

Case Study: Sharp HealthCare Achieves Significant Cost Savings with Oracle Advanced Compression

Oracle Advanced Compression

The Advanced Compression Option in Oracle Database 11g offers a comprehensive set of compression capabilities to help organizations maximize resource utilization and reduce costs. It allows IT administrators to significantly reduce their overall database storage footprint by enabling compression for all types of data – regular relational data (tables), file data (documents, spreadsheets, XML and other files), network, and backup data. While storage cost savings are an obvious tangible benefit of compression, the innovative Advanced Compression technologies in Oracle Database 11g are designed to reduce resource requirements and costs for all components of your IT infrastructure, including memory, backup media and network bandwidth.

Sharp HealthCare

Sharp HealthCare is a [not-for-profit](#) integrated regional health care delivery system based in San Diego, California. Sharp includes four acute-care hospitals, three specialty hospitals and two medical groups, plus a full spectrum of other facilities and services.

As San Diego's healthcare leader, Sharp has an unwavering commitment to excellence and passion for caring. At the forefront of Sharp's commitment to excellence is The Sharp Experience, a sweeping performance improvement initiative launched in 2001. This initiative has resulted in numerous advances in clinical outcomes, patient safety enhancements and organizational and service improvements.

Sharp was named a recipient of the [2007 Malcolm Baldrige National Quality Award](#) and was the first healthcare system to be named a gold-level award recipient by the California Council for Excellence (CCE) for the California Awards for Performance Excellence (CAPE) program, the state-level affiliate of the Baldrige Award, in 2006.

Sharp's passion for caring is shared by 2,600 physicians, including more than 1,000 physicians in our two affiliated medical groups — Sharp Rees-Stealy and Sharp Community Medical Group — and more than 14,000 employees. Together this team is working to make Sharp San Diego's best place to work, the best place to practice medicine and the best place to receive care.

BACKGROUND

The Data Warehouse for Sharp HealthCare is a vital part of the Information System's infrastructure. Its purpose is to separate business intelligence reporting from time-critical healthcare transactional systems. This is accomplished by feeding data into a common repository optimized for decision support queries through one enterprise-reporting tool. The growth of this data continually increases year after year and we realized we were rapidly outgrowing our existing Microsoft solution, based on Windows technologies running SQL Server. Previous attempts in upgrading to a newer version of Windows technologies had been unsuccessful. It was

then decided, under the direction and guidance of Ken Szymanski, Information Systems Vice President of Business Systems, to replace the Data Warehouse technologies with a different platform utilizing IBM/AIX and Oracle solutions. This decision was made based on the well-known scalability and stable environment that Oracle has provided supporting other Sharp HealthCare enterprise applications and database systems.

The SQL Server to Oracle conversion initiative officially commenced in the fall of 2008. At that point, Szymanski made the decision that no new data feeds would be developed for the existing Data Warehouse and required all new data feeds to be for the new Oracle-based Data Warehouse. The first application that was developed for the Oracle Data Warehouse database was a clinical electronic medical records application feed using Informatica as the ETL tool. The initial size of the Oracle Data Warehouse database was 2.5TB and was rapidly increasing at a weekly rate of 15-20GB. Based on the high volume of medical transactions pushed from the first clinical application and the previous decision to migrate all other existing application feeds from the Microsoft Data Warehouse to the new Oracle Data Warehouse, we were concerned with the escalating database growth of the new Oracle Data Warehouse.

To resolve the issue, Advanced Compression was chosen, as the solution to help meet the escalating demands for storage. After the current Oracle Database was upgraded from 10.2.0.4 to 11.1.0.7, Sharp HealthCare made the decision to take full advantage of the new OLTP Table Compression in Oracle Database 11g by enabling it by default at the tablespace level.

IMPLEMENTATION & MIGRATION

Testing was conducted on small tablespaces located on the development server running AIX 6.1 (64-bit), with 4 processors and 32GB of RAM. Small tables proved to load efficiently utilizing significantly less storage. A migration plan was then developed to generate compressed tablespaces for all user tables. Existing tables were relocated into the newly compressed tablespaces with a 2:1 compression ratio. It was determined that the creation of new tables was taking the same amount of time as table creations without compression.

After executing a successful development and testing strategy, a plan for production go-live was scheduled for June 2009. Oracle Database 11g Release 1 was installed on new hardware running AIX 6.1 (64-bit), 16 processors and 256GB of RAM. As initial groundwork, all user tablespaces on the new database were created with compression prior to the export from the existing production system. The next step was to move individual tables through a database link, as this procedure would take the same amount of time as a regular create table on uncompressed tablespaces. The final outcome was a 2:1 compression ratio, similar to the results of the development testing. The end result was significantly reduced storage usage.

In February 2010, additional modifications were made to the development and test environments for the Data Warehouse. The Oracle development database was upgraded from 11.1.0.7 to 11.2.0.1 in conjunction with an operating system upgrade to AIX 6.1.4. The upgrades were completed successfully and no issues were experienced. Following the same procedures used in previous migrations, tablespaces were created with Advanced Compression. Oracle Data Pump was utilized to transfer a copy of the production data (~1.5TB) onto the test server. Upon running

the Data Pump import, the tables were created in considerably less time in comparison to the previous Oracle 11.1 version of Data Pump and Advanced Compression.

Both development and test environments were monitored and tracked for a month and ran without any issues. The production system was upgraded in March 2010 from Oracle 11.1.0.7 to 11.2.0.1 and the operating system was upgraded to AIX 6.1.4. All three environments (development, test and production) are now on Oracle Database 11g Release 2.

OUTCOME

Sharp HealthCare saw an overall 2:1 compression ratio. Implementing Advanced Compression on Oracle Database significantly reduced the storage requirements and allowed us to build a second non-production environment for analyst testing. In development, total disk space available is 2.5TB and, due to compression, only 1.2TB has been utilized. In production, 2.75TB disk space is available and only 1.5TB has been utilized. Performance has been exceptional. Without a doubt, the estimated cost and time of purchasing and managing an otherwise necessary abundance of storage over an undetermined amount of time, outweighs the cost of Advanced Compression licensing.

Sharp HealthCare continues to reap the benefits of Advanced Compression and is saving substantial amounts of storage as the transition from SQL Server to Oracle nears its completion.

AUTHORS

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