Migration Case Study

Business Problem

The California Department of Justice (DOJ) is based in Sacramento, California and is responsible for a wide range of law enforcement issues throughout the state.

DOJ has run Unisys OS2200 systems for many years and has had a large body of legacy code running on Clearpath Dorado servers.

The applications are expensive to run on this platform and difficult to support by an aging workforce of legacy programmers.

To cut cost and improve agility DOJ embarked on a multi-year programme of application rewrite and replacement. However, it became clear in 2011 that this programme would not be complete by the relicensing deadline of July 2012 and the last and most contentious applications would still not be completely transferred to new technology.

Business Solution

MSS and Practical Transitions contracted through LCS, a well-established and trusted supplier to the State, to complete the migration of the last applications away from the mainframe.

The migration project was conducted during the first half of 2012 and the last components went live at the end of June 2012. The end result was a system running faster than before on commodity hardware and low-cost software.

Overview

DOJ already had programs in place that would move most of their Unisys OS2200 applications to their chosen strategic platform – CentOS Linux. However the last, possibly most difficult, applications remained. These comprised several different systems written in diverse languages.

DOJ chose to use MSS tools to "lift and shift" these applications to the target environment. MSS staff were able to tackle not only the standard application languages of Cobol and Mapper but also the PL/1 application running on compiler technology now obsolete for many years.

The Cobol programs were translated to Open Cobol running against Oracle database using the COBOL-IT compiler. The department has a bias towards open source software and low cost. It therefore chose the compiler for its cost-effectiveness and availability of support. The Mapper applications were migrated to BIS, the successor product from Unisys that runs on Linux. The PL/1 application was moved to PL/1 on Linux using the Iron Spring compiler.

In addition data was migrated from the mainframe and from its attached virtual tape subsystem to Oracle database using programs provided by MSS.

Challenges

The Cobol migration was relatively straightforward but, since the target compiler does not support REPORT SECTION code, extra effort was required to replace several reports coded in this way. In addition, the Cobol programs had extensive and somewhat obscure interfaces to other system components. In many cases ECLs were generated making a conversion to native scripting difficult. MSS solved this problem by supplying an ECL emulator to interpret ECL at run-time.

The Mapper migration was, in some ways, more straightforward. However much of the code had been written some decades earlier and adhered to very out-of data standards making the transition to BIS difficult at times. Much of the code had to be relocated due to its use of reserved cabinets and many of the modules had to be modifies to address the new locations. Testing was also a problem since much of the data was sensitive and could not be made available to staff outside the DOJ organization. Finally, considerable effort was expended in creating a system of file and print routing that would be compatible with Linux. Many different agencies within the State government send and receive data and print files and these were all accommodated during the project.

Challenges

The PL/1 application was actually a code generation system designed for allowing very flexible reporting on DOJ statistical data. The application takes in scripts written in its own proprietary language and creates customized PL/1 programs that are then compiled and run to produce the desired output. The translation of the generation program was accomplished in a relatively short time but the testing took some time due to the relative immaturity of the Iran Spring PL/1 compiler. However, with exceptional support from the software provider, all of these problems were overcome and the system tested successfully against all of the significant production scripts.

The virtual tape subsystem appeared to be a big challenge at the start. However, after rigorous examination of the historical data, it was determined that very few tape images would be required to be retained. MSS created a method of transferring the data to flat disk files that could be napped to an Oracle schema using the "external" syntax. This enables normal file management to be used – more than one backup would be inappropriate for this static, rarely-accessed data – but allows access via tools using normal SQL syntax.

Results

The migration project was completed by July 2012 enabling the Dorado machine to be decommissioned on time. The Linux system proved to be very stable and performed well.

DOJ is very happy to be able to lower its cost base and take advantage of more modern technologies enabled by the Linux / Oracle platform and now has a development path for the future unencumbered by the old difficult-to-maintain legacy assets.