Case Study: Orange County Transportation Authority

The Orange County Transportation Authority wanted to run their mission-critical multivalue applications on an Oracle database. It found a way.

Orange County Transportation Authority (OCTA) is one of the largest public transportation companies in the United States. Located in Orange, California, OCTA manages everything from road improvements of city and county roads, freeway construction, to public transportation for Orange County including buses, trains (METROLINK) and taxi service.

Their mission critical applications were originally developed on PRIMOS operating system running Prime INFORMATION, in-house. The applications were migrated to an open system platform (UNIX) and the UniVerse DBMS over the period of one year in 1992.

The applications that manage the OCTA mission included in the UniVerse to Oracle migration include:

- the Bus Automated Tracking System
- Board of Directors, Record System
- Commuter Club System
- Employee Injury and Temporary Alternative Work Program
- Fixed Route System
- Pass Sales
- Public Information and Customer Service
- Contract Budgeting
- Radio Inventory
- Key Inventory

"We ended up with 11 different databases because of years of re-organizations and the consolidation that resulted in the Authority," said Ray Riggins, manager of applications development with OCTA. "At the end of the day, we had no desire to have more than one database to support."

Availability was also an issue.

> *"We had a number of requirements to fulfill - 24/7 operations require minimum downtime. Our largest window of system downtime was limited to 3 hours on a Sunday," Riggins said. "We didn't want to re-train end users. Applications should look, feel, and behave as they do in their original environment.. We also wanted limited involvement of the OCTA IT staff for the conversion effort."*

The Authority commissioned a study of the top three databases in UNIX market, Oracle, INFORMIX and DB2. INFORMIX had a better engine at the time , but Oracle had better marketing machine. "After a search and evaluation process over 2 years, it was determined that none of the packaged solutions out in the market place could adequately replace OCTA's mission critical applications" Riggins said. "I learned about MVON through a flyer—it sat

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on my desk for 3 months—I just kept moving it around, not having the time to read it. We had a big new HP box with Oracle loaded just sitting there idle…and the executives kept asking why it wasn't being utilized."

"ON Corp did a demo, then a Proof of Concept, a Needs Assessment—to see how big the breadbox—came up with a budget." The project wasn't as easy as I had I thought and it wasn't as hard as it could have been," said Riggins. "Really, implementing the last 3 of the 13 applications was non-eventful. We actually felt a little disappointed in how quiet it was". "We had a team ready on Sunday evening to trouble shoot any problems and we all sat around with nothing to do. The biggest issues we dealt with were hardware, O/S and database configuration issues. Testing was bigger than anyone anticipated, but we still got the project done in six months."

The corporate server (Fiji) an HP 9000 model N4000 with 2 CPUs, HP-UX 11.0, 64-bit O/S, 2 GB RAM, and Oracle 8.1.6 64-bit was purchased for the consolidation on Oracle. This server was used as the migration and QA platform and now is the production machine for the mission critical applications. Oracle Client and Server were installed and configured on Fiji. Then, MVON Oracle Login Server and Run Machine were installed on the migration server and the MVON Data Server was installed on the Legacy server (Tiger).

The Data files and Dictionaries were analyzed for integrity and compatibility with Oracle's relational database structure. Dictionary inaccuracies were corrected and data incompatibility issues resolved on the source machine before migration. MVON's migration tools examined the data dictionaries and created scripts to execute SQL CREATE TABLE commands. The scripts were reviewed, revised as needed and executed to create the Oracle tables.

Application files such as BASIC programs, paragraphs, sentences and Unix scripts were copied to the migration server and into Oracle tables using the MVON COPY command. The BASIC programs were compiled and cataloged with the MVON BASIC and CATALOG commands. Once compiled and cataloged with the MVON Application Server, these applications become database and platform independent. OCTA chooses to store their data in Oracle, but they now have the choice to perform I/O with the database of their choice on the platform of their choice. And a single program can perform I/O with multiple database types concurrently, so if needed, some files can be stored in Oracle, some in MS SQL Server, some in UniVerse and INFORMIX and the application behaves the same, regardless.

Where appropriate, multivalued data was automatically mapped from the three-dimensional data structure to the two-dimensional structure required for first normal form in a relational database such as Oracle. MVON's migration tools loaded the data from the UniVerse files on the source server to the Oracle tables on the target server. The OCTA development team performed QA and the System was released to the End Users.

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OCTA chose three small and relatively simple applications to start the migration process. These applications are somewhat autonomous from the rest of the mission critical applications and they could move these end-users to the new machine without disrupting their workflow. These three applications, Employee Injury and Temporary Alternative Work Program, Commuter Club System, and Key Inventory, though small were the most labor intensive during the migration process. They proved the most labor intensive as they were used to shake out the migration process within the organization. The migration project taking a total of 6 months, these three took up the first 3 months. The final applications though much larger and complex took up the remaining 3 months of the project.

William Mao, the manager of IT for OCTA remarked, "We're not looking to be a leader in IT; we follow, and if Oracle is the leader, then we follow. We lead transportation industry in terms of adoption of new technology, such as CAMNET our procurement system. If the technology adds value, we adopt it."

"The highest praise", Mao said, "was that we offered to be a reference. ON didn't ask, we offered it."

Oracle offers users of the MultiValue model a path to Oracle without requiring changes to their applications. This is done in cooperation with the ON Group, who specializes in opening the doors for MultiValue users to mainstream information technology of all types, and especially Oracle.