



Document Excellence through Innovation

ACTIVEDOCS OPUS TOPOLOGY AND PERFORMANCE

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Abstract: This document provides contextual information on ActiveDocs Opus usage models also covering Topology and Performance Benchmarks.

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1 Introduction

1.1 The ActiveDocs Opus Suite

ActiveDocs Opus is built on the Microsoft .NET framework and leverages the power of Microsoft Word. The power of ActiveDocs Opus to automate complex and critical business documents creates efficiencies and allows your business total control over document templates and content via our Content Manager application. This major step forward allows Template designers to visually see the linkage of rules and business logic across hundreds or thousands of Templates. By leveraging Content Manager residing within ActiveDocs Opus, a Template designer can make a change to critical content (e.g. a legal clause) that will dynamically update that content in any linked Templates. This significantly simplifies the management and change control of literally thousands of business templates.

Document Approval and Finalization Workflow

ActiveDocs Opus provides integrated workflow for Approval and Finalization. Workflow configuration includes:

- Document Approval with fine-grained Approver selection and extended notification choices
- Draft document format, Draft / Final document property settings, and Draft / Final watermarking
- Document Finalization including format storage, disposal, assignment, and notification.

1.2 The ActiveDocs Opus Components

The ActiveDocs Opus product suite provides a comprehensive set of components for Template Design, composition, automation and delivery. These components are organized in an interlocking architecture which is easy to install and maintain. The components are designed to be either a standalone application or integrated with other applications such as Enterprise Content Management (ECM) or Customer Relationship Management (CRM) systems.

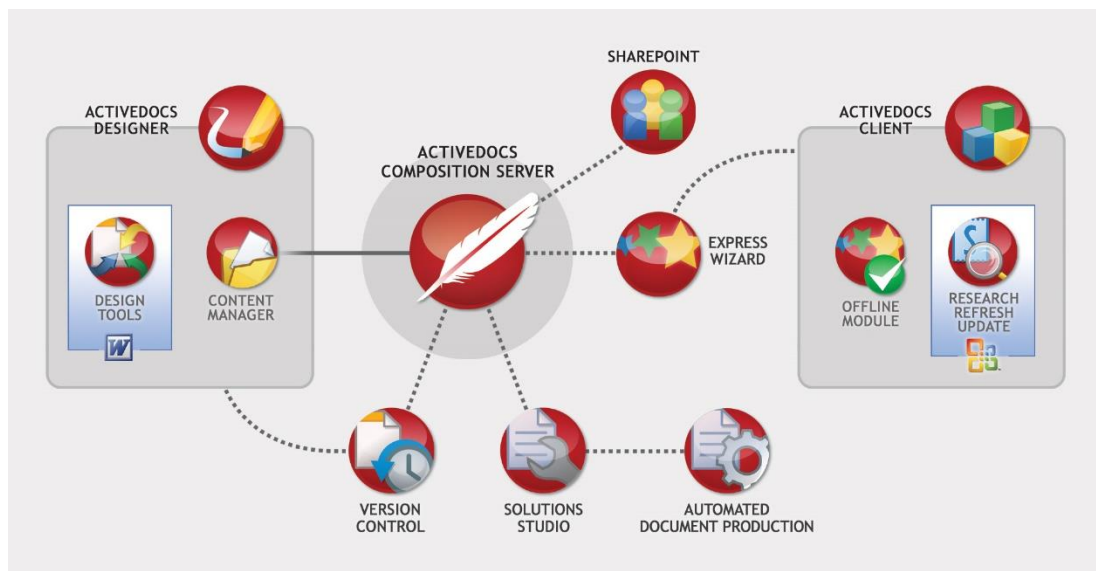


FIGURE 1: ACTIVEDOCS OPUS COMPONENTS

1.2.1 ActiveDocs Opus Composition Server

ActiveDocs Opus Composition Server is the core of the ActiveDocs Opus product suite, and functions as the basis for either the User-Driven or Automated document creation processes. With the addition of the ActiveDocs Opus modules we can work with you to design a solution that best meets your specific business needs.

Browser-based and built on Microsoft .NET architecture, the ActiveDocs Opus product suite works as a centralized Template management system, creating documents from the ActiveDocs Templates that have been deployed to it. Compiling these documents in Microsoft Word (Open XML) format, ActiveDocs Opus then converts them into the document formats that you require: other Microsoft Word formats, PDF, XPS, RTF or HTML documents.

1.2.2 ActiveDocs Opus Designer

ActiveDocs Opus Designer is a suite of applications for the creation, maintenance and management of intelligent, automated Templates based on Microsoft Word. ActiveDocs Opus Designer consists of the ActiveDocs Content Manager, an enterprise application for collaboratively managing ActiveDocs Design Components, and the ActiveDocs Design Tools, an add-in for Microsoft Word.

For Template designers, ActiveDocs Designer supports relationship driven reporting for all Design Components ensuring templates are appropriately and accurately updated across your organization. Data Views using your company data can be securely managed at three different levels: setup, design and document creation, and allow for advanced calculations, joins and filtering. For administrators, it also provides a simple, easy-to-use interface for the management of content on ActiveDocs Composition Server Sites and Subsites.

ActiveDocs Opus Designer has been designed to deliver usability and simplicity. If you have an understanding of Microsoft Word to an advanced level and a sound knowledge of your own business processes you will be able to work immediately and effectively with the ActiveDocs Design Tools. When it comes to designing intelligent Templates with ActiveDocs Design Tools, 'point and click' technology and natural language tools make this process fast and effective. You can easily incorporate business logic, calculations and reusable text as well as integrating data from your back-end systems without the need to create macros or for a programmer to write code. Once your template is automated with the ActiveDocs Design Tools, it is made available to ActiveDocs Composition Server to create documents.

The ActiveDocs Design Tools provide wizards and natural language tools to add automation to your templates, enabling you to create reusable text components (Snippets), identify data sources and create rules that determine what text, data and graphics will be included in your documents.

Once automated, the ActiveDocs Template automatically renders a step-by-step Document Wizard that prompts the user with questions and their answers are used to create the final document.

From a security aspect, you have complete control over who can access the templates for creation purposes and who can then modify them further. This means each document you create is personalized and ensures a consistent message, correct information and professional output.

1.2.3 ActiveDocs Opus Express Wizard Module

The Express Wizard Module is a thin-client Wizard, specifically developed to guide users quickly and simply through the document creation process. The Document Wizard is generated automatically from the deployed ActiveDocs Template. User security rights are discretely generated, with user function and access control simple to put in place.

1.2.4 ActiveDocs Opus Express Wizard Offline

The Express Wizard Offline Module is used to create documents when not connected to the ActiveDocs Opus Composition Server. New or modified documents are automatically uploaded to ActiveDocs Opus Composition Server on network synchronization.

1.2.5 ActiveDocs Opus Solutions Studio

The Solutions Studio Module is a toolkit designed for developers to integrate ActiveDocs functionality into your document based solutions, systems and processes. Used for application to application integration for both the User-Driven and Automated solutions, the Solutions Studio Module comes complete with the software components, example code and documentation that your developers will require.

1.2.6 ActiveDocs Opus ADP (Automated Document Production)

Used for program-driven Automated Document Production, this can generate more than 150,000 documents an hour. Easily integrated into incumbent systems, the ADP Module provides maximum document generation efficiency of the highest quality with minimal labor resource.

1.2.7 ActiveDocs Opus Client

The ActiveDocs Opus Client includes the ability to automatically save documents that have been opened and edited from the ActiveDocs Composition Server. The ActiveDocs Opus Client also gives users the ability to use the Microsoft Research Service to search for and use Snippets. This feature can be used within other Microsoft Office applications allowing Snippets to be inserted into other applications, for example Microsoft Outlook. Another feature of the ActiveDocs Opus Client is the ability to Refresh Snippets. Documents can be set to retain a refreshable section that can be refreshed at any time with the latest Snippet content. If your version of Microsoft Word supports custom XML, Refreshable Snippets can be enabled.

While the ActiveDocs Opus Client can run independently, it can also interlock with the Express Wizard Offline Module.

1.2.8 ActiveDocs Opus Version Control

The optional ActiveDocs Opus Version Control module enables complete version control of Design Components via the Content Manager interface including Publishing (and Deferred Publishing) integrated with the Approval process. The Version Control Module also enables the recreation of documents using the original Design Components with which they were created, even if these have since been superseded.

1.2.9 ActiveDocs Opus SharePoint

The optional ActiveDocs Opus SharePoint module is a ready-to-deploy Microsoft® SharePoint® solution that enables seamless integration with SharePoint 2010 and 2013. The solution provides specialized libraries and web parts that can easily be incorporated in a SharePoint installation. SharePoint pages can be provisioned with web parts that list the ActiveDocs Templates available to the user and provide direct access to the ActiveDocs Opus Document Wizard for User-Driven document creation. ActiveDocs Opus SharePoint Document Libraries support ActiveDocs Opus Workflows which are fully integrated with SharePoint Document Approval workflows for document drafting, approval, and finalization.

2 Document Automation

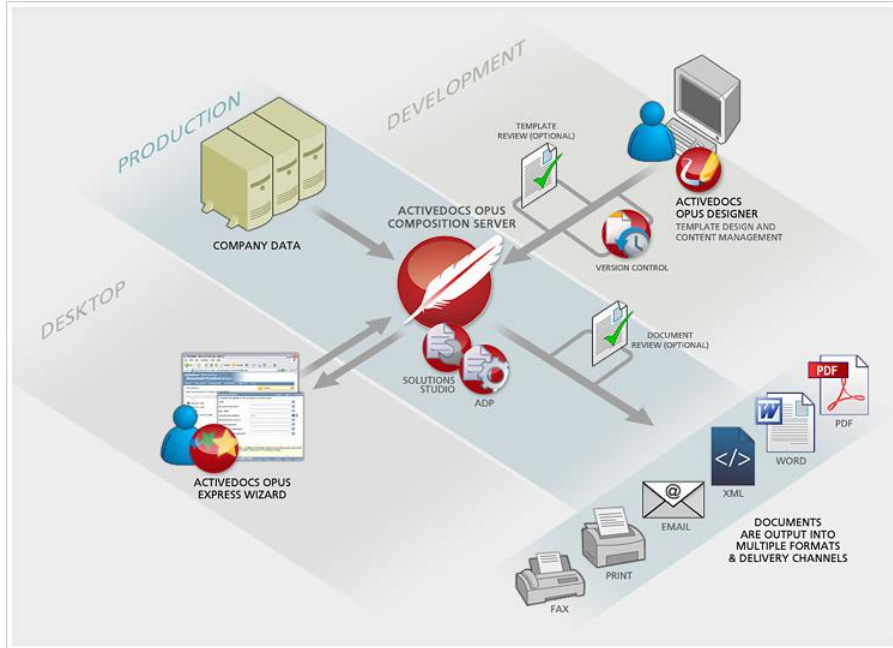







FIGURE 2 : ACTIVEDOCS OPUS DOCUMENT AUTOMATION

Key

-  **ActiveDocs Opus Designer:** Used to create and maintain the ActiveDocs Templates.
-  **Express Wizard Module:** For browser enabled User-Driven Document creation.
-  **Solutions Studio Module:** Integration Toolkit used for different types of integration.
-  **ADP Module:** Automated Document Production Module
-  **Version Control Module:** Version management, Publishing, Document Recreation.

2.1 User-Driven Document Creation

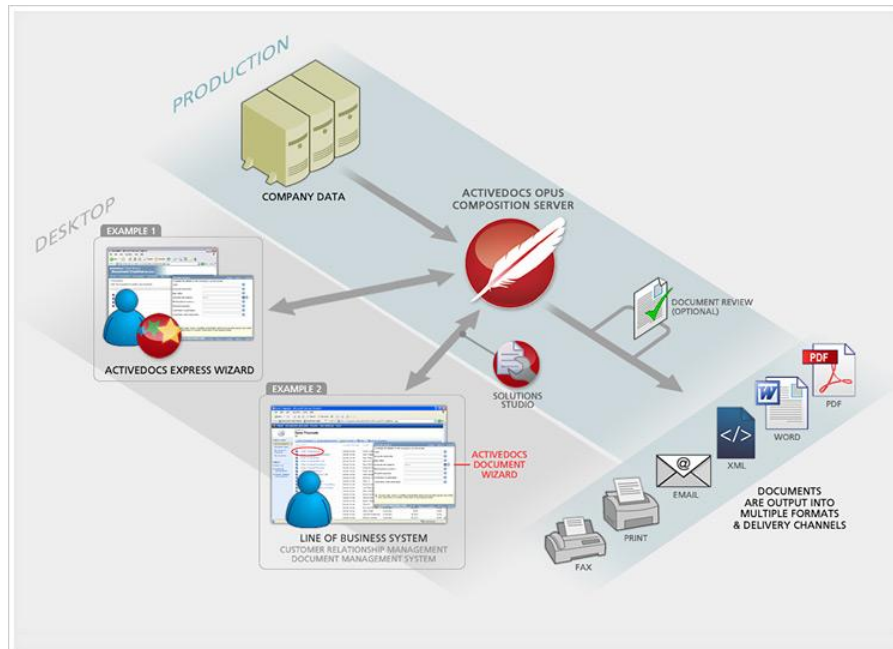


FIGURE 3: ACTIVEDOCS USER-DRIVEN DOCUMENT CREATION

In the User-Driven document creation process, users can easily create the documents they need at their desktop, online or offline, simply by calling up the appropriate document Templates.

The ActiveDocs browser-based Document Wizard automatically guides the user through a step-by-step interview process, prompting for and validating answers needed to complete the document. Answers may be entered directly, selected from preset values, or obtained from external data sources. Any user can create professional documents, quickly and efficiently. All ActiveDocs Templates are fully customizable to suit your purposes and processes, and to reflect your brand image and corporate identity.

Two examples of User-Driven document creation are shown in the diagram above.

Example 1 shows the Express Wizard user interfacing with ActiveDocs Opus Composition Server via the Document Wizard to create a document.

Example 2 shows using a Line of Business application to start the Document Wizard process to create a document. The end-user is stepped through the wizard as a pop-up within the Line of Business application they are using – for example a CRM system. The Solutions Studio module is required to achieve this integration.

2.2 Automated Document Production

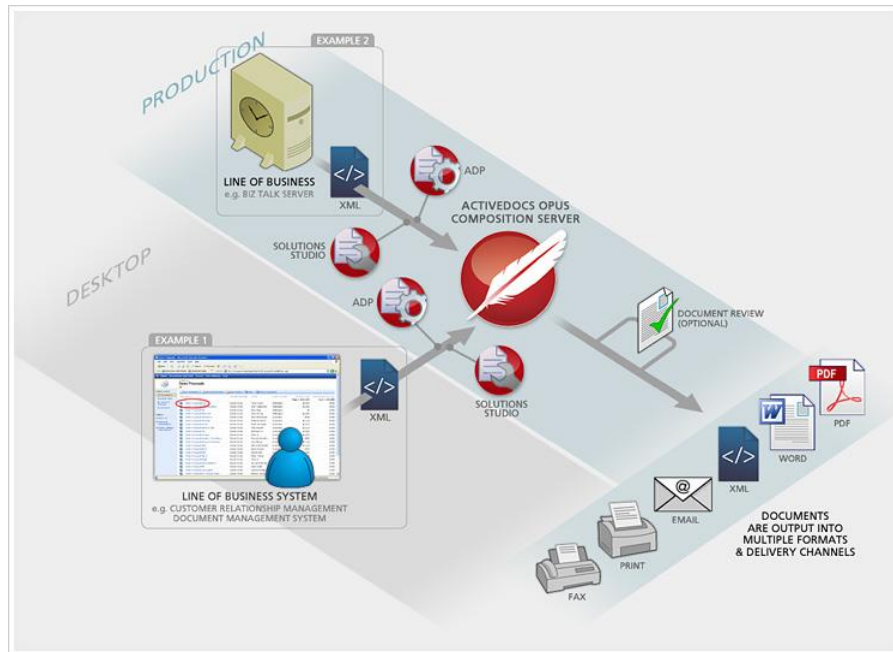


FIGURE 4: ACTIVEDOCS OPUS AUTOMATED DOCUMENT PRODUCTION

In the Automated Mode of document creation, systems can easily create the documents required by passing to ActiveDocs an XML stream specifying the Templates, data, output formats, and delivery instructions for the documents being created. ActiveDocs processes the XML stream, merging the supplied answer data with the requested Templates, and then generates documents to the volumes, formats, and delivery requirements specified. The automated process can be manually and automatically invoked, and is the ideal solution when the source information comes from a line-of-business (LOB) system and requires no additional user input.

Two examples of Automated Mode document creation are shown in the diagram above.

Example 1 shows a user-requested automated document creation process. From within a LOB application, such as a CRM system, a user selects a button which will automatically create the document in the background without any further user input.

Example 2 shows a fully automated process. On schedule, a LOB system (such as Biz Talk server) generates a 'request for document creation' in XML format. ActiveDocs takes this XML file and automatically creates the required documents, such as bank statements.

3 Concepts and Planning

We recommend carefully planning your ActiveDocs Opus configuration prior to installation as differing uses have varying hardware and topology implications. For example, implementations used for Automated Document Production and delivery of documents differ from Express Wizard implementations.

Consider some of the following questions when planning your ActiveDocs Opus installation:

- Is this a Solutions Studio installation (no Express Wizard Module interface is required)?
- How will ActiveDocs Templates be managed?
- What type of security model is required?
- Will there be multiple groups of users using the system?
- Where will the documents be stored?
- Is usage reporting required?
- Is server based printing, faxing or emailing required?
- How will the system be administered?
- What ActiveDocs licensing is required?

The answers to these questions will help you decide which ActiveDocs components to install and how to configure them. In the ActiveDocs Topology section, we provide descriptions of the various ActiveDocs server topologies. This will give you a better indication of the hardware requirements for your solution.

3.1 ActiveDocs Opus Topology

ActiveDocs Opus supports a number of topology options. The selection of a particular topology is largely driven by requirements and the expected system load profile. Consider the following areas when determining the requirements to your solution:

- Number of users.
- System load (peaks and troughs).
- Complexity of documents.
- Types of tasks e.g. batch document assembly and delivery, printing, file format transformation, content storage.
- Disaster recovery planning.
- Required system availability.

3.1.1 Basic Topology

The Basic Topology detailed below is the simplest and most cost effective of supported topologies.

End-Users access the Express Wizard Module application for document creation or alternatively third party developers may automate the ActiveDocs Opus Composition Server (CS) by another process running on the same server. All components run on a single server with Configuration, State and Content databases housed on the same physical box. This configuration supports up to 100 users producing approximately 1000 documents per day. When considering this option, you need to take into consideration the complexity of the documents, for example, the number of pages per document (e.g. 1 or 100 pages), the ActiveDocs functionality used within the Template (e.g. the number of Active Fields and Rules) and the particular load profile (e.g. periods during the day of peak use). Another consideration is the database licensing. ActiveDocs Opus supports Microsoft's free run time Microsoft SQL Server 2008 Express, and 2012 Express, that is usually sufficient to service the loads anticipated by the Basic Topology.

It is important to note that the Microsoft SQL Server can potentially starve the operating system and ActiveDocs Opus Composition Server of memory. Therefore you will need to ensure that the SQL Server's maximum RAM is set. It is recommended that no more than 50% of RAM is allocated to SQL Server as the maximum it is allowed to use. For example, on a server with 1GB of RAM set the maximum RAM allocated to SQL Server to 512 MB.

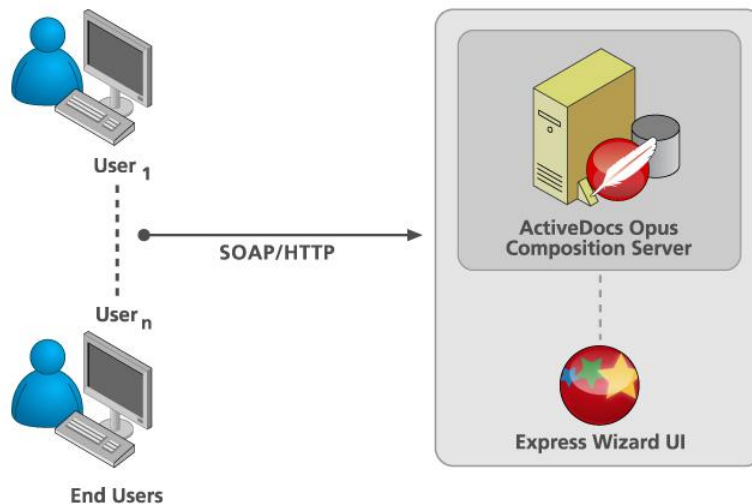


FIGURE 5: BASIC TOPOLOGY

3.1.2 Typical Topology Diagram

The Typical Topology is the most commonly used, with the ActiveDocs Opus Composition Server separated from the ActiveDocs Opus Database. This topology gives better performance, improved disaster recovery options and scalability, and is also well suited to Automated Mode high volume document delivery applications.

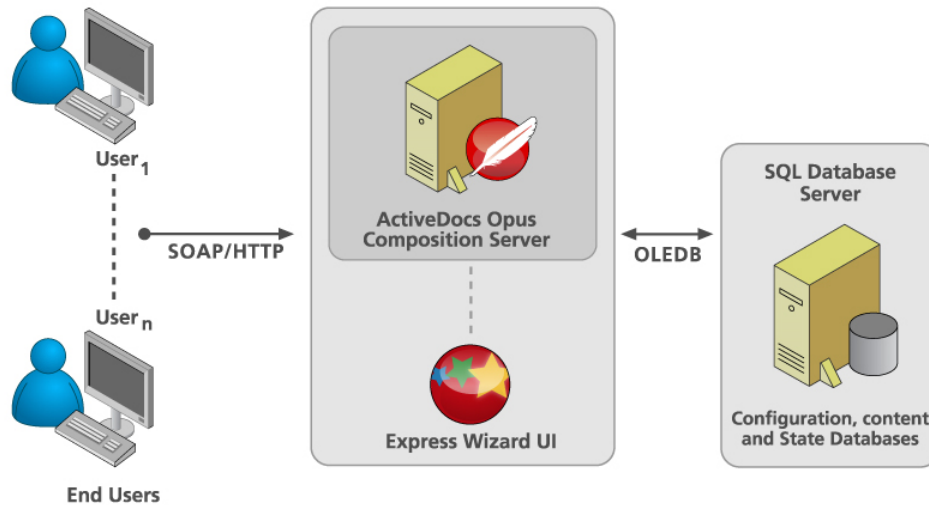


FIGURE 6: TYPICAL TOPOLOGY

3.1.3 Scale-Out Topology Diagram

The **Scale-Out Topology** has a number of ActiveDocs Opus Composition Servers (CSs) sharing assembly jobs, with a master server in control. All CS Services partake in the processing of jobs found in the Document Job Queues held on the ActiveDocs Opus database server.

This scale-out configuration provides a high degree of scalability and can be configured in a live environment as the need arises.

ActiveDocs architecture is well suited to operate in either software- or hardware- based load shared environments. Load sharing optimizes server request distribution improving performance and reliability in a server farm configuration.

Note The ActiveDocs Opus Composition Server also supports multi-threading.

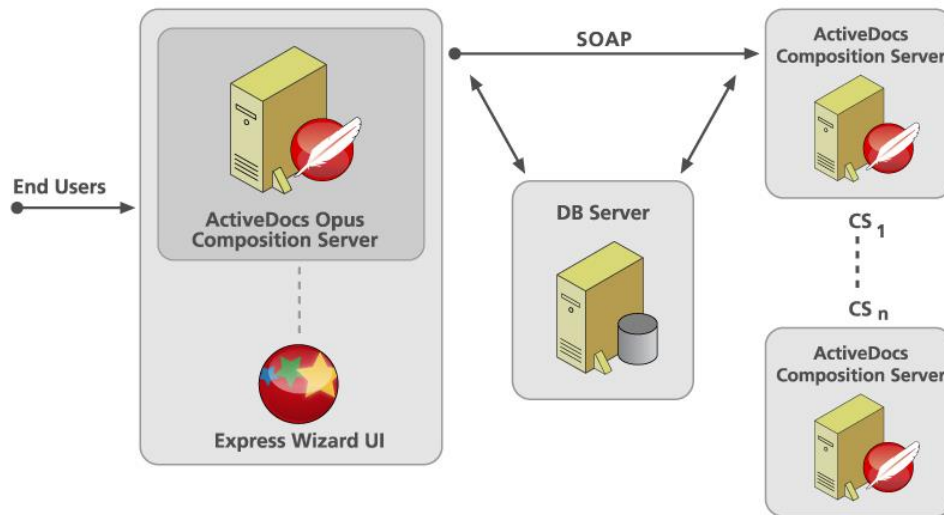


FIGURE 7: SCALE-OUT TOPOLOGY

4 Performance Bench Marks

4.1 Introduction

The section has been included to give the reader a view on the document throughput performance that can be expected utilizing a typical hardware configuration.

ActiveDocs Opus is designed to scale-up and scale-out. This means ActiveDocs Opus can scale-up to fully utilize multi-CPU servers and scale-out with the addition of servers to share the load of both assembling and delivering documents.

The complexity of documents created by users has a large bearing on how many users can simultaneously create documents. For example, with a single CPU, single server topology, ActiveDocs Opus can create 60 one-page Word XML or Office Open XML (docx) documents containing 5 rules and 20 fields in about 35 seconds. A Quad CPU server can create the same number of documents in about 15 seconds.

4.2 Bench Mark Configuration

This performance test was carried out using the topologies outlined in sections 3.1.2 and 3.1.3.

4.2.1 Hardware/Software Specifications

ActiveDocs Opus Composition Server and SQL Database Server

- 3.0 GHz Pentium D
- 2 GB RAM
- Windows Server 2003 Standard Edition SP2
- IIS 6 (Installed on ActiveDocs Opus Composition Servers only)
- SQL 2005 Standard Edition (Installed on SQL Database Server only)

Test ActiveDocs Opus Template details

- 2 Pages
- 1 Image (Jpeg format)
- 20 Active Fields
- 5 Conditional Content Rules

4.2.2 Other Configuration Details

File Format:

- Output File Format Office Open XML (.docx)

General Notes:

- Output to other formats requires Microsoft Word for conversion.
- Under Word 2007, throughput for Word binary files (.doc) is typically 90% of the throughput rate for Office Open XML (docx) files, and for PDF files is typically 80%.

4.3 Express Wizard Module User Performance Test

This test simulates a number of users (10 to 1000) all finishing an Express Wizard session at exactly the same time. The times shown are the average delays a user will experience before they are notified that their document has been created. Multiple CPUs are for the ActiveDocs Opus Composition Server only. The SQL Database server remains a single CPU server for all tests.

4.3.1 Typical Topology (see 3.1.2)

Number of Users	Single CPU *	Dual CPU *	Quad CPU *
10	3.9	2.5	1.6
100	38.5	25.0	16.3
500	192.5	125.1	81.3
1000	385.0	250.3	162.7

* Average document creation times in seconds

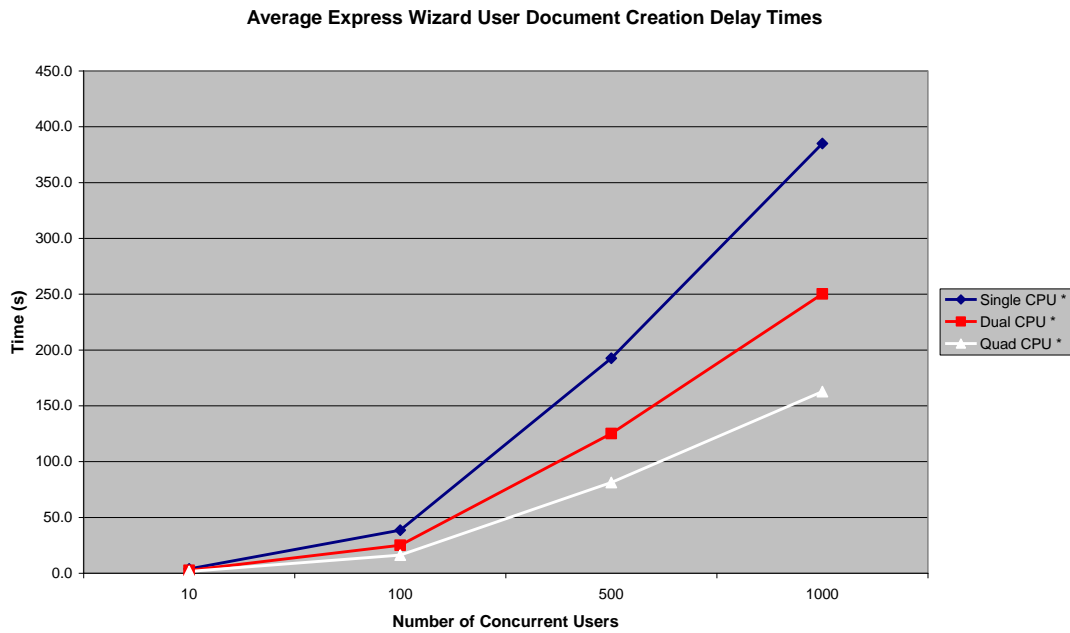


FIGURE 8: EXPRESS WIZARD USER PERFORMANCE TEST RESULTS FOR A SINGLE ACTIVEDOCS OPUS COMPOSITION SERVER



4.3.2 Scale-Out Server Topology (see 3.1.3)

This performance test was carried out using two ActiveDocs Opus Composition Servers and a separate SQL Database Server.

Number of Users	Single CPU *	Dual CPU *	Quad CPU *
10	2.3	1.5	1.0
100	22.6	14.7	9.5
500	113.0	73.5	47.7
1000	226.0	146.9	95.5

* Average document creation times in seconds

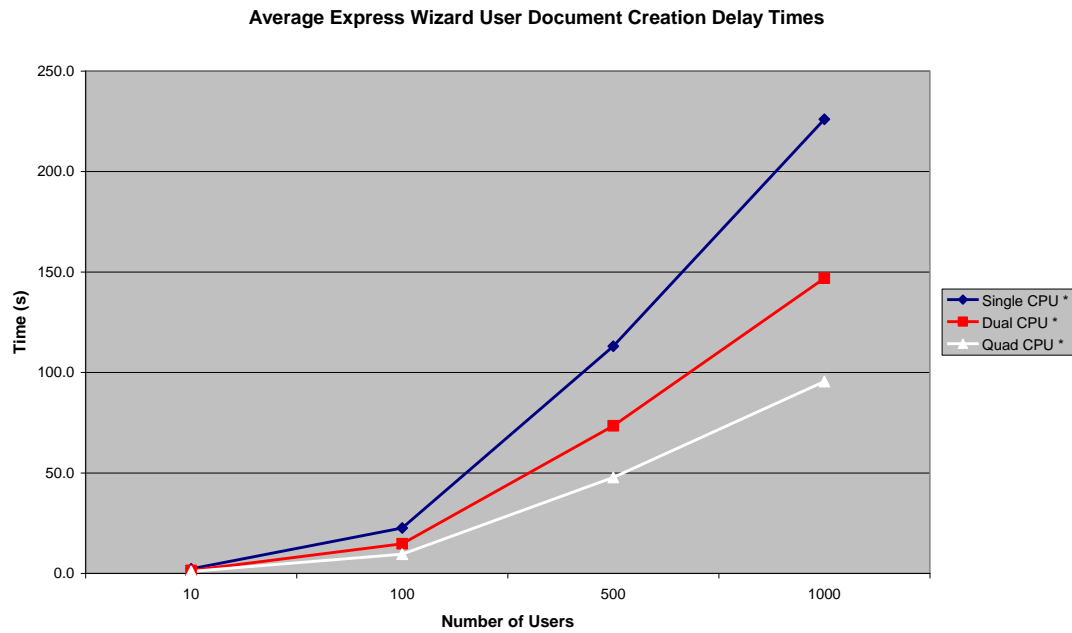


FIGURE 9: EXPRESS WIZARD USER PERFORMANCE TEST RESULTS FOR TWO ACTIVEDOCS OPUS COMPOSITION SERVERS

4.4 ADP Module Performance Test

This test involved the creation of 50,000 2 page documents delivered to a Windows Print Queue. Multiple CPU's are for the ActiveDocs Opus Composition Servers only. The SQL Database server remains a single CPU server for all tests. This performance test was carried out using the topologies outlined in sections 3.1.2 and 3.1.3.

Note: ActiveDocs Opus ADP Module can deliver in excess of 100,000 documents per hour on a single CPU server in a typical topology configuration.

4.4.1 Typical Topology (see 3.1.2)

Document Merge Factor *	Single CPU	Dual CPU
0	224 min	157 min
10	47 min	31 min
20	33 min	22 min
100	28 min	18 min

* Merge Factor is an optional performance optimization setting that merges xx number of documents into one file at the time of creation. This effectively reduces the number of physical print jobs sent to the print queue.

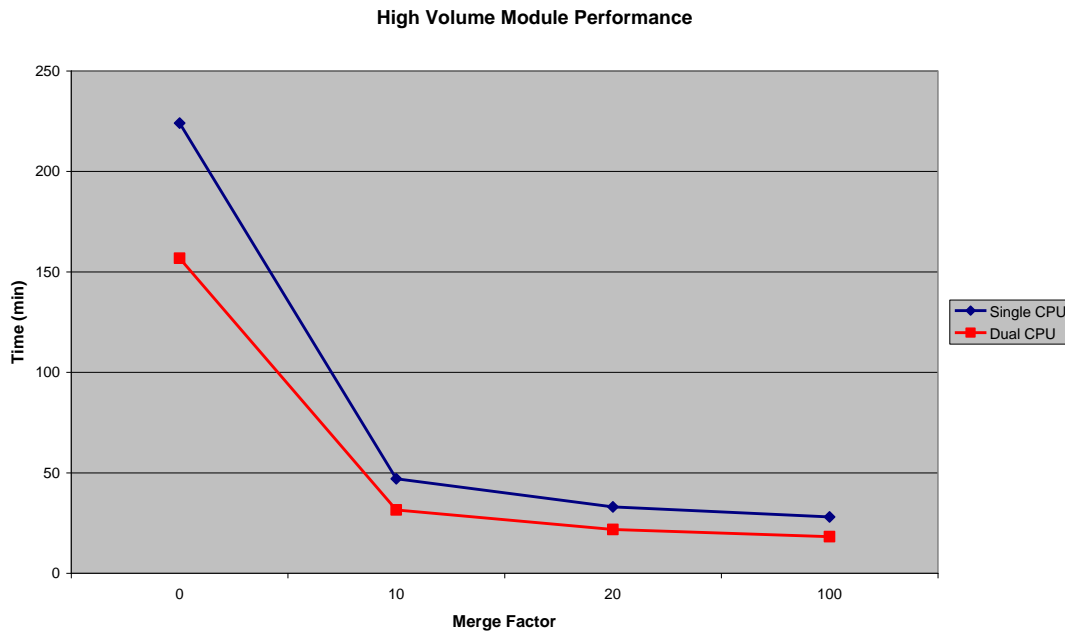


FIGURE 10: HIGH VOLUME MODULE PERFORMANCE TEST RESULTS FOR A SINGLE ACTIVEDOCS OPUS COMPOSITION SERVER



4.4.2 Multiple Server Topology (see 3.1.3)

This performance test was carried out using two ActiveDocs Opus Composition Servers and a separate SQL Server.

Document Merge Factor *	Single CPU	Dual CPU
0	140 min	98 min
10	26 min	17 min
20	19 min	13 min
100	16 min	10 min

* Merge Factor is an optional performance optimization setting that merges xx number of documents into one file at the time of creation. This effectively reduces the number of physical print jobs sent to the print queue.

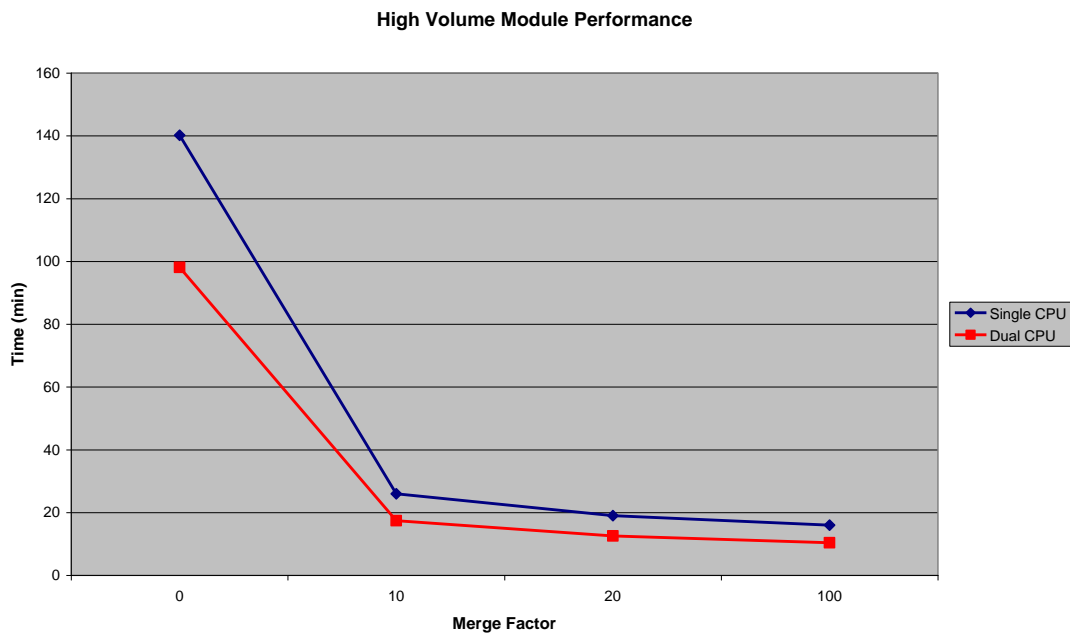


FIGURE 11: HIGH VOLUME MODULE PERFORMANCE TEST RESULTS FOR TWO ACTIVEDOCS OPUS COMPOSITION SERVERS