

White Paper



NORTHSTAR

**NorthStar Performance and
Scalability Benchmarks**

August 2007

Executive Summary

NorthStar is the leading provider of wealth management software to financial services institutions. Delivered either on-premise or on-demand, NorthStar products enable firms and their advisors to dramatically improve productivity, enhance client relationships and reduce compliance risk.

NorthStar has made significant improvements in performance and scalability. This white paper presents the results of a recent lab test which demonstrates that NorthStar 5.0 meets the demanding performance and scalability requirements for large deployments of the application. Clients can use this document as an aid in deploying NorthStar software to meet business requirements.

NorthStar Technology

Unique among wealth management software vendors, NorthStar employs a contemporary Service-Oriented Architecture (SOA) that provides wealth management firms a flexible yet cost-efficient approach to the integration and distribution of services.

This leading-edge SOA structure allows NorthStar software to co-exist and integrate with existing IT infrastructure consisting of advisory tools, analytics, data systems of record, and mid- and back-office systems. As a result, IT departments can deliver a high-performance advisor desktop with unprecedented flexibility, allowing wealth management firms to eliminate point applications and unnecessary middleware, increase business agility, and lower total cost of ownership.

Test Methodology

The program test was executed at an Oracle ETC Lab using an Oracle 10g on Real Application Cluster (RAC) database. The benchmark simulates the real-world requirements of a large advisory community of 1,000 concurrent users in a wealth management firm using all four NorthStar Solutions.

The test was conducted based on scenarios (test workloads) derived from NorthStar clients, reflecting some of the most frequently used and most critical components of NorthStar Solutions (Compliance, Client Acquisition, Product Catalog, and Client Reporting), including normal advisory tasks such as generating presentations and integrating to analytics calculators. The program required that the test run in steady state for at least one hour and that certain key performance indicators be reached prior to certification.

The end users were simulated using Borland SilkPerformer version 6.5 with a think time that ranges between 5 and 55 seconds with a mean of 30 seconds between user operations. The Product Catalog Solution workload handled requests for information on investment products. The Compliance Solution generated and monitored investment policy compliance. The Client Acquisition Solution generated and monitored investment plans for portfolios. The Client Reporting Solution monitored and reported on the client hierarchy.

Test Data Size

The size of the database was approximately 50 GB and represented data across all four application solutions. Below is a sample of the number of records for key business entities used for the test.

Business Entity	Number of Records
Client	100079
Prospect	20065
Legal Entities (Ownership)	267205
Portfolios	360342
Hierarchy Accounts	354063
Ledger Accounts	295619
Positions	2416296
Parties	208118
Application Users	1854
Relationships (Client to Party)	3205396
Security Master (Equity, Fixed Income, etc.)	94747
Investment Catalog (Products)	28559

Test Results¹: 1,000 Concurrent User Benchmark²

Test Results Summary

Average HTTP response time	0.42 seconds
Average server busy time	0.24 seconds
Average application page response time	0.73 seconds
Number of HTTP hits per second	125.76
Number of total HTTP hits in 60 minutes testing	465511
Average CPU Utilization across all 4 application servers	32%
Average CPU Utilization across all 4 database servers	5%

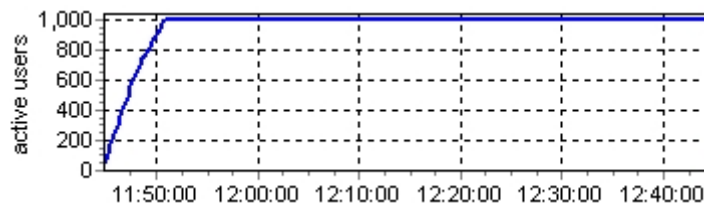
The test demonstrates that the NorthStar 5.0 architecture easily scales to at least 1,000 concurrent users, representing a 3,000 to 5,000 active user community.

- Based on the CPU usage on the database, 1,000 users could have been served by just one node with this hardware configuration. Maximum CPU usage on the database server was approximately 25%. The database cluster can easily scale to 4,000 users with four nodes. The application server with four nodes in the cluster can take additional 1,000 users with no significant degradation to the performance.
- The application server shows excellent horizontal and vertical scalability with concurrent users, with no noticeable degradation across multiple application servers.
- The NorthStar 5.0 architecture shows efficient use of the RDBMS, load balancing all 1,000 concurrent users through the NorthStar application to Oracle RAC using JDBC Thin Driver connectivity.

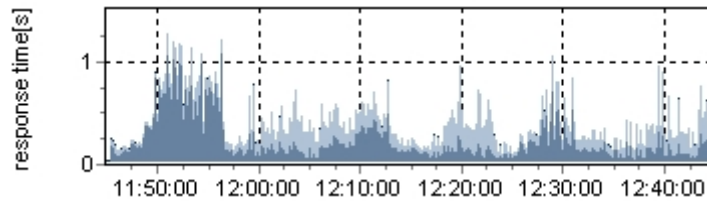
Generally, 1,000 virtual users with a think time of 15 seconds are roughly equal to 2,000 virtual users with 30 seconds. Initial tests show NorthStar 5.0 easily scales to 2,000 virtual users, representing a 6,000 and 10,000 active user community.

Below are the detailed results for 1,000 concurrent users, integrated across each of the four NorthStar Solutions.³

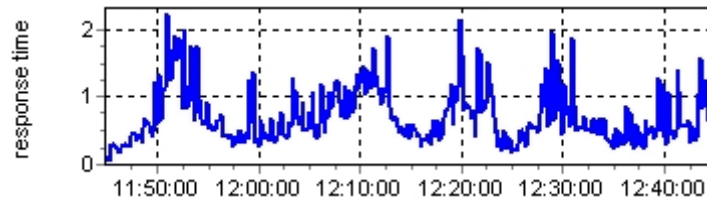
Concurrent users: All 1,000 users were logged onto system within 5-6 minutes of test run.



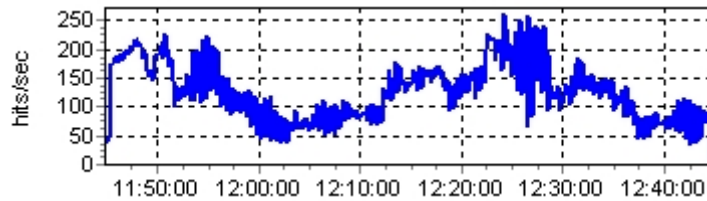
HTTP response time: The average HTTP per hit time across all application pages, as shown below, is 0.42 seconds, corresponding to an average server busy time of 0.24 seconds.



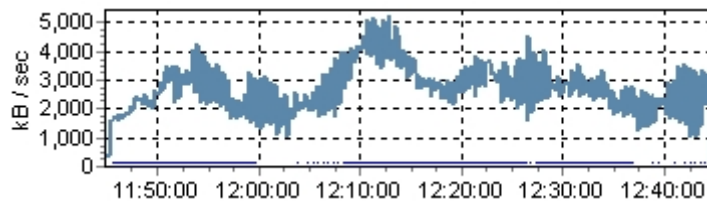
Application page response time: Application page may contain multiple HTTP requests. For example, each region on the page is loaded using AJAX. Average application page response time is 0.73 seconds.



HTTP hits: The average number of HTTP hits across the test cluster, as shown below, is 125.76 per second and total number of hits during test is 456,511.



Throughput: The average amount of data sent to and received from server was 2.8 MB/second and during the test, total was 10.1 GB.



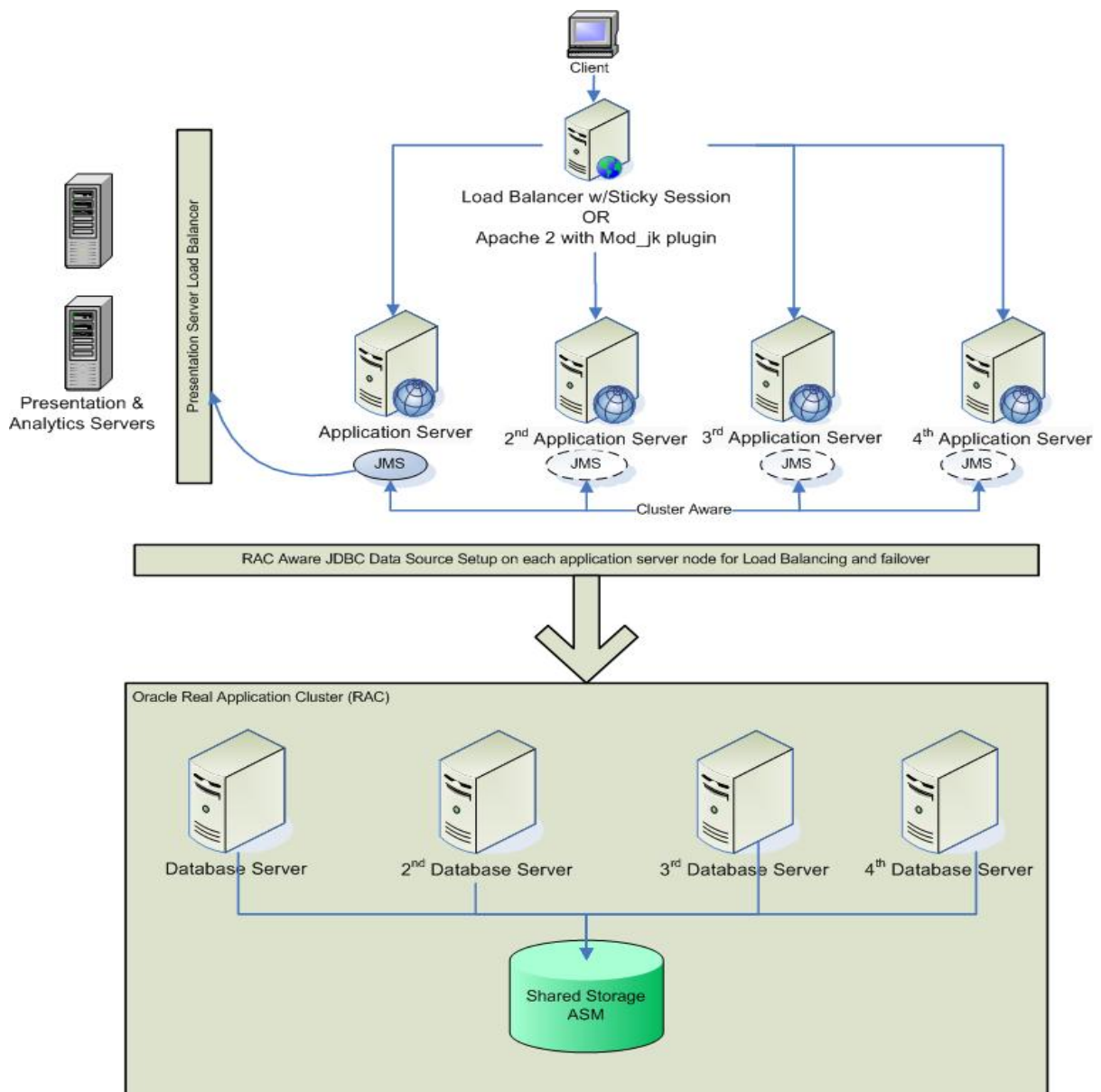
CPU Utilization of Application and Database Servers

Resource utilization across the application server and database tiers was quite good, averaging 31.61% across all four application servers. This suggests that the application server should support in excess of 100 concurrent users per core.

For the Oracle RAC RDBMS, performance was extremely good, reflecting the power of the RAC environment, averaging 4.78% for the duration of the test. This suggests that the RDBMS server should support in excess of 100 concurrent users per core.

Test Topology

NorthStar software is a Java/J2EE-based N-tier enterprise SOA application. Scalable, fault-tolerant, and secure, NorthStar software is a 100% thin-client browser-based application able to support redundant network appliances and clustered application components for all tiers and designed for performance optimization across loosely coupled and tightly coupled Enterprise Service Bus environments.



Deployment Options

Web Servers	Apache HTTP Server 2.0.54 or above
Application Servers	JBoss 4.03 SP1 WebLogic 8.1 SP4 IBM WebSphere 5.1.0
Database Servers	Oracle 10.2g for Linux Microsoft SQL Server 2000 SP4 for Windows
Operating System	Windows 2003 Server Red Hat Linux ES 2.1

Test Hardware and Software

Application Server	<ul style="list-style-type: none"> • 4 nodes in the cluster with 2 Dual Intel® Xeon® CPU 5160 @3.00 GHz on each node • 4 GB RAM with JVM configured to use 1 GB max • JBoss 4.03 SP1
RDBMS Server	<ul style="list-style-type: none"> • 4 nodes in the Real Application Cluster (RAC) with 4 Quad Intel® Xeon™ CPU @3.2 GHz on each node • 32 GB RAM with Oracle SGA configured to use 1.5 GB max • Oracle 10.2g
Presentation Server	2 Nodes (for failover) running Windows Server 2003 & IIS
Analytics Server	Collocated with one of the presentation servers running Windows Server 2003
SilkPerformer	Dell Latitude 620 laptop 2GB RAM

Contact Information

For more information on NorthStar software, go to www.northstar.com. For details on how NorthStar can address your firm's needs, call 1-866-916-8524.

About NorthStar Systems International

NorthStar is the leading provider of wealth management software to financial services institutions. It has a growing list of clients across market segments and sizes such as Charles Schwab, Legg Mason, Merrill Lynch, Wachovia, BlackRock and several national banks. NorthStar products, delivered either on-premise or on-demand, enable firms and their advisors to dramatically improve productivity, enhance client relationships and reduce compliance risk.

¹ Actual results may vary, based on a broad range of implementation-specific factors, such as transaction mix, hardware platform, network parameters, and database size. NorthStar Systems International does not warrant or guarantee that clients will obtain the same or similar results, even if they use the same or similar equipment and/or software applications. NorthStar Systems International does not warrant, endorse, or guarantee any performance of any products, any results desired or achieved, or any statements made within this document.

²This benchmark data is intended for general information purposes and not for use as a substitute for implementation-specific sizing or benchmarks.

³Customizations and configurations can affect performance.