MKS Toolkit Case Study

Star Enterprise

This major petroleum refiner and retailer wanted to port a complex UNIX-based application onto Microsoft Windows without giving up a solid, tested code base. Using MKS Toolkit for Enterprise Developers (formerly N*u*TCRACKER), the powerful UNIX-to-Windows migration tool from MKS Inc., the company ported 250,000 lines of code in just two months, protecting its investment in a system with many productive years ahead of it.

According to Dave Hardin, a Technologist at Star Enterprise, there are really only two ways to move a solution from UNIX to the Microsoft Windows operating system.

"The first involves throwing away the UNIX code and starting over from scratch. Much like a revolution," he says. "The second option is to carry the UNIX source code forward into Windows and adapt it over time as required. Much like an evolution. "If the system in question is performing effectively," Hardin continues, "evolution makes far more sense."

Strategic Move To Windows
The need to port Galaxy arose in 1995, when Star Enterprise made a strategic commitment to reduce administrative costs by migrating its IT infrastructure onto Microsoft Windows.

"The real issue boiled down to the fact that the UNIX vendors had a hard time creating a unified version of UNIX," says Hardin. "Each vendor had its own flavor, and there was enough difference to cause trouble. We wanted to go to a single operating system, which should translate into savings." Switching to Windows would also enable Star Enterprise to deploy more cost-effective, commodity-priced hardware.

A Galactic Migration Challenge
Star Enterprise first ported its file, print, and e-mail servers onto Microsoft Windows, and then turned to its business systems, including Galaxy.

Created in 1987, Galaxy is a process information integration environment that collects real-time process control data from various Distributed Control Systems at Star Enterprise's refineries and makes it available to business systems such as yield accounting and decision-support applications.

"Galaxy maintains the integrity of the control systems while allowing large numbers of users and applications to access an aggregated, 'mirror image' of the control systems' real-time data," says Hardin.

A large and complex system, Galaxy runs on some 20 Intel-based SMP servers

supporting approximately 500 client PCs. At the core of the system are dozens of UNIX daemons organized into clusters. Each cluster is responsible for all of the functions related to a specific process unit within a refinery, and each daemon performs a specific predefined task within its cluster.

"The migration issue was basically one of either rewriting the whole system or morphing the different UNIX daemons into Windows services that looked and felt like Windows was their native home," recalls Hardin.

Early on, Hardin concluded that a complete rewrite was not a practical option. "Several clusters run in UNIX systems that had to be maintained for several years," he says. "Some clusters actually run embedded in third-party equipment." Moreover, Hardin adds, "a rewrite wasn't absolutely necessary, because the base system architecture was still valid and didn't need to be trashed. The UNIX code base, while not 'bug free,' was strong and had many, many hours of run time."

The challenge, then, was to port Galaxy onto Microsoft Windows without simply jettisoning its reliable UNIX-based core. "Bottom line, we wanted Windows without giving up UNIX," says Hardin.

Best of Both Worlds
The answer, Star Enterprise eventually concluded, was NuTCRACKER.

"After checking out several products that claimed to provide a POSIX/SVR 4 UNIX development/runtime environment for Windows, we chose NuTCRACKER from MKS," says Hardin.

"NuTCRACKER was selected because it provided a comprehensive UNIX API library, including support for shared memory, sockets, and signals," Hardin explains. "Also, it was not a separate subsystem, but an extension to Win32, allowing the addition of conditional calls to Win32 DLLs. It's a mature, well-integrated, and easy-to-use product that combines the two distinct worlds of UNIX and Windows into an environment that is truly 'best of both worlds.'"

Using NuTCRACKER, Star Enterprise was able to port 250,000 lines of C code from UNIX to Windows quickly and easily. "The code port was accomplished as a background task and went quite well," reports Hardin. "All required daemons were converted to Windows services in about two man-months."

Throughout the migration, Hardin found MKS's responsiveness impressive. "The tech support people at MKS were a great resource," he says.

Passing the Full Scale Test
Though the port went smoothly, Hardin was anxious to see if the new Windows NT-based version of Galaxy would perform as well as its UNIX-based predecessor.

"A single process unit system could run on a laptop," Hardin notes, "but would it scale to an entire refinery? That question was answered when we had the opportunity to participate in a beta test of a quad-processor Pentium Pro 166 with one gigabyte of RAM. We were able to run a full refinery real-time database under simulation with hardware resources to spare!"

Benefits
Using NuTCRACKER, Star Enterprise was able to migrate 250,000 lines of complex C code onto Microsoft Windows in just two months. Truly a best of both worlds solution, NuTCRACKER gave Star Enterprise the flexibility it needed to create the Win32-based version of Galaxy without sacrificing its investment in UNIX software and skills.

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Technologist
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Renewed Life

Thanks to N*u*TCRACKER, Star Enterprise was able to port Galaxy onto Microsoft Windows without spending a lot of time and money on a complete rewrite, sacrificing its investment in UNIX software and skills, or weakening system performance.

"It bought me a lot of flexibility," says Hardin. "N*u*TCRACKER allows me to have a single code base for applications that have to run on both UNIX and Windows. That's probably its single most important feature."

Based on his experience with Galaxy, Hardin views N*u*TCRACKER as a powerful way for organizations that are migrating applications onto Microsoft Windows NT to choose evolution over revolution.

"If a system has real business value, provides a competitive advantage, and has received proper care and feeding through its life cycle," he says, "the tools exist to cost-effectively give it renewed life under Windows. The best such solution is N*u*TCRACKER."