Windows Tool Reference

Windows Management Tools

This appendix lists sets of Windows management, maintenance, configuration, and monitoring tools that you may not be familiar with. Some are not automatically installed by Windows Setup but instead are hidden away in obscure folders on your Windows Setup DVD or CD-ROM. Others must be downloaded or purchased from Microsoft. They can be a great help in using, updating, and managing Windows.

We'll discuss the following tool kits:

- **Standard Tools**—Our pick of handy programs installed by Windows Setup that we think are unappreciated and not well-enough known.

- **Support Tools**—A set of useful command-line and GUI programs that can be installed from your Windows Setup DVD or CD-ROM.

- **Value-Added Tools**—Several more sets of utilities hidden away on the Windows Setup CD-ROM.

- **Windows Ultimate Extras and PowerToys for XP**—Accessories that can be downloaded for free from microsoft.com. The PowerToys include TweakUI, a program that lets you make adjustments to more Windows settings than you knew existed.

- **Resource Kits**—A set of books published by Microsoft for some versions of Windows that includes a CD-ROM containing hundreds of utility programs. What you may not have known is that in some cases you can download the Resource Kit program toolkits without purchasing the books.

- **Subsystem for UNIX-Based Applications** *(SUA)*—A package of network services and command-line tools that provide a nearly complete UNIX environment. It can be installed only on Windows Vista Ultimate and Enterprise, and Windows Server 2003. SUA can be downloaded for free from microsoft.com.

- **Services For UNIX (SFU)**—An earlier version of SUA, which can be used on Windows XP Professional, Windows 2000, or versions of Windows Server prior to 2003. Like SUA, SFU can be downloaded for free from microsoft.com.

We'll go over each of these toolkits in order in the following sections. Although we don't have room to cover all of the tools in detail, we'll give you listings of the available tools.

Standard Commands

A standard installation of Windows includes a number of command-line tools that are extremely useful. Table A.1 describes a few of them. For a complete list of all command-line programs provided with Windows, scan through the programs listed with type CMD in Appendix B, "Windows Command Reference."

Table A.1   Important Standard Command-Line Commands

Command	Description
control	Opens and runs a control panel from the command line. For details, see the section named "**control**," in Chapter 9, "Windows Commands and Scripting."
findstr	Searches through text files for specified strings. (If you're familiar with UNIX or Linux, **findstr** is like **grep**.) For more information, see "findstr," in Chapter 9.
ftp	Copies files to and from other computers using the Internet's File Transfer Protocol. You can use the FTP command-line program to post files to a web server, retrieve files from a UNIX host, or perform other file-copying tasks. Type **ftp** and press Enter, and the program will prompt you to enter commands. The most important commands are

	open *hostname*	Establishes a connection to the specified computer
	binary	Indicates that the files to be transferred are binary (data) files; use for images and programs
	ascii	Indicates that the files to be transferred are text files; use for text and HTML files
	cd *dirname*	Changes directories on the remote computer
	lcd *dirname*	Changes directories on the local (your) computer
	dir [*filename*]	Lists the directory on the remote computer
	!dir [*filename*]	Lists the directory on *your* computer
	send *filename*	Transfers the specified file from your computer to the other computer
	get *filename*	Retrieves the specified file from the other computer to your computer
	mput *filename*	Sends multiple files; use wildcards in the filename
	mget *filename*	Gets multiple files; use wildcards in the filename
	prompt	**mget** and **mput** normally prompt you for a yes/no response before transferring each file; **prompt** toggles this prompting on or off
	quit	Terminates the connection

Command	Description
iexpress	**IExpress** is a wizard that builds a simple setup program for software you've developed yourself. You have to provide the one or more files that make up your application, and a configuration file that describes where these files are to be copied on the target computer. Additionally you can define Registry entries that are to be made, and you can designate a program or script that is to be run after the files are copied onto a target computer to complete the installation. **IExpress** then compresses all of this into a single executable (.**EXE**) file that you can distribute and run on other computers. It's a neat tool, but **iexpress** is based on 16-bit Windows technology rather than Windows Installer, so it's not usable on 64-bit versions of Windows, and we expect that its useful life is coming to an end.

Command	Description
ipconfig	**Ipconfig** displays IP address configuration information for your computer's network adapters. Additionally it can release or renew the adapter's DHCP lease, although the GUI "repair" option on the Network Connections control panel is more thorough. Type **ipconfig /help** for syntax information.
net	The **net** command can perform quite a number of chores, from creating local user accounts, to mapping network drives, to viewing the resources shared on a remote computer, to sharing folders. For more information about **net**, see the section named "net," in Chapter 9.
netsh	**netsh** is a complex, interactive program that can configure and display just about every aspect of Windows networking. You can work with **netsh** interactively or give it commands from a batch file or script. For syntax information, type **netsh** then **help**. Exit with **quit**.

nslookup	**nslookup** is an interactive program that lets you query Domain Name Service (DNS) servers. **nslookup** is particularly useful for finding information about the ownership of IP addresses. The syntax is the same as the UNIX versions from which it came. To find out the hostname of a given IP address, type
	
	    `nslookup `*`xxx.yyy.zzz.qqq`*
	
	replacing *xxx*, *yyy*, *zzz*, and *qqq* with the corresponding parts of the IP number in question. If this does not produce an answer, type the following commands:
	
	    `nslookup`
	    `set type=ANY`
	    `zzz.yyy.xxx.in-addr.arpa.`
	    `yyy.xxx.in-addr.arpa.`
	    `exit`

runas	**runas** runs a command under another user's credentials. It's like the UNIX utility **su**, and is most often used to run a management tool as Administrator. The program run can be GUI or command-line, and if you specify **cmd** as the command, you get a command prompt window from which you can run any other programs. The syntax is
	
	    `runas /user:`*`xxx`*` "`*`command`*`"`
	
	where *xxx* is the login name of the user whose credentials you want to use. It's rarely required on Vista because User Account Control takes care of this for you, but on XP I use it frequently, in three ways:
	
	    `runas /user:Administrator "control firewall.cpl"`
	    `runas /user:Administrator cmd`
	    `and`
	    `runas /user:Administrator mmc`
	
	to open the Firewall control panel, to open a command prompt, or to run Microsoft Management Console, respectively.
	
	(For setup and installation programs, it's usually easier to locate the program in Explorer, right-click, and select Run As, or Run As Administrator.)

ping	**ping** tests network connectivity by sending data packets to another computer on your network or on the Internet, and reports whether the data got through. It's a valuable diagnostic tool. For syntax information type **ping /?**. Perhaps the most useful command-line switch is **-t**. This will keep **ping** pinging until you interrupt it with Ctrl+C, a very handy thing if you're trying to fix network cabling or find a problem with your network setup.

(continues)

Table A.1 Continued

Command	Description

sc	Starts, stops, configures, and queries for information about services and device drivers. For information, type the commands
	
	`sc /? >x`
	`y`
	`notepad x`
	
	Some useful examples are shown here:

	`sc queryex`	Lists installed services, including process IDs of active services
	`sc start servicename`	Starts the named service. Type **sc query** or **sc queryex** to get a list of the names of all services.
	`sc query`	Lists all installed device drivers. (There must be no space before the = sign, and there must be a space after it.)
	`type= driver`	

Command	Description
tasklist	Lists running applications and services. Available on XP Pro and Media Center Edition only*. tasklist can provide detailed information about the services provided by running applications, and can list tasks running under other logins (due to Fast User Switching). Type **tasklist** alone on the command line for a list of programs or **tasklist /?** for syntax help.
taskkill	**taskkill** kills the program(s) specified on the command line, and it can often kill errant programs that the Windows Task Manager cannot. Available on XP Pro and Media Center Edition only*. Type **taskkill /f /pid ###** to forcibly terminate a program with process ID number ###; or type **taskkill /?** for a list of all options.
tracert	**tracert** probes the path between your computer and another computer on your network or the Internet, listing each intermediate network router between the two. It's an important diagnostic tool. Type **tracert /?** for a syntax description.

For some reason, Microsoft chose not to install `tasklist.exe` and `taskkill.exe` on Windows XP Home Edition. If you use XP Home, you might want to grab copies of these two useful tools from the `\windows\system32` folder of an XP Pro or XP Media Center Edition installation.

Support Tools

On Windows XP and 2000, the Windows Setup CD-ROM contains a set of *very* useful diagnostic and maintenance tools that is not installed by default when you install Windows. I recommend that you install these tools on any Windows XP or Windows 2000 computer that you personally maintain; or, at least install them on a shared network folder so that you can access them from any computer in your organization or home.

Note

The Support Tools package is not provided with Windows Vista. However, four of the support tool programs listed in Table A.2 (bitsadmin, reg, setx, and whoami) are installed by default on Vista, in the \windows\system32 folder. In addition, the XP Support Tools and the Support Tools provided with Windows Server 2003 can be installed on Vista, so, the Windows Server 2003 support tools are listed in this section. However, be aware that you must have an XP or Windows Server 2003 setup disc to install these tools on Vista. (No End User License Agreement is displayed when you install the tools, so doing this is not an obvious violation of any licensing terms. Presumably, Microsoft allows this because people need to support Server systems from other computers.)

To install the Support Tools, insert your Windows Setup CD-ROM or DVD, wait for the menu window to appear, click Perform Additional Tasks if this option appears, then select Browse This CD. (If Autorun is not enabled, open Windows Explorer and browse the CD drive manually.) Open the folder \SUPPORT\TOOLS. If you are logged on as a Computer Administrator, double-click suptools.msi or setup.exe. If you are not currently logged on as an Administrator, right-click suptools.msi or setup.exe, select Run As, and select Administrator as the alternate account.

The installer will copy programs to \Program Files\Support tools, add a Start menu item that opens the Support Tools Help file (suptools.chm), and also add \Program Files\Support Tools to the PATH environment variable, so that the tools may be run from the command line.

When the installation is complete, browse the folder \program files\support tools. Documentation is sparse. There are a few .doc files describing a few of the applications (double-click these to open them in WordPad or Microsoft Word). There are .hlp files for a few more applications (double-click to open these in Windows Help). Several more applications are documented in the Support Tools Help File (click Start, All Programs, Support Tools).

Note

The help files provided with the Support Tools are in Windows Help (.HLP) file format, which can't be viewed on Windows Vista. To read the help information online, visit technet.microsoft.com and search for Windows Support Tools. Select the match that leads you to the following Table of Contents entry: Windows Server TechCenter for Windows Server 2003 Technical Library, Windows Server 2003: Technical Reference, Tools and Settings Collection, Windows Support Tools. Alternately, install the tools on a computer running XP or Windows 2003 Server to read the documentation.

Other toolshave no online documentation. For these, open a command prompt window and type the name of the program followed by /?; for example,

```
xcacls /?
```

For more information about some of the support tools, see http://support.microsoft.com/kb/838079. This article assumes that you've installed Windows XP Service Pack 2.

The set of Support Tools provided with Windows varies from one version of Windows to another. Table A.2 lists all the tool programs and the operating systems which with each is supplied. The letters used in the OS column are

2	Windows 2000 Professional
X	Windows XP (all editions)
V	Windows Vista (default installation)
3	Windows Server 2003 Support Tools, when installed on Vista

The Type column indicates the program type:

CMD	Command-line program
GUI	Graphical user interface program
MMC	Microsoft Management Console snap-in. Run by typing **start *xxx.msc***, replacing *xxx.msc* with the actual filename of the snap-in.
SCR	Windows Script Host Script, mostly meant to serve as an example for writing your own scripts. Issue the command

```
cscript //H:cscript
```

(just once) to make these work properly from a command-line prompt.

Table A.2   Support Tool Programs

Filename	OS	Type	Description
acldiag.exe	2X3	CMD	Detects and reports discrepancies in Active Directory Access Control Lists.
activate.exe	X	CMD	Activates Windows XP from the command line.
addiag.exe	X3	CMD	Displays information on published (advertised) applications.
adsiedit.msc	2X3	MMC	Active Directory LDAP Browse/Edit tool.
apcompat.exe	2	GUI	Application Compatibility tool, runs applications in an environment that simulates earlier versions of Windows.
apimon.exe	X	GUI	Profiles Windows API usage and page faults to tune applications.
apmstat.exe	2X3	CMD	Displays motherboard APM (power management) availability.
bindiff.exe	X3	CMD	Compares binary files.
bitsadmin.exe	XV	CMD	Background Intelligent Transfer Service exerciser. (Standard program on Vista.)
browstat.exe	2X3	CMD	Displays browser server status.
cabarc.exe	X3	CMD	Creates, lists, or extracts cabinet files.
clone.vbs	3	SCR	Sample script, copies printer configuration from one computer to another.
clonegg.vbs	2X3	SCR	Sample script, copies global groups from NT domain to Windows 200x.
cloneggu.vbs	2X3	SCR	Sample script, copies global groups and users from NT domain to Windows 200x.
clonelg.vbs	2X3	SCR	Sample script, copies local groups from NT domain to Windows 200x.
clonepr.vbs	2X3	SCR	Sample script, copies users from NT domain to Windows 200x.
connstat.cmd	3	SCR	Summarizes File System Replication log data. (Oddly enough, this is a Perl script embedded in a batch file.)

Filename	OS	Type	Description
dcdiag.exe	23	CMD	Domain Controller diagnostic utility, checks connectivity and replication in a forest of Windows domain controllers.
depends.exe	2X3	GUI	Dependency Walker, identifies all of the DLLs used by a given program or module.
devcon.exe	3	CMD	Command-line version of Device Manager: lists devices, enables and disables devices, installs, updates, or removes drivers.
dfsutil.exe	2X3	CMD	Queries Distributed File System configuration.
dhcploc.exe	X3	CMD	Detects authorized and unauthorized DHCP servers.
diruse.exe	X3	CMD	Displays disk space usage by directory.
dmdiag.exe	X3	CMD	Displays information about mounted file systems.
dnscmd.exe	2X3	CMD	Displays and changes data in Windows Server DNS Server.
dnslint.exe	3	CMD	Validates and summarizes Domain Name Service (DNS) entries for a domain.
dsacls.exe	2X3	CMD	Displays and changes Active Directory Access Control Lists.
dsastat.exe	2X3	CMD	Verifies correct AD replication.
dskprobe.exe	2X3	GUI	Disk contents viewer, displays data by file or sector.
dumpchk.exe	2X	CMD	Validates format of a system memory dump file.
dupfinder.exe	X	GUI	Duplicate file finder, locates identical files stored in different folders.
efsinfo.exe	X3	CMD	Displays information about Encrypting File System.
exctrlst.exe	X3	CMD	Lists application services that have registered performance counters.
extract.exe	X	CMD	Extracts files from Microsoft `.CAB` files.
filever.exe	2X3	CMD	Prints version information stored in executable and DLL files.
ftonline.exe	X3	CMD	Mounts and recovers files from Windows NT 4 RAID volumes.
getsid.exe	X3	CMD	Displays security ID associated with a user account.
gflags.exe	2X3	GUI	Edits global flags to enable operating system debug options.
health_chk.cmd	3	SCR	Reports on status of File System Replication service on a server.
httpcfg.exe	3	CMD	Configures HTTP API for web applications that do not run under IIS. (Server tool.)
iasparse.exe	3	CMD	Summarizes IAS (Radius authentication) logs.
iologsum.cmd	3	SCR	Summarizes File Replication System logs.
ipseccmd.exe	X	CMD	Configures and displays IPSec Security policies.
kill.exe	2	CMD	Kills tasks from the command line (like `taskkill`).
ksetup.exe	2X3	CMD	Sets Windows to use MIT Kerberos authentication server.

(continues)

Table A.2   Continued

Filename	OS	Type	Description
ktpass.exe	2X3	CMD	Creates Kerberos keytab file for UNIX hosts.
ldp.exe	2X3	GUI	Graphical LDAP browser/query viewer.
memsnap.exe	2X3	CMD	Displays memory usage of all active processes.
movetree.exe	2X3	CMD	Moves AD objects between domains.
msicuu.exe	2X3	GUI	Windows Installer cleanup utility.
msizap.exe	2X3	CMD	Windows Installer cleanup utility, called by msicuu.
netcap.exe	X3	CMD	Logs network traffic to a file.
netdiag.exe	2X3	CMD	Comprehensive Windows networking diagnostic tool.
netdom.exe	2X3	CMD	Manages domain membership and user accounts.
netset.exe	X	CMD	Lists, installs, and configures networking components.
nltest.exe	2X3	CMD	Queries and updates Domain Controller status.
ntfrsutl.exe	X3	CMD	Displays internal status of File Replication Service.
pfmon.exe	X	CMD	Page Fault Monitor, displays memory activity in an application.
pmon.exe	2X	CMD	Process Resource Monitor, displays CPU and memory usage.
poolmon.exe	2X3	CMD	Memory Pool Monitor, displays paged and non-paged pool usage.
portqry.exe	3	CMD	Scans TCP and UDP ports on a designated host, reports listening and blocking status.
pptpclnt.exe	2X3	CMD	Point-to-Point Tunneling Protocol tester, client side.
pptpsrv.exe	2X3	CMD	Point-to-Point Tunneling Protocol tester, server side.
pstat.exe	X3	CMD	Process Status snapshot utility.
pviewer.exe	2X3	GUI	Process Viewer, displays the status of active processes on your computer or other networked computers. Lists active threads, memory usage, priority level.
rasdiag.exe	X3	CMD	Dial-Up Networking diagnostic gathering tool.
reg.exe	2XV	CMD	Edits or displays Registry data. (Not provided with XP Home Edition support tools. Standard program on Vista.)
remote.exe	2X3	CMD	Remote debugging client/server communication program.
repadmin.exe	23	CMD	Replication diagnostic tool, displays replication topology for Windows 2000 Server domain controllers.
replmon.exe	2X3	GUI	Monitors and queries AD replication.
rsdiag.exe	2X3	CMD	Remote Storage diagnostic, displays information in Remote Storage (HSM) databases.
rsdir.exe	2X3	CMD	Remote Storage file information tool.
sdcheck.exe	2X3	CMD	Displays security descriptors for AD objects.
search.vbs	2X3	SCR	LDAP directory search tool.

Filename	OS	Type	Description
setspn.exe	X3	CMD	Sets service principal name, repairs certain directory authentication problems.
setx.exe	XV	CMD	Sets current and default environment variables from the command line. (Standard program on Vista.)
showaccs.exe	2X3	CMD	Server Migration tool, lists SIDs found in file system or Registry.
showperf.exe	X	GUI	Displays performance counter raw data.
sidhist.vbs	2X3	SCR	Sample script, demonstrates use of `ICloneSecurityPrincipal::AddSidHistory`.
sidwalk.exe	2X3	CMD	Server Migration tool, updates mapped SIDS in file system or Registry.
sidwalk.msc	2X3	MMC	Security Migration Editor, edits old to new SID mapping.
snmputilg.exe	2X	GUI	Browses network data returned by SNMP-enabled devices.
spcheck.exe	X3	CMD	Service Pack Checker, verifies installation of hotfixes and service packs.
timezone.exe	X	CMD	Sets the time zone and daylight saving time start/end dates from the command line.
tlist.exe	2	CMD	Lists tasks running on the system (like `tasklist`).
topchk.cmd	3	SCR	Summarizes topology of File System Replication configuration.
tracefmt.exe	X	CMD	Formats and displays trace information gathered by `tracelog`.
tracelog.exe	X	CMD	Enables and disables tracing of system components during debugging.
tracepdb.exe	X	CMD	Creates trace message database used by `tracefmt`.
vfi.exe	X	GUI	Records snapshot information about files to help detect changes.
whoami.exe	XV	CMD	Displays current username, security groups, and privileges. (Standard program on Vista.)
windiff.exe	23	GUI	Compares text files and/or entire folders, highlighting additions, changes and deletions.
wsremote.exe	2X	CMD	Remote debugging client/server communication program.
xcacls.exe	X3	CMD	Edits and displays file Access Control Lists.

Application Compatibility Toolkit

The 32-bit Windows Application Programming Interface (Win32 API) through which Windows provides service and support to application programs has been evolving since its debut with Windows 95. Certain system functions behave slightly differently from one version of Windows to the next, and these differences can trip up an application that depends on a specific behavior. Windows lets you set gross Windows version compatibility settings through the Compatibility tab on each program's Properties page, but the Application Compatibility Toolkit lets you make extremely fine-grained adjustments.

In the terminology of the Application Compatibility Toolkit, specific adjustable behaviors are called *compatibility fixes*, and groups of related fixes are called *compatibilty modes*. There are approximately 200 fixes, from lying to applications about the running version of Windows, to adjustments to the behavior of specific Windows API functions, to "faking" the locations of Windows folders and components that have changed from one version of Windows to another. Additionally, you can use compatibility settings to instruct Windows to keep logs of application behavior, to force or prevent the elevation of privilege through User Account Control on Vista, and to prevent an application from running on more than one CPU or core of a multiprocessor system.

This toolkit is meant primarily for software developers and for corporate deployment managers, but in some cases end users might find it useful as well—if the company that produced a problematic application is of no help, it can't hurt to mess with these settings before giving up entirely.

You should download the current toolkit version from www.microsoft.com/downloads (search for Application Compatibility Toolkit). At the time this was written, the current ACT version is 5.0, and requires you to install .NET Framework 2.0. A version was provided on the Windows XP Setup CD-ROM, but it is obsolete.

The toolkit programs are installed on your hard disk in \Program Files\Microsoft Application Compatibility Toolkit 5. Documentation is provided in the act.chm file in that folder. There is also extensive information on technet.microsoft.com. Just search for (you guessed it) Application Compatibility Toolkit. The programs are listed in Table A.3.

Table A.3   Application Compatibility Toolkit Programs

Program	Description
Application Compatibility Manager	Collects and analyzes application errors and failures across an enterprise network. (Requires Microsoft SQL Server.)
Compatibility Administrator	Creates and edits sets of compatibility fixes and compatibility modes for applications.
Internet Explorer Compatibility Test Tool	Detects issues that may prevent correction function of (intranet) websites viewed with Internet Explorer 7.
Setup Analysis Tool	Monitors running of application setup programs and reports possible security issues, including installation of kernel-mode drivers, 16-bit Windows components, modification of protected Registry keys, and use of non-Vista-compatible secure logon components.
Standard User Analyzer	Monitors behavior of application running as a standard (nonelevated) user, and reports User Account Control compatibility issues.

Deployment Toolkit

If you are in the business of (legally) installing identical Windows configurations on large numbers of computers, you may be able to save a lot of time by using a Windows deployment toolkit. The toolkits let you set up new computers with a fresh, clean, installation of Windows configured to your liking from the get-go. Here's how the process works. You start with a fresh installation of

Windows on one computer. You then install applications, add user accounts, certificates, network printers, and other personalized data, adjust Windows settings, and so on. Then, you run a deployment toolkit program that prepares Windows for duplication. This ensures that subsequently made copies will have unique security databases, don't all share a single product ID code, perform user personalization upon startup (if desired), and most important, don't look like illegal copies to Windows Activation. After this preparation step, you can copy the "master" computer's hard disk as many times as necessary. When installed into a new computer, "cloned" disk copies will contain your preinstalled settings and applications.

On Vista, the process is considerably different than in previous versions of Windows. The master "images" can contain multiple setup configurations within one master medium, and the predefined "answer files" that control parts of the Windows setup process have a different format than that used for previous Windows deployment systems.

You can get information about Windows deployment kits at technet.microsoft.com. Search for any of the following phrases:

- *Comparing Windows XP and Windows Vista Deployment Technologies*
- *Automated Installation Toolkit (Windows AIK)*
- *Windows Vista Deployment Step by Step Guide*
- *OEM Installation Toolkit (Windows OPK)*

For more information on XP deployment tools, see www.microsoft.com/whdc/system/winpreinst/default.mspx, or search microsoft.com for the phrase *Windows Preinstallation*.You should know that Microsoft doesn't provide a disk duplication tool as part of the XP deployment toolkit—you have to use a third-party disk cloning program or hardware device for that. On Vista, you can duplicate disk images using your own disk cloning software or hardware, or you can also use the tools that Microsoft provides to create your own custom bootable Windows Setup DVDs.

Value Added Tools

The Windows 2000 or XP Setup DVD or CD-ROM may contain additional program suites that are not installed through Windows Setup. These include some programs provided by Microsoft and some third-party tools. We won't list all the tools, but we will list the general categories. Table A.4 lists the Value Added Tool folders found on current versions of the Windows 2000 and Windows XP setup CD-ROMs, with a brief description of the tools found inside each folder. The tools provided on your Windows XP setup CD-ROM may be different, depending on your version of Windows and your computer vendor.

Note

At the time this was written, no Value Added Tools were provided with Windows Vista.

To install a given toolset, view the folder in Windows Explorer, and double-click whatever setup program you find: setup.exe or (*something*).msi. Alternatively double-click any .CHM (help), .HTM (HTML), or .TXT (text) files you find; these may contain installation instructions.

Updated third-party tools may be provided on Windows Service Pack CD-ROMs. If you install any third-party tools, be sure to check for updates when you install subsequent service packs. The service pack installer itself may not update these tools.

Table A.4   Windows XP Value Added Tool Categories

Folder	Toolkit
\VALUEADD\3RDPARTY\MGMT\CITRIX	Client software for Citrix Terminal Services (a specialized multiuser server version of Windows Terminal Services, similar to Remote Desktop).
\VALUEADD\MGMT\PBA	Phone Book Administrator, used by corporate networks and ISPs to deploy Dial-Up Networking Point of Presence databases. Also called Connection Point Services, Phone Book Service, and Connection Manager Administration Kit.
\VALUEADD\MSFT\FONTS	Arial alternative fonts for the Minitel/Prestel terminal emulator.
\VALUEADD\MSFT\MGMT\CIMV2R5	Strictly compliant CIM version 2.5 schema file for Windows Management Instrumentation.
\VALUEADD\MSFT\MGMT\IAS	Windows NT 4.0 Internet Authentication Service snap-in.
\VALUEADD\MSFT\MGMT\MSTSC_HPC	Terminal Server Client for the handheld PC.
\VALUEADD\MSFT\MGMT\WBEMODBC	ODBC driver for WMI.
\VALUEADD\MSFT\NET\NETBEUI	NetBEUI protocol driver for XP.
\VALUEADD\MSFT\NET\TOOLS	TCP/UDP test utility.
\VALUEADD\MSFT\NTBACKUP	The standard backup program for Windows 2000 and XP is not installed by default on Windows XP Home Edition. XP Home users can find it here.
\VALUEADD\USMT\ANSI	User State Migration Tool—Administrator's version of the Files and Settings Transfer Wizard.

PowerToys and Extras

Microsoft has an odd habit of making you download some useful tools that really should have been on the Setup CD-ROM to begin with. On Windows XP, these are called the PowerToys for Windows XP. TweakUI, in particular, is an indispensable tool. It's a sort of Windows Swiss army knife, and gives access to several dozen adjustments and settings that should have been on the control panel.

The PowerToys and tools vary from one version of Windows to another. Check carefully before trying to use "toys" from one version on another. In particular, don't use the XP TweakUI tool on Windows 2000 or 9x, or vice versa. We'll discuss the PowerToys for XP shortly.

With Vista, Microsoft seems to have abandoned the idea of providing simple, useful add-on tools as easy-to-get downloads. The Support Tools (discussed earlier in this appendix) and the Resource Kit tools (discussed later) are still available, but the PowerToys are gone. What took their place is named Windows Ultimate Extras, but so far, there's nothing ultimate about them.

Windows Ultimate Extras

Windows Vista Ultimate edition introduced a new concept called Windows Ultimate Extras, which are delivered through Windows Update. When Vista was originally released in January 2007, the Ultimate Extras were touted as one of the many benefits of paying more money for Ultimate, and were described as a source of future "cutting-edge programs, innovative services, and unique publications." However, Microsoft has deleted this language from its marketing materials, and at the time this was written, the only Ultimate Extras are a game, a desktop video gimmick, and a few items that should have been part of the original Vista release, but were delayed for one reason or another: multilingual user interface language packs, and two tools to help set up BitLocker drive encryption. Microsoft has promised that more Extras will be forthcoming, but they seem to be pretty low on Microsoft's priority list, and my advice is not to hold your breath waiting for them.

The Extras that have been released are available only on Windows Vista Ultimate Edition, and they are made available only through Windows Update. To download them, click Start, All Programs, Windows Update, and then click View Available Extras.

At the time this was written, the Extras listed in Table A.5 were the only Extras that have been produced.

Table A.5   Windows Ultimate Extras

Extra	Description
Windows DreamScene	Lets you select a video as your desktop background, rather than just a static picture. (Requires a video card that supports the Aero display environment.)
Hold Em Poker Game	Lets you practice playing Texas Hold Em poker. This is a single-user game.
BitLocker and EFS enhancements	Two tools: one to prepare your disk for installing BitLocker encryption, and an encryption key backup utility.

In addition, multiuser language interface (MUI) language packs, which let you select a language in which to work with Windows, are avialable to Windows Vista Ultimate and Enterprise users, although on Ultimate, the updates are listed as optional items under the Windows Update heading (as *Windows Vista Ultimate Language Packs*), rather than under the Windows Ultimate Extras heading. To see these items, you have to select Show Available Updates on the Windows Update screen.

For whatever reason, Microsoft seems to have abandoned the world of Vista tweaking tools to third-party developers. So, in the place of Microsoft's PowerToys or Ultimate Extras, we suggest that you download at least these two indispensible tools:

- TweakVI, a third-party TweakUI for Vista, at www.tweakvi.com.
- Vista Boot Pro, multiboot configuration manager, from www.vistabootpro.org.

You might also check into the Windows Server 2003 Support Tools and Resource Kit tools discussed elsewhere in this appendix. These tools, however, don't match the XP PowerToys for GUI simplicity. There are also quite a number of other valuable—but free—tools provided by Microsoft (without support), which I'll discuss shortly.

PowerToys for Windows XP

To download PowerToys for Windows XP, visit www.microsoft.com/windowsxp, and at the top click Downloads, and then Add-ons, and finally PowerToys and Add-Ins for Windows XP. Each of the PowerToys is a downloadable installation program (.EXE file). To install them, do the following:

1. Select and download a PowerToy from the Microsoft website, and save the .EXE file on your desktop.

2. If you're logged on as a Computer Administrator, just double-click the installer's icon. If you're not a Computer Administrator, right-click the icon, select Run As, check The Following User, and enter an Administrator's username and password.

3. Follow any additional instructions that appear.

4. When the installation is complete, drag the downloaded installer to the Recycle Bin, or move it to a shared network folder for installation on other computers.

5. Click Start, All Programs, Powertoys For Window XP to use the new tool, or select the Readme entry for a description of the tools.

The Windows XP PowerToys available at the time of this writing are listed in Table A.6.

Table A.6   PowerToys for Windows XP

PowerToy	Description
Color Control Panel Applet	Helps graphic artists, photographers, and publishing professionals manage color profiles for displays and printers.
SyncToy	A nifty new tool that lets you automatically synchronize the contents of folders between your hard disk and removable media, network shared folders, cameras, and other devices. Updates can be triggered manually or on a schedule. At the time this was written, SyncToy version 2.0 was available in beta form. Search microsoft.com for "SyncToy" to see if there is a more recent version available.
RAW Image Thumbnailer and Viewer	Lets you view, organize and modify RAW-format image files from your digital camera.
ClearType Tuner	For LCD monitor users only, adjusts ClearType to your preferences, letting you make your own trade-off between jagginess and blurriness.
HTML Slide Show Wizard	Creates a nice set of web pages from a folder of pictures, with thumbnails, forward and back navigation buttons, and so on.
Open Command Window Here	Adds a handy right-click menu choice for folders selected in Windows Explorer. Clicking Open Command Window Here opens a command prompt window with the selected directory as the current directory. Indispensable if you do a lot of work on the command line.

PowerToy	Description
Alt-Tab Replacement	When this tool is installed, Alt-Tab displays not only the name and icon of each open application, but also lets you view thumbnail views of the associated windows, so that you can more easily select the desired instance of an open application.
TweakUI	A must-have tool, makes adjustments to the XP user interface including menus, the mouse, Windows Explorer, the taskbar, desktop icons, the location of special folders, Control Panel applets, and more. For more details, see "TweakUI," in Chapter 6, "Tweaking and Tuning Windows."
Power Calculator	A peculiar tool—a reverse Polish calculator with a graphing feature. If you know what *reverse Polish* means, you'll love this. Otherwise, hmmmm.
Image Resizer	Resizes one or more images to a selected size, handy for making web pages or thumbnails.
CD Slide Show Generator	Adds a slide-show display wizard to a set of pictures to be burned on to a CD. The CD will then auto-run the slide-show display when inserted into a computer running Windows 95 through XP.
Virtual Desktop Manager	Allows you to set up and switch among four separate desktops.
Taskbar Magnifier	Displays in the taskbar a magnified version of the area under the mouse. After installing, right-click the taskbar, select Toolbars, and check Taskbar Magnifier.
Webcam Timershot	Lets you automatically take and save pictures from a webcam or attached camera; the pictures are saved in a designated folder. If the folder is part of a website, this can let you create an automatically updating webcam page.

TweakUI for Windows 9x, NT, and 2000

For Windows 95, 98, Me, NT, or 2000, you can obtain TweakUI version 1.33 from www.microsoft.com. Search for "TweakUI download Windows NT." The download page contains download and installation instructions. The Windows 95-98-NT-2000 TweakUI tool is a control panel applet (`tweakui.cpl`), meaning that it will appear as an icon in your Control Panel.

Free Tools for Vista and XP

In addition to the PowerToys for XP, Microsoft has quite a number of useful free utility programs, most of which work on XP, some of which work on both Vista and XP. Very few of these programs are getting the visibility they deserve. The SyncToy PowerToy, for instance, is designed to be used on both Vista and XP (because it's based on .NET Framework 2.0), and it's *really* useful. Some of these tools are listed as XP PowerToys, but many of them are the products of Microsoft research and development labs.

Blogger Blake Handler has compiled a great listing of the free software available for download from Microsoft and other developers. Check it out at `http://bhandler.spaces.live.com/blog/ cns!70F64BC910C9F7F3!1231.entry`. You don't want to type all that in? I don't blame you. Try this: search Google for "Ultimate List of Free Windows Software from Microsoft." Be sure to use the result that links to bhandler.spaces.live.com. (If you're patient and bored, try to find this page by searching live.com.)

Caution

Most of the tools in this "Ultimate List" are Microsoft products, but a few of the links appear to be developed by or downloaded from third parties, including codeplex, Microsoft's Open Source hosting site. Although they may be safe, I'd suggest you be cautious in downloading and using them. Even the Microsoft downloads are technically unsupported, so all of these tools are "use at your own risk."

Here are just a few of the highlights:

- **SyncToy**—A tool that synchronizes the contents of a folders on your hard disk with folders stored on other disks, network shared folders, removable media, cameras and so on. It's my new favorite quick-backup tool.
- **Mount ISO Files Virtually**—Lets you view the contents of ISO file (a single-file image of a data CD or DVD) through a virtual drive letter.
- **Terminals**—A multitab, multiprotocol terminal client that lets you easily switch between Remote Desktop, VNC, VMRC, RAS, Telnet, SSH and Citrix ICA connections.
- **Virtual WiFi**—Lets you simultaneously connect to multiple Wi-Fi networks through a single wireless networking adapter. (How cool is that?!)

Finally, Microsoft's acquisition of SysInternals has made a bunch of system monitoring and diagnostic tools available for free. Check out http://www.microsoft.com/technet/sysinternals.

Resource Kits

Microsoft sells Resource Kits for its various operating systems, which usually consist of a box containing advanced documentation in printed form and management and diagnostic tools on an accompanying CD-ROM. Some of the Resource Kits' text is available online; for example, the XP Pro Resource Kit text is at
www.microsoft.com/resources/documentation/Windows/XP/all/reskit/en-us.

Resource Kits are available for Windows 98, Windows 2000 Professional, Windows 2000 Server, Window XP Professional, and Windows Server 2003. The Resource Kit for Windows XP Professional is a book only and does *not* include software tools. However, you can use tools from the Windows 2000 Professional, Windows 2000 Server, or Windows Server 2003 Resource Kits on Windows XP Professional or Home Edition.

There is no Resource Kit for Windows Vista, but you may install the Windows Server 2003 Resource Kit on Vista. For this reason, even though Windows Server is not in the scope of this book, we've listed the Windows Server 2003 Resource Kit tools in this section.

The tools number about 300 and many are quite useful. It's worth obtaining a copy of them for use in your organization. If you subscribe to the Microsoft Developer's Network, you may find that the Resource Kit tools are already included as part of your subscription, and are downloadable or are provided on your library CD- or DVD-ROMs. You can also download the Windows Server 2003 Resource Kit Tools from www.microsoft.com/downloads at no cost—search for Windows Server 2003 Resource Kit Tools.

For more information, see http://www.microsoft.com/technet/itsolutions/reskits/rktmain.mspx.

Tip

To help you familiarize yourself with the tools, you might want to put shortcuts to their help files on your desktop for easy access. These help files are part of the Windows Help system, so the actual command line to open them is complex. It's best to create the shortcut by copying an existing one. To do this, find the Resource Kit help entry in the Start menu under, for example, All Programs, Windows Resource Kit Tools. Right-click the Help entry and drag the help icon to your desktop. When windows prompts you, choose Copy Here.

Table A.7 lists the Resource Kit tools. The Kit column lists the Resource Kit(s) in which the tool is included: 2 for the Windows 2000 Professional and Server kits, and 3 for the Windows Server 2003 Resource Kit (installed on Windows Vista).

The Type column indicates the program type:

BF	Batch file (`.BAT` or `.CMD` file)
CMD	Command-line program (`.EXE` file)
GUI	Graphical User Interface program (`.EXE` file)
MMC	Microsoft Management Console snap-in (`.MSC` file)
SAV	Screen Saver (`.SCR` file)
SCR	Windows Script Host Script (`.VBS` or `.JS` file)
SVC	Windows Service (`.EXE` file)

Table A.7   Resource Kit Tools

Command	Kit	Type	Description
addiag	2	CMD	Displays information on published (advertised) applications.
addusers	2	CMD	Adds and removes user accounts from data listed in a text file.
adlb	3	CMD	Active Directory Load Balancing Tool, tunes sharing of workload in multiple-server Active Directory networks (server tool only).
apimon	2	GUI	Profiles Windows API usage and page faults to tune applications.
appsec	2	GUI	Citrix terminal server application security configuration utility.
associate	2	CMD	Registers or deletes Explorer links between filename extensions and application programs; like "assoc."
atanlyzr	2	GUI	AppleTalk network device analyzer, scans and lists devices.
atmarp	23	CMD	ATM network diagnostic tool.
atmlane	23	CMD	ATM network diagnostic tool.
auditpol	2	CMD	Modifies local computer audit policy.
autoexnt	23	SVC	Service to run a batch file on computer startup (not needed for Windows XP).
bootconfig	2	SCR	Prints "boot configuration", not actually useful (WMI).
browmon	2	GUI	Browser (network neighborhood) monitor, displays info on active workgroups/domains and browser masters.
bus	2	SCR	Lists busses, such as ISA and PCI in local computer (WMI).

(continues)

Table A.7   Continued

Command	Kit	Type	Description
cacheinfo	2	SCR	Lists CPU cache information (WMI).
cachemov	2	GUI	Moves offline files and offline content cache to a different drive or folder.
cat	2	CMD	Concatenates named file(s) to standard output, like `type`.
cdburn	3	CMD	Burns a CD-R or CD-RW disk from an ISO image file.
cdromdrives	2	SCR	Lists CD-ROM drives present on local computer (WMI).
cepsetup	3	GUI	Installs SCEP add-on for Certificate Services.
checkbios	2	SCR	Lists BIOS information reported by WMI.
checkrepl	3	SCR	Check replication; monitors domain controller replication (server tool only).
chklnks	23	GUI	Locates shortcuts that point to programs that no longer exist, offers to delete them.
chknic	3	CMD	Checks the computer's network adapters to see whether they are compatible with Network Load Balancing (server tool only).
chkusers	2	SCR	Scans active directory for users meeting specified criteria (ADSI).
choice	2	CMD	Batch file tool that prompts for input and lets user make selection from a list of choices.
classifymembers	2	SCR	Lists members of a specified AD container or group (ADSI).
clean	23	SCR	Deletes all printers from a system (Printer admin demo).
cleanspl	3	GUI	Erases print jobs, spooled files, printers, and print drivers on a remote computer.
clearmem	23	CMD	Flushes the file cache, minimizes working set size of running applications.
clip	2	CMD	Copies standard input to the clipboard so it can be pasted into any GUI application.
clippool	2	GUI	Network shared Clipboard.
cliptray	2	GUI	Notification area tool that lets you create named blocks of text that can be selected and copied into the Clipboard via a pop-up menu.
clone	23	SCR	Generates scripts to clone a computer's printer setup (Printer admin demo).
clusrest	2	CMD	Restores cluster quorum data after restoring disks from backup.
clusterrecovery	3	GUI	Server Cluster Recovery Utility; reconfigures cluster disk information after a bus or disk failure (server tool only).
clustsim	2	CMD	Cluster Verification Utility management program.
codecfile	2	SCR	Displays info on installed audio and video codecs (WMI).
compress	23	CMD	Tool to pack one or more files into a compressed file. Can create ZIP and other compression formats.
compsys	2	SCR	Displays information about the computer and its owner (WMI).
con2prt	2	CMD	Establishes and deletes network printer connections (icons).
conall	23	SCR	Establishes connections to (icons for) all printers on a specified server.
confdisk	3	CMD	Stores server cluster configuration data in the Automated System Recovery database to help after a failure (Server tool only).

Command	Kit	Type	Description
consume	3	CMD	Stresses CPU by consuming memory, page file memory, disk space, CPU time, or kernel pool. Used to test the capability of applications and services to deal with marginal conditions.
cpustres	2	GUI	Stresses CPU by consuming CPU cycles.
createusers	2	SCR	Creates user accounts on a domain.
creatfil	23	CMD	Creates a file of a specified name and size.
csccmd	3	CMD	Manages client-side caching (offline files) database (Pro and Server only).
ctrlist	2	CMD	Lists installed Performance Monitor counters.
cusrmgr	2	CMD	Adds or deletes users or groups, sets account parameters, can assign random passwords.
custreasonedit	3	CMD	Adds/edits predefined reasons for logging Windows shutdowns and restarts.
defprn	23	SCR	Sets or displays default printer.
defptr	2	GUI	Task tray tool to change default printer.
delprof	23	CMD	Deletes user profiles; can delete profiles not used with a specified number of days.
delrp	2	CMD	Deletes a file and any associated NTFS reparse points.
delsrv	2	CMD	Unregisters a service.
depends	2	GUI	Dependency Walker; displays modules used by applications.
desktop	2	CMD	Lists desktops and their properties (WMI).
device	2	SCR	Lists and/or controls device drivers.
devicemem	2	SCR	Lists hardware device memory address ranges (WMI).
dh	23	CMD	Displays global and user-mode heap debugging information.
dhcmp	2	CMD	Formats and compares heap dumps created by dh.exe.
dhcploc	2	CMD	Detects authorized and unauthorized DHCP servers.
dhcpobjs	2	GUI	Installs COM library to remotely administer DHCP server on Windows Server.
diruse	2	CMD	Displays disk space usage by directory.
diskmap	2	CMD	Displays disk drive geometry information.
diskpar	2	CMD	Adjusts disk partition information for large disks to improve access speed under some circumstances.
diskpartition	2	SCR	Lists disk partition information for a computer (WMI).
diskraid	3	CMD	Manages and configures RAID disk configurations (server tool only).
diskuse	23	CMD	Counts disk space usage on a per-user basis.
dmachan	2	SCR	Lists Direct Memory Access (DMA) channels on a computer (WMI).
dmdiag	2	CMD	Displays information about mounted file systems.
dnsdiag	3	CMD	Displays DNS data used by SMTP service to help diagnose mail delivery problems.
dommon	2	GUI	Displays status of domain controller and secure connections between domain controllers.
drivers	2	CMD	Lists installed device drivers.

(continues)

Table A.7   Continued

Command	Kit	Type	Description
drives	2	SCR	Lists disk drive information (WMI).
drmapsrv	2	CMD	Maps local drives to host computer when using Terminal Services or Remote Desktop Connection.
drvmgr	23	SCR	Displays, installs, and manages printer drivers.
dsstore	2	CMD	Manages public-key certificates.
dumpcfg	2	CMD	Displays and changes disk signatures (helpful in recovering from mirror failure).
dumpel	2	CMD	Dumps event log from local or remote computer to a tab-delimited text file.
dumpfsmos	23	CMD	Dumps Flexible Single Master Operation (FMSO) domain controller information.
dupfinder	2	GUI	Locates duplicate files.
dureg	2	CMD	Calculates Registry content size and can search Registry for text strings.
dvdburn	3	CMD	Burns DVD/R or DVD/RW discs from an ISO image file.
efsinfo	2	CMD	Displays information about Encrypting File System.
elogdmp	2	CMD	Dumps event log from local or remote computer to the standard output.
empty	23	CMD	Frees all working set pages for a specified process (that is, pushes task from memory into page file).
enabledhcp	2	SCR	Lists or sets DHCP settings on network adapters (WMI).
enumclasses	2	SCR	Lists available WMI classes (WMI).
enuminstances	2	SCR	Lists instances of WMI class objects (WMI).
enumnamespaces	2	SCR	Lists WMI namespaces—broad categories of WMI classes (WMI).
enumprop	2	CMD	Lists all properties of a given Active Directory object given its LDAP descriptor.
eventcombmt	3	GUI	Searches the event logs on multiple computers for specified events.
eventlogmon	2	SCR	Monitors event log and prints new entries as they occur.
exctrlst	2	CMD	Lists application services that have registered performance counters
exec	2	CMD	Runs a command on a remote computer using WMI.
exetype	2	CMD	Displays information about an executable file: expected operating system, and so on.
expand	2	CMD	Expands files from packed files created by **compress.exe** or from **.CAB** files.
extract	2	CMD	Extracts files from Microsoft **.CAB** files.
fcsetup	23	GUI	Installs a file-copy utility that uses Message Queueing Service to copy files over a slow or unreliable network link.
fileinfo	2	CMD	Displays version information stored in system files.
fileman	2	SCR	Deletes, renames, or changes ownership of files on local or remote computers.

Command	Kit	Type	Description
filespy	2	CMD	Monitors local and network file I/O activity. Requires FileSpy service (see `fspyinst.exe`).
filever	2	CMD	Displays version information stored in system files. The Services for UNIX version works only on the Interix system files.
findgrp	2	CMD	Lists all groups of which a user is a direct or indirect member.
findstr	2	CMD	Finds text in files, advanced.
floplock	2	SVC	Service that secures floppy disk drives so they can be used only by Administrators.
forfiles	2	CMD	Scans for files based on name and date, and issues a specified command on each matching file.
forms	23	SCR	Lists, adds, and deletes forms associated with printers (Printer admin demo).
freedisk	2	CMD	Batch file tool, verifies that there is at least a specified amount of free disk space.
frsflags	3	SCR	Enables and disables the Install Override feature of the File Replication Service (server tool only).
fspyinst	2	GUI	Installs the FileSpy service (see `filespy.exe`).
fspyunin	2	CMD	Uninstalls the FileSpy service (see `filespy.exe`).
ftedit	2	GUI	Edits Fault Tolerant Disk (software RAID) setup information in Registry.
fxfrinst	2	CMD	Installs file copy functionality for Terminal Services Client (`rdpclip.exe`).
getcm	3	CMD	Downloads and installs a Connection Manager profile, part of the Connection Manager Administration Kit.
getmac	2	CMD	Displays network adapter MAC addresses.
getsid	2	CMD	Displays security ID associated with a user account.
gettype	2	CMD	Determines current Windows version; useful in batch files when different operating systems require different procedures.
global	2	CMD	Lists members of global groups on remote servers or domains.
gpmonitor	3	GUI	Monitors Group Policy updates/refreshes and displays a report indicating changes (server tool only).
gpolmig	2	CMD	Migration tool—copies Windows NT version 4 policy file settings to Windows Server Group Policy.
gpotool	23	CMD	Checks consistency of Group Policy objects on domain controllers; can also modify preferred controller list.
gpresult	2	CMD	Computes and displays Group Policy Resultant Set of Policy.
group	2	SCR	Lists groups for a given domain or server (WMI).
groupdescription	2	SCR	Lists the descriptive title for a domain or server's groups (WMI).
grpcpy	2	GUI	Copies usernames between groups in a domain, or between domains.
guid2obj	2	CMD	Looks up distinguished (human readable) name for a given GUID identifier.
heapmon	2	CMD	Displays information about the global heap.
hlscan	3	CMD	Scans for and lists all hard links on an NTFS disk partition.
htmlfltr	2	CMD	Removes comments and extra whitespace from HTML files.

(continues)

Table A.7 Continued

Command	Kit	Type	Description
httpcmd	2	CMD	Command-line HTTP client, sends a query to an HTTP server and displays response.
iasparse	2	CMD	Formats IAS and RAS server log files into a human-readable text format.
ifilttst	23	CMD	Validates user-built IFilter COM implementations (add-ons to Microsoft Index Server).
ifmember	23	CMD	Tests whether a user is a member of a group; useful in batch files.
iishostsvc	2	SVC	IIS Host Helper Service; registers IIS host header strings (host-names) with WINS.
iniman	3	CMD	Adds, deletes, modifies, or displays entries in an **.INF** or **.INI** file; helpful if you want to use a batch file to create or customize **.INI** files.
instaler	2	CMD	Installation monitor, creates a log of file, Registry, and **.INI** file changes made by a setup program (see also **showinst.exe**, **undoinst.exe**).
installd	2	BF	Installs a debugging version of **NTDETECT.COM** on the boot drive (probably works only on Windows 2000, may disable Windows XP).
instcm	3	CMD	Installs a connection manager profile that was obtained by **getcm**.
instexnt	23	SVC	Service that runs a specified batch file when computer boots up (not needed on Windows XP because it has a boot-script policy setting).
instsrv	23	CMD	Installs a specified **.EXE** file as a Windows service.
intfiltr	23	CMD	Configures a multiprocessor system to handle interrupts on a specific processor.
inuse	2	CMD	File copy utility for files in use by the operating system; if the destination file is locked, the copy will take place at the next reboot.
ipsecpol	2	CMD	Command-line IPSec policy tool; lets you configure (and document) IPSec policy setup in a batch file.
irqres	2	SCR	Lists hardware interrupt levels in use (WMI).
javareg	2	CMD	Registers Java classes as COM components (servers).
kerbtray	23	GUI	Task tray tool to display Kerberos ticket information.
kernprof	2	CMD	Gathers and displays Windows kernel statistics.
kernrate	3	CMD	Kernel-profiling tool reports CPU usage by location in the Windows kernel or user-mode processes.
keyboard	2	SCR	Lists information about the installed keyboard (WMI).
kill	2	CMD	Terminates task(s) based on name of the executable file.
kix32	2	CMD	Enhanced logon script processor and batch programming language interpreter. More or less made obsolete by Windows Script Host.
kixplay	2	GUI	Plays KIX "music" files. Appalling.
klist	23	CMD	Lists and deletes Kerberos tickets.

Command	Kit	Type	Description
krt	3	GUI	Key Recovery Tool; lets a Key Recovery Agent recover private keys from the Windows 2003 Server Certification Authority (server tool only).
kxrpc	2	GUI	RPC client program.
lbridge	23	BF	Copies logon scripts from a Windows 2000 server to the replication folders of a Windows NT 4 server (demo).
ldordergrp	2	SCR	Lists dependency groups for Windows services.
leakyapp	2	GUI	Allocates and holds memory to test system performance under memory stress.
linkd	23	CMD	Creates links in an NTFS file system. A link is an alternative directory entry for a file or folder.
linkspeed	3	CMD	Displays the speed of the network connection between specified computers.
list	23	CMD	Text file browsing utility. Very useful. Much like **less** on UNIX.
listadapters	2	SCR	Lists information about each network adapter and some network interface layers (WMI).
listdcs	2	SCR	Lists domain controllers for a specified domain.
listdisplayconfig	2	SCR	Lists display (monitor) settings (WMI).
listdomains	2	SCR	Lists all domains within a namespace (ADSI).
listfreespace	2	SCR	Lists amount of free space on all disk drivers (WMI).
listmembers	2	SCR	Lists all members of an AD container or group (ADSI).
listos	2	SCR	Lists properties of a computer's operating system (WMI).
listprinters	2	SCR	Lists properties of all printers installed on a computer (WMI).
listproperties	2	SCR	Lists properties of a specified Active Directory object (ADSI).
listspace	2	SCR	Lists amount of disk space on all drives on a specified computer (WMI).
local	2	CMD	Lists the members of the specified local security group.
lockoutstatus	3	GUI/CMD	Displays or lists locked-out user accounts in selected domains.
logevent	2	CMD	Adds an entry to the event log on a local or networked computer.
logmeminfo	2	SCR	Lists physical and virtual memory sizes (WMI).
logoff	2	CMD	Logs off from Windows.
logtime	23	CMD	Batch file utility; creates a log file with timestamps and progress messages.
ls	2	CMD	Directory listing utility, a port of the UNIX **ls** command.
lsreport	23	CMD	Lists Terminal Server license data from a domain's license server(s).
lstdpconinfo	2	SCR	Lists display adapter settings (WMI).
lsview	23	GUI	Displays the status of your domain's license server(s).
mcast	23	CMD	Sends or listens for multicast packets (diagnostic tool).
mcopy	2	CMD	Copies files like **copy** but creates a log file recording progress and problems.
memmonitor	3	CMD	Monitors a task's memory consumption, and triggers a debugger if a set threshold is reached.

(continues)

Table A.7 Continued

Command	Kit	Type	Description
memtriage	3	CMD	Monitors memory usage and leakage, and issues a report suggesting ways to save a running system.
mibcc	23	CMD	Compiles SNMP MIB files into binary format used by Windows SNMP service.
modifyldap	2	SCR	Modifies LDAP object properties (ADSI).
modifyusers	2	SCR	Modifies properties of User objects in Active Directory (ADSI).
motherboard	2	SCR	Lists information about a computer's motherboard (WMI).
moveuser	23	CMD	Renames and changes security of a user profile.
mqcast	3	CMD	File replication tool send-side client; uses TCP/IP multicasting.
mqcatch	3	CMD	File replication tool receive-side server.
mtc	2	CMD	Copies files like **xcopy** but creates a log file recording progress and problems.
mtfcheck	2	CMD	Checks that a tape contains a valid Microsoft Tape Format (MTF) backup set; can also erase tapes and restore data.
mv	2	CMD	Like **move** or **rename**.
netclip	2	GUI	Displays and copies content to and from Clipboard on another computer.
netconnections	2	SCR	Lists network connections (mapped drives).
netcons	2	GUI	Displays current network connections; GUI version of **net use**.
netset	2	CMD	Lists, installs, and configures networking components.
netsvc	2	CMD	Start, stop, pause, and query status of services running on remote computers.
networkprotocol	2	SCR	Displays installed network protocol information (WMI).
nlmon	2	CMD	Displays received Browser Service advertisements.
nlsinfo	3	CMD	Displays locale information (national language settings) for a computer.
now	23	CMD	Batch file utility, displays a time stamp and comment text. Can be redirected to a log file if desired.
ntfrsutl	2	CMD	Displays internal status of File Replication Service.
ntimer	23	CMD	Computes time elapsed and CPU time consumed by a specified command line.
ntrights	23	CMD	Adds or removes a Windows 2000 privilege (right) to a user or group on a specified computer.
oh	23	CMD	Displays information about open handles to files, synchronization objects, Registry keys, or threads.
oidgen	2	CMD	Generates a pair of random class and attribute OIDs that you can use when extending the Active Directory schema.
oleview	23	GUI	OLE/COM object viewer, lets you browse installed OLE/COM objects, view properties and methods, and test interfaces.
osreconfig	2	SCR	Displays the OS recovery settings for a specified computer (WMI).
pagefile	2	SCR	Configures the Windows page file from the command line.
parallelport	2	SCR	Lists parallel port information (WMI).

Command	Kit	Type	Description
pathman	23	CMD	Adds or removes folders from the systemwide or per-user **PATH** environment variable settings.
perfmon4	2	GUI	Updated version of Performance Monitor tool; probably obsolete under Windows XP.
perfmtr	2	CMD	Command-line performance monitor, prints CPU or memory statistics at intervals.
permcopy	23	CMD	Copies the share and file permission settings from one shared folder to another.
perms	23	CMD	Displays a given user's user-level permission settings for a file or files. Does *not* compute the user's actual net permissions because group rights are not factored in.
persist	23	SCR	Saves or restores user's printer configuration settings (Printer admin demo).
pfmon	23	CMD	Page Fault Monitor, displays memory activity in an application.
playback	2	CMD	Records a sequence of requests received by IIS and can "play back" the requests to the same or another IIS server.
pmon	3	CMD	Displays CPU and memory usage by running tasks. Sort of a text-mode graphical display.
pointdev	2	SCR	List pointing device (mouse) information (WMI).
portconv	23	SCR	Adds TCP ports to a server for printers configured to use the **lpr** protocol.
portmgr	23	SCR	Modifies port settings for local or TCP network-attached printers.
printdriverinfo	3	CMD	Lists information about installed printer drivers.
prncfg	23	SCR	View or set printer's spooling configuration settings.
prnctrl	23	SCR	Manages printer queues from the command line.
prndata	23	SCR	Manipulates or displays printer configuration settings stored in the Registry.
prndemo	2	SCR	Demonstrates use of printer administration object in JavaScript.
prnmgr	23	SCR	Adds, deletes, or lists printers. Can install drivers if necessary.
processor	2	SCR	Lists information about a computer's CPU (WMI).
programgroups	2	SCR	Displays the "program groups" (Start menu subfolders) on a given computer (WMI).
protocolbinding	2	SCR	Lists protocol and adapter bindings (WMI).
ps	2	SCR	Lists the programs running on a specified computer.
pstop	2	SCR	Lists the programs running in order of descending CPU usage (this makes more sense if you pronounce the script's name as "ps top" rather than "p stop").
pulist	2	CMD	Lists the programs running on a specified computer, along with the username associated with each task.
qgrep	23	CMD	Fast file search utility, can use regular expressions like UNIX **grep** and Windows **findstr**.
qidle	2	CMD	Identifies idle Terminal Server sessions; used with **robosim** for Terminal Server capacity planning simulations.
qslice	2	GUI	Displays a histogram of CPU usage for all active processes.
qtcp	23	CMD	Utility to test end-to-end network performance.

Table A.7 Continued

Command	Kit	Type	Description
query	2	SCR	Performs a general WBEM query and displays the results (WMI).
queryad	3	SCR	Submits queries to Active Directory from the command line; displays results.
quickres	2	GUI	Creates a notification-area icon that lets you select screen resolutions from a pop-up menu.
quiktray	2	GUI	Adds a clunky "quick launch" tool icon to the notification area. The Windows desktop's Quick Launch bar is better.
raslist	2	CMD	Displays RAS server announcements received over the network.
rassrvmon	23	GUI	Displays RAS server status and statistics, and can run commands when unusual conditions are detected.
rasusers	2	CMD	Lists user accounts that have RAS access permissions.
rclient	2	CMD	Remote character-mode remote control system; more robust than `rcmd`. Gives text-mode remote console window.
rcmd	2	CMD	Remote Command shell; lets you run command-line programs on a remote computer running the `rcmdsvc` service. More secure than telnet, less secure than ssh.
rcmd	2	CMD	Issue command on remote computer running `rcmdsvc` service.
rcmdsvc	2	SVC	Service component of `rcmd.exe`.
rcmdsvc	2	SVC	Remote command service.
rconmode	2	CMD	Sets buffer and window size for `rclient` console window.
rconstat	2	CMD	Lists active rclient connections.
rconsvc	2	SVC	Service component of `rclient.exe`.
rcontrolad	3	GUI	Adds Remote Control to the context menu of Active Directory MMC tools; lets you right-click a computer in the AD display and establish a Remote Desktop connection to it.
reducer	2	CMD	Extracts information from log files created by `tracelog.exe`.
regback	2	CMD	Creates a backup of the system portions of the Windows Registry in a disk file.
regconfig	2	SCR	Displays or sets the Registry maximum size settings (WMI).
regdmp	2	CMD	Dumps Registry contents to a text file.
regfind	2	CMD	Locates and optionally replaces arbitrary values in the Registry.
regini	23	CMD	Creates Registry entries and sets permissions.
regrest	2	CMD	Restores the Registry by installing Registry file backup created by `regback.exe`. Note—this is not as good or as safe a tool as you would hope.
regview	3	CMD	Displays contents of Group Policy `.POL` files.
remapkey	23	CMD	Remaps the scan codes of keys on the keyboard; for example, to swap the Caps Lock and Ctrl keys (some programmers of a Certain Age prefer this).
restart	2	SCR	Initiates a shutdown and restart of a remote computer.
rkill	2	CMD	Lists and optionally terminates processes on a remote computer. Requires `rkillsrv.exe`.
rkillsrv	2	SVC	Service to permit remote use of `rkill.exe` (remote process kill).

Command	Kit	Type	Description
rm	2	CMD	File removal tool like `delete`.
robocli	2	CMD	Executes commands sent by `robosrv`, used for Terminal Server capacity planning simulations.
robocopy	23	CMD	Robust file copy; copies files and folders across a network connection. Very useful.
robosrv	2	GUI	Sends commands to `robocli`; used for Terminal Server capacity planning simulations.
rpccfg	3	CMD	Configures the network ports used by remote procedure calls.
rpcdump	23	CMD	Lists Remote Procedure Call (RPC) endpoints on specified computer.
rpcping	3	CMD	Tests RPC connectivity by echoing packets between two computers.
rpingc	23	CMD	Remote Procedure Call (RPC) service test tool, 32-bit Windows client-side test program.
rpingc16	2	GUI	Remote Procedure Call (RPC) service test tool, 16-bit Windows client-side test program.
rpingdos	2		Remote Procedure Call (RPC) service test tool, DOS client-side test program.
rpings	23	CMD	Remote Procedure Call (RPC) service test tool, server-side program.
rqc	3	CMD	Remote Access Quarantine Client tool; used on client side to verify that a computer connecting to the network meets security requirements and can be granted full network access.
rqs	3	SVC	Remote Access Quarantine Service; runs on Windows 2003 server to manage quarantined/full connection of remote hosts.
rqs_setup	3	BF	Installs Remote Access Quarantine Service (server tool only).
rsetup	2	CMD	Installs and activates `rconsvc` on local or remote computer.
rshsvc	2	BF	Installs UNIX rsh host service.
rshsvc	2	SVC	Remote Shell (UNIX rsh) host service.
rsm_dbic	2	CMD	Validates the integrity of the Removable Storage Manager (RSM) media database.
rsm_dbutil	2	GUI	Validates the integrity of, backs up, and restores the Removable Storage Manager (RSM) media database.
rsmconfg	2	GUI	Removable Storage Manager (RSM) robotic tape-changer configuration wizard.
runapp	2	GUI	Runs an application and reruns it whenever the application exits.
sc	2	CMD	Displays and manages installed services.
scanreg	2	CMD	Searches Windows Registry for specified keys or values.
schemadiff	2	SCR	Compares the Active Directory scheme of two different enterprises.
sclist	2	CMD	Displays stopped and/or active services on a specified computer.
scsicontroller	2	SCR	Lists information about installed SCSI controllers (WMI).
sectemplates.msc	2	MMC	Security template editor.
serialport	2	SCR	Lists information about a computer's serial ports (WMI).

(continues)

Table A.7 Continued

Command	Kit	Type	Description
service	2	SCR	Lists and manages services (WMI).
setedit	2	GUI	Edits chart configuration files for **perform4.exe**.
setprinter	3	CMD	Manages network shared printers.
setspn	2	CMD	Sets service principal name; repairs certain directory authentication problems.
setupmgr	2	GUI	Wizard to help construct answer files for automated installation of Windows.
setx	2	CMD	Sets environment variables.
share	2	SCR	Lists, creates, or deletes shared folders (WMI).
showacls	23	CMD	Displays net access control list (ACL) rights for a file or folder.
showgrps	2	CMD	Lists the security groups of which a specified user is a member.
showinst	2	CMD	Displays file, Registry, and **.INI** file changes made by a setup program (see **instaler.exe**).
showmbrs	2	CMD	Lists the users in a specified security group.
showperf	23	GUI	Displays performance counter raw data.
showpriv	23	CMD	Lists users and groups that have a specified privilege.
shutdown	2	CMD	Shuts down, logs off, or restarts a local or networked computer. (Note: Shutdown mode is the default; you must specify **/R** to cause a restart.)
sipanel	2	GUI	Displays instructions on configuring Windows 2000 to use pen input only with no keyboard.
sleep	23	CMD	Batch file utility, silently pauses for a specified number of seconds. **Timeout.exe** is an alternative tool.
smclient	2	CMD	Simulation component used in Terminal Server capacity planning simulations.
smconfig	2	GUI	Configures the Windows 2000 service monitor to send email notification when specified services start or stop.
snmputil	2	CMD	Lists data under specified SNMP object IDs. (Support Tools install provides a GUI version of this.)
sonar	3	CMD	Displays File Replication Service statistics and status (server tool only).
soon	2	CMD	Schedules a command to run "soon," much easier than trying to use the "at" command for this purpose.
sounddevice	2	SCR	Lists information about a computer's sound devices (WMI).
splinfo	3	CMD	Displays statistics and status of the print spooling service on a local or networked computer.
srvany	23	SVC	Runs any Windows program as a Windows service. **srvany** handles interaction with the service manager and runs a specified program.
srvcheck	23	CMD	Lists file shares on a specified computer along with per-user share read/write permissions.
srvinfo	23	CMD	Lists for a specified server the OS version, installed hotfixes, disk space on all drives, and status of all services.
srvinstw	2	GUI	Installs or removes a Windows service on local or remote computer.

Command	Kit	Type	Description
srvmgr	23	GUI	Displays computers in a domain or workgroup; lets you view on each the use of network resources. You may disconnect users if necessary.
ssdformat	3	CMD	Creates an XML file that displays the contents of the System State Data log file (server tool only).
startup	2	SCR	Lists startup programs for a given computer; lists only programs specified in the Run Registry keys (WMI).
su	2	CMD	Runs a command from an alternate user account. For Windows 2000 only; use **runas** on Windows XP.
subinacl	23	CMD	Replaces usernames and/or domain names in access control lists for files, Registry keys, and so on.
subnet_op	2	SCR	Lists, adds, and deletes subnet information in Active Directory.
suss	2	SVC	Service component of **su.exe**; use on Windows 2000 only.
svcmon	2	SVC	Service that monitors the state of other services; used with **smconfig.exe**.
sysdiff	2	CMD	Automated installation tool. Takes a snapshot of a computer's files and Registry settings before and after installing stuff; then creates a script to replicate the changes on target computers.
systemaccount	2	SCR	Displays information about standard system accounts like NET-WORK.
tail	3	CMD	Displays the last several lines (the tail end) of a text file; for example, a log file.
takeown	2	CMD	Lets you delete old Windows installations from a multiboot system by resetting ownership of some very well hidden files and folders.
tapedrive	2	SCR	Lists information about a computer's tape drives (WMI).
tcmon	3	BF	Runs **tcmon.exe** when the **'tcmon'** command is typed in a random directory.
tcmon	23	GUI	Traffic Control Monitor; monitors Quality of Service (QoS) networking functions.
textview	2	GUI	Text viewing and editing tool, has an Explorer folder view in the left pane and a Notepad-like text editor in the right.
thread	2	SCR	Lists all threads running on a computer (WMI).
timeit	3	CMD	Records time it takes to run a specified command.
timeout	2	CMD	Pauses execution of a batch file for a specified number of seconds. Like **sleep.exe** but displays a countdown, and allows user to interrupt the delay.
timethis	2	CMD	Prints time elapsed running a specified command.
timezone	23	CMD	Displays and sets current time zone.
tlist	2	CMD	Lists active tasks, tasks using a given DLL, and Windows services associated with tasks.
tlocmgr	2	GUI	Telephony Location Manager, provides task-tray icon to pop up dialing properties and activate Phone Dialer.
top	2	CMD	Console program that displays running applications in descending order of CPU usage. A text-mode GUI; makes one nostalgic for the 1980s.

(continues)

Table A.7   Continued

Command	Kit	Type	Description
totlproc	2	GUI	Program that computes total usage of all CPUs and makes the value available to Performance Monitor. Useful? Hmmm. Appears not to work anyway.
touch	2	CMD	Sets file timestamp to specified time or current time.
tpc	2	CMD	Utility to test RSVP services.
tracedmp	2	CMD	Extracts and formats trace log data from performance monitor or `tracelog.exe`.
traceenable	2	GUI	Enables RAS and Radius tracing.
tracelog	2	CMD	Enables and disables tracing of system components during debugging.
tsctst	3	CMD	Terminal Services Client License dump; display info on license being used by a Terminal Services Client computer.
tsinstl	2	CMD	Installs a QoS Timestamping service.
tsreg	2	GUI	Edits Terminal Service Client Registry settings (sort of a TweakUI for the TSC).
tsscalling	3	GUI	Installer for Terminal Services Scalability Planning Tools, tools for automated gathering of load information, and capacity planning analysis.
tsver	2	GUI	Tool to let Terminal Server restrict connecting Terminal Service Clients based on client version number.
typeperf	2	CMD	Displays performance data.
tzedit	2	GUI	Time Zone editor; lets you create and modify the time zones that can be selected from the Date/Time control panel.
uddicatschemeeditor	3	GUI	UDDI Services Categorization Scheme Editor; defines categorization schemes for automated gathering of web services resources.
uddiconfig	3	CMD	Sets UDDI service configuration.
uddidataexport	3	GUI	Exports data from the UDDI Registry as XML.
undoinst	2	CMD	Undoes changes made by a setup program (see `instaler.exe`).
uptime	2	CMD	Displays time since a computer's last boot in (optimistically) days, hours, minutes, seconds. Optionally lists boot events, application failure events.
useraccount	2	SCR	Displays information about computer accounts: names, descriptions, password settings, and so on.
usergroup	2	SCR	Adds or deletes users from Active Directory groups; can add lists of names stored in a file.
usrmgr	23	GUI	Manages user accounts for Windows NT 4 workstations and domains.
usrstat	2	CMD	Displays user accounts and last logon date/time for each user in a specified domain.
usrtogrp	2	CMD	Adds or deletes users from domain local or domain global groups, operates on lists of names entered in a text file.
vadump	23	CMD	Describes the virtual memory space of a specified task, in great detail.

Command	Kit	Type	Description
vfi	23	GUI	Records snapshot information about files to help detect changes.
vi	2	GUI	Text-based screen editor from UNIX. Quirky and very powerful.
volperf	3	CMD	Installs or uninstalls Shadow Copy performance counters.
volrest	3	CMD	Displays and restores files from shared folders protected by Shadow Copies for Shared Folders.
vrfydsk	3	CMD	Checks consistency of a FAT or NTFS disk volume. Like `chkdsk` but uses Shadow Copy so it can check a running system; cannot repair problems.
waitfor	2	CMD	Batch file utility, pauses until a named "signal" is received via the network. Can be used to synchronize multiple computers collaborating on some task.
wc	2	CMD	Counts characters, words, and lines in a text file or read from standard input.
where	2	CMD	Searches for files on the hard disk.
whoami	2	CMD	Displays current username, security groups, and privileges.
windiff	2	GUI	File comparison utility, displays differences between text files.
winexit	2	SAV	Logout (logs user out when system is left idle).
winhttpcertcfg	3	CMD	Imports and installs certificates and private keys.
winhttptracecfg	3	CMD	Enables or disables tracing (debugging) of the WinHTTP service.
winpolicies	3	GUI	Views and refreshes Group Policy settings for the current user and local computer.
winschk	2	CMD	Validates WINS database; can also monitor WINS replication.
winscl	2	CMD	WINS command-line shell, performs limited WINS database management.
winsta	2	GUI	Monitors users logged in to Terminal Server.
wpcvp	2	GUI	Cluster Verification Utility main program.
wperf	2	GUI	Spiffy little graphical display of Performance Monitor statistics, very compact. Double-click window to show/hide menu.
wrkill	2	GUI	Displays and kills processes on a selected computer; target computer must be running `rkillsrv` service (see `rkill.exe`).
xcacls	2	CMD	Edits and displays file Access Control Lists.
xinst	2	BF	Installs RPC client on another computer over the network; may work only on Win9x clients.
xnet	2	CMD	Utility program to install and start RPC service on remote computer, used by `xinst.cmd`.

Subsystem for UNIX-Based Applications and Services for UNIX

In the world of corporate networking and Internet service provider operations, the UNIX and Linux operating systems are widely used. To help Windows compete in this market arena, and to help make Windows more palatable to users and managers in a heterogeneous network environment, Microsoft has developed a set of UNIX-compatible programs and network services. These make up a Windows "subsystem," which is a full operating system application programming

interface (API) supported by the Windows kernel. It's not a software layer *over* the Windows API, but is a completely parallel environment, and even provides full support for case-sensitive filenames.

On Windows Vista, this environment is called the Subsystem for UNIX-Based Applications (SUA) and runs only on Windows Vista Ultimate and Enterprise. On Windows XP and 2000, the environment is called Services for UNIX (SFU) and runs only on Windows XP Professional, Media Center Edition, and Windows 2000 Professional.

The SUA and SFU environments include

- More than 350 command-line programs that UNIX users take for granted, including the Perl scripting language.
- Network services to let UNIX clients access Windows resources and vice versa.
- The Interix (POSIX) subsystem, which lets native UNIX applications run on a Windows computer (remember that the Windows NT kernel can support more than one operating system interface).
- The GNU C Compiler (gcc) suite.
- The X11 windowing system.
- Network File System (NFS) file-sharing client and server components.

The Windows Vista SUA provides additional features, including

- Capability to interactively debug POSIX applications in Visual Studio 2005 or later
- Choice of SVR-5 or BSD UNIX environments
- Capability to run 32-bit or 64-bit POSIX applications on Windows Vista 64-bit versions
- OCI/ODBC database connectivity from POSIX applications

The toolkits include command-line tools that can be run from the Windows command prompt, Windows services, and native UNIX command-line programs that must be run from a UNIX shell (the Korn and C shells are provided). Table A.9 lists the programs included with SFU version 3.5 (shown with X in the OS column) and Subsystem for UNIX-Based Applications (shown with V in the OS column). The Type column indicates the type of program:

BAT	Batch file (.BAT or .CMD file).
CMD	Windows command-line program (.EXE file).
IX	Interix (UNIX) command-line program, can be run only from an Interix shell.
B/I	Program provided in both Windows batch file (.BAT file) and Interix command-line versions, so that the command can be used in either environment. The Interix version has no filename extension.
C/I	Program provided in both Windows command-line (.EXE file) and Interix command-line versions.
SCR	Script file, usually a sample illustrating a script programming technique, less often a command-line tool.
X11	X Window graphical application.

Some of the installed command-line programs are UNIX versions of standard DOS/Windows command-line programs such as append and attrib. These programs are stored in /usr/ contrib/win32/bin and are not listed in Table A.8.

Table A.8   Services for UNIX 3.5 Programs

Program	OS	Type	Description
[	XV	IX	Evaluates an expression on the command line and sets the exit status to the resulting value.
a2p	XV	C/I	Compiles a Perl script from an AWK script. (Even if you don't know what that means, doesn't it sound cool?)
addr	XV	IX	Formats and displays IP addresses and network numbers.
addr2line	XV	IX	Converts executable program address to source code line number.
alias	X	IX	Lists or sets command aliases.
appres	XV	X11	Displays application resources.
ar	XV	IX	Creates, maintains, and extracts files from **ar** archive files.
args.wsf	X	SCR	Windows Script Host Perl script demo.
as	XV	IX	GNU assembler.
asa	XV	IX	Interprets first character of every input line as FORTRAN carriage control and outputs ASCII control codes.
at	XV	IX	Runs a command at a specified time.
atobm	XV	X11	Converts ASCII text format to X11 bitmap format.
atq	XV	IX	Lists commands scheduled to run with the **at** command.
atrm	XV	IX	Removes commands scheduled to be run with the **at** command.
autodfs	X	CMD	Creates Windows Distributed File System links from UNIX automount map files.
awk	XV	IX	A peculiar but powerful pattern-matching and text-manipulation scripting language.
banner	XV	IX	Prints large block-letter banners from text specified on the command line.
basename	XV	C/I	Returns just the filename portion of a path/filename passed on the command line.
batch	XV	IX	Schedules a command to be run when the system is not busy.
Bc	XV	IX	Text-input calculator; can compute numbers to arbitrary precision.
bdftopcf	XV	X11	Converts font from Bitmap Distribution Format to Portable Compiled Format.
bdiff	V	IX	Diff for big files (SVR-5 utility).
Bg	X	IX	Lets a suspended program continue running in the background (disconnected from console window).
bgjob	X	CMD	For users connecting via Telnet, runs a command in the background that can continue to run after your telnet session ends.
bitmap	XV	X11	Creates simple bitmap images.
bmtoa	XV	X11	Converts X11 bitmap format to ASCII text representation.
bp	XV	IX	Generates new text files from boilerplate templates: scripts, source code with a copyright notice, and so on.

(continues)

Table A.8   Continued

Program	OS	Type	Description
c++	XV	IX	GNU C++ compiler.
c++filt	XV	IX	Demangles C++ or Java symbol names; displays original name.
c2ph	XV	B/I	Generates equivalent Perl structure definitions from C structure definitions.
c89	XV	IX	Runs the Microsoft C compiler.
cal	XV	IX	Displays a calendar.
calendar	XV	IX	Reminder service; displays lines matching today's date; usually run upon logon.
calprog	V	IX	Utility used by calendar program.
captoinfo	XV	IX	Displays terminfo listing for a specified termcap terminal description file.
cat	XV	IX	Concatenates specified input file(s) to the standard output.
cat32	XV	C/I	Like cat, but circumvents problems when mixing Interix and Windows commands on one command line.
cc	XV	IX	C compiler and linker (gcc).
cc89	V	IX	See c89.
cd	XV	IX	Changes the current working directory.
checkeq	V	IX	Checks for blatant syntax problems in documents marked up with eqn formatting commands.
chgpath	XV	IX	Converts pathnames specified on the command line between Windows and UNIX formats.
chgrp	XV	C/I	Changes a file's group ownership.
chmod	XV	C/I	Changes a files read/write/execute permissions.
chown	XV	C/I	Changes a file's user ownership.
chroot	XV	IX	Runs a command or shell that will see a specified directory as the root directory.
chrtbl	V	IX	Compiles localized character sets for use by $\texttt{setlocale}$ and the $\texttt{ctype}$ function (SVR-5 utility).
chsh	XV	IX	Changes your default (logon) shell.
ci	XV	IX	Checks a source file into the Revision Control System (RCS).
cksum	XV	IX	Computes and displays file checksum and size.
clear	XV	IX	Clears the terminal window (like DOS $\texttt{cls}$).
cmp	XV	IX	Compares files, reports differences.
co	XV	IX	Checks a source file out of RCS.
col	XV	IX	Removes reverse line feeds and tabs from input; used to filter output of nroff or tbl.
colltbl	V	IX	Compiles character set collation sequence data for use by system routines (SVR-5 utility).
column	XV	IX	Formats input text lines into columns.
comm	XV	IX	Displays or removes lines common to two files.
command	X	IX	Runs specified command, or determines what program a command would run.

Program	OS	Type	Description
compress	XV	IX	Compresses files. On Interix, compress and gzip are the same program.
config.pl	X	SCR	Updates the perl interpreter `config.pm` file.
configPPM.pl	X	SCR	Updates the Perl Package Manager configuration file.
cp	XV	C/I	Copies files.
cpio	XV	IX	Copies files to or from cpio or ar format archives files on disk or tape.
cpp	XV	IX	C preprocessor, interprets `#include`, `#ifdef`, and other directives.
cron	XV	C/I	Manages the Interix task scheduler service (daemon).
crontab	XV	C/I	Manages a user's crontab (Interix task scheduler) table entries.
csh	X	IX	The standard UNIX C shell command-line interpreter.
csh.bat	X	BAT	Runs the Interix C shell.
csplit	XV	IX	Splits input file(s) into smaller pieces based on embedded text delimiters or line numbers.
ctags	XV	IX	Extracts the location of functions defined in C, Pascal, FORTRAN, yacc, lex, or LISP source code; output is used by vi editor.
cut	XV	C/I	Extracts parts of each line of input files, writes results to standard output.
dag	V	IX	Purpose unknown at this time. (SVR-5 utility.)
date	XV	C/I	Sets or displays the system time and date.
dc	XV	IX	Reverse Polish arbitrary-precision calculator.
dd	XV	IX	File copy utility primarily used to block or deblock files to or from magnetic tape; can perform EBCDIC conversion.
df	XV	IX	Displays amount of free disk space.
diff	XV	C/I	Compares two text files, displays the differences.
diff3	XV	IX	Compares three versions of a file and reports differences.
dig	XV	IX	Domain Name System (DNS) diagnostic tool, queries DNS servers directly.
dircmp	XV	IX	Compares two directories.
dirname	XV	C/I	Displays just the directory portion of a filename specified on the command line.
dnsquery	X	IX	Domain Name System (DNS) diagnostic tool, uses local resolver.
dos2unix	X	CMD	Converts line separators in text files from Windows format (CR+LF) to UNIX format (LF only).
dprofpp	XV	B/I	Displays profile data collected from a Perl program's execution.
du	XV	C/I	Displays disk usage statistics.
echo	XV	IX	Echoes command-line arguments.
ed	XV	IX	Simple line-oriented text editor. Not very user-friendly but can be useful in scripts.
editres	XV	X11	X11 Toolkit resource editor.
egrep	XV	C/I	Extended version of the grep text pattern matching utility.
elvis	XV	IX	Variant of vi, can be used instead of nvi.

(continues)

Table A.8 Continued

Program	OS	Type	Description
elvrec	XV	IX	Recovers file edited by elvis after a system or editor crash.
env	XV	IX	Sets or displays environment variables.
ex	X	IX	Powerful text editor, same as vi but defaults to line-oriented mode.
exetype.bat	X	BAT	Sets a given program for command-line or Windows execution mode.
expand	XV	IX	Converts tabs to spaces.
expr	XV	IX	Evaluates expressions on command line and displays result.
FALSE	XV	IX	Returns exit status 0.
fc	X	IX	Lists, edits, or reissues previously entered commands (Korn shell).
fg	X	IX	Resumes a suspended program in foreground mode (connected to console window).
fgrep	XV	C/I	Fixed-string version of the grep text pattern matching utility.
file	XV	IX	Determines the type of a specified file.
fileinfo	XV	IX	Displays information about executable files.
find	XV	IX	Scans a directory and its subdirectories for specified files.
find2perl	XV	B/I	Compiles UNIX Find utility command lines into Perl scripts.
finger	XV	IX	Looks up information about a specified user via a finger server.
flip	XV	IX	Converts text file line endings between DOS (CR-LF), UNIX (LF), and Apple (CR) formats.
fmt	XV	IX	Formats input text by collecting words into lines of about 65–75 characters.
fold	XV	IX	Folds long text lines into shorter lines for easier reading.
fsinfo	XV	X11	Displays X11 server information.
fslsfonts	XV	X11	Lists X11 fonts.
fstobdf	XV	X11	Reads a font and creates a Bitmap Distribution Format file.
ftp	XV	IX	File Transfer Protocol (FTP) utility. Supports passive mode.
g++	XV	IX	GNU C++ compiler.
g77	XV	IX	GNU Fortran-77 compiler.
gawk	XV	IX	GNU implementation of the AWK pattern matching and text-processing interpreter.
gcc	XV	IX	GNU C/C++ compiler.
gccbug	XV	IX	Tool to help report compiler bugs to the gcc developers.
gcov	XV	IX	GNU C coverage tool; identifies what sections of a program are never executed.
gdb	XV	IX	GNU debugger.
gencat	XV	IX	Compiles national language catalogs into binary format.
GET	X	IX	Fetches a file from a web server.
getconf	XV	IX	Displays system parameters such as maximum file path length.
getopt	XV	IX	Parses a command line into individual components, validates syntax.
getopts	X	IX	Parses a command line into individual components, validates syntax.

Program	OS	Type	Description
gettxt	V	IX	Retrieves a string from a localized message file.
grep	XV	C/I	Text pattern matching utility.
gunzip	XV	IX	Uncompresses files packed with gzip, zip, or pack.
gzip	XV	IX	Compresses files. Gzip, pack, and zip use different algorithms.
h2ph	XV	B/I	Generates equivalent Perl structure definitions from C structure definitions.
h2xs	XV	B/I	Generates Perl extensions to access C structures.
head	XV	C/I	Displays the first few lines of a text file.
helloworld.wsf	X	SCR	Windows Script Host Perl script demo.
hexdump	XV	IX	Displays binary data in ascii, decimal, or hex format.
host	XV	IX	Looks up hostnames in the Domain Name Service (DNS).
hostname	XV	IX	Displays the name of the local computer.
hoststat	X	IX	Displays status information about the sendmail mail server.
iceauth	XV	X11	Edits and displays Inter-Client Exchange (ICE) authentication records.
ico	XV	X11	Displays an animated icosahedron or other polyhedron.
iconv	XV	C/I	Converts text files from one code page to another.
id	XV	IX	Displays the user and group names and numbers.
ident	XV	IX	Displays identification information placed in files by the Revision Control System (RCS).
igetty	XV	IX	Configures serial ports and if specified, starts login shells on them.
IISScriptMap.pl	X	SCR	Adds file extension mappings to the IIS web server.
imake	XV	X11	Creates a makefile for an X11 application from a template file.
inetd	XV	IX	Internet service daemon, starts host services when incoming requests are received and validated.
infocmp	XV	IX	Compares or prints terminfo descriptions.
infotocap	X	IX	Converts a terminfo terminal capability description into termcap format.
init	XV	IX	Runs Interix services upon startup.
insight	XV	IX	GNU debugger.
install	XV	IX	Copies files to a target directory.
instclus.cmd	X	BAT	Installs NFS share resources on a Windows Server Cluster.
ipcrm	XV	IX	Deletes an interprocess communications (IPC) resource.
ipcs	XV	IX	Reports status of IPC objects.
ispell	XV	IX	Interactive spell checker for text files.
jobs	X	IX	Lists active tasks associated with a given Interix shell command window or telnet session.
join	XV	IX	Combines lines from input files based on matching fields, as a relational database's join function would.
kill	XV	IX	Terminates programs.
ksh	XV	IX	Korn command-line interpreter (shell).
ksh.bat	X	BAT	Runs the Interix Korn shell.

(continues)

Table A.8   Continued

Program	OS	Type	Description
last	XV	IX	List last logon time for users or last user of a given terminal.
lbxproxy	XV	X11	Low bandwidth X proxy.
ld	XV	IX	GNU linker, produces executable files from object and library files.
less	XV	IX	Displays text one screen at a time. Has more features than more utility.
lessecho	XV	IX	Expands wildcards on command line as "echo" would but puts quotes around filenames that contain spaces.
lesskey	XV	IX	Modifies mapping of keys to file manipulation commands for the less utility.
lex	XV	IX	Generates C source code for a lexical analyzer from a specification file.
liblock	XV	IX	Marks a library module as deprecated; warnings are issued if a user attempts to link against it.
line	XV	IX	Reads and echoes one input line from the standard input to the standard output; see read.
listres	XV	X11	Lists resources in widgets.
ln	XV	C/I	Create hard links—multiple directory entries for a single file, with different names or in different folders.
lndir	XV	X11	Creates a directory tree of links to a directory tree of "real" files.
locale	XV	IX	Displays national language locale information.
localedef	XV	IX	Adds locale mappings to the system.
logger	XV	IX	Adds entries to log file `/var/adm/log/logger`.
login	XV	IX	Initializes a user session.
loginenv	XV	IX	Creates a new logon session.
logname	XV	IX	Displays your logon name.
lp	XV	IX	Sends a text file to a printer; like the Windows `print.exe` command.
lpfx	V	IX	Purpose unknown at this time. (SVR-5 utility).
ls	XV	IX	Displays and formats directory listings (like the DOS `dir` command).
lwp-download	X	B/I	Downloads large files using HTTP given the file's URL.
lwp-mirror	X	B/I	Updates a mirror copy of a file or entire website via HTTP.
lwp-request	X	B/I	Simple HTTP command-line tool; can fetch or post files.
lwp-rget	X	B/I	Fetches files from a website recursively via HTTP.
m4	XV	IX	A macro language preprocessor.
mail	X	IX	A simple text-based email program.
mailq	X	IX	Lists mail messages waiting for delivery.
mailx	XV	IX	A simple text-based email program.
make	XV	IX	Builds programs based on dependency specifications.
makedepend	XV	X11	Generates dependency lists from C source files, writing results to a makefile.

Program	OS	Type	Description
makedev	XV	IX	Creates special (device) files.
makeg	XV	X11	Runs make with options to create a debugging version of the application.
man	XV	IX	Displays online documentation for Interix programs, library routines, services, and file formats.
mapadmin	XV	C/I	Manages Windows/UNIX username mapping.
maze	XV	X11	Creates and solves mazes.
merge	XV	IX	Merges two sets of file changes into a single file.
mergelib	XV	X11	Merges object libraries.
mkdir	XV	C/I	Creates a directory (folder).
mkdirhier	XV	X11	Creates directories from path specifications, creating parent directories if necessary.
mkfifo	XV	IX	Creates a FIFO special file (named pipe).
mkfontdir	XV	X11	Indexes X fonts.
mknod	XV	IX	Creates regular files, special files, or directories.
montbl	V		Compiles localized currency format table for use by `setlocale`.
more	XV	C/I	Displays text files one screen at a time.
mount	X	CMD	Mounts (attaches to) NFS network shares.
mpack	XV	IX	Packs one or more files into a MIME mail message format.
mt	XV	IX	Manipulates a magnetic tape drive (usually SCSI-attached).
munpack	XV	IX	Unpacks a MIME mail message file into its component files.
mv	XV	IX	Moves or renames files.
mvdir	V	IX	Moves a directory and its contents (SVR-5 utility).
mvwtmpx	XV	IX	Renames the wtmpx (user logon record) file and starts a new one.
newaliases	X	IX	Rebuilds the mail alias file.
newgrp	XV	IX	Changes your effective user group.
nfsadmin	XV	C/I	Manages Server for NFS, Client for NFS, and Gateway for NFS network services.
nfsmount	XV	IX	Version of mount, supports NFS file mounts.
nfsonly	X	CMD	Enables/disables NFS-only mode for NFS shares.
nfsshare	XV	C/I	Manages NFS shared folders.
nfsstat	XV	C/I	Displays or resets NFS server statistics.
nfsumount	XV	IX	Version of umount, supports NFS file mounts.
nice	XV	C/I	Runs a program at a specified priority level.
nis2ad	XV	C/I	Imports Network Information Service (NIS) maps into Active Directory.
nisadmin	XV	C/I	Manages the Network Information Service (NIS) service.
nismap	XV	C/I	Manages Network Information Service (NIS) maps.
nl	XV	IX	Prepends line numbers to the input text file(s).
nm	XV	IX	Lists symbol names from compiled object files.
nmf	V	IX	Purpose unknown at this time (SVR-5 utility).

Table A.8 Continued

Program	OS	Type	Description
nohup	XV	IX	Runs a program so that it will not be terminated if the shell is closed.
notepad.wsf	X	SCR	Windows Script Host Perl script demo.
nslookup	XV	IX	Domain Name System (DNS) diagnostic tool, queries DNS servers directly, a predecessor to dig.
nsupdate	XV	IX	Updates DNS servers supporting dynamic update.
ntpath2posix	XV	IX	Converts pathname specified on the command line from Windows to UNIX format.
nvi	X	IX	A variant of the vi text editor.
objcopy	XV	IX	Copies compiled object files, making alterations along the way.
objdump	XV	IX	Displays information about compiled object files.
oclock	XV	X11	Analog clock.
od	XV	C/I	Dumps binary files in octal, decimal, hex, or ASCII format.
pack	XV	IX	Compresses files. Gzip, pack, and zip use different algorithms.
pagesize	V	IX	Reports memory page size (SVR-5 utility).
passwd	XV	IX	Changes your Interix password.
paste	XV	C/I	Joins lines from each specified input file creating a tab-delimited file.
patch	XV	IX	Applies diff changes to a text file, creating an updated version.
pathchk	XV	IX	Verifies that a pathname is portable and legal.
pax	XV	IX	Enhanced version of the tar file archiving tool.
pcat	XV	IX	Displays files stored in a pack compressed file.
pdomain	XV	IX	Displays the computer's principal domain.
perl	XV	C/I	Perl scripting language interpreter.
perl5.6.0	X	CMD	Runs this specific version of the Perl interpreter.
perlbug	XV	B/I	Used to report bugs in the Perl core modules to the modules' developers.
perlcc	XV	B/I	Compiles Perl scripts into executable programs.
perldoc	XV	B/I	Extracts documentation from the Perl program library.
perlglob.bat	X	BAT	Expands wildcards into lists of filenames; used when running Perl scripts from the Windows command line.
pfmt	V	IX	Formatted printing tool for scripts (SVR-5 utility.)
pg	XV	IX	Displays text one screen at a time. Has fewer features than "less."
piconv	V	IX	Purpose unclear. It appears to converts file character set encoding. (SVR-5 utility).
ping	XV	IX	Sends ICMP packets to a network host; diagnoses network connectivity.
pl2bat.bat	X	BAT	Wraps a Perl script in a Windows **.BAT** batch file so it can be conveniently run from the command line. Most of the **.BAT** files in this table were created using this tool.
pl2pm	XV	B/I	Converts Perl scripts to Perl module files.
pod2html	XV	B/I	Converts Perl **.POD** documentation files into HTML.

Program	OS	Type	Description
pod2latex	XV	B/I	Converts Perl `.POD` documentation files into LaTeX, a non-WYSIWYG typesetting language.
pod2man	XV	B/I	Converts Perl `.POD` documentation files into UNIX `.MAN` documentation format.
pod2text	XV	B/I	Converts Perl `.POD` documentation files into plain ASCII text.
pod2usage	XV	B/I	Prints the usage information from Perl `.POD` documentation format.
podchecker	XV	B/I	Validates the syntax of Perl `.POD` documentation.
podselect	XV	B/I	Prints selected portions of a Perl `.POD` document.
popper	XV	IX	Post Office Protocol (POP3) server.
posix	V	CMD	Executes UNIX (POSIX) program from Windows command line.
posixpath2nt	XV	IX	Converts pathname specified on the command line from UNIX to Windows format.
POST	X	IX	Posts a file to a web server.
ppm.bat	X	BAT	Runs the Perl Package Manager.
ppm.pl	X	SCR	Perl Package Manager; downloads and manages Perl add-on modules.
pr	XV	IX	Paginates text files for printing.
printenv	X	CMD	Displays the values of environment variables.
printf	XV	C/I	Formats command-line arguments.
protoize	XV	IX	Converts C source function prototypes from K&R format to ANSI format.
proxymngr	XV	X11	Manages X proxy services.
ps	XV	C/I	Displays information about running processes.
pstat	XV	IX	Displays process status.
pstruct	XV	B/I	Displays structure offset data extracted from C source code.
psxoffset	XV	IX	Lists or sets POSIX domain offsets.
psxrun	XV	C/I	Runs an Interix program without a connected terminal or console window; for example, X11 programs or Interix-based services.
purgestat	X	IX	Purges expired messages from sendmail's queues.
puzzle	XV	X11	Tile-shifting game.
pwd	XV	C/I	Displays the current working directory.
ranlib	XV	IX	Provides compatibility with old UNIX make files; does nothing.
rcp	XV	IX	Copies files to a remote system.
rcs	XV	IX	Creates and manages files for the Revision Control System (RCS).
rcsdiff	XV	IX	Displays differences between versions of files in the RCS.
rcsmerge	XV	IX	Applies changes made to an earlier version of an RCS-managed file into a newer modified version.
rdist	XV	IX	Distributes files to multiple remote systems.
rdistd	XV	IX	A component program used by rdist.
read	X	IX	Reads a line of input from the standard output; used in shell scripts to get user input.
regcmp	V	IX	Precompiles regular expressions (SVR-5 utility).

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Table A.8   Continued

Program	OS	Type	Description
regpwd	XV	IX	Stores a protected copy of your password for use by cron, rlogin, and rsh.
regread.wsf	X	SCR	Example showing use of Perl under Windows Script Host.
renice	XV	C/I	Modifies the priority of running processes.
reset	X	IX	Resets your terminal window if, for example, echo gets turned off.
resize	XV	X11	Sets termcap entries to reflect current window size.
rlog	XV	IX	Displays log messages about RCS-managed files.
rlogin	XV	IX	Opens a terminal session on a remote computer.
rm	XV	IX	Deletes files.
rmb	V	IX	Purpose unknown at this time (SVR-5 utility).
rmdir	XV	C/I	Removes a subdirectory.
rpcgen	XV	IX	Generates C linkage source code from a Remote Procedure Call specification.
rpcinfo	X	C/I	Displays information about and tests Remote Procedure Call services.
rsh	XV	IX	Opens a terminal session on a remote computer.
rshpswd	X	CMD	Sets your remote shell service password.
rstart	XV	X11	Sample remote start application for rsh protocol.
rstartd	XV	IX	Sample implementation of an rsh remote start helper.
runperl.bat	X	BAT	Used to run Perl scripts from the command line; read the file for details.
runwin32	XV	IX	Runs a Windows (Win32) program. The Interix shells can run Win32 programs directly, but runwin32 automatically searches the Windows **PATH**.
s2p	XV	B/I	Compiles a Perl script from a sed (stream editor) script.
script	XV	IX	Creates a transcript of an interactive terminal session.
sdiff	XV	C/I	Compares two text files or directories; displays the differences side-by-side.
search.bat	X	BAT	Enhanced grep utility.
sed	XV	C/I	Stream editor; applies changes to text line by line, from a file or pipeline.
sendmail	XV	IX	Mail delivery server.
service	XV	IX	Manages an Interix application running as a Windows service.
sessreg	XV	X11	Manages user logon auditing records.
sfuadmin	X	CMD	Displays SFU version, can also set User Name Mapping server.
sfumgmt.msc	X	MSC	Services for UNIX Management MMC snap-in.
sh	X	IX	Default command interpreter shell (same as ksh).
showenv.wsf	X	SCR	Windows Script Host Perl script demo.
showfont	XV	X11	Lists X fonts.
showmount	X	C/I	Displays file systems exported by an NFS server.
size	XV	IX	Displaysv information about program section sizes from compiled object files.

Program	OS	Type	Description
sleep	XV	IX	Pauses for a specified number of seconds; used in scripts.
smproxy	XV	X11	X session manager proxy.
sort	XV	IX	Sorts or merges text files line by line.
specialfolder.wsf	X	SCR	Windows Script Host Perl script demo.
spell	XV	IX	Lists unrecognized (potentially misspelled) words found in a text file.
splain	XV	B/I	Expands upon diagnostics issued by the Perl compiler and interpreter (from the phrase "'Splain it to me, Lucy").
split	XV	C/I	Breaks a large text file into smaller files of at most 1,000 lines.
sqlserver.wsf	X	SCR	Windows Script Host Perl script demo.
sqlserverevents.wsf	X	SCR	Windows Script Host Perl script demo.
ssimda	XV	IX	Delivers a mail message to a local mailbox (file on the local computer).
startx	XV	X11	Starts the X Window system.
strerror	XV	IX	Displays text description of an Interix (UNIX) error code.
strings	XV	C/I	Displays any printable character strings found in a binary file.
strip	XV	IX	Deletes symbols from compiled object code files.
strsignal	XV	IX	Displays text description of an Interix (UNIX) signal number.
stty	XV	IX	Changes terminal window characteristics.
su	XV	IX	Switches user identity (like Windows **runas**).
sum	XV	IX	Obsolete version of cksum.
syslogd	XV	IX	Logging service, receives messages from network devices and services and records messages in a log file.
tail	XV	C/I	Displays the last few lines of a file. The -f option prints additional lines as they are added, very useful for monitoring log files.
talk	XV	IX	Interuser text chat utility.
tar	XV	IX	Archiving utility; packs files into or extracts files from a single file; a subset of pax.
tcsh	XV	IX	The C shell command-line interpreter with filename completion and command-line editing enhancements.
tee	XV	C/I	Inserted into a command pipeline, saves a copy of the data passing through the pipeline.
telnet	XV	IX	Establishes an interactive session on a remote computer, device or network service.
test	XV	IX	Evaluates an expression on the command line and sets the exit status to the resulting value.
test.wsf	X	SCR	Windows Script Host Perl script demo.
tftp	XV	IX	Trivial file transfer protocol client.
tic	XV	IX	Compiles terminfo source files into a binary format.
time	XV	IX	Runs a command and displays elapsed and effective CPU time.
tip	XV	IX	Connects to a remote system through a serial adapter.
tnadmin	X	CMD	Manages the Telnet server.
toe	XV	IX	Displays the terminfo database.

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Table A.8   Continued

Program	OS	Type	Description
touch	XV	IX	Updates or sets file access or modification times.
tput	XV	IX	Displays or sets terminal capability values.
tr	XV	C/I	Used in a command pipeline; substitutes or deletes specified characters.
TRUE	XV	IX	Returns exit status 1.
truss	XV	IX	Runs a command and displays its system calls and signals.
tset	XV	IX	Sets terminal characteristics upon logon.
tsort	XV	IX	Sorts and formats text describing a directed graph.
tty	XV	IX	Displays the name of the current terminal device.
twm	XV	X11	Window manager for X.
tzselect	XV	IX	Sets the local time zone.
umask	XV	IX	Displays or sets the default file creation mask (read/write/execute attributes given to new files).
umount	X	CMD	Deletes NFS network mount points.
unalias	X	IX	Removes aliases defined in the command-line shell.
uname	XV	C/I	Displays information about the local computer's hardware and software environment.
uncompress	XV	IX	Uncompresses files packed with compress.
unexpand	XV	IX	Replaces strings of spaces in a text file with tabs.
unifdef	XV	IX	Interprets and removes `#ifdef` sections from source code files.
uniq	XV	C/I	Filters out repeated lines in its input file(s).
unix2dos	X	CMD	Converts line separators in text files from UNIX format (LF only) to Windows format (CR+LF).
unixpath2win	XV	IX	Converts the UNIX file path specified on the command line to Windows format.
unlink	V	IX	Deletes links to files (SVR-5 utility).
unpack	XV	IX	Uncompresses files packed with pack.
unprotoize	XV	IX	Converts C source function prototypes from ANSI format to K&R format.
unvis	XV	IX	Converts visible text representation back to original format; see vis.
unzip	XV	IX	Uncompresses files packed with zip (use this on `.ZIP` files from Windows and DOS).
use_builtin	V	SCR	Executes a command as shell built-in command (SVR-5 utility).
uudecode	XV	C/I	Decodes a uuencoded text file into its original binary representation.
uuencode	XV	C/I	Encodes a binary file into a text format suitable for emailing or other forms of transmission.
vi	XV	IX	Full-screen character-mode editor; same as ex in screen mode.
view	X	IX	Same as vi but read-only mode is enabled by default; used to peruse files with less risk of saving changes.
viewres	XV	X11	Athena Widget class browser.
vis	XV	IX	Displays a text file with non-printing characters displayed in a visible text format.

Program	OS	Type	Description
wait	X	C/I	Pauses until a specified program has completed; useful for batch files.
wat	XV	IX	Runs the Windows at command from an Interix shell. (Generally, any Windows command can be run from an Interix shell. These 'wxxx' commands are provided for the cases where there is an Interix command with the same name as a Windows command.)
wc	XV	IX	Displays count of words, lines, and characters in text files.
wchrtbl	V	IX	Localization utility (SVR-5 utility).
wdate	XV	IX	Runs the Windows date command from an Interix shell.
wecho	XV	IX	Runs the Windows **echo** command.
wexit	XV	IX	Runs the Windows **exit** command.
wexpand	XV	IX	Runs the Windows **expand** command.
wfc	XV	IX	Runs the Windows **fc** command.
wfind	XV	IX	Runs the Windows **find** command.
wfinger	XV	IX	Runs the Windows **finger** command.
wftp	XV	IX	Runs the Windows **ftp** command.
which	X	CMD	Scans the **PATH** to identify which **.EXE** file will be run when its name is typed on the command line.
who	XV	IX	Displays a list of logged-on users.
whoami	XV	IX	Displays your logon name.
whostname	XV	IX	Runs the Windows hostname command from an Interix shell.
winpath2unix	XV	IX	Converts the Windows file path specified on the command line to UNIX format.
wmkdir	XV	IX	Runs the Windows **mkdir** command from an Interix shell.
wmore	XV	IX	Runs the Windows **more** command.
wnslookup	XV	IX	Runs the Windows **nslookup** command.
wperl	X	GUI	Runs a Perl script as a Windows application, not as a console mode program.
wping	XV	IX	Runs the Windows **ping** command.
wprint	XV	IX	Runs the Windows **print** command.
wrcp	XV	IX	Runs the Windows **rcp** command.
write	V	IX	Text-based chat utility (SVR-5 utility).
wrmdir	XV	IX	Runs the Windows **rmdir** command.
wrsh	XV	IX	Runs the Windows **rsh** command.
wset	XV	IX	Runs the Windows **set** command.
wsort	XV	IX	Runs the Windows **sort** command.
wtelnet	XV	IX	Runs the Windows **telnet** command.
wtftp	XV	IX	Runs the Windows **tftp** command.
wtime	XV	IX	Runs the Windows **time** command.
wtype	XV	IX	Runs the Windows **type** command.

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Table A.8   Continued

Program	OS	Type	Description
wvisible	XV	IX	Tests whether the current window station is visible (it would not be if the current process is running as a service, or is hidden due to Fast User Switching).
wwrite	XV	IX	Runs the Windows **write** command from an Interix shell.
x11perf	XV	X11	X server performance test program.
x11perfcomp	XV	X11	Compares results of x11perf test runs.
xargs	XV	C/I	Runs a specified command with command-line arguments read from the standard input.
xauth	XV	X11	Manages authentication database for X server.
xbiff	XV	X11	Notifies you of incoming mail.
xcalc	XV	X11	Calculator.
xclipboard	XV	X11	Shared Clipboard tool for X11 applications.
xclock	XV	X11	Analog/digital clock.
xcmsdb	XV	X11	Xlib Screen Color Characterization Data utility.
xcmstest	XV	X11	XCMS application tester.
xconsole	XV	X11	Displays X11 system console messages.
xcutsel	XV	X11	Tool to help manage cut and paste operations between X11 applications.
xditview	XV	X11	Displays formatted output from ditroff.
xdm	XV	X11	X11 display manager.
xdpyinfo	XV	X11	Displays X11 server capabilities.
xedit	XV	X11	Text editor.
xev	XV	X11	Debugging tool, displays events for a given window.
xeyes	XV	X11	Displays a pair of eyes that follow the mouse cursor.
xfd	XV	X11	Displays all characters in an X font.
xfindproxy	XV	X11	Locates X11 proxy services.
xfontsel	XV	X11	Displays and selects fonts.
xfs	XV	X11	X11 font server; usually started automatically.
xfwp	XV	X11	X11 firewall proxy.
xgc	XV	X11	Demonstrates X11 graphical capabilities.
xhost	XV	X11	Manages list of hosts allowed to connect to X11 server.
xieperf	XV	X11	Exercises XIE protocol.
xinit	XV	X11	Initializes and starts X11 server when not started by init.
xkbbell	XV	X11	Manages beep and keyboard feedback.
xkbcomp	XV	X11	Compiles keyboard layout descriptions for X Window.
xkbevd	XV	X11	X11 keyboard event daemon (service).
xkbprint	XV	X11	Prints a description of an X11 keyboard layout file.
xkbvleds	XV	X11	Virtual LED indicators for keyboard.
xkbwatch	XV	X11	Unknown.
xkill	XV	X11	Kills an X11 client program.

Program	OS	Type	Description
xlogo	XV	X11	Displays the X11 Window logo.
xlsatoms	XV	X11	Lists X11 protocol atoms (defined strings).
xlsclients	XV	X11	Lists active X11 client applications.
xlsfonts	XV	X11	Lists X11 fonts.
xmag	XV	X11	Magnifies selected part of X11 screen.
xman	XV	X11	Displays manual pages.
Xmark	XV	X11	Summarizes x11perf results.
xmkmf	XV	X11	Creates a makefile for an X11 application from an imakefile.
xmodmap	XV	X11	Modifies X11 server keyboard maps.
xon	XV	X11	Starts the X11 window system on a remote computer.
xprop	XV	X11	Displays properties of a selected window or font.
xrdb	XV	X11	X11 server resource database managers; sets user preferences at startup.
xrefresh	XV	X11	Refreshes X11 screen.
xset	XV	X11	Sets user preferences for X11.
xsetroot	XV	X11	Sets X11 window background design.
xsm	XV	X11	X11 window session manager.
xstdcmap	XV	X11	Defines color mapping for X11.
xterm	XV	X11	X11 terminal emulator and command prompt window.
xuctblgen	XV	X11	Sets X11 locale.
xwd	XV	X11	Captures image of X11 window.
xwininfo	XV	X11	Displays information about X11 windows.
xwud	XV	X11	Displays images captured by xwd.
yacc	XV	IX	Generates C source code for an LR parser from a grammar specification file.
yearistype	XV	IX	Tests whether the current year is leap, even, odd, or a U.S. presidential election year.
ypcat	X	CMD	Dumps a Network Information Service (NIS) map database.
ypclear	X	CMD	Clears the NIS map cache.
ypmatch	X	CMD	Displays NIS data for specified keys.
yppush	X	CMD	Forces updating of slave NIS servers following an update to the master.
zcat	XV	IX	Displays files stored in a zip compressed file.
zdump	XV	IX	Lists information from the time zone database.
zic	XV	IX	Compiles time zone definitions.
zip	XV	IX	Compresses files. Gzip, pack, and zip use different algorithms. This is the one commonly used on DOS and Windows systems.