
Business Intelligence – Data Warehousing, Enterprise-Wide Data Distribution

## About Barnes & Noble

With 1997 sales of over $2.4 billion, Barnes & Noble is the number one bookseller in the United States. The company operates more than 1,000 stores, including over 480 superstores and 550 mall stores, as well as a leading direct-mail business and an Internet web site at **www.barnesandnoble.com.**

Barnes & Noble customers have access to 1.5 million book titles. The Barnes & Noble Distribution Center, located in Jamesburg, New Jersey, replenishes books sold at all Barnes & Noble stores and fills web site orders. The Distribution Center contributes over fifty percent of the total volume of books sold.

The primary data repository for the Barnes & Noble Distribution Center is an IBM AS/400. Individual stores access the Distribution Center's database to search for and order book titles. In addition, the inventory planners at the Distribution Center constantly access the database to analyze inventory movement in order to best anticipate replenishment needs.

## The Problem

But, while the AS/400 provides a superior platform for housing and managing the databases, some users requested a different interface. "Although the AS/400 is an extremely powerful and capable platform for data warehousing, many of our users were asking for tools to make queries more convenient," comments Jerry Ridder, MIS Client/Server Manager for Barnes & Noble. "We felt we could better serve our users and increase productivity through an efficient client/server SQL environment with a GUI. This would speed queries and show the information more effectively."

However, the huge database and large number of daily transactions presented a challenging question: how could Barnes & Noble keep the NT-based SQL Server synchronized in real-time with the AS/400? They needed a fast, reliable, easy-to-use solution for replicating data between the two platforms that would require low transaction processing overhead on both the AS/400 and NT SQL Servers.

## Transformation Server Provides the Solution

To provide real-time data synchronization and cross-platform data transformation, Ridder selected DataMirror Transformation Server for Microsoft SQL Server based upon a recommendation by John Kuhn, Manager of AS/400 Programming.

Transformation Server is an innovative replication software tool that provides users with the flexibility to easily move and continuously synchronize enhanced data between Microsoft SQL Server databases and an IBM AS/400, without having to restructure or reprogram critical business applications. In addition, this versatile program efficiently enables applications such as data warehousing, backup and recovery, data distribution and high availability.

"We have tables ranging in size from as few as 476 rows to one that is 331 million rows by 132 columns," explains Ridder. "These tables are constantly replicated. With an estimated ten million transactions per day, reliability and speed are both vitally important. We needed a replication architecture that we knew could work day in and day out with minimal monitoring and tweaking. DataMirror proved to fit this need and met our benchmarks."

After purchasing Transformation Server, Barnes & Noble intensively tested the system for 1.5 months before putting the system into production. Ridder, with the assistance of Jeanette Seip, Team Leader for AS/400 programming, tested all of the product's features and evaluated the most efficient way to divide the AS/400 tables, handle indexing issues, and transform day/date fields. Ridder and Seip also evaluated SNA versus TCP/IP for inter-computer communications.

Using Transformation Server, Barnes & Noble Distribution Center replicates the desired tables in the AS400 to a network of NT-based SQL Servers. While the initial system uses three SQL Servers, the company plans to eventually upgrade to six. Stores can interrogate inventory and place orders through dial-up and shared server links to the NT's, taking advantage of the powerful SQL tools and easy to use graphical user interface.

## The Results

The twenty tables currently being replicated average ten million transactions a day. In fact, since Barnes & Noble implemented the system in July 1997, one table alone has had 1.24 billion transactions. The system also sees heavy client usage. The system's users now query the databases about one thousand times a day. Even with this activity, Transformation Server constantly replicates approximately 7,000 rows per minute.

The user community within Barnes & Noble could not be happier. "Our users are constantly asking for more data to be replicated to the NT environment so that they don't need to interact directly with the AS/400," states Ridder. "Not a week goes by that we don't have another table that users want to have replicated or another function made available so that more analysis can be done."

"We initially zeroed in on DataMirror due to the company's responsiveness and knowledge of both the AS/400 and NT platforms," Ridder adds. "Since using the product we have found the support to be top notch and have found the product to be as reliable, fast, and effective as we had hoped."



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