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Subsystem for UNIX-Based Applications: Providing More Choices

For decades, large companies have faced the complexities of working in mixed IT environments. The costs, time, and headaches associated with porting applications from one operating system to another cannot be overstated. And as legacy systems age, these challenges show no sign of abating.

To address the specific problems of porting UNIX-based applications to the Windows® operating system, a company called Softway Systems developed Interix in the early 1990s. Interix, a subsystem for UNIX that runs atop the Win32 kernel, provided POSIX-compliant APIs that enabled applications built on UNIX platforms to be recompiled on Windows.

Solving the problem of rewriting applications

Before Interix was developed, a company wanting to run a UNIX-based application on Windows would have to rewrite the program code entirely. The application, typically written by a UNIX programmer, would be rewritten for Windows, usually by a Windows programmer. This process created enormous resource and cost issues. And frequently, new bugs were introduced into the application, further complicating the process.

With Interix, however, rewriting all of the code became unnecessary. To port an application to Windows, programmers simply recompiled the code to the POSIX-compliant APIs of the Interix subsystem. It was similar to porting applications from one flavor of UNIX to another. For the first time, programmers could quite easily move a UNIX-based application to Windows and run it in a familiar UNIX environment.

Microsoft integrates Interix, develops SUA

In 1999, Microsoft acquired the Interix technology from Softway Systems. Instead of shelving the technology, as some Interix users feared, Microsoft put it to use. They began offering Microsoft Interix 2.2 and later incorporated Interix into in version 3.0 and 3.5 of Microsoft Windows Services for UNIX, a software package that provides parts of the UNIX environment on Microsoft Windows NT.

In 2005, in an effort to advance the Interix technology, a team at Microsoft created a re-architected POSIX-compliant subsystem called Subsystem for UNIX-based Applications (SUA). While the core technology is similar to Interix, SUA provides better operating system integration. It supports mixed-mode and 64-bit compatibility, and it enables UNIX-based applications to be linked with Windows libraries.

While developing SUA, the Microsoft team worked hard to ensure that the GNU Compiler Collection (GCC) and the GNU Project debugger (GDB)—two applications essential to open source programmers—operated seamlessly on SUA. To further reach out to the UNIX and open source programmers and system administrators who use the technology, the SUA team provided users the source code of the GCC and GNU changes and the binaries.

SUA is integrated as a component of Windows

Today, SUA ships as an optional component of Windows Vista® Enterprise, Windows Vista Ultimate, Windows Server® 2003 R2, and Windows Server 2008. As an out-of-the-box feature, SUA simply provides the subsystem on which UNIX programmers can work.

To help these programmers make the most of the subsystem, however, the SUA team created a free download. Available from the Microsoft Download Center, Utilities and SDK for Subsystem for UNIX-based Applications includes shells, development tools, libraries, binaries, and the source code for the GCC and GDB changes.

As noted by Shamit Patel, a Microsoft project manager who worked on the most recent SUA offering, the download provides all the tools and utilities programmers need to make really useful, new applications on SUA.

A growing community of users

The Interix and SUA technology, as well as the efforts of Microsoft, have not gone unnoticed. Since Interix was first introduced, a community of Interix and now SUA users has steadily evolved.

Today, that community is centered around the Interop Community Web site, found at www.interopcommunity.com. The site is the product of Bill Miller, president of Interop Systems, who helped with the commercialization of Interix while he was at Softway Systems.

The Interop Community site is a place to share user experiences and solve problems. With a more general focus on interoperability, the site also supports the tools that currently run on Interix and SUA. Community participants can also find several hundred more open source applications and utilities that are not part of the Microsoft download.

If interest in the Web site is any indication of the awareness of Interix and SUA, more people are catching on. "We've had 14,000 members to date and get about 600 new visitors to the site a month," says Miller. "If people work in mixed IT environments, they tend to find us."

Judging by a recent SFU / SUA survey[1] conducted by Interop Systems, users are largely Windows, UNIX, and Linux developers and system administrators. While working in SUA, they use many features, including:

- Generic shells for running utilities and tools
- Shell scripts developed within their company
- Remote access tools such as telnet or SSH
- The SDK to port applets, utilities, and open source tools

SUA users also work with a wealth of Interop tools such as X/Motif SDK, OpenSSH, Interop Secure Shell, Bash, GNU Wget, Python, and many others.

As Miller notes, Interix and SUA have been a big win for Microsoft. Both demonstrate that Microsoft is genuinely interested in interoperability and in open source. At the end of the day, Microsoft is working to build a better platform experience for its customers.

Indeed, by creating a world of choices, Microsoft has worked to reduce the pains associated with working in mixed IT environments. Says Patel, "Providing developers more choices is a good thing. We want people to develop applications, and we want to make their lives easier."

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[1] The "SFU / SUA User Survey" is located at: www.interopsystems.com/SurveyResults.htm.

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