

# Scalability and Performance Report - Analyzer 2007

## Executive Summary

Strategy Companion's Analyzer 2007™ is enterprise Business Intelligence (BI) software that is designed and engineered to scale to the requirements of large global deployments. Analyzer 2007 and has been tested for user scalability, data scalability, and wide area network performance. This white paper focuses on user scalability and performance.

Analyzer 2007 provides powerful Online Analytical Processing (OLAP), Key Performance Indicator (KPI) Management, Dynamic Reporting, Ad-hoc Query, and Corporate Performance Management (CPM) tools to ensure real-time decision-making in demanding enterprise environments. Analyzer 2007 is a key decision support system that provides enterprises with powerful yet intuitive, simple drag-and-drop features through a 100% zero-footprint Internet Explorer client. Analyzer also presents multiple reports and dashboards, each with multiple charts and graphs - all within a single browser instance. Analyzer also supports SharePoint and web-services-based deployments as well, allowing you to embed Analyzer's advanced BI capabilities within other existing applications.

Strategy Companion Corporation (SCC) and Hewlett Packard (HP) performed a scalability test of Analyzer 2007 on HP C-Series servers running Microsoft Windows Server 2003 & Microsoft SQL Server 2005 Enterprise edition. The results of this test indicated that Analyzer 2007 can scale in Out-of-Band signaling (OOB) environments to meet the needs of the most demanding enterprise requirements.

The results reflect that in an 'out-of-the-box' setup with no optimization on the OS, Application, Web servers, and databases, Analyzer 2007 is able to handle the workloads of a varied number of users. The performance results for 300, 400 and 500 users were as follows:

Sub-second response times for 300 and 400 concurrent users.

Response time of 1.20 seconds for 500 concurrent users, with 1.2 million Web requests, and 3700 reports executed, with an application load of less than 25%.

These results also show that with optimization, much higher performance levels can be attained.

## RESULTS SUMMARY

The following performance characteristics were observed within this test environment:

**Table 1: Benchmark Test - Results Summary**

Concurrent Users	Average Response Time	Web Requests	Reports Executed	Average SQL Server Utilization	Average Analyzer Server Utilization
500	1.20 seconds	1,209,600 / hr	3737 / hr	67.7%	24.9%

## Business Challenge

The one key competitive advantage that a business needs to have is to be able to make decisions in a real-time marketplace. This requires BI and other Decision Support Systems (DSSs) to be able to look for patterns in data across different data sets, including Enterprise Resource Planning (ERP) systems, Customer Relationship Management (CRM) systems, and other data repositories. Businesses need to reduce the complexity caused by multiple sources of information, and improve the decision-making processes within the enterprise, by implementing smarter business processes. Organizations can achieve this by successfully integrating BI into their business processes, ultimately resulting in a significant return on investment. The technology platform for BI must be capable of delivering information on demand, and in a cost-effective manner.

Applying BI to an operational process can provide a significant return on investment. Therefore, BI is one of the leading investment priorities for companies today. For BI to be a strategic part of operations, BI systems must be as available and scalable as any mission-critical system. Mission-critical BI depends on a secure, reliable, cost-effective, and high-performance infrastructure. Analyzer 2007 has been designed to meet these demanding requirements.

Maximizing performance and creating and maintaining competitive advantages, while at the same time ensuring a low cost of deployment and maintenance for BI solutions has always been a challenge for most enterprises. Analyzer 2007 helps resolve these challenges along with others such as an increasing number of users and consistent performance and scalability of the business worldwide.

Analyzer 2007 is based on the Microsoft .NET platform and is completely compatible with Microsoft Analysis Services. Analyzer 2007 provides all the technology advantages of the .NET platform. Analyzer 2007 integrates with Microsoft BI and provides an easy-to-implement and exceptionally user-friendly browser-based front end for Analysis Services. The ease of use of Analyzer 2007 enables users to quickly access and analyze your corporate data and turn it into meaningful and valuable information, resulting in faster and better business decisions.

## Overview

Analyzer 2007 is designed to meet stringent requirements of enterprises in the areas of performance, scalability, ease of use, collaboration, and availability to users. These requirements are achieved by integrating with multiple architectures, as described in the sections below.

- **Performance and Scalability**

Analyzer 2007 combines the advantages of the Microsoft Windows Server and SQL Server platforms, and provides levels of performance and scalability to suit the business needs of enterprises. Analyzer 2007 utilizes the inherent scalability of Microsoft Analysis Services, Microsoft Windows Server, and Internet Information Server (IIS). Analyzer 2007 can be a monolithic installation, a load balanced configuration on high performance servers, or scaled horizontally with deployment over a Web farm.

- **Reporting, Visualization and Ease of Use**

Analyzer 2007 provides users with a simple standardized interface, along with easy-to-use dashboards and visualization capabilities. It is easy to use even for non-technical users, without sacrificing powerful analytical capability. Some of the advanced visualizations provided by Analyzer 2007 include heat maps, funnel, radar, boxplot, and histogram charts. Advanced filtering and drag-and-drop features provide for an easily configurable look and feel. Analyzer 2007 can be integrated into existing portals via the Microsoft Sharepoint Portal Server, and provides enterprise flexibility via comprehensive set of web services.

- **Collaboration and Security**

The real value in information is getting it in the hands of someone who can take action. Analyzer completes the information cycle by making it easy to share results. Analyzer's unique collaboration features let users overlay color-coded "sticky" notes with their questions, comments, and instructions. Users can also quickly highlight report areas of interest in multiple colors corresponding to one or more of the "sticky" notes which have been annotated to the report. Once the report is ready to share, it can be e-mailed using Analyzer's built-in messaging system or through your standard e-mail system.

Analyzer 2007 is fully integrated with Microsoft Analysis Services security. It relies upon Active Directory to provide the authorizations that have already been established in the enterprise. Analyzer 2007 is also integrated with Kerberos authentication, and utilizes enforcement of SQL Server 2005 security, as well as additional security protocols. These authorization mechanisms allow the enterprise to have a single point of control for security in the organization. Since in most situations, security at this level has already been defined, these permission settings need not be re-created for Analyzer 2007.

- **Pervasive Decision Information**

Analyzer 2007 is a 100% zero-footprint, browser-based BI front end application for SQL Server Analysis Services that is loaded only onto the server. The browser-based front end allows decision-making intelligence to be available to all users by providing access to Analyzer 2007, even if they are located in remote offices. Users are able to obtain the required information within minutes.

## **Testing Methodology**

### **Business Transactions**

Based on extensive customer feedback, test scenarios were designed to reflect the typical usage of Analyzer 2007 by an enterprise-level organization. Simulated users performed common tasks and each business transaction represented a user performing an end-to-end business process. The business process involved multiple interactions between the user and the system. A typical test scenario required the user to perform the following tasks:

1. Log on to Analyzer 2007
2. Open the Shared Report Area

3. Execute a Report (with 2- and 3-dimensional charts and pivot table)
4. Expand a Row Dimension
5. Expand a Column Dimension
6. Create a New Measure (Growth Rate)
7. Perform Drill Through on a Cell of Data
8. Create a New Chart (3D Pie Chart)
9. Log out of Analyzer 2007

### **Transaction Workload**

The scalability tests were performed jointly by Strategy Companion and HP, at the HP Labs in Taiwan. These tests were executed for 300, 400 and 500 concurrent users on a C-Series HP server with 3 blades dedicated to the testing of these scenarios. This was a real-world test environment with no tuning or optimizations applied (i.e. Internet Explorer, OS, Application and SQL Server were all left at the default settings, and no other performance tweaks were applied).

The test execution server executed tests utilizing Microsoft Visual Studio 2008 Team Suite (VSTS 2008), following a most common usage of Analyzer 2007. The test scenario included report execution, drill down, and drill through with 2D and 3D charts being generated.

### **Database Server**

Performance testing was done on a pre-installed AdventureWorks Data Warehouse. Analyzer 2007 and IIS running on a Microsoft SQL Server 2005 Enterprise server demonstrated the ability to handle a significant load, and scaled consistently as the load increased.

### **Tuning and Optimization**

In order to simulate an out-of-the-box deployment of Analyzer 2007, no customizations were applied in the test environment.

### **Hardware Environment**

This section describes the hardware used in the test configuration, as well as the software installed on each system.

**Table 2: Hardware Description**

Test Function	Quantity	Processor	Operating System	RAM	Software
Database Server	1	Dual Socket, quad core 3.0 GHZ	Microsoft Windows Server 2003 Enterprise x64	10 GB RAM	Microsoft SQL Server 2005 Enterprise
Application Server	1	Dual Socket, quad core 3.0 GHZ	Microsoft Windows Server 2003 Enterprise x86	10 GB RAM	Analyzer 2007 and IIS
Load Generation Server	1	Dual Socket, quad core 3.0 GHZ	Microsoft Windows Server 2003 Enterprise x86	10 GB RAM	Microsoft Visual Studio 2008 Team Suite

For a detailed description of the hardware, see the Appendix.

### Test Results

The results of the benchmark study validate that Analyzer 2007 scales to support 500 concurrent users at the same time, at an average response time of 1.20 seconds. It is important to note that these results were achieved with an out-of-the-box configuration and without performance tuning.

To demonstrate how the application performance changed with scale, user groups of three different sizes were considered. The benchmark tests were executed against these three different user groups, using the same machine configurations, test cases and data volumes.

The following table summarizes the performance of Analyzer 2007 for user groups of three different sizes:

**Table 3: Summary of Scalability Results**

Metric	300 Users	400 Users	500 Users
Average Response Time	0.63 seconds	0.76 seconds	1.20 seconds
Web Requests	1,112,400 / hr	1,148,400 / hr	1,209,600 / hr
Reports Executed	3189 / hr	3489 / hr	3737 / hr

Metric	300 Users	400 Users	500 Users
SQL Server CPU % Utilization	63.6%	65.1%	67.7%
Analyzer Server % Utilization	19.3%	21.2%	24.9%

The test results were achieved without tuning and optimization. Better user scalability may be achieved with advanced tuning and optimization.

### Conclusion

Analyzer 2007 demonstrated its ability to scale to support the needs of large-scale enterprise deployment. The benchmark testing showed that without customization or optimization, Analyzer 2007 and IIS together with Microsoft Windows Server 2003, Microsoft SQL Server 2005 Enterprise, and Microsoft Visual Studio 2008 Team Suite, scales to easily support 500 users. When projected to the usage patterns of a global enterprise, these results indicate that the implementation of Analyzer 2007 is capable of supporting 89,688 reports per day on a single server.

Analyzer 2007 is easily maintained, and is built on the powerful, cost-effective Microsoft technology stack. Analyzer 2007 is rapidly deployed, and has multiple deployment options: IE browser, SharePoint, and Web services. Analyzer 2007 has multi-tenant, OEM, and SaaS versions available, and it can access a wide variety of data sources. The Drag-and-Drop interface of Analyzer 2007 is easy to use, and increases productivity. A powerful BI front end analysis tool for business users, Analyzer 2007 is highly scalable and manageable, and leverages your existing IT infrastructure and skill sets. These capabilities are delivered through a highly intuitive, zero-footprint client that provides enterprises with the flexibility of creating and manipulating multiple reports, each with multiple tables, graphics, and charts, all within a single Web browser instance.