

Insuresoft™ Diamond System™ 4.0, Microsoft® Windows® 2000 Server, and Microsoft SQL Server™ 2000: Proven Scalability and Performance

A White Paper

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The test results reported in this White Paper have not been independently verified. Only Insuresoft, Microsoft, and potential or current Diamond System customers have observed the testing procedures and results.

Appendix C: Glossary

Application Server	This is a middle-tier server that executes common application business logic. Application servers provide their greatest benefit in terms of enterprise scalability and business logic reuse.
COM	The Component Object Model (COM) is the Microsoft component software model.
COM+	COM+ is the next evolutionary step of COM that adds new features and incorporates the Microsoft Transaction Server (MTS) programming model for managing components.
COM TI	Microsoft's COM Transaction Integrator (TI) consists of a set of development tools and run-time services that automatically "wrap" IBM mainframe transaction and business logic as COM components that run in a Windows DNA environment.
Scalability	This refers to the ability to add capacity to a system, such as support for additional users, by incrementally adding hardware and software without needing to redesign or redeploy the entire system.
System Architecture	This is the underlying framework that provides the infrastructure on which the application runs.
High Availability	A highly available system to appear to the users as if it were operating continuously, even though failures have occurred.
Reliability	The system needs to be available to users a high percentage of the time in order to be considered reliable.
Topology	Topology is the physical setup for a test set. The topology describes the number and type of machines used, as well as which programs run on each physical box.

Test Type	# App Servers	# Client Machines	# Users	# Policies	% Sim. Data Entry Time	Sim Users	Average Time	Average Per User
Submission	1	1	1	10	0.00%	1	00:01.5	00:01.5
Submission	1	1	10	10	0.00%	10	00:00.6	00:06.3
Submission	1	1	20	10	0.00%	20	00:00.6	00:12.6
Submission	1	1	30	10	0.00%	30	00:00.6	00:18.7
Submission	1	1	50	10	0.00%	50	00:00.7	00:33.8
Submission	1	1	100	10	0.00%	100	00:00.7	01:11.2
Submission	2	2	50	10	0.00%	100	00:00.7	00:34.8
Issue	1	1	1	5	0.00%	1	00:07.4	00:07.4
Issue	1	1	10	5	0.00%	10	00:02.9	00:29.4
Issue	1	1	20	5	0.00%	20	00:02.9	00:57.6
Issue	1	1	25	5	0.00%	25	00:02.9	01:12.8
Issue	1	1	50	5	0.00%	50	00:03.6	03:00.6
Issue	1	1	1	5	25.00%	4	01:14.0	01:14.0
Issue	1	1	10	5	25.00%	40	00:08.8	01:28.0
Issue	1	1	25	5	25.00%	100	00:04.2	01:44.0
Issue	1	1	30	5	25.00%	120	00:03.5	01:45.6
Issue	1	1	40	5	25.00%	160	00:03.6	02:23.2
Issue	1	1	50	5	25.00%	200	00:03.4	02:49.0
Issue	1	1	100	5	25.00%	400	00:03.8	06:17.6
Issue	1	1	1	5	100.00%	1	04:50.2	04:50.2
Issue	1	1	10	5	100.00%	10	00:29.0	04:49.6
Issue	1	1	100	5	100.00%	100	00:04.3	07:12.2
Issue	1	2	100	5	100.00%	200	00:04.6	15:28.7
Claims	1	1	1	5	0.00%	1	00:15.0	00:15.0
Claims	1	1	10	5	0.00%	10	00:06.8	01:08.0
Claims	1	1	20	5	0.00%	20	00:07.6	02:31.4
Claims	1	1	30	5	0.00%	30	00:08.1	04:04.4
Claims	1	1	1	5	25.00%	4	01:58.0	01:58.0
Claims	1	1	10	5	25.00%	40	00:13.8	02:18.0
Claims	1	1	20	5	25.00%	80	00:09.2	03:05.0
Claims	1	1	30	5	25.00%	120	00:00.0	00:00.0
Claims	1	1	50	5	25.00%	200	00:00.0	00:00.0
Inquiry	1	1	1	5	0.00%	1	00:02.4	00:02.4
Inquiry	1	1	10	5	0.00%	10	00:00.8	00:08.0
Inquiry	1	1	20	5	0.00%	20	00:00.7	00:13.0
Inquiry	1	1	25	5	0.00%	25	00:00.6	00:16.0
Inquiry	1	1	30	5	0.00%	30	00:00.6	00:17.6
Inquiry	1	1	50	5	0.00%	50	00:00.6	00:29.2
Inquiry	1	1	100	5	0.00%	100	00:00.6	00:57.0
Inquiry	1	2	100	5	0.00%	200	00:00.5	01:48.6
Inquiry	1	1	1	5	25.00%	4	00:47.2	00:47.2
Inquiry	1	1	10	5	25.00%	40	00:05.1	00:50.8
Inquiry	1	1	50	5	25.00%	200	00:01.2	00:58.8
Inquiry	1	1	100	5	25.00%	400	00:00.9	01:27.2
Inquiry	1	2	100	5	25.00%	800	00:00.6	02:09.7
Inquiry	1	3	40	5	100.00%	120	00:02.1	04:14.9
Issue	1	2	30	3	100.00%	60	00:06.9	06:56.5
Claims	1	1	20	2	100.00%	20	00:33.4	11:08.5
Inquiry	2	6	40	5	100.00%	240	00:02.3	04:41.1
Issue	2	4	30	3	100.00%	120	00:07.7	07:39.2
Claims	2	2	20	2	100.00%	40	00:35.5	11:50.3

Appendix B: Test Data

Abstract

Consumer demand for rapid service and responsiveness is driving insurance companies to seek increasingly automated solutions[Note: to what?] in order to remain competitive. In addition, to support increasing demand for online insurance services, insurance companies are looking for scalable, high-performance Internet solutions, capable of handling heavy transaction volumes and large numbers of users—solutions that also integrate easily with their backend systems.

The Insuresoft® Diamond System™ 4.0 provides this solution. The Diamond System is a complete policy processing, billing, and claims system engineered exclusively for insurance companies. It offers the first fully automated and integrated system for the real-time processing of inquiries, quotes, and claims. In addition, it provides a high-performance and scalable solution that is equal to the most demanding insurance environment.

Benchmark tests conducted by Insuresoft and Microsoft® offer compelling evidence that Insuresoft Diamond System 4.0, the Microsoft Windows® 2000 Server operating system, and Microsoft SQL Server™ 2000 deliver exceptional scalability while maintaining a high level of service.

This paper begins with a brief discussion of how the Diamond System 4.0, Windows 2000 Server, and SQL Server 2000 combine to form a powerful yet cost-effective solution. It then documents the following results of benchmark testing:

- The Diamond System 4.0, running under Windows 2000 Server and SQL Server 2000, proved capable of sustaining **at least 3000 concurrent users**.
- Under the same extreme load conditions simulated in the benchmark testing, 3000 concurrent users could be expected to perform **216,000 transactions a day** and **54 million transactions per year**.
- Based on 3 transactions per policy per year, these performance results indicate that the Diamond System 4.0, Windows 2000 Server, and SQL Server 2000 could comfortably support policy base of at least **18 million**.

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Figure A.4: Policy Control Dialog Box

After entering the information requested, the user clicks **Submit**, and then fills out detailed applicant information in the **Edit Name** dialog that appears, as shown next:

Figure A.3: Edit Name Dialog Box

When the user clicks **OK**, Diamond 4.0 processes the data in real time and returns detailed policy information, including a quote for the premium, in the Policy Control dialog box, as shown on the next page.

The agent can access the Policy Control dialog box at any time to quickly verify and change policy information and update a customer's address and telephone number.

1.0 Insuresoft's Diamond System 4.0, Microsoft Windows 2000, and Microsoft SQL Server 2000: a Winning Combination

To compete effectively in an increasingly Web-oriented insurance marketplace, today's insurance companies need Internet-enabled applications that are:

- **Enterprise Capable.** Insurance companies require enterprise-capable systems able to process data quickly and reliably.
- **Scalable.** As a company grows, its throughput needs and user loads also grow. Insurance companies insist that their applications continue to deliver fast, efficient performance even when asked to process more data for more people.
- **Cost-effective.** Insurance companies want power and scalability at a low cost of purchase and ownership. That means choosing systems that hold down integration and maintenance expenses, and that run on affordably priced hardware.
- **Flexible.** Companies are looking to integrate their systems with host and legacy applications need open, interoperable technologies.
- **Extensible to the Internet.** To future-proof their technology investments, insurance companies want solutions that can run not only over corporate networks, but over the Internet as well.

Insuresoft's Diamond System 4.0, the Microsoft Windows 2000 operating system, and Microsoft SQL Server 2000 combine to form insurance industry services solutions with all of these qualities.

Insuresoft's Diamond System 4.0 has the comprehensive functionality and cost-effective flexibility that insurance companies need. And as the benchmark results discussed later in this paper demonstrate, when run under the Microsoft Windows 2000 Server operating system and the Microsoft SQL Server 2000 database system, the Diamond System 4.0 offers significant scalability and power.

1.1 Why Insurance Companies Need Insuresoft's Diamond System 4.0

With the rise of the Internet and renewed focus on integrating the enterprise, the need for insurance companies to expand beyond traditional client/server architectures is critical. An architecture that supports multiple delivery channels for direct customer interaction, as well as internal corporate use, is essential for success. Forward thinking businesses must implement solutions quickly, yet retain the ability to scale them upward incrementally as demand for their services and products grows.

The Diamond System 4.0 meets all of these needs by providing real-time, high-performance, multiple-channel processing for the first time in the insurance industry. It enables insurance companies to extend their business rules to agents and customers and embrace the Internet as another channel for customer interaction and customer service. And, perhaps most importantly, it enables companies to meet increasing demand for online processing by adding inexpensive PC hardware to their systems in an incremental fashion, saving deployment time and avoiding the high cost of implementing complete new systems.

1.1.1 The Diamond System 4.0 Features

The Diamond System 4.0 is a complete policy processing, billing, and claims system engineered exclusively for insurance companies. The Diamond System 4.0 automates insurance company policy and claims processing. It is the simple, reliable, and cost-effective way for insurance companies to manage and book business.

By creating The Diamond System 4.0 for use with the PC platform and the popular Windows operating system, Insuresoft has flattened the learning curve so that its customers can quickly achieve maximum productivity. Most insurance company employees already know how to use Windows, and even if they've had no previous PC experience, Diamond's intuitive user interface makes it easy to learn. In addition, to support self-service over the Internet, The Diamond System 4.0 also provides an easy-to-use Web-browser interface.

The networked PC platform means that The Diamond System 4.0 requires no proprietary, single purpose hardware. This gives sufficient processing power for even the most complex tasks, along with the ability to add third-party programs to the system at any time.

Insuresoft custom tailors each implementation of the Diamond System 4.0 to meet the specific needs of its customers' businesses, their agents, and their agents' customers. Every implementation is different, incorporating the policy criteria and company-specific information.

1.1.2 The Diamond System 4.0 Architecture

The Diamond System 4.0 n-tier architecture, depicted on the next page, supports its easy customization, upgrade-ability, extensibility, and scalability. Diamond ships with a rich client presentation layer, as well as a comprehensive array of .Net Web Services which facilitates the deployment of a web client interface. Its rich client interface enables insurance companies to serve customers by using traditional channels. Its Web Services enable insurance companies to extend Diamond's functionality to their agents or even their customers over the internet.

The application layer comprises the Diamond System 4.0 application server, which uses Microsoft's COM+ technology to encapsulate and process the system's business logic, and the Diamond System 4.0 web application server, which uses Microsoft's ASP.Net technology. With the addition of the web application layer to the architecture, Diamond is now able to offer a more Service Oriented Architecture (SOA) which leverages Microsoft's .Net technology via Web Services. The SOA expedites development of agency web portals as well as a fully functioning web interface to Diamond.

With the release of ASP 2.0 second quarter 2005, Diamond will utilize a web interface leveraging published web services to offer a full set of "Web Parts." Web Parts is Microsoft's new method of encapsulating web functionality into deliverable and configurable parts that the end user can incorporate into their web application. When you build a web site with Web Parts, the web site can be easily customized by either the administrator of the web site or the individual users of the web site, allowing for maximum flexibility.

In the data layer is the Diamond System 4.0 custom database, which can optionally write to a legacy mainframe system by using Microsoft's COM Transaction Integrator (TI). This architecture enables the system scale easily and inexpensively to meet increasing demand. It also enables the system to extend to the Internet because any authenticated client, including customers and business partners, can access the application's business rules. To support more concurrent users, the Diamond System 4.0 is built to support the use of Microsoft Windows 2000 Datacenter Server for clustering Web application servers and database servers.

Appendix A: Diamond 4.0 User Scenarios

This section describes the user scenarios that were tested. For an online demonstration of the Diamond System 4.0 interface and workflow, see:

<http://www.insuresoft.com/Diamond/workflow.htm>

With Diamond System 4.0, in order to start the application process for an insurance product, the user enters company, state, and effective date information in the New Policy Application dialog box, shown in the following screen capture:

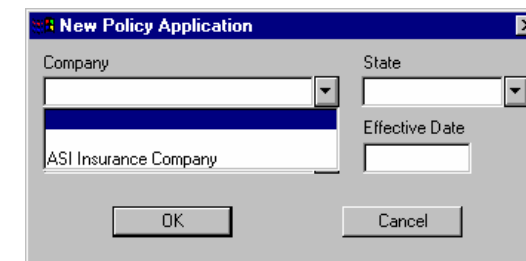


Figure A.1: New Policy Application Dialog Box

When the user clicks **OK**, the following screen opens in which the user types agency information and basic policy data.

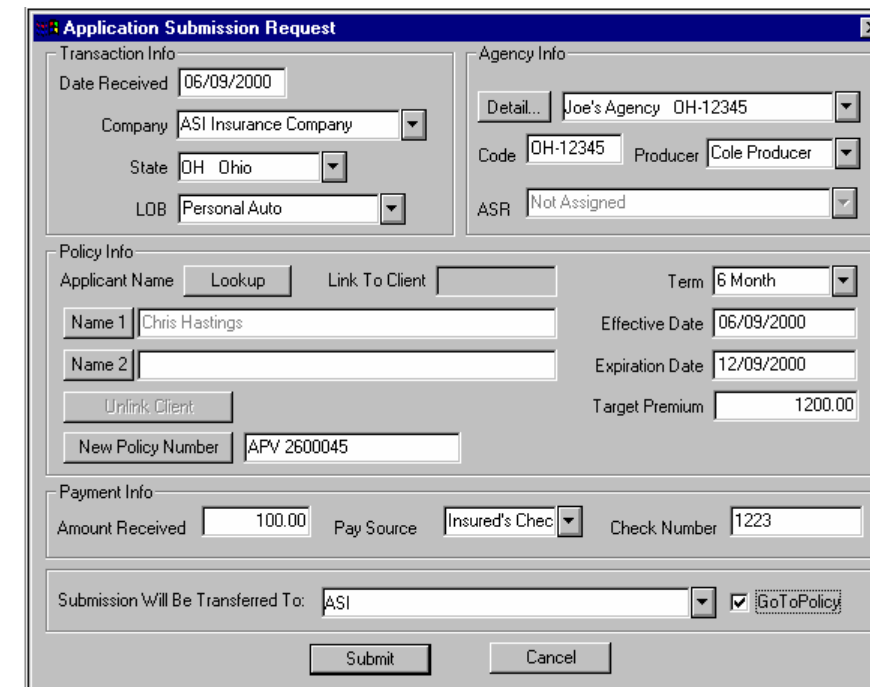


Figure A.2: Application Submission Request Dialog Box

For more information about Microsoft products, call the Microsoft Sales Information Center at (800) 426-9400. In Canada, call the Microsoft Canada Information Centre at (800) 563-9048. Outside the 50 United States and Canada, please contact your local Microsoft subsidiary.

To find information about Microsoft via the World Wide Web, see: <http://www.microsoft.com/>

To find information about Microsoft in the insurance industry, see:

<http://www.microsoft.com/industry/insurance/>

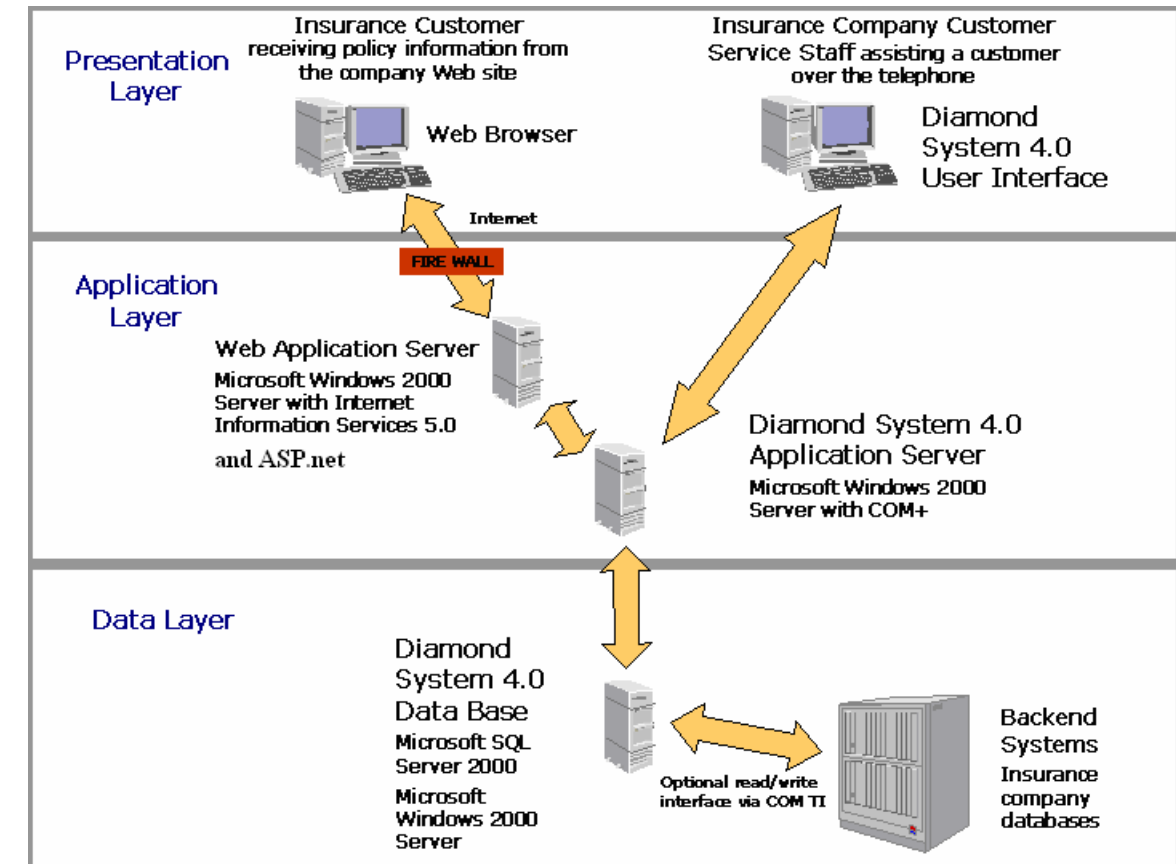


Figure 1.1: Diamond System 4.0 Architecture

1.2 Why Insurance Companies Need Microsoft Windows 2000 and Microsoft SQL Server 2000

Microsoft Windows 2000 Server and Microsoft SQL Server 2000 maximize the power and cost-effectiveness of the Insuresoft's Diamond System 4.0, delivering the performance and scalability that growing insurance companies need:

- **Scalability.** Three-tier applications running on Microsoft technologies can be economically scaled by adding inexpensive hardware to the middle tier, rather than requiring the implementation of an entire new system to support demand, reducing the cost per transaction.
- **Portability.** Windows 2000 Server and SQL Server 2000 are highly portable technologies, supporting many hardware platforms (including both CISC and RISC systems) and a wide range of processor families. This increases your hardware options when you deploy the Diamond System 4.0.

- **Interoperability.** Based on open standards and component-based technologies supported throughout the industry, Windows 2000 Server and SQL Server 2000 interoperate smoothly with existing systems while providing a secure foundation for future migrations. For example, COM TI enables the Diamond System 4.0 to easily read and write information to legacy mainframe systems. This means that solutions based on these technologies protect your present IT investments even as they open up the flow of strategic decision-making information.
- **Affordability.** Windows 2000 Server and SQL Server 2000 run on commodity-priced hardware that is often significantly less expensive than comparable proprietary servers.
- **Manageability.** With their graphical, drag-and-drop management tools, Windows 2000 Server and SQL Server 2000 require fewer support personnel and cut support costs dramatically. Tight integration—across server products and between server and desktop systems—further reduces the cost and complexity of deploying and administering solutions such as Insuresoft Diamond System 4.0.

Above all, with their native support for symmetric multiprocessing, Windows 2000 Server and SQL Server 2000 provide Diamond System 4.0 users with cost-effective scalability. The current industry-standard measure of the performance and scalability of Online Transaction Processing (OLTP) systems is the Transaction Processing Performance Council's TPC-C benchmark. As of November 1999, Microsoft SQL Server 7.0 Enterprise Edition held all 10 of the top 10 TPC-C benchmarks when ranked by price/performance. As of October 2000, SQL Server 2000 running on Windows 2000 achieved the highest performance ever for the TPC-C benchmark, with 505,302 tpmC and price/performance of \$20.68 per tpmC. For more information, see:

<http://www.microsoft.com/sql/productinfo/2000fastfxOct10.doc>

and

http://www.tpc.org/new_result/ttperf.idc

While TPC benchmarks are helpful for comparing platforms, they offer only an approximate prediction of how a given operating system and database will perform when running a given application under real-world conditions. Therefore, the only way to establish the scalability of Diamond System 4.0 on Windows 2000 Server and SQL Server 2000 conclusively is to test it in a realistic production environment, and see how many transactions it processes and how many concurrent users it supports.

Accordingly, in the spring of 2000, Insuresoft and Microsoft Consulting Services conducted a series of live performance and scalability tests. The remainder of this white paper discusses the nature and results of those tests.

2.0 Putting the Diamond System 4.0 to the Test

In June and July 2000, Insuresoft and Microsoft Consulting Services conducted benchmark tests designed to demonstrate that Diamond System 4.0, running on Windows 2000 Server and SQL Server 2000, offers sufficient performance and availability to support the needs of large insurance companies. Insuresoft's goal was to scale its Diamond Systems 4.0 software to support 10,000 concurrent users. With this capability, the system could handle the needs of the largest and busiest insurance companies in the U.S. for the foreseeable future.

Testing multiple database servers was outside the scope of this test. However, from the results, it can be extrapolated that by using Microsoft Datacenter Server to cluster two SQL Server 2000 database servers (each supporting 10 application servers) the Diamond System 4.0 can support up to **6,000 concurrent users**.

In addition, it can be extrapolated from the results of these tests that the Diamond System 4.0 is capable of processing approximately **54 million policy transactions per year** per SQL Server 2000 database server. At an average of 3 transactions per year per policy, the Diamond System 4.0 scales to **18 million in-force policies** per SQL 2000 database server.

Test Data

Test results show that, within the margin of experimental error, a Diamond System 4.0 system with 10 application servers is nearly 10 times as fast as a one-application-server system, which proves that Diamond System 4.0 scales linearly.

Optimal number of users for one application server. The test for application server scalability was run on one dual-processor application server. The number of concurrent users was increased until performance began to degrade, indicating the optimal number of users per server. This limit was reached at 200 users. Based on previous testing it was determined that a quad processor performs 50 percent better than a dual processor. Extrapolating the results of this test to a quad processor, it was estimated to support 300 concurrent users.

Optimal number of application servers per database server. After determining the number of users that can be supported by one application server, scalability was determined by adding application servers to increase the load on the SQL Server 2000 database server. Additional application servers were added until database performance began to degrade. The number of servers that could be added with no reduction in performance was 10, representing a total of 3000 concurrent users.

Number of policy transactions per database server per year. The number of policy transactions possible in a year with a single computer running SQL Server 2000 can be extrapolated as follows: Running 10 application servers 250 days per year, 12 hours per day, the Diamond System 4.0 can process approximately 54 million policy transactions per year. At an average of 3 transactions per year per policy, the Diamond System 4.0 scales to 18 million in-force policies per SQL 2000 database server. Customers requiring greater scalability will be able to deploy clustering by using Microsoft Windows 2000 Datacenter Server.

4.0 About Insuresoft

Insuresoft began as a division of Applied Systems, Inc. which was founded in 1980. Applied Systems is a leading vendor of automation for the independent insurance industry serving the unique needs of insurance agents, brokers, MGAs, banks and insurance companies in the U.S. and abroad.

In 1991, Applied Systems began offering customized policy processing including company specific rating, underwriting, policy issuance, and statistical reporting. This effort later served as the engine to drive the release of Applied Systems' first Company Systems product, known as The Diamond System, which was released in 1992. Since the first installation of The Diamond System at Cincinnati Equitable Insurance in 1994, Applied has implemented a total of fifteen systems in insurance company operations. The Company Systems Division offers full service and support of The Diamond System, and has positioned itself to become the leading solution for insurance company automation.

- **Percent data entry time adjustment.** This allows simulated data entry times to be adjusted based on the transaction or inquiry. This simulates the diversity of requests from a pool of concurrent users.

2.3 Test Cases

The test script ran on the Benchmark Controller, which controlled the Benchmark Agents workstations that emulate system users. Benchmark Agents submitted information to the application server for each dialog box item of the Diamond System 4.0 user interface, in the same manner as user would enter and submit the information in a real-world scenario. Server response time was recorded for each submission.

Three different test cases were developed based on real-world scenarios for the Diamond System 4.0. A description of each test case, along with the number of transactions and the pause time is listed in the following table. Simulated data entry time represents the amount of time it would take the typical user to enter the information into the system for each transaction.

The real world test distributed testing among the three test cases as follows:

- 60 percent of users performing a policy inquiry with 50 percent of those adding a note to the policy
- 30 percent of users performing new business policy processing (which is more complex than the other transactions)
- 10 percent of users processing claims

Test Case: Feature	Data Measured	Simulated Data
Issue	System response to a user submitting basic information to issue an applica-	5 minutes
Get Random Policy	System response to a user submitting a	1 minute
Claim: Submit	System response to a user submitting a	6 minutes

Figure 2.3: Test Case Description

For more information about the usage scenarios and the information submitted for each one, see "Appendix A: Diamond 4.0 Usage Scenarios."

2.4 Test Results

Scalability tests showed that a configuration with one Diamond System 4.0 application server and one database server supports up to **100 concurrent users per application-server processor**. A configuration with two application servers and one database server supports up to **200 concurrent users**, and so on, up to a configuration with 10 application servers and one database server, which supports up to **3000 concurrent users**.

The tests measured the degree to which the Diamond System 4.0 meets this goal in terms of both performance and scalability. Scalability tests measured the number of concurrent users that can be supported by each application server, and the number of application servers than can be supported by each database server. Level of performance was assessed by server response times. Tests were performed in non-production lab facilities in Renton, WA.

2.1 Test Environment

Software and hardware used in the tests is listed in the following tables.

Software
Diamond System 4.0
Microsoft Windows 2000 Server
Microsoft SQL Server 2000
Microsoft Proxy Server 2.0

Server	No. Used	Description
Application Server	5	CPQ5500 Dual PIII 500 MHz Xeon, 1024 KB LZ Cache, 2048 MB RAM, 53 GB Hard Disk
Database Server	1	CPQ7000 Quad PIII 500 MHz Xeon, 1024 KB LZ Cache, 4096 MB RAM, 163 GB Hard Disk
Developer Workstation	4	PROFWKST5100 Dual PIII 400 MHz Xeon, 256 KB LZ Cache, 256 MB RAM, 4 GB Hard Disk
Benchmark Agent	22	CPQ1850 PIII 500 MHz Xeon, 512 KB LZ Cache, 1024 MB RAM, 4 GB Hard Disk
Benchmark Controller	1	CPQ5500 Dual PIII 500 MHz Xeon, 1024 KB LZ Cache, 4096 MB RAM, 53 GB Hard Disk
Domain Controller	2	CPQ1850 PIII 500 MHz Xeon, 512 KB LZ Cache, 1024 MB RAM, 4 GB Hard Disk

The test topology is depicted in the following figure:

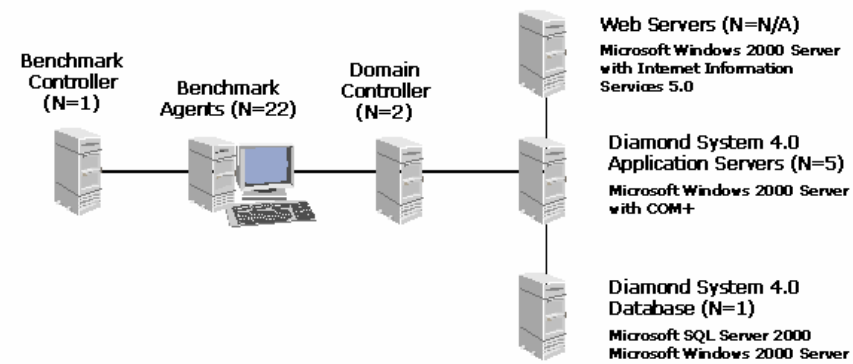


Figure 2.1: Test Topology

2.2 Test Script

The testing tool consisted of a two-part Visual Basic application:

- **Stress Generator** (DiamUIStressGen.exe) determined the type of test to run, the number of users to simulate, and the wait period between iterations of the test.
- Stress Server (DiamUIStressServer.exe) actually performed the tests.

The test script exercised the basic features of Diamond System 4.0 and represented the type of load a typical user would generate. The primary tests performed were as follows:

- **Submit Policy.** This test generated random information and submitted a policy. It did not include any detailed information in addition to submit, client, and basic policy information. The test made a call to the Diamond System 4.0 application server and received a blank submit structure from the database, determined the proper detail and rating version based on a random date, called the policy number generator on the middle tier, added a random name and address, and then called the business to submit.
- **Issue Policy.** This test submitted, rated, and issued a policy. It first performed the submit test as described above, and then added two drivers and two vehicles, as well as random coverages for each vehicle. It rated the policy by first saving the entire policy, rating it, and then saving it again. Finally it issued the policy, creating all billing and forms information.
- **Get Random Policy.** This tested a standard policy inquiry by loading a random policy complete with billing information. Fifty percent of the time, this test also added a note to the policy and then saved it.
- **Claims Test.** This test submitted a new claim to a random policy, generated a new claim number, added two claimants and two features, and then set the initial reserve for each feature.

The test script user interface is shown in the following screen capture. For more information about the usage scenarios and the information submitted for each one, see "Appendix A: Diamond 4.0 Usage Scenarios."

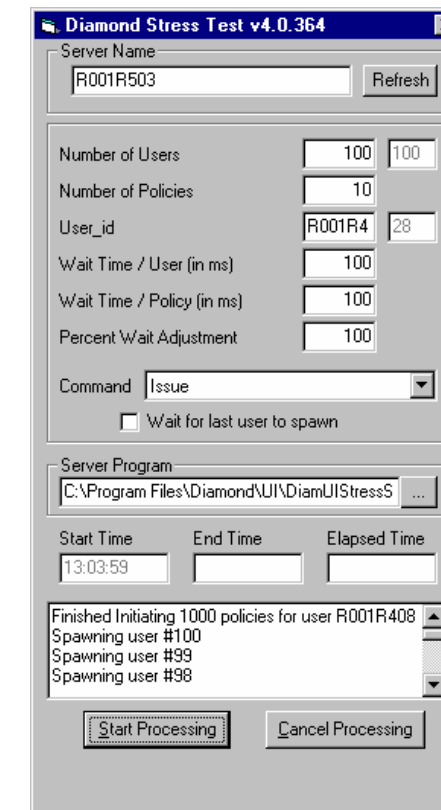


Figure 2.2: Test Script User Interface

The user interface for the test script enabled testers to set the following variables for each test run.

- **Number of users.** The number of simultaneous users that the script would emulate as using the system. This showed how well the system performed at a variety of load levels, ranging from one to 100 simultaneous users.
- **Number of policies.** The number of active policies, as well as policy instances, that could be stored on 1 SQL dbase.
- **Simulated data entry time per user.** The delay in milliseconds before the script would submit the data for each screen. It takes real users much longer to enter data in the Diamond System 4.0 user interface than it takes the test script to do so. Simulated data entry time was added to make the test more closely follow a real-world situation. Data entry times were based on the average time it took an experienced customer service or clerical representative to enter policy information in the user interface.
- **Simulated data entry time per policy.** To simulate a real-world situation the test script added a simulated data entry time for each policy approximating the amount of time it would take a user to enter in policy information.