.5906
10K	0.1429	0.5835
25K	0.1410	0.5727

50K	0.1397	0.5947
100K	0.1234	0.6037

The following graph compares the variation in the average time of creation of a list item in the AgilePoint-enabled List versus SharePoint List as the load is increased:



Conclusion

There is a static overhead of ~0.5 seconds for creating a List Item in an AgilePoint-enabled list. The time is not increasing with additional load.

Load Testing

Test Criterion

- Test was conducted with varying number of concurrent users. (15, 50, 100, and 15)
- The results are based on a test conducted for a time of 2 minutes.

Test Method

Microsoft Visual Studio Suite, Test Edition was used to conduct these tests. Web Test was created for a single unit (i.e., single list item creation), and it was executed as part of a load test with varying concurrent users.

Acceptable Performance

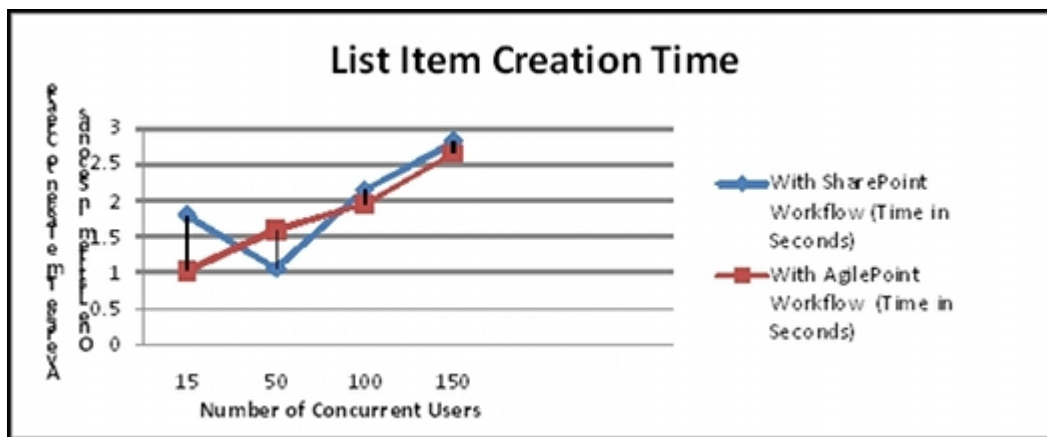
An overhead of up to .02 seconds per list item is acceptable, and the system must be able to serve concurrent users in a reliable way.

Results

* Duration of test is 2 minutes

# Concurrent Users	With SharePoint Workflow			With AgilePoint Workflow		
	Average List Item Creation Time (in seconds)	% Processor Time SharePoint	% Processor Time Client	Average List Item Creation Time (In Seconds)	% Processor Time SharePoint	% Processor Time Client
15	1.80	19.8%	6.96%	1.03	25.9%	8.28%
50	1.05	35.0%	15.5%	1.58	30.5%	10.4%
100	2.15	33.3%	12.2%	1.96	43.2%	17.9%
150	2.83	23.2%	23.2%	2.67	29.5%	20.5%

The following graph shows a comparison of the average creation time for a list item in an AgilePoint-enabled List versus a SharePoint List as the load increases.



Conclusion

An AgilePoint enabled SharePoint Custom List gives good performance, even when the number of concurrent users is 150. Also, the performance is comparable and linear with the time taken by a SharePoint workflow-enabled Custom List.

Impact Analysis on SharePoint Web Page Response Times

The following performance testing results are SharePoint Web page load times based on the presence of the AgilePoint Web Parts.

Objective

The objective of this test case is to measure the impact of AgilePoint Web Parts on the response time of a SharePoint web page.

Volume Testing

Test Criterion

- The response time of a SharePoint Web Page with the AgilePoint Task List Web Part and three other simple SharePoint Web Parts is compared with a SharePoint Web Page with the SharePoint Task List Web Part and three other simple SharePoint Web Parts.
- The number of items in the task list is varied from 0 to 10000.
- The default setting for the AgilePoint Task List Web Part is to retrieve the most recent 500 task items. The default setting is used for this test case.

Test Method

The response time is measured by a custom tool which sends an HTTP request to the Web page and measures the response time.

Acceptable Performance

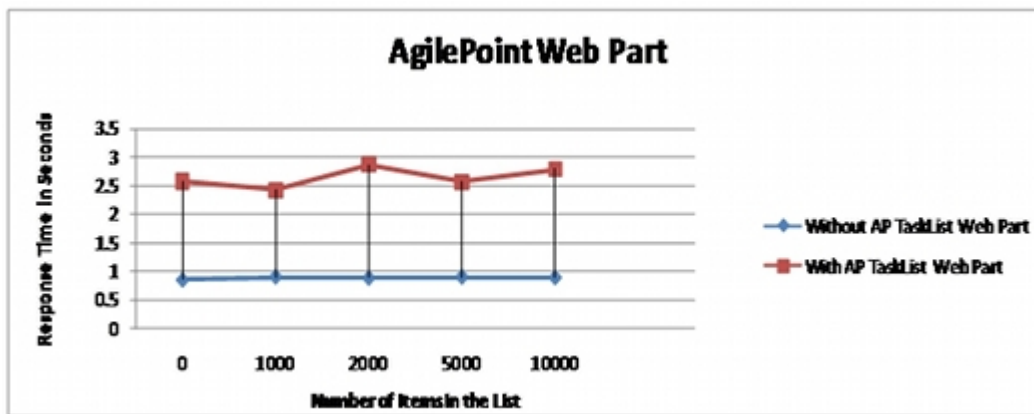
Based on general accepted Web user expectations, an overhead of about 5 seconds is acceptable for loading a Web page.

Results

Number of Processes Running (i.e. Tasks Assigned)	Web Page Loading Time	
	Without AP (Time in Seconds)	With AP (Time in Seconds)
0	0.8416	2.5818
1,000	0.8975	2.4274

2,000	0.8750	2.8703
5,000	0.8952	2.5677
10,000	0.8847	2.7867

The following graph the comparison of how average response time for an AgilePoint Task List varies versus the SharePoint Task List as the number of items in the list is varied:



Conclusion

The results above conclude that there is an impact of about two seconds on the response time with the AgilePoint Task List Web Part. Also this overhead is static and doesn't vary with the number of items in the AgilePoint Task List

Load Testing

Test Criterion

- The response time of a SharePoint Web Page with the AgilePoint Task List Web Part and three other simple SharePoint Web Parts is compared with a SharePoint Web Page with the SharePoint Task List Web Part and three other simple SharePoint Web Parts.
- The number of items in the task list is set to 5000.
- The default setting for the AgilePoint Task List Web Part is to retrieve the most recent 500 task items. The default setting is used for this test case.
- Test was conducted with varying number of concurrent users. [15, 50, 100 and 15]
- The results are based on a test conducted for a time of 2 minutes.

Test Method

Microsoft Visual Studio Team Suite, Test Edition was used to conduct these tests. Web Test was created for a single unit [i.e. web page loading] and it was executed as part of a Load Test with varying concurrent users.

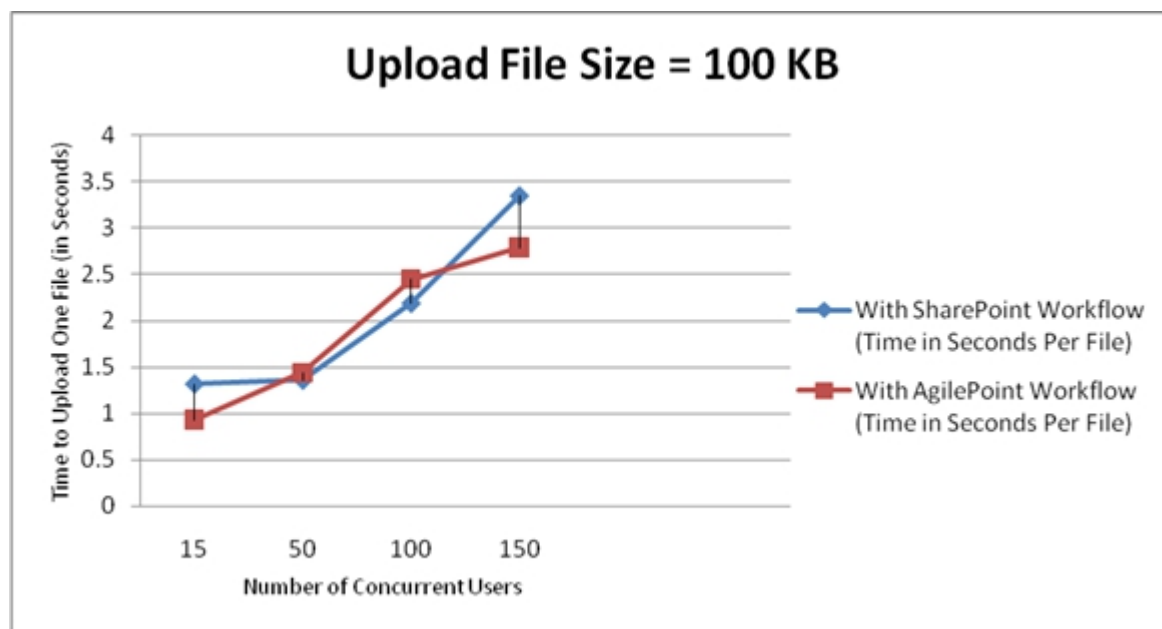
Acceptable Performance

Based on general accepted Web user expectations, an overhead of about 5 seconds is acceptable for loading a Web page.

Results

# Concurrent Users	With SharePoint Web Part			With AgilePoint Web Part		
	Page Load Time (In Seconds)	% Processor Time		Page Load Time (In Seconds)	% Processor Time	
		SharePoint	Client		SharePoint	Client
15	2.86	57.4%	9.38%	2.82	70.3%	6.57%
50	4.56	66.0%	15.9%	3.95	60.9%	7.88%
100	4.35	69.3%	18.4%	3.84	78.1%	9.58%
150	4.02	66.5%	66.5%	3.54	79.5%	11.7%

The following graph shows a comparison of the average response times for an AgilePoint Task List versus a SharePoint Task List as the number of items in the list is varied.



Conclusion

The results above conclude that the response times of AgilePoint web parts are comparable with the SharePoint counterparts and the number of concurrent users accessing the pages does not impact the response times in a big way.

Contributing Factors

The results mentioned here are under simulated conditions as described throughout this document. Performance may vary based of the following factors:

- Hardware specifications for the involved systems
- Network Bandwidth
- Usage pattern (i.e. is the load distributed through the day and occurs in a random way or is it a frequent burst of high activity)

Summary

This analysis provided in this document enables the stakeholder to make an assessment of the impact the AgilePoint Integration has on SharePoint performance. The results of the impact analysis supports an acceptable level of SharePoint performance given the AgilePoint Integration installed on a SharePoint.

The summary of each test scenario is as follows:

Impact Analysis on SharePoint Document Libraries

- **Volume Testing** - An AgilePoint-enabled SharePoint document library provides optimum performance up to a load of 50K files per day. In absolute terms, the difference is very insignificant (i.e. 0.1 seconds up to 100K load).
- **Load Testing** - An AgilePoint enabled SharePoint Document library gives a good performance even with the number of concurrent users being 150. Also the performance is comparable and linear with the time taken by a SharePoint workflow enabled document library.

Impact Analysis on SharePoint Lists

- **Volume Testing** - There is a static overhead of ~ 0.5 seconds for creating a List Item in an AgilePoint-enabled list. The time is not increasing with additional load.
- **Load Testing** - An AgilePoint enabled SharePoint Custom List gives a good performance even with the number of concurrent users being 150. Also the performance is comparable and linear with the time taken by a SharePoint workflow enabled custom list.

Impact Analysis on SharePoint Web Page Response Times

- **Volume Testing** - The results above conclude that there is an impact of about two seconds on the response time with the AgilePoint Task List Web Part. Also this overhead is static and doesn't vary with the number of items in the AgilePoint Task List.
- **Load Testing** - The results of our load tests conclude that the response times of AgilePoint web parts are comparable with the SharePoint counterparts and the number of concurrent users accessing the pages does not impact the response times in a big way.