# eRoom v5 Scalability

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## Performance and Scalability of eRoom v5 Server

## Overview

Business today requires diverse teams that have the need to collaborate in many ways. The eRoom digital workplace is an ideal location for this collaboration to occur. eRoom 5.0 delivers improved ease-of-use, cross-enterprise support and even greater levels of scalability.

This paper describes the performance testing that was executed to determine the scalability of the eRoom server. Also detailed are the testing scenarios that were used to emulate the user population, the hardware and software configurations of the application and database servers, and the overall workload that was placed on the servers. The Measurements and Results section of the paper discusses the results that were obtained for the default installation of an eRoom server and an optimally configured server.

## The Test Scenarios

To emulate the "real-world" use of an eRoom server in a production environment, an interactive workload was designed. The interactive user workload emulates the various tasks that a user performs from viewing notes to creating and uploading documents. These tasks are mapped to the following operations:

Operation	Percentage of Time Performing Operation
Navigating through Pages	61%
Viewing Files	30%
Adding Comments	3%
Adding Files	3%
Editing Files	3%

The user population is comprised of two types of users: short-term and long-term. Short-term users log in and work for three minutes. Long-term users log in and work for 30 minutes. Both of the user types randomly perform the operations listed above. The workload is distributed across all of the facilities and eRooms on the server. During the simulation, users perform operations at random intervals averaging one per minute.

## The Server Configurations

A quad processor configuration was chosen for the performance testing. There are two possible database configurations, Microsoft SQL Server or Sybase SQL Anywhere. Some testing was performed and the Microsoft SQL Server provided greater performance than the Sybase SQL Anywhere database. Therefore, Microsoft SQL Server was used for the testing.

The hardware used to stage the simulations consisted of two servers. The first is the eRoom application server. The second server was configured as the database server. To provide the heaviest load, SSL was also enabled.



## **Application Server**

#### Hardware

- Quad 550 MHz Processors
- 1 GB RAM

#### Software

- Microsoft Windows 2000 Service Pack 1
- Internet Information Server Version 5
- eRoom Server Version 5
- SSL Enabled

#### Facilities, eRooms, and Members

- Ten Facilities with 50 eRooms in each Facilities for a total of 500 eRooms
- Five thousand members in the Server Member List
- All users are participants in all eRooms

#### The Database Server

#### Hardware

- Single 733 MHz Processor
- 1 GB RAM

#### Software

- Microsoft Windows NT Server Version 4 Service Pack 6
- Microsoft SQL Server Version 7 Service Pack 2

### The Overall Workload

The overall workload on the eRoom server consists of three components. The first component is the monitor users. The eRoom Monitor performs operations such as polling for instant messages, updating the personal My eRooms page and synchronization with Microsoft Outlook. An eRoom Monitor simulator was run throughout the performance test. Two thousand users were simulated with the following settings:

- Polling for instant message every 30 seconds
- Polling for My eRooms updates once per hour. Each users polls for updates to four different eRooms on two different facilities

The second component is the total number of users who are logged into the eRoom server. In order to emulate a geographically disbursed population, 1,000 users log in during the first hour, 500 during the second and 500 during the third hour. Logged in users also represent users who have made a request of the eRoom server, such as downloading a document, and are then in the process of reading or editing the document.



The final component is the number of users who are concurrently making requests of the eRoom server. The number of users who are concurrently making requests of the eRoom server is a percentage of the number of logged in users, typically between 5 and 10 percent. The combination of users making requests, users logged in and monitor users represent the total eRoom user population in a production environment and is the load that was simulated.

#### The Measurements and Results

The simulation was executed for 180 minutes, against the default installation of the eRoom server configured as described in the Server Configuration section. During the simulation, 2,000 users logged into the eRoom server and performed the operations that were listed in the Test Scenarios section above.

### **Processor Scalability**

The processor utilization was low during the entire simulation. There were several peaks in use but only two peaks were greater than 40%, indicating that the server was not severely taxed. The chart below displays active users and the percent web processor time.





## Memory and Throughput Scalability

The scalability of the physical memory is also very good. At no point during the simulation does the eRoom server drop below 450 MB of available memory. The decrease in available memory during the simulation is not the result of increased use of system resources of the eRoom application server but to the optimization of the Windows 2000 and Internet Information Server. The following chart displays the available memory, active users and throughput.



### **Transaction Time Scalability**

The average transaction time is the culmination of connection time, send time, response time and process time. This data was aggregated from each of the client simulation machines. The average recorded transaction time was 1.30 seconds with a minimum of 0.30 and a maximum of 4.9 seconds.

A performance monitoring client, probing client, was also used to validate the results gathered from the client simulation machines and quantify an individual user's experience with the system under load. Although there are some spikes that indicate slow response times, the average response time of the probing client is 1.31 seconds. The difference between the probing client and the average response time of the simulation machines is only .01, indicating an excellent response times and end user experience.

The chart below displays the average response times for the client simulation machines and the probing clients. Also displayed are the values for the total number of transactions per second and the current active users.





### The Optimal Configuration

The optimal eRoom server configuration has only two modifications to the default installation configuration. The following two server-side settings have been disabled:

- Send Instant Message
- Send Intercom Message

The effect of disabling these two settings is that Alerts, used either from the Alert button on the toolbar or in the Intercom, can only send e-mail alerts and not instant messages. Since instant messaging has been disabled at the server-level, the monitor users simulator polls the server every hour to determine if instant messaging has been enabled. There is no change to the hardware configuration of the server.

With the optimization of the eRoom server, additional load was place on the server during the simulation. The number of monitor users was increased from 2,000 to 5,000.



### **Processor Scalability**

Under the optimal configuration of the eRoom server, the processor scalability was excellent. The processors were not taxed during the simulation. The average percent processor time was 11.16, with a maximum of 27.76 percent. The following chart displays the percent web server process time and current active users.



The optimally configured eRoom server was able to support more than double the number of monitor users while utilizing less processor resources. On average 21.33 percent of the processor was consumed by the default configuration. While 21.33 percent is an excellent number, the optimal configuration utilized roughly half, 11.16 percent, of the processor time. The following chart compares the processor utilization between the default configuration and the optimally configured server.





### **Transaction Scalability**

The transaction times in the optimal configuration averaged 1.80 seconds from the client simulation machines and 1.30 seconds from the probing client. These values represent excellent transaction times. During much of the simulation the average transaction time was the same for both the client simulation machines and the probing client. The chart below displays the average transaction response times along with the number of active users and the transactions per second.





The average transaction time from the client simulation machines rose from 1.30 seconds to 1.80, a minimal difference considering the number of monitor users was increased from 2,000 to 5,000. The number of active users remained the same during both the default and optimized configuration testing.

#### Your Environment

The testing scenarios upon which the simulations were based were derived from typical usage patterns. There are several other factors that could impact the performance of the eRoom server in your environment, such as network connectivity, document size and usage patterns.

This variance in the usage patterns could result in performance that differs from the results reported in this paper. With similar usage patters, you can expect the server performance to be in the same range as that reported.

### Summary

During each of the simulations that were performed, the eRoom server delivered excellent performance and an ideal end-user experience. To ensure that eRoom continues to meet the needs of our customers, an extensive regiment of performance testing continues to be performed. At the conclusion of each stage of testing, a white paper will be issued with the results.





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