What is 'Wine'?

Wine is a free software application that allows Unix-like computer operating systems, primarily Linux, to execute programs written for Microsoft Windows. It currently focuses primarily on the dominant 32-bit applications. *(It does other things of interest to developers as well.)*

The name 'Wine' derives from the recursive acronym Wine Is Not an Emulator.

Rather than acting as a full emulator, Wine implements a compatibility layer, providing alternative implementations of the Dynamic Link Libraries (DLLs) that Windows programs call, and processes that provide necessary functionality equivalent to that in the Windows NT kernel.

Wine is predominantly written by means of enhanced 'clean-room' techniques. Wine developers mostly use black-box testing to uncover specific behaviour. Code added to Wine is generally required to be accompanied by test cases.

The project has proved time-consuming and difficult for the developers, primarily due to the incomplete and incorrect documentation of the Windows Application Programming Interface (API). While Microsoft extensively documents most Win32 functions, some areas, such as file formats and protocols, have no official Microsoft specification. There are also undocumented low-level functions and obscure bugs. The Wine team has had to reverse engineer and duplicate precisely many function calls and file formats in low level code (colloquially known as 'thunking') in order to enable some applications to work properly.

The Wine project originally released Wine under the same MIT License as the X Window System but, owing to concern about proprietary versions of Wine not contributing their changes back to the core project, work after March 2002 has been licensed under the LGPL.

Version 1.0 of Wine was released on June 17, 2008, after 15 years of development.

Architecture

Wine implements the Windows API entirely in user-space, rather than as a kernel module. *What that means is that programs are installed under Wine for a single user.* Services normally provided by the kernel in Windows are provided by a daemon known as wineserver. Wineserver implements basic Windows functionality, as well as providing extra functions such as integration with the X Window System and translation of signals into native Windows exceptions.

Although Wine implements some aspects of the Windows kernel, it is not possible to use native Windows drivers with it, due to Wine's underlying architecture. This prevents certain applications from working, including some copy-protected titles.

Corporate sponsorship

The main corporate sponsor of Wine is CodeWeavers, which employs many Wine developers to work on Wine and on CrossOver, CodeWeavers' supported version of Wine. Crossover includes some application-specific tweaks not considered suitable for the WineHQ version, as well as some additional proprietary components.

Other corporate sponsors include Google, which hired CodeWeavers to fix Wine so Picasa ran well enough to be ported directly to Linux using the same binary as on Windows; Google later paid for improvements to Wine's support for Adobe Photoshop CS2. Wine is also a regular beneficiary of Google's Summer of Code programme.

Functionality

As of 2010, Wine runs some software packages with good stability and many others with minor issues. The developers of the Direct3D portions of Wine have continued to implement new features such as pixel shaders to increase game support. Wine can also use native DLLs directly, thus increasing functionality, but then a license for Windows is needed unless the DLLs were distributed with the application itself.

winecfg is a GUI configuration utility included with Wine which makes configuring Wine easier by making it unnecessary to edit the registry directly – although this can be done with the included registry editor (similar to Windows regedit). Wine also includes its own open-source implementations of several other Windows programs, such as notepad, wordpad, control, iexplore and explorer.

AppDB is a community-maintained database of which Windows applications work, and how well they work, with Wine.

64-bit applications

Preliminary support for 64-bit Windows applications was added on December 5, 2008. This currently requires gcc version 4.4 and the Wine developers expect that it will take significant time before support stabilizes. However, as almost all Windows applications are currently available in 32-bit versions and as support for 32-bit Windows applications is handled by linking with 32-bit versions of Wine's shared library dependencies on 64-bit platforms, this is seen as a non-issue.

Usage

In a 2007 survey of 38,500 Linux desktop users by desktoplinux.com, 31.5% of respondents reported using Wine to run Windows applications. This plurality was larger than all x86 virtualization programs combined, as well as larger than the 27.9% who reported not running Windows applications.

Third-party applications

Some applications require more tweaking than simply installing the application in order to work properly, such as manually configuring Wine to use certain Windows DLLs. The Wine project does not integrate such workarounds into the Wine code-base, instead preferring to focus solely on improving Wine's implementation of the Windows API. While this approach focuses Wine development on long-term compatibility, it makes it difficult for users to run applications that require workarounds. Consequently, many third party applications have been created to ease the use of those applications that don't work 'out of the box' within Wine itself. The Wine wiki maintains a page of current and obsolete third party applications.

Microsoft and Wine

Microsoft has generally not made public statements about Wine. However, the Microsoft Update software will block updates to Microsoft applications running in Wine.

The Windows Genuine Advantage (WGA) system also checks for existence of Wine registry keys. The WGA FAQ states that WGA will not run in Wine by design, as Wine does not constitute "genuine Windows". When WGA validation detects Wine running on the system, it will notify users

that they are running non-genuine Windows and disallow genuine Windows downloads for that system. In the case of Internet Explorer 7 and Windows Media Player, Microsoft has since removed the WGA requirements.

Security

Because of Wine's ability to run Windows binary code, concerns have been raised over native Windows viruses and malware affecting Unix-like operating systems. However, programs running in Wine are confined to the current user's privileges, restricting any undesirable consequences. For this reason Wine should never be run with superuser privileges.

Installing WINE

The version of Wine in the Karmic repositories is a recent 'beta' version, currently 1.1.31 (despite being identified as '1.2'). The latest 'beta' version, currently 1.1.39 (19 Feb 2010), is available from WineHQ. The differences between the versions are basically bug-fixes. I've followed the instructions here:

        http://www.winehq.org/download/deb

to install this version and ensure that any updates to it will also be installed.

Problems and Possible Solutions

Version Sensitivity

SmartSuite worked with Wine version 1.1.20 – but didn't work when I tried it with a later version! Now, running Wine 1.1.38, it seems to be working again! So, you may need to force the installation and preservation of a specific version of Wine for your application to work. ***HOW?***

- Select 'wine' in Synaptic;
- Choose Package > Force Version (or use Ctrl+E);
- Select the version you want from drop-down list (which will include the version that you downloaded from WineHQ and the 'standard' version in the Ubuntu repositories);
- Click 'Force Version' button.

Choosing your DLLs

Wine includes a 'vanilla set' of DLLs i.e. not specific to a particular application. Many applications for MS Windows include application-specific DLLs on their installation CD. Sometimes it is necessary to install these; other times they can upset the workings of Wine. Googling for '[application name] linux' produced a result for me when a Windows app. my mother-in-law was using under Wine stopped working after a set of updates!

Note that if you install a DLL from the application's installation CD its use is covered by the application's licence. If you want to install a 'genuine' Microsoft DLL, you need to have a licence for the version of Windows that it comes with. If you need to use a 'genuine' DLL and you have the MS licence, it's probably as convenient to install MS Windows virtually as to use Wine.

WineTricks

Wine Tricks is a script that enables you to install things that the developers of programs running under Windows may have expected to be present on the computer – so they didn't bother to put them on the installation CD or script a check to see whether they are in fact present! Get it from here:

```
http://winezeug.googlecode.com/svn/trunk/winetricks
```

Desktop Effects

Compiz may interfere with the workings of the graphics aspects of Wine, resulting in slow running or even a crash. WineHQ recommends switching Compiz off.

Ejecting a CD

Sometimes a CD will 'stick' after an installation. Try:

```
wine eject
```

in a terminal window.

Uninstall HowTo

Wine has its own built-in uninstaller - the equivalent of Windows' 'Add/Remove Programs' function for running standardized uninstallers. In recent versions, a shortcut has been added to Wine's menu, along with a shortcut to `winecfg`.

Note that Wine does not fully implement everything required to cleanly uninstall all applications. Some uninstallers might not function at all. To remove all programs installed under Wine, remove the ~/.wine directory:

Please note that in the following commands there should be no spaces in the path, particularly between $HOME/ and .whatever.

```
rm -rf $HOME/.wine
```

To uninstall a particular program you can delete its directory in drive_c/Program Files. You need to type 'Program Files' **including the single quote marks** otherwise Linux will be confused by the space.

Also the uninstaller does not remove menu and desktop entries. To remove all Wine-created menu entries run the following commands

```
rm -f $HOME/.config/menus/applications-merged/wine*

rm -rf $HOME/.local/share/applications/wine

rm -f $HOME/.local/share/desktop-directories/wine*

rm -f $HOME/.local/share/icons/????_*.xpm
```

Proprietary Alternatives

Bordeaux

"Bordeaux for Linux is Wine 1.1.36 plus Cabextract, Wget, Unzip and other tools and libraries compiled on Ubuntu Linux for Linux systems. Bordeaux comes with a simple UI written in GTK that facilitates in the installation and execution of select programs that we currently support."

CrossOver Linux

CrossOver is a proprietary version of Wine, with extra tweaks, aimed at the office environment. It runs Adobe Photoshop and Microsoft products such as Microsoft Office (but only the 2000 version of Access). It does not require a Windows licence. Again, it costs and comes in two versions (basically for small and large organisations).

Easysoft Access ODBC Driver

A proprietary product to connect applications on Linux to Microsoft Access 2000, 2002, 2003 (.mdb) and 2007 (.accdb) databases.

Win4Lin

Win4Lin is a specialised virtualization product, optimised for Microsoft Windows. It requires a Windows licence and comes in two versions with different levels of support, depending on how much you pay.

Links

WineHQ:	http://www.winehq.org/
AppDB	http://appdb.winehq.org/
FAQ	http://wiki.winehq.org/FAQ
Frank's Corner	http://frankscorner.org/index.php?p=cxo
Bordeaux	http://www.bordeauxgroup.com/