PTC MKS Toolkit

Developer's Evaluation Guide

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PTC MKS Toolkit: Developer's Evaluation Guide

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Technical Support

To request customer support, please contact us by one of the means listed below and in your request include the name and version number of the product, your serial number, and the operating system and version/patch level that you are using. Contact PTC MKS Toolkit customer support at:

Technical Support Form:	http://www.mkssoftware.com/support/support.asp
E-mail:	MKSToolkitSupport@ptc.com
Telephone:	+1-703-803-7660
Fax:	+1-703-803-3344

When reporting problems, please provide a test case and test procedure, if possible. If you are following up on a previously reported problem, please include the problem tracking number in your correspondence.

Finally, tell us how we can contact you. Please give us your e-mail address and telephone number.

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Introduction

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This guide will help you evaluate, become familiar with, and choose the appropriate PTC MKS Toolkit® product to meet your needs. While this guide is aimed primarily at software and web developers, it also discusses the general scripting and automation capabilities inherent in all PTC MKS Toolkit products and applicable to almost any use. There is also a separate evaluation guide aimed more at system administrators as well as one aimed at users of the MKS AlertCentre Add-On. These guides are available from the same source as this evaluation guide.

This evaluation guide will:

- Give you an overview of the PTC MKS Toolkit product family.

- Help you install the PTC MKS Toolkit evaluation kit.

- Walk you through some of the highlights of each of the PTC MKS Toolkit developer products.

- Tell you where to get more information about these products.

- Help you get customer support, should you need it.

Product Family Introduction

There are several products in the PTC MKS Toolkit family aimed at different kinds of people, performing different kinds of tasks. All products in the PTC MKS Toolkit family are unified by our goal of making your use of Windows more efficient and more enjoyable. Our products fall into two broad categories – those for system administrators and those for software developers.

PTC MKS Toolkit Developer Products

PTC MKS Toolkit development products facilitate a cross-platform, "write once-deploy anywhere" development and deployment strategy across Windows and legacy systems, and preserves existing investments in technology and expertise. The PTC MKS Toolkit development products also allow pure Windows developers to automate routine tasks with scripting and

increase productivity with file and text manipulation tools, batch search and replace tools, and scheduling interfaces. PTC MKS Toolkit development products provide solutions in the following areas:

- **User Compatibility** – a variety of command shells and hundreds of command-line utilities help make your software engineers more productive on their Windows machines.

- **Platform Interoperability** – a selection of connectivity utilities provides you with secure interactive access to both your remote Windows servers and workstations and your legacy systems.

- **Application Portability** – more than 2700 APIs let you port all manner of legacy applications to Windows, while maintaining a single source code baseline.

The PTC MKS Toolkit product family is the only solution for developing and deploying enterprise-critical cross-platform applications. It is also the leading product for evolving those applications to incorporate the latest Windows and web technologies, such as COM and Java™. Whether you are a native Windows or cross-platform software, script, or web developer, the PTC MKS Toolkit developer products can help you be more efficient in your job.

- **PTC MKS Toolkit for Developers** – a Windows development product for software, script, and web developers, who can choose from command-line or graphical Visual Studio ® build environments. It is ideal for developing common, cross-platform scripts for UNIX ® , Linux, and Windows, from a single Windows desktop. Using the power of more than 400 command-line utilities, including **make**, **cc**, and **vi**, you can develop native Windows applications, as well as Perl, KornShell, C shell, **bash**, Tcl, **sed** / **awk**, and others.

- **PTC MKS Toolkit for Interoperability** – extending PTC MKS Toolkit for Developers by adding a complete X server for displaying X Window System-based graphical applications, including OpenGL and Motif applications, on Windows. A network-capable server can display a graphical application on your Windows workstation from any machine on your network.

- **PTC MKS Toolkit for Professional Developers** – an ideal solution for the migration of non-graphical, character based, UNIX C, C++, and Fortran applications and utilities to Windows. With over 1500 APIs, you can extend the power of the PTC MKS Toolkit and migrate custom utilities, non-graphical C, C++, or FORTRAN applications as well as Perl, KornShell, C shell, **bash**, Tcl, **sed** / **awk**, and CGI scripts.

- **PTC MKS Toolkit for Enterprise Developers** – the proven solution for porting robust, mission-critical UNIX applications to Windows. With over 2700 UNIX APIs and a full command-line development environment, PTC MKS Toolkit for Enterprise Developers is the ultimate in UNIX to Windows migration. No other product can match our full support for C, C++, and Fortran; for UNIX process management including fork(), signals, alarms, and threads; for file system and security management; and for curses, X, Motif, and OpenGL. And no other product matches PTC MKS Toolkit's access to Win32 APIs for Windows integration and interoperability.

- **PTC MKS Toolkit for Enterprise Developers 64-bit Edition** – 64-bit Windows is an ideal platform for applications that require large amounts of memory and high-performance such as digital content creation, electronic design automation, data warehousing, mechanical design automation, and advanced scientific and research applications. PTC MKS Toolkit for Enterprise Developers 64-bit Edition simplifies the migration of 32-bit and 64-bit UNIX applications to both Itanium and extended architecture 64-bit Windows platforms.

PTC MKS Toolkit System Administration Products

PTC MKS Toolkit system administration products are built on a solid foundation of robust tools and engines that have been optimized for building best-of-breed system administration solutions. Whether you are administering a Windows ® environment or one that mixes Windows and legacy systems, these tools and engines let you effectively manage that environment.

The PTC MKS Toolkit for System Administrators is no longer sold, but its capabilities are completely encapsulated in the PTC MKS Toolkit for Developers. This document continues to refer to the now defunct product, but as you read PTC MKS Toolkit for System Administrators, think the System Administrator subset of PTC MKS Toolkit for Developers.

The MKS Alertcentre is no longer sold, but it serves as a wonderful example of the sorts of applications you can build with PTC MKS Toolkit and the source is still fully available for download as example code and for and reuse. The PTC MKS Toolkit Development shop still monitors server and builds using this technology.

- **PTC MKS Toolkit for System Administrators** – a powerful administration suite featuring PTC MKS Toolkit for System Administrators also gives you the ability to move data and files between machines, remotely administer systems, and perform

backups across multiple platforms. Increase productivity and automate repetitive tasks like password synchronization, adding users and groups, setting up new machines, cloning a system file or a document tree on local or remote systems, and automatically scheduling recurring tasks.

■ **MKS AlertCentre**™ **Add-On** – a complete solution for monitoring, alerting and job scheduling. MKS AlertCentre can monitor your mission-critical systems and applications 24 hours a day, seven days a week to provide you with the peace of mind of knowing that your network, applications, and Internet/Intranet-based information systems are running normally.

For more information on MKS AlertCentre Add-On, please visit `http://www.mkssoftware.com/products/ac`.

What's in the PTC MKS Toolkit Products

This section details the contents of each of the PTC MKS Toolkit products:

PTC MKS Toolkit for System Administrators—a powerful administration suite that lets you move data and files between machines, remotely administer systems, automate administration tasks, and perform UNIX-compatible backups, across UNIX, Linux, and Windows platforms. It includes:

■ Over 350 utilities (full POSIX.2 specification), including remote utilities (`rsh`, `rshd`, `rexec`, `rexecd`, `rcp`, `rlogind`), secure utilities (`ssh`, `sshd`, `scp`, `sftp`, `sftp-server`), and `telnetd` for accessing UNIX systems.

■ MKS KornShell (`ksh`), Bourne Again Shell (`bash`), and MKS C shell (`csh`) command environments.

■ Powerful scripting tools such as `Perl`, `awk`, and `sed` and standard UNIX workhorse tools such as `vi` and `grep`.

■ SNMP (Simple Network Management Protocol) utilities that let you control and monitor network devices and their functions.

■ Utilities for setting up users, groups, and permissions on Windows.

■ Tape and archive commands (`tar`, `pax`, `cpio`, `mt`), for creating UNIX-compatible backups.

■ Service and registry commands to start and stop local or remote Windows services and manipulate the Windows registry.

■ Commands to manage device drivers, Windows domains, and file associations (`dev`, `domain`, `ftype`).

- PTC N*u*TCRACKER Workstation.

PTC MKS Toolkit for Developers—a Windows development product for software, script, and web developers, who can choose from UNIX-style command line or graphical Visual Studio build environments. It includes:

- All the features of PTC MKS Toolkit for System Administrators.

- Over 400 utilities, including command line build utilities (`make`, `cc`, `ar`, `ld`, `vi`, `grep`), for migrating and unifying your builds across UNIX and Windows.

- Tools and utilities for manipulating HTML and other web content as well as pulling and pushing content from local or remote servers (`web`, `htdiff`, `htsplit`, `url`, `mkurl`, `mkscgi`).

- PTC N*u*TCRACKER Workstation.

PTC MKS Toolkit for Interoperability—a full UNIX and Windows interoperability suite, allowing remote access, remote system administration, interconnectivity, file sharing, and full automation and scripting capabilities. It includes:

- All the features of PTC MKS Toolkit for Developers.

- The fully network-capable PTC X/Server, for displaying both local and remote X Windows applications.

- PTC N*u*TCRACKER Workstation.

PTC MKS Toolkit for Professional Developers— an ideal solution for the migration of non-graphical, character based, UNIX C, C++, and Fortran applications and utilities to Windows. It includes:

- All the features of PTC MKS Toolkit for Developers.

- Over 1500 UNIX APIs for migrating non-graphical UNIX applications to Windows.

- Process management: `fork()`, `exec()`, signals.

- POSIX, DCE, and Solaris threads.

- File system handling: `mount()`, `umount()`, `symlink()`.

- IPC and Networking: sockets (including UNIX-domain sockets), shared memory, message queues, semaphores, and FIFOs.

- UNIX to Win32 file and user security mapping.

- UNIX to Win32 file path and file system mapping, including devices such as `/dev/null` and `/dev/lp`.

- Curses and terminal handling.

- A complete build environment including **ar**, **cc**, **cxx**, **ld**, **make**, **gmake**, **tcl**, **bison**, and **flex**.

- A Deployment Wizard, a simple, graphical tool for preparing applications for distribution.

- The *PTC MKS Toolkit UNIX to Windows Porting Guide*.

- PTC N*u*TCRACKER Workstation.

PTC MKS Toolkit for Enterprise Developers—a complete solution for integrating UNIX and Windows software development on a single developer system, solving both interoperability and cross-platform development needs; for migrating complex, graphical UNIX and Linux applications and scripts to Windows; and for evolving and modernizing those applications to take advantage of Windows, to integrate with Windows applications, and to become web-enabled. It includes:

- All the features of PTC MKS Toolkit for Professional Developers and all the features of PTC MKS Toolkit for Interoperability.

- Over 2700 UNIX APIs including X11R6, Motif 2.1, OpenGL, and XView.

- A selection of X servers, for providing display from local and remote X Window System clients.

- PTC N*u*TCRACKER Workstation.

Summary

Here is a summary of the features available in each of the PTC MKS Toolkit products to help you choose the right one for your needs:

	PTC MKS Toolkit for System Administrators	PTC MKS Toolkit for Developers	PTC MKS Toolkit for Interoperability	PTC MKS Toolkit for Professional Developers	PTC MKS Toolkit for Enterprise Developers	PTC MKS Toolkit for Enterprise Developers 64-bit Edition
Command shells and scripting utilities	•	•	•	•	•	•
System administration utilities	•	•	•	•	•	•
Graphical and command-line scheduling interfaces	•	•	•	•	•	•
Tape backup and archiving utilities	•	•	•	•	•	•
Client/server remote utilities	•	•	•	•	•	•
Client/server secure utilities	•	•	•	•	•	•
Telnet server	•	•	•	•	•	•
Multibyte support	•	•	•	•	•	•
Software development utilities		•	•	•	•	•
Web development utilities		•	•	•	•	•
Tcl shell and built-in commands		•	•	•	•	•
PTC X/Server			•		•	•
Advanced development utilities				•	•	•
Non-Graphical APIs				•	•	•
Tcl development APIs				•	•	•
X, Motif, OpenGL APIs					•	•
64-bit versions of APIs						•

Installing the PTC MKS Toolkit Evaluation Package

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All PTC MKS Toolkit products install the Evaluation Guide and companion scripts by default. Custom installations have an option to disable the install of the Evaluation Guide, so if your installation is missing the Evaluation Guide, please rerun the installer and add the Evaluation Guide. In all other cases, the start menu **PTC > MKS Toolkit > Evaluation Guide** will contain the evaluation guides and links to the companion scripts and demonstrations**.**

Installing the PTC MKS Toolkit Resource Kit

You must have a non-demo PTC MKS Toolkit product installed on your machine before the PTC MKS Toolkit Resource Kit can be installed.

- Visit http://www.mkssoftware.com/reskit and download and run The PTC MKS Toolkit Resource Kit self-extracting installer.

- Follow the on-screen instructions.

PTC MKS Toolkit Basics

There are a few basics you should know before embarking on your evaluation of PTC MKS Toolkit.

- **Using PTC MKS Toolkit Features**. While PTC MKS Toolkit has several graphical utilities for doing useful things such as compressing archives of files, the majority of the utilities in PTC MKS Toolkit are non-graphical in nature. These non-graphical utilities are designed to be used from inside of a command processor, which we call a shell. UNIX users will be familiar with shells, which are more extensive than, but similar to the Windows command processor, `cmd.exe`. You will find the graphical utilities on and be able to launch them from the Start menu (**Start > Programs > PTC > MKS Toolkit > …**). On the other hand, to launch the non-graphical utilities, you will need to be in a shell or command processor, preferably one of the PTC MKS Toolkit shells.

- **Launching a Shell**. All versions of PTC MKS Toolkit come with a KornShell (`ksh`), Bourne Again Shell (`bash`) and a C shell (`csh`). The easiest way to launch these is from the Start menu, **Start >**

Programs > PTC > MKS Toolkit > Korn Shell, **Start > Programs > PTC > MKS Toolkit > C Shell, or Start > Programs > PTC > MKS Toolkit > Bash Shell**. There are some basic differences in these shells, but they are conceptually very similar. If you have no experience with shells or have no preference, you should probably start with the KornShell. This evaluation guide assumes that you are running the KornShell. The PTC MKS Toolkit products contain extensive documentation on these shells that you can read at your leisure to understand the differences in shells.

■ **Getting Help**. There are two main ways to get help in PTC MKS Toolkit, the Windows way and the UNIX way, whichever you prefer. Traditionally, in UNIX, in a shell you type `man` and then the name of a utility, and this displays what is known as the manual page for that utility. Try typing `man sh`, for example, for help on the KornShell. On Windows, however, help tends to be more graphical in nature. You will find graphical documentation for the PTC MKS Toolkit utilities, plus additional tutorials and other information, on the PTC MKS Toolkit entry in the Start menu, under Documentation (**Start > Programs > PTC > MKS Toolkit > Documentation**). There, you will find the *PTC MKS Toolkit Utilities Reference*, which contains the same information as the manual pages, only in a graphical format.

■ **Launching a Script**. Launching files on Windows is different from launching files on UNIX. Windows identifies how to launch any file by looking up the program to run by the file extension (the three letter suffix after the dot in the file name, such as `.exe` or `.doc`). Files on UNIX often have no extensions, while extensions are fairly critical on Windows. Windows maintains a list of registered file associations that allows a given file extension to be associated with a given file type which in turn is associated with a given application. This allows you to launch an application and load the specified file by simply clicking on the file name in the Windows Explorer or by simply typing the file name on the command line of a shell or command interpreter. For example, if you have Microsoft Word installed on your system, typing `file.doc` on the command line launches Microsoft Word with `file.doc` open. When you install a member of the PTC MKS Toolkit product family, you have the option of registering several PTC MKS Toolkit-specific file associations. The following table shows the registered file extensions, their associated file types, and the PTC MKS Toolkit utilities used to run files with those extensions:

Extension	File Type	Associated PTC MKS Toolkit Utility
.awk	mks_awk	MKS AWK(**awk**)
.cpi	mks_vpax	Visual Pax (**vpax**)
.cpio	mks_vpax	Visual Pax (**vpax**)
.csh	mks_csh	MKS C Shell (**csh**)
.gz	mks_gunzip	gunzip
.ksh	mks_shell	MKS KornShell (**sh**) Windowless
.mk	mks_make	MKS Make(**make**)
.pax	mks_vpax	Visual Pax (**vpax**)
.pl	mks_perl	MKS Perl (**perl**)
.sh	mks_shell_sh	MKS KornShell (**sh**) Console
.tar	mks_vpax	Visual Pax (**vpax**)
.Z	mks_uncompress	umcompress

Evaluating the PTC MKS Toolkit Developer Products

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When evaluating the PTC MKS Toolkit developer products, keep in mind that each product in the product line is a superset of the preceding product. For example, if you are evaluating PTC MKS Toolkit for Professional Developers, in addition to its own features, it also includes everything in PTC MKS Toolkit for Developers.

PTC MKS Toolkit for Developers is a Windows development product for software, script, and web developers, who can choose from UNIX-style command line or graphical Visual Studio build environments.

Developer Features

PTC MKS Toolkit for Developers has many utilities that developers will find simplify their daily development tasks:

- Command line build utilities (`make`, `cc`, `ar`, `ld`), for migrating and unifying your builds across UNIX and Windows.

- Standard editing and scripting tools for editing source code, make files, and for building complex development environments (`vi`, `grep`, `find`, `awk`, `sed`, `Perl`).PTC MKS Toolkit also includes a graphical version of `vi` (called Vi for Windows or `viw`), that responds to the standard `vi` commands, but supports standard Windows features such as font control and printer integration – the best of both worlds.

- Source differencing tools for determining the scope of changes in your source code (`diff`, `diffh`, `bdiff`), including a side-by-side visual differencing tool (`vdiff32`).

- Utilities for manipulating HTML and other web content as well as pulling and pushing content from local or remote servers (`web`, `htdiff`, `htsplit`, `url`, `mkurl`, `mkscgi`).

- A scheduler for easily and automatically starting repetitive tasks, such as nightly builds, backups, and automated test runs.

Editing

The **vi** editor is the editor that is common to every version of UNIX. PTC MKS Toolkit for Developers includes three versions of this editor for your convenience. The first is a standard UNIX version, which you can exercise by typing **vi** from any command or shell prompt, or by selecting **Start > Programs > PTC > MKS Toolkit > Evaluation Guide > Vi**. If you are unfamiliar with **vi**, there is a tutorial in $ROOTDIR/samples/vi/ tutor.vi.

Try this: **vi** is integrated with the Windows clipboard making it easy to cut and paste between Windows and **vi**. At the **vi** command prompt, type set clipboardbuffer=x, setting the Windows clipboard to buffer x. (You may want to add this to your profile file ex.rc in your home directory, $HOME.) Yank a couple of lines into the clipboard, "x2Y. Move your cursor into a Windows application, such as Notepad or Word, and use control-V to paste this text. Now, highlight some text in the Windows application and copy it using control-C. Move into **vi** and paste it: "xp.

The second version of **vi** in PTC MKS Toolkit for Developers is a graphical version, **vi** for Windows (or **viw**), that responds to the standard **vi** commands, but supports standard Windows features such as font control and printer integration – the best of both worlds. You can try it by typing **viw** from any command or shell prompt, or by selecting **Start > Programs > PTC > MKS Toolkit > Evaluation Guide > Vi for Windows**.

Try this: UNIX and Windows use different end-of-line characters: UNIX uses a linefeed, while Windows uses the combination of a carriage control and a linefeed. You can control the style to use by selecting **Options > PC Specific** from the **viw** menus. While you're at it, go to a command or shell prompt and type man flip to find out how to automatically convert whole files.

The third version of **vi** in PTC MKS Toolkit for Developers is actually a variation on **viw** that can be used with Microsoft Visual Studio.NET. When you install PTC MKS Toolkit for Developers, you can enable **viw**'s integration with Visual Studio. If you do so, **viw** will be the default editor.

Try this: Start Microsoft Visual Studio.NET (2003 or 2005) and open an existing C/C++ project. From the project file list in the **Solution Explorer**, select a file, right click, and select **Open with …** from the context menu and choose **MKS Viw**. You can now edit your file with the power and familiarity of **viw** while still being able to access the features of the Visual Studio IDE.
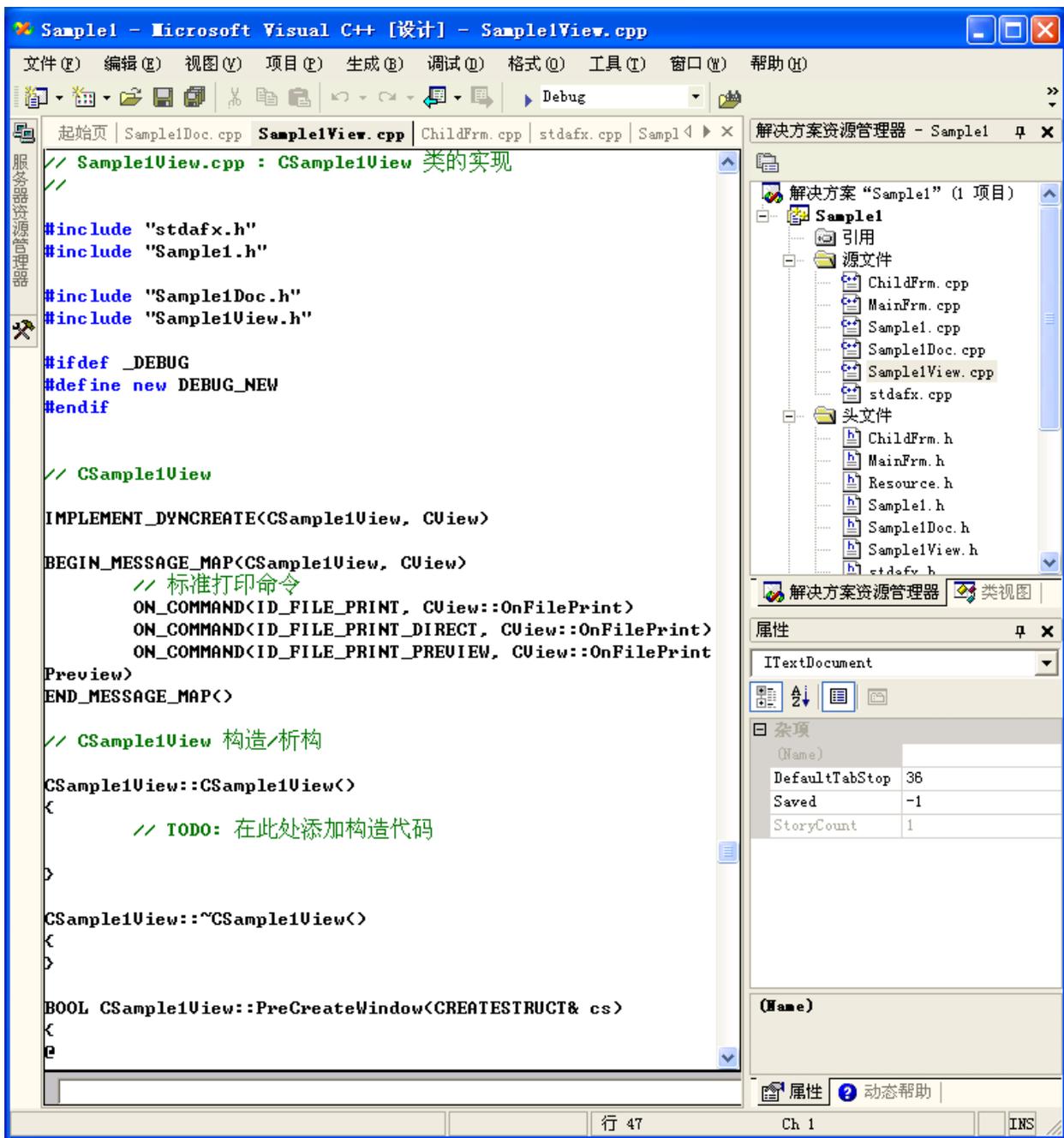
The screenshot above shows the **viw** editor integrated with a Chinese-localized version of Microsoft Visual Studio running on a Chinese-localized version of Windows. Note both the syntax highlighting and the support for multibyte characters.(both of which are available in all three versions of **vi**).

Scheduling Tasks

PTC MKS Toolkit for Developers includes a scheduler that lets you define the time and frequency of execution of any program, including PTC MKS Toolkit utilities and scripts. For developers, this is a good way to automatically start nightly and weekly builds and to run automated test suites.

Invoke the scheduler at **Start > Programs > PTC > MKS Toolkit > Evaluation Guide > For Developers > Scheduler**.
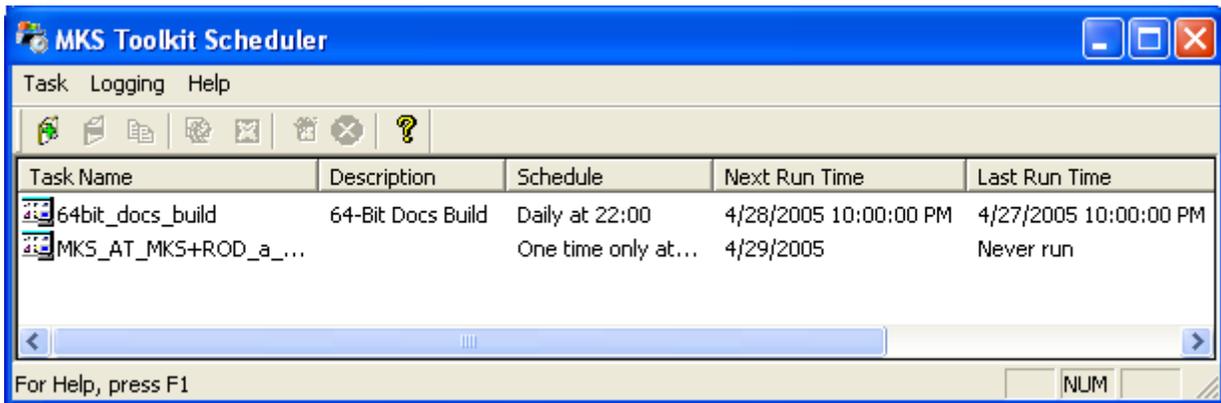
PTC MKS Toolkit features a number of command-line utilities and the graphical PTC MKS Toolkit Scheduler that serve as interfaces to the Windows Task Scheduler. Using these interfaces provides greater feedback and flexibility than is available with the Windows Task Scheduler.

- The **at** command-line utility schedules a task to run at a specified time.

- The **batch** command-line utility schedules a task to run immediately.

- The **crontab** command-line utility lets you create, edit, and view a text file that contains the scheduling information for one or more tasks.

- The **taskrun** command-line utility schedules a task to run at a specified time and sends the output and errors produced by the task to a specified location. This command is primarily intended for use by the **at**, **batch**, and **crontab** utilities although it can also be used directly.

- The **wts** command-line utility is similar to the **at** utility, but allows you to schedule a task to run on a remote machine and to remove or edit an existing task.

- The PTC MKS Toolkit Scheduler graphical utility (**tksched**) allows you to schedule tasks using a graphical interface that features greater scheduling feedback and flexibility that the Windows Task Scheduler.

- MKS AlertCentre Add-On also features scheduling capabilities allowing you to schedule tasks (monitors and jobs) to run at regular intervals over a given period of time.

Visual Differencing

In addition to standard command-line differencing tools (**diff**, **diffh**, **bdiff**, **diffb**), PTC MKS Toolkit for Developers also includes a graphical side-by-side differencing and merging tool, which you can exercise by typing **vdiff32** from any command or shell prompt, or by selecting **Start > Programs > PTC > MKS Toolkit > Evaluation Guide > For Developers > Visual Diff**.

Differences are color-coded to make your work easier. Added text is green, deleted text is red, and changed text is yellow. You can easily change these colors. Visual Diff supports automated merging, side-by-side viewing, merged viewing, printing of difference reports, and summaries of changes.

For more information about Visual Diff, see the comprehensive on-line help in the tool itself.
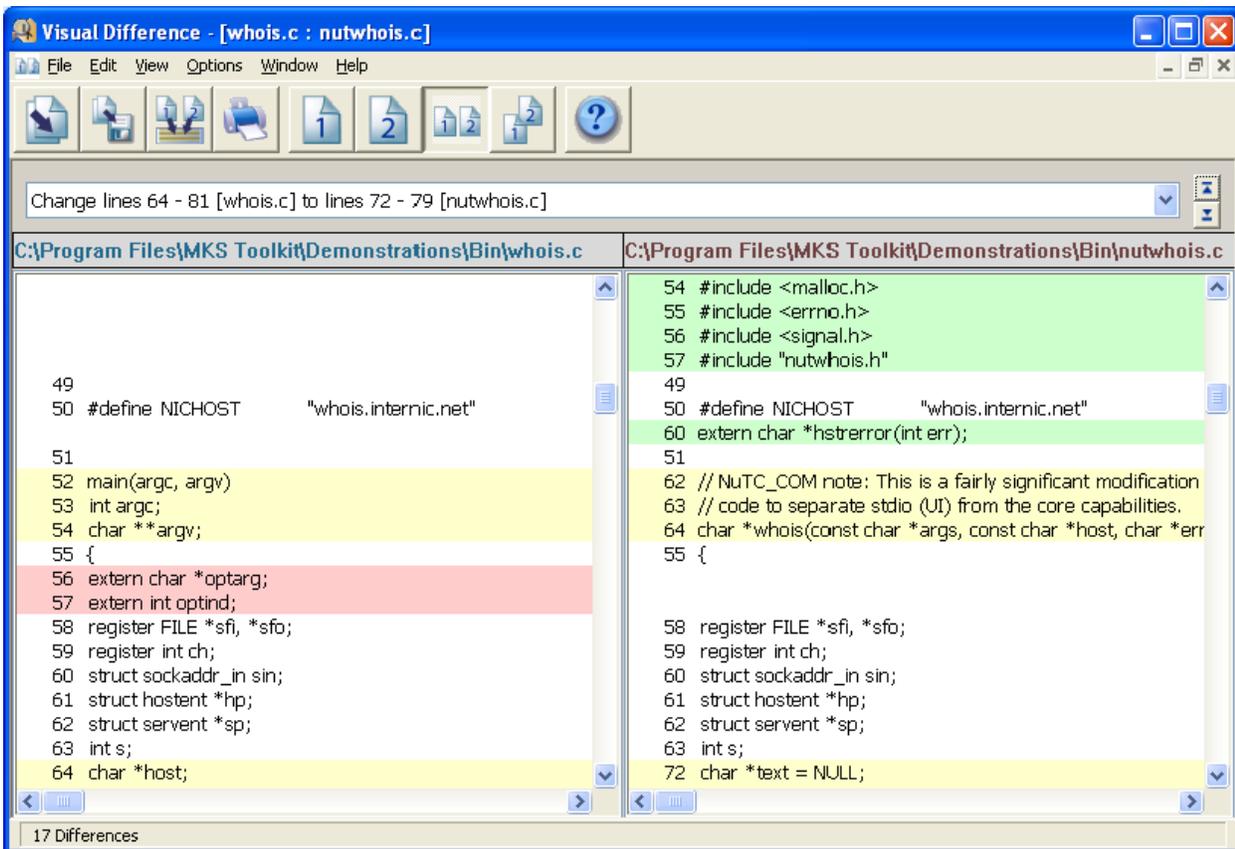
Build Environment

One of the primary strengths of PTC MKS Toolkit for Developers is its command line build enviroment, including utilities (`make`, `cc`, `ar`, `ld`), for migrating and unifying your builds across UNIX and Windows.

The native development environment on Windows is Visual Studio, which is extremely comprehensive, and consequently fairly difficult to learn. Although Visual Studio works very well for certain tasks, it is not particularly well-suited for developers who are migrating an existing UNIX build environment to Windows. These UNIX build environments, often the result of large amounts of time and effort, are usually proven technology and can now now be resued with minimal effort with PTC MKS Toolkit for Developers.

The build environment demonstration, **Start > Programs > PTC > MKS Toolkit > Evaluation Guide > For Developers > Build Environment**, shows PTC MKS Toolkit for Developers' POSIX-compliant `make` compiling a

source file with `cc`, archiving it with `ar`, and running the resulting executable. Note: you must have a compiler installed and in your path before running this demonstration.

This PTC MKS Toolkit for Developers software build environment is designed for those developers who want to do native development on Windows from a command line environment, who want to harness the batch build capabilities of `make`, who want to deploy a common build environment across UNIX and Windows, and who want to migrate scripts from UNIX to Windows with minimal changes. Those developers who want to migrate applications from UNIX to Windows should evaluate the two migration products, PTC MKS Toolkit for Professional Developers and PTC MKS Toolkit for Enterprise Developers, both of which include the PTC MKS Toolkit UNIX APIs.

KEY POINTS

Improve Developer Productivity

1. You can immediately start using your UNIX skills on Windows with the PTC MKS Toolkit C Shell, KornShell, `bash` and over 250 commands and utilities (`vi`, `grep`, `find`, `awk`, `Perl`, etc.) that behave just like their UNIX counterparts.

2. Multi-platform scripting capabilities enable existing UNIX build environments to work on Windows, and builds can be automated and replicated in a cross-platform environment. If you have a compiler installed, you will have the full capabilities of `cc`, `ld`, and `ar`.

3. The `vi` and `viw` editors support the Windows clipboard and support both UNIX and Windows file formats.

4. Review changes to your source code with your team using MKS Visual Diff. Create code review packages with scripts built around `diff`.

5. Schedule nightly or weekly builds using the PTC MKS Toolkit Scheduler.

Evaluating PTC MKS Toolkit for Professional Developers

PTC MKS Toolkit for Professional Developers an ideal solution for the migration of non-graphical, character based, UNIX C, C++, and Fortran applications and utilities to Windows PTC MKS Toolkit for Professional Developers contains the flexible development environment of PTC MKS Toolkit for Developers, extended with additional development utilities such as `gmake`, `tcl`, `lex`, and `yacc`; more than 1500 UNIX APIs; a Deployment Wizard, a simple, graphical tool for preparing applications for distribution;

and a copy of The *PTC MKS Toolkit UNIX to Windows Porting Guide*, encapsulating our years of experience in the migration and cross-platform development business.

The following demonstrations show just a few of the multitude of ways that you can use PTC MKS Toolkit for Professional Developers. These demonstrations show examples of migrating UNIX code to Windows (one using curses character-based graphics and one using POSIX threads) and examples of evolving migrated applications to take advantage of Windows features (one showing how to package UNIX code as a Windows DLL that can be used from other Windows programs and another showing conversion of a UNIX daemon to a Windows service).

Using Curses

PTC MKS Toolkit for Professional Developers contains a full curses library, including full color support and support for both cooked and raw mode programs. To see a demonstration of a character-based clock in color text, in `cbreak` and `noecho` modes, invoke **Start > Programs > PTC > MKS Toolkit > Evaluation Guide > For Developers > Professional Developers > Curses**.

You can view the source code for this example at `$ROOTDIR/samples/curses/gdc` to see that PTC MKS Toolkit for Professional Developers is the ideal product for migrating your curses-based application to Windows. If your application uses X Windows for its graphics rather than curses, you will need to use PTC MKS Toolkit for Enterprise Developers.

Using POSIX Threads

UNIX applications are more and more commonly threaded, and the most common threading package is POSIX threads. PTC MKS Toolkit for Professional Developers contains POSIX threads and portability wrappers for both Solaris and DCE threads. In addition, the *PTC MKS Toolkit UNIX to Windows Porting Guide*, contains an entire chapter on migrating threaded applications to Windows.Without this threading support, any threaded UNIX application would have to be substantially rewritten to the very different Windows threading model.

For a demonstration of a POSIX-threaded application, run **Start > Programs > PTC > MKS Toolkit > Evaluation Guide > For Developers > Professional Developers > Threaded Grep**, a multithreaded program that combines the power of the UNIX **find** and **grep** utilities in a single process.

To see how simple it is to take threaded UNIX code and move it to Windows using PTC MKS Toolkit for Professional Developers, you should examine the threaded grep source code. It will show you how complete our threading

support is and how few changes are necessary to migrate real-world applications. The source code is located in $ROOTDIR/samples/threads/ programs/tgrep.

Building DLLs

Once you have migrated UNIX code to Windows, it would be nice to be able to reuse this code in new and unexpected ways. With PTC MKS Toolkit for Professional Developers, you can. The simplest way to do this, as this demonstration illustrates, is to convert the code to a DLL—the Windows equivalent of a UNIX shared library. See the WhoIs: Creating COM Objects from UNIX Code section later in this document for alternative ways to reuse code.

This demonstration program, at **Start > Programs > PTC > MKS Toolkit > Evaluation Guide > For Developers > Professional Developers > Using PTC MKS Toolkit DLLs**, shows how to build a DLL containing UNIX code and how to use the resulting DLL. You should also note that the DLL uses two native UNIX constructs, alarms and signals, demonstrating that these features may be used even when the driving program has not been migrated with PTC MKS Toolkit.

The source code for this demonstration is in $ROOTDIR/samples/ tutorial/dll/basic_dll_cc. It shows how simple it is to evolve UNIX code to a new form that you can load and run from any Windows program. There is also an entire chapter on building DLLs in the *PTC MKS Toolkit UNIX to Windows Porting Guide*.

Building Windows Services (daemons)

Not all applications are foreground or interactive applications. Many times control and monitoring programs are set running by the operating system at boot time. These programs are called daemons on UNIX and services on Windows.

On Windows 2000/XP/2003, and NT, early in the boot sequence, a Service Control Manager starts and scans the registry (rather than a static flat file such as found in /etc/rc) for service processes to start running. Using PTC MKS Toolkit for Professional Developers, any UNIX daemon program can be converted to run as a Windows service using the PTC MKS Toolkit service framework. With minor source code changes, your daemon will start and stop using the Windows Control Panel or the PTC MKS Toolkit **service** utility. For more information about **service**, useful for controlling services from scripts, from the command line, and from remote telnet or login sessions, type man service at a command or shell prompt.

Because services are initiated at boot time, we have not included a demonstration program. However, `$ROOTDIR/samples/tutorial/service` contains the source code for the service tutorial, which shows how to evolve a UNIX daemon into a Windows service. This code and the chapter on building services in the *PTC MKS Toolkit UNIX to Windows Porting Guide* show just how easy it is to convert a daemon to a service using our framework and how few code changes are required.

KEY POINTS

The Power of UNIX on Windows

1. PTC MKS Toolkit for Professional Developers is a complete and robust solution for migrating existing UNIX and Linux applications to Windows.

2. PTC MKS Toolkit for Professional Developers supports advanced UNIX process control constructs such as fork(), threads, alarms, and signals.

3. By building DLLs from your legacy UNIX code, you can launch that code from a Windows process and reuse it in novel ways.

4. The more than 1500 UNIX APIs in PTC MKS Toolkit for Professional Developers support curses, terminal handling, file system handling, process control, and file and user security.

5. The *PTC MKS Toolkit UNIX to Windows Porting Guide* is an invaluable resource, based on years of experience and thousands of applications, for migrating and evolving applications.

Evaluating PTC MKS Toolkit for Enterprise Developers

You can use PTC MKS Toolkit for Enterprise Developers to develop single- or multi-threaded C, C++, or FORTRAN applications, shared libraries, and daemons, shell scripts, and make files on Windows 2000, Windows XP Windows Server 2003 and Windows Vista while maintaining a common source code baseline across all platforms, including UNIX. PTC MKS Toolkit-migrated applications run natively in the Win32 subsystem just like other Windows applications, and can take advantage of all Windows features, including COM, the registry, and Windows help.

Interoperability Features

PTC MKS Toolkit for Enterprise Developers includes several interoperability features to help you harmonize your mixed UNIX and Windows environments, including PTC X/Server and a telnet client and server. The following sections discuss these interoperability features.

PTC X/Server

The high performance PTC X/Server lets Windows workstations display native X11/Motif applications running on remote UNIX servers as well as locally running X11/Motif and Open GL applications ported with PTC MKS Toolkit for Enterprise Developers.

Upon installing PTC MKS Toolkit for Enterprise Developers, PTC X/Server should be ready to autostart whenever an X application is run. To confirm that this is the case:

1. Launch the Windows Control Panel. (**Start > Settings > Control Panel**).

2. Double click on the **Configuring PTC MKS Toolkit** icon.

3. Select the **Runtime Settings** tab and choose **X Window System Settings** from the **Category** dropdown list.

4. Ensure that the PTC X/Server is selected and that **Registered** is toggled.
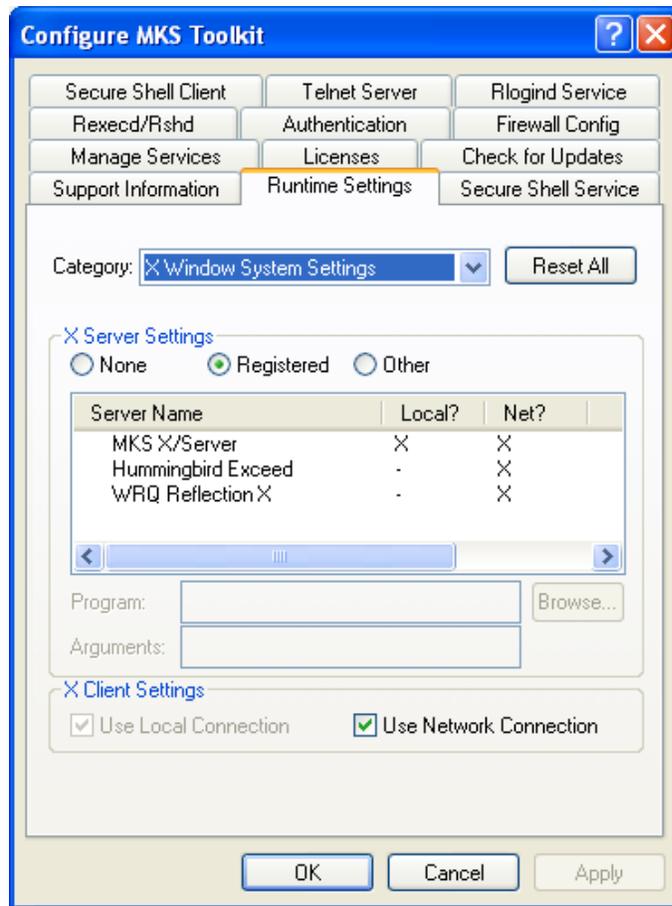
Next, test that PTC X/Server is working properly:

1. Start a command prompt (**Start > Programs > PTC > MKS Toolkit > Development > Command Prompt for NuTCRACKER Development**).

2. Type `xlogo` at the command prompt.

3. After waiting a short period of time (the first time the PTC X/Server starts) you will see the Xlogo application display using the installed X server. (*Note: You may be asked to tune the X server if this is the first time you have run an X application on the machine*).

Problem: An X application will not run.

Solution: If the X server is loaded, you will see a stylized X on the task bar. If not, start the server manually (**Start > Programs > PTC > PTC XServer > XServer**).

Solution: If PTC X/Server is not installed, reinstall PTC MKS Toolkit for Enterprise Developers, and be certain to install the PTC X/Server.

Solution: The server is installed and loaded, but the application will not run. Ensure that the *TCP/IP Protocol* is installed. From the Network applet in the Control Panel, select the Protocols tab. If *TCP/IP Protocol* is not in the list, click Add to install it.

Solution: If you are running PTC X/Server, select Configuration from the PTC XServer Start menu and click PTC XServer Communications. Select the Transports tab. If *TCP-UNIX* is in the list, but disabled, enable it by clicking Properties. If *TCP-UNIX* is not in the list, add it with the Add button. Restart the X server.

Problem: Colors are strange at startup.

Solution: Click in the window. The colors should correct themselves.

Solution: Configure your display properties to use 65536 colors.

Connectivity Components

PTC MKS Toolkit for Enterprise Developers has several telnet clients (each emulating a different terminal type), a Secure Shell client and server, `xterm` and a full range of remote tools such as `scp`, `sftp`, `rcp` and `rsh`.

To launch a telnet client:

1. Invoke **Start > Programs > PTC > PTC X/Server > ANSI Emulator**.

2. Select **Session/Connect…**. In the resulting dialog, type in your Host destination (for example, `brillig.mks.com`) and click **OK**.

3. Type in your username and password for the chosen host.

4. The telnet connection is now established and you are accessing the remote machine from your local Windows system. Using PTC X/Server, you can have multiple Telnet connections running at the same time.

To launch a secure shell client to connect to your own machine:

1. If you have already started the PTC X/Server (there is no stylized X on your task bar), do so now with **Start > Programs > PTC > PTC XServer > X Server**.

2. Invoke **Start > Programs > PTC > MKS Toolkit > Evaluation Guide > Secure Shell**.

3. You are prompted for your account password. Please type the correct password and press ENTER.

4. A standard shell prompt should appear.

5. Please type `xterm &`.

6. The shell within the secure shell window displays a process ID for the background process it created, while a X window pops up containing a shell prompt.

7. The X11 protocol has been tunneled through the secure shell connection. This is not tremendously useful for the localhost connection established here, but it works to any Secure Shell server that enables X11 tunneling.

KEY POINTS

UNIX-Windows Application Accessibility

1. With the power of PTC MKS Toolkit for Enterprise Developers, application developers can seamlessly coexist within UNIX and Windows environments.

2. Software engineers familiar with the UNIX command line and runtime environment are able to leverage the same utilities on the Windows platform.

3. Using the telnet or secure shell clients, a developer can compile and build source remotely and display the output of the resulting application locally on the Windows workstation via the X Server.

UNIX and Windows Application Interoperability

The core of PTC MKS Toolkit for Enterprise Developers is a development environment that empowers developers to build Windows software from their existing UNIX source code. This facilitates a cross-platform, "write-once, deploy-anywhere" development strategy across UNIX, Linux, and Windows systems.

The following migration and portability demonstrations demonstrate the power of the PTC MKS Toolkit for Enterprise Developers. They show how developers can compile and run single- or multi-threaded C, C++, or FORTRAN applications, shared libraries, and daemons, on any 32-bit Windows Intel Platform.

The demonstrations also show how easily existing UNIX baselines can be integrated with native Microsoft Windows technologies such as Win32 and COM.

Mosaic: Using X Windows and Motif

The Mosaic public domain web browser:

- Comprises over 130,000 lines of X and Motif code written in C.
- Can be migrated to Windows by any developer in less than 30 minutes using PTC MKS Toolkit for Enterprise Developers.
- Requires zero modifications to source code.

This demonstration presents the Mosaic browser with the traditional Motif look.

To run Mosaic with the Motif look:

1. Invoke **Start > Programs > PTC > MKS Toolkit > Evaluation Guide > For Developers > Enterprise Developers > PTC MKS Toolkit Mosaic (Motif)**. There may be a brief delay while the X server autostarts. Once the server is running, X clients start quickly.

2. Notice that the colors, icons, buttons, and sliders are all Motif standard.

3. Notice that the **Help** menu is to the far right of the menu bar.

4. Select **File > Open Local**. Notice that you get a standard Motif file selection dialog.

KEY POINTS

UNIX-Windows Application Portability

1. Large, graphical applications migrate to Windows quickly and with little to no changes. Character mode applications, daemons, and complex server applications migrate just as readily.

2. UNIX developers are productive on Windows immediately, without having to know Microsoft Windows programming.

3. You can maintain a common source code baseline across Windows 2000, Windows XP, Windows Server 2003, Windows Vista, and UNIX, because you make few changes between the platform ports.

4. You can choose a Motif or Windows look at runtime. Fonts and other UI details can be customized with standard resource files.

MotifBurger: Using DDE

The MotifBurger application is a simple Motif application modified to include calls to WIN32 DDE functions. *Note: This demonstration requires that you have Excel 95 or later installed.*

To run this demonstration:

1. Invoke **Start > Programs > PTC > MKS Toolkit > Evaluation Guide > For Developers > Enterprise Developers > PTC MKS Toolkit Motifburger**. This will launch the MotifBurger application and an X Server if one is not already running.

2. From the main menu of the application, select **Order / Create Order Box…**.

3. Within the dialog select various characteristics and quantities of each item. When you are finished, select **Apply**. Then click **Dismiss**.

4. Return to the main application window and select **Order / Submit Order**.

5. If Excel is installed, your order data will be transferred to a new Excel spreadsheet via DDE and your profits will be totaled.
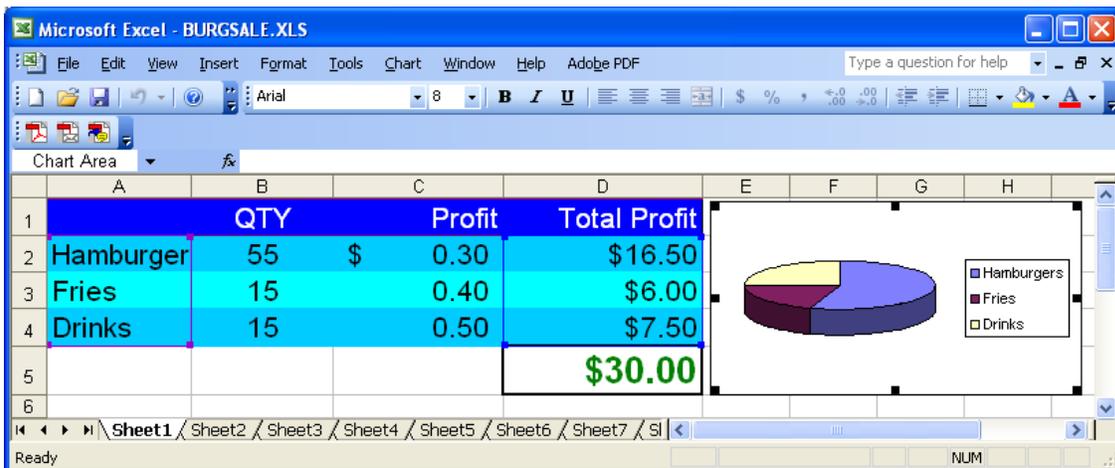
X Tetris: Automating an X11 Application with COM Automation

Using PTC MKS Toolkit for Enterprise Developers, legacy UNIX applications can integrate directly with native Microsoft Win32 APIs. This sample illustrates how an X11 application ported to Windows can take advantage of Microsoft's Component Object Model (COM). By exposing a COM Automation Interface from the X11 application, it becomes instantly able to communicate and integrate with other Win32 programs.

To view the X Tetris application in stand alone mode (no automation):

1. Invoke **Start > Programs > PTC MKS Toolkit > Evaluation Guide > For Developers > Enterprise Developers > PTC MKS Toolkit Tetris un-automated demo**.

2. To play a game of Tetris, use the arrow keys and the space bar for movement.

To view the X Tetris demo with COM capabilities enabled:

1. Invoke **Start > Programs > PTC > MKS Toolkit > Evaluation Guide > For Developers > Enterprise Developers > PTC MKS Toolkit Tetris** automated demo.

2. Note that there are now two windows. The first window is the original X application. The second window is actually a native Windows program that is automating the X application via COM automation, essentially remote-controlling the Tetris game.

WhoIs: Creating COM Objects from UNIX Code

The next demonstration program shows how a standard UNIX application (`whois`) can be directly embedded as a COM object in off-the-shelf Microsoft Windows programs, such as Internet Explorer, Word, and Excel, among others.

The `whois` object locates companies and Internet domains. To run the first `whois` demonstration, you need a web browser that can host ActiveX controls, such as Internet Explorer 4.0 or later, and an Internet connection.

To run this demonstration:

1. Invoke **Start > Programs > PTC > MKS Toolkit > Evaluation Guide > For Developers > PTC MKS Toolkit Whois COM Demo**. This will launch your browser on an HTML page that will show the whois control.

2. In the **Query** field, type the name of a domain, such as `mkssoftware.com`, and click the **Query** button.

3. An **Abort** button replaces the **Query** button (domain lookups on the Internet can take a long time). The abort function is possible because this application uses POSIX threads.

4. The results appear in the **Response** field.

5. Highlight a URL in the results, such as `mkssoftware.com`, and right click on it. You can open this URL by selecting the **Goto** menu item.

The HTML page will direct you to a technical paper, *Building COM Automation Objects with* PTC MKS Toolkit, which describes the general process for converting UNIX applications to COM components, if you want more detail. You may have to scroll down to find the link.

Now you can examine other ways that this COM component (from ported UNIX code) can be used:

1. Start Word and create a new document.

2. Select **Insert > Object** and from the list, select **whois**.

3. You will see the control as in the previous example. Enter `mkssoftware.com` and click the Query button and wait for the results.

4. Move your cursor off the control and click it. The control will disappear, but the results will remain.

5. Some of the results text may be clipped. Click in the results text to make resize handles appear. Stretch the bounding box to the size you want.

6. If you double click on the results, the control appears again, ready for another query.

You have just used an embedded control to retrieve information and to insert the results directly into a document. This illustrates what is called *visual editing*, a powerful COM-based integration feature of PTC MKS Toolkit for Enterprise Developers. This integration facility has powerful implications for reuse and ease-of-use of PTC MKS Toolkit-ported UNIX applications.

Consider a mission-critical, DoD battle planning application running on UNIX. Using PTC MKS Toolkit for Enterprise Developers, it can be transformed into a COM component on Windows that can be embedded into a Word document to facilitate editing and distribution of a plan. The same component could also be embedded into a PowerPoint presentation to facilitate a briefing and it could be embedded into an Active Server Page on Microsoft Internet Information Server (IIS) for rapid Intranet distribution purposes.

Problem: The control gets no response when you query a domain.

Solution: Make sure that you have an Internet connection.

Problem: The demo does not run.

Solution: Install Internet Explorer 4.0 or later, then reinstall the demos and then retry the whois demo.

The ATL COM AppWizard for PTC MKS Toolkit

Using the ATL COM AppWizard for PTC MKS Toolkit, generating a COM server is as easy as pushing a few buttons. The wizard, installed with the PTC MKS Toolkit Resource Kit, is a Visual C++ application wizard (VC++ 6.0 only) that lets developers easily generate a skeleton source framework that is PTC MKS Toolkit-aware and that can call PTC MKS Toolkit's UNIX APIs. Note: *The ATL COM AppWizard requires installation of the Resource Kit. See the installation instructions at the beginning of this document.*

To use the wizard:

1. Launch the Visual C++ 6.0 IDE (will not be installed for Visual C++ 5.0 or earlier or Visual Studio .NET or later).

2. From the menu, select **File > New…**, and then choose the **Project** tab.

3. Select the **ATL COM AppWizard for PTC MKS Toolkit** and name your project. Click **OK** to move on to the next step.

4. Here you may choose the form that your COM server will take. Choose the desired option and click **Finish**.

5. After selecting **OK** from the summary screen the wizard will generate the requested source framework and you may then build the application.

UNIX-Windows Application Interoperability

1. Build mission-critical Windows components from existing UNIX code.

2. These components can be embedded in off-the-shelf Windows applications, such as Word, PowerPoint, Exchange documents, and Active Server Pages.

3. These components are automatically web-enabled when embedded in HTML pages or Active Server Pages.

4. PTC MKS Toolkit gives direct access to Win32 APIs, libraries, and COM components, enabling a wealth of integration options.

5. With the advent of COM for UNIX, PTC MKS Toolkit-based COM components are portable across Windows and UNIX.

6. POSIX threads are fully operable in Windows applications.

Additional Sample Programs

In addition to the demonstration programs, we have included sample source code for several applications that illustrate other key features. You will find other samples and tutorials in the PTC MKS Toolkit distribution, under `$ROOTDIR/samples`.

To build any of these samples:

1. Start an PTC MKS Toolkit command prompt or KornShell.

2. Change directory to the desired sample directory.

3. Type **make** (Review the readme file in the respective sample directory file for more details). If the sample uses an imakefile, you must first run **xmkmf** to generate a make file, before you run **make**.

4. When the build is complete, run the built program.

KEY POINTS

UNIX-Windows Developer Productivity

1. PTC MKS Toolkit for Enterprise Developers easily ports shell scripts and command-line, curses, and X/Motif applications. It supports porting shared libraries, daemons, and threaded applications.

2. PTC MKS Toolkit for Enterprise Developers is the ideal tool for cross-platform development of C and C++ applications across UNIX, Linux, and Windows.

3. PTC MKS Toolkit's development environment is just like that on UNIX, including over 300 UNIX utilities, for example, **cc**, **ld**, **make**, **vi**, **truss**, **grep**, **find**, **awk**, **Perl**, etc.

4. You continue to use your UNIX make files and build environment on Windows.

5. Many applications just compile and run with PTC MKS Toolkit, with no or very few modifications.

6. Porting to Windows is comparable to porting to another version of UNIX, using PTC MKS Toolkit's over 2700 POSIX and UNIX 98 (and UNIX 03) standard APIs, including POSIX threads.

7. Applications migrated with PTC MKS Toolkit are native Win32 applications that you build with Visual C++ and debug using standard Windows debuggers, such as `msdev`. This lets you enhance your applications with native Microsoft technologies.

8. A common source code baseline dramatically reduces ongoing maintenance across Windows and UNIX.

Available Resources

<div align="right">4</div>

Customer Support

PTC offers extensive customer support to ensure your success with our products. At any time during your evaluation of our products, please feel free to contact us concerning any issues that may arise.

The evaluation versions of any PTC MKS Toolkit products include free support from the time of installation. In order to continue support beyond the evaluation period you must purchase a fully licensed version of the product along with a Support Contract (Maintenance). A Support Contract is renewable annually for a small fee and entitles you to unlimited customer support, patches, bug fixes, and product upgrades. All of our sales channels offer PTC MKS Toolkit products with bundled a Support Contract for your convenience.

To request customer support, please contact us by one of the means listed below and in your request, include the name and version number of the product that you are using, your serial number, and the operating system and version/patch level that you are using. Contact PTC MKS Toolkit customer support at:

Technical Support Form:http://www.mkssoftware.com/support/support.asp
E-mail:MKSToolkitSupport@ptc.com
Telephone:+1-703-803-7660
Fax:+1-703-803-3344

Additional PTC MKS Toolkit Resources

There are several other sources for additional information about our PTC MKS Toolkit products. We have general product information, including technical specifications, detailed utility listings, and datasheets at:

PTC MKS Toolkit Product Information: http://www.mkssoftware.com/products

We offer a resource kit including example scripts, additional utilities, more tutorials, and a wide variety of other useful information at:

PTC MKS Toolkit Resource Kit Page: http://www.mkssoftware.com/reskit

Through the years, we have accumulated a lot of technical details about the NuTCRACKER Platform products and have put this information in a searchable database at:

PTC MKS Toolkit Knowledge Base: http://www.mkssoftware.com/support/kb

Our customers commonly ask certain questions. These questions and their answers are in our Frequently Asked Questions pages at:

PTC MKS Toolkit FAQs: http://www.mkssoftware.com/support/faqs

Features Summary

The PTC MKS Toolkit product family is the most comprehensive suite of products for UNIX-Windows interoperability, UNIX-Windows application migration, cross-platform development and system administration, and advanced Windows scripting. Today's power users, developers, and system administrators require powerful utilities that are rock-solid in performance and reliability. PTC MKS Toolkit is the choice of Global 2000 companies worldwide for the management and automation of mission-critical tasks. Used by over 450,000 power users, developers, and system administrators worldwide, PTC MKS Toolkit is the premium brand for addressing your organizations' critical Windows and UNIX/Linux interoperability needs.

The primary features of the products are:

- **Advanced Scripting for Windows**. With Korn, Bourne Again and C shells, `sed`, `awk`, `Perl`, `dlg`, `filebox`, and over 400 additional utilities, there is no finer scripting environment on Windows.

- **Comprehensive Command Line and Build Environments**. Power users, developers, and system administrators will love the flexibility of our command line environments, for batch processing, for automation of recurring tasks, for remote access, and for general scripting. With rock-solid, proven utilities such as `vi`, `grep`, `find`, `make`, `cc`, and `ld`, our command-line and build environments are unsurpassed.

- **Scriptable System Administration Utilities**. With extensive system administration utilities for managing users, groups, desktops, shortcuts, and permissions; for tape handling, file archiving, and UNIX-compatible backups; for registry manipulation; for service, device driver, domain, and file association management; for queuing

actions and scheduling tasks; and for process and system information queries; there are no better system administration products than those in PTC MKS Toolkit.

- **Scriptable Web Development Utilities**. Web developers and maintainers will love the ability to create custom utilities and scripts to manage their sites with our utilities for manipulating HTML, for pushing and pulling content to and from local or remote servers, for Perl scripting in the Microsoft Active Scripting environment, and CGI programming in `Perl` and `mkscgi`.

- **Advanced UNIX-Windows Interoperability Suite**. PTC MKS Toolkit products have everything that you need to interoperate in a mixed UNIX and Windows world, including telnet server, remote commands (`rexec, rsh, rlogin, rcp`) and servers (`rexecd, rshd, rlogind`), secure commands (`ssh, sshd, scp, sftp, sftp-server`) and X Windows servers.

- **Most Extensive UNIX-Windows Migration and Cross-Platform Development Facilities**. With over 2700 UNIX APIs and a full command-line development environment, PTC MKS Toolkit products are the ultimate in migration and cross-platform development environments. No other products can match our full support for C, C++, and FORTRAN; for UNIX process management including `fork()`, signals, alarms, and threads; for file system and security management; and for curses, X Windows, Motif, and OpenGL. And no other product matches PTC MKS Toolkit's access to Win32 APIs for Windows integration and interoperability.

- **Advanced Modernization and Evolution Facilities**. Beyond migration, PTC MKS Toolkit products help you modernize and evolve your legacy applications, by creating objects that can be reused within existing Windows applications, that can be used to build new Windows applications; and that can be embedded in Active Server Pages, web-enabling your application.

- **Most Extensive Suite of Value-Added Utilities for Windows**. No other products on the market address real-world needs for robust utilities like PTC MKS Toolkit products. Following are some of our powerful value-added utilities:

Command	Definition
64decode	Decode a file using base64.
64encode	Encode a file using base64.
appc	Arbitrary precision programmable calculator.
assoc	Set file extension association in the Windows registry.
autorun	Specify programs to run on bootup or log in under Win32.
awkc	Compile awk programs into executables.
bindres	Encode resources and insert them into a specified text file; used with `dlg`.
c	Produce multiple-column output.
chacl	Change the access control list (ACL) on Windows objects.
chgrp	Change group attribute of a file on Windows.
color	Change foreground and background colors of the shell window
db	Send SQL queries to a database via ODBC.
dde	Perform DDE client operations.
desktop	Simple command-line desktop manipulation.
dev	Display device driver information.
dlg	Load and manage Windows dialog boxes; create graphical shell scripts.
domain	Display Windows domain information.
filebox	Display Windows Open or Save dialog box.
filever	Print file version information.
ftype	Set file type association within the Windows registry.
gdf	Graphically display the amount of free space remaining on a disk (a `dlg` example).
gdir	Graphically display and manage the current directory stack.
ghist	Display and manage command history from a scrollable dialog box.
gps	Display and manage process status in a scrollable dialog box (a `dlg` example).
groupinfo	Manipulate Windows group information.
gset	Graphically define shell settings.
gvar	View or define variables, parameters, functions, and aliases.
halt	Shut down the system.
hist	Display, fix, edit and re-enter previous command.
htdiff	Compare two HTML files and display differences.
htsplit	Split an HTML file into tokens.
htstrip	Remove HTML tokens from a file or stream.
imapmail	Manipulate e-mail messages on an IMAP mail server.
lsacl	List access control lists for Windows objects.
manstrip	Strip the unprintable sequences out of online man pages.
mapimail	Send mail on a Win32 system using the MSMapi32 ActiveX COM object.
member	Manipulate Windows group membership information.
mkscgi	Run scripts on HTTP server through the Common Gateway Interface.
mksdiag	Check PTC MKS Toolkit configuration.
mksinfo	Display PTC MKS Toolkit serial number and other information.
mkszip	Compress/decompress a file.
msgbox	Display a Windows message box.
pop3mail	Manipulate e-mail messages on a POP3 mail server.
registry	Display and modify the Windows registry.
security	Find security related information.
sendevent	Send mouse or keyboard events.
service	Manage Windows services.
shortcut	Create Windows shortcuts from the command line.
sid	Display user's security identifier.
start	Start a new program in another window.
strerror	Display a system error message.
sysinf	Display technical system information.
tksched	Launch commands at predefined times.
ugrep	Search for regular expressions from a dialog box (dlg example).
uncname	Return the UNC name for a specified file.
url	Parse Uniform Resource Locators (URLs).
userinfo	Manage Windows user information.
VDiff	Compare two text files and show / merge differences.
viw	Display-oriented interactive text editor for Windows.
VPax	(Visual Pax) graphical interface to `pax`, `cpio`, and `tar` archives.
wcopy	Copy from a specified file or standard input to the Windows clipboard.
web	Transfer files to or from a Web server.
winctrl	Manipulate windows and dialog boxes.
windir	Display the name of the Windows directory.
wpaste	Print Windows clipboard text to standard output or a specified file.
ws	Display the name of the current workstation or desktop.
wstart	Start a new program in another window.

No matter what your need in UNIX-Windows interoperability, there is an PTC MKS Toolkit product that is just right for you. Whether you are a power user, developer, or system administrator, PTC MKS Toolkit is the clear choice. After evaluating PTC MKS Toolkit, we hope that you understand, as have our 450,000 existing customers, why no other interoperability product delivers comparable quality, extensive support, and features in one convenient package. If you still have questions or concerns, please contact us at the numbers below.

Ordering Information

PTC MKS Toolkit can be purchased by emailing MKSToolkitInfo@ptc.com or by calling +1-703-803-3343 or 1-800-637-8034.