

Windows Subsystem for Linux

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What is Windows Subsystem for Linux?

Simply put WSL lets you run certain Ubuntu Linux programs on Windows 10

How to Install WSL

1. Install Windows 10 Anniversary Edition - Windows 10 Upgrade Advisor
2. Set to Developer Mode
3. Turn on Windows Subsystem for Linux (beta) in the add features sections
4. (Optional) install Cygwin X11 or Xming

How to run apps on a different O/S

Five Major Approaches

1. Virtual Machine - KVM / Xen / VirtualBox / Vmware, etc
2. Recompile applications for host O/S - Cygwin, UWin
3. Dynamic recompilation of program for different platform
4. Application layer - Interix, WSL, Wine
5. Run the kernel/os alongside the other - colinux, interex

History of WSL (assumed)

Years ago there was a product called Lxrun by SCO
Lxrun included a bunch of Linux source code and was able to run
some Linux programs on SCO Unix

Sun also released a version of Lxrun

There were other systems like HP's libhplx

This has been updated / enhanced by Microsoft and appears to
form the basis of WSL

There was also a project (linux-abi) to run SCO Unix programs
on Linux

History of WSL (assumed, cont'd)

Microsoft had a project named Astoria. The goal of this project was to run Android apps on Windows Phone O/S

Needless to say they decided they really didn't need this.

See OS/2 3.0 a better Windows than Windows

How does it work? (assumed)

Windows NT had a Posix subsystem, also an OS/2 subsystem as well

This continues on to its derivatives (XP, Vista, 7, 8, 10)

WSL takes the Lxrun program and maps most of the relevant system calls/etc to the Posix subsystem

WSL also provides support programs to emulate some kernel infrastructure as well

The program when run has the Linux calls trapped out to the Posix equivalents

IS WSL Open Source?

Could not find source for it

Lxrun was released under the Mozilla Public License

There is a github page for WSL, but it looks to be for issue tracking

Lxrun and probably WSL use a lot of Linux Source code (headers at least) and they might be under the GPL

Do a search for groklaw and lxrun and there is some interesting info about lxrun which might also apply to WSL

Lxrun isn't all of WSL but it is a chunk of it

IS WSL Open Source? (cont'd)

Lxss.sys translates linux call to equivalent Windows NT call
If there isn't an equivalent Windows NT call it does a call out to pio driver which provides a "clean room" implementation of the linux syscall interface

Limitations

No udev, No systemd, etc.

Not a full Linux emulation. Emulates an environment to let some Linux programs run

It is designed for developers to make them happier with Windows 10

No Graphics - well you can run an x-windows server to run some stuff

Limitations (continued)

Won't run "big" programs like *Google-chrome* at all or *Firefox* acceptably

Still in beta, might always be in beta

Only supports *Ubuntu 14.04* currently - other versions, distro support might appear in the future

No real interaction between systems, can't mix *grep* and *powershell*

Benefits

You are running the same executables you'd be running on a comparable Ubuntu Linux box. You install vim and you have the same vim binaries you'd have on an ubuntu 14.04 box

A lot of Ubuntu 14.04 is available to install, not all of it will run however

Benefits

It is just at the beginning of its development, lots of room to grow/improve

You can run Linux apps on your Windows box

Kind of like a dog playing a piano. Every now and then the dog is going to hit a wrong note. But hey it is a dog playing a Piano :-)

What if I Screw Up?

Resetting WSL

```
Lxrun.exe /uninstall /full
```

```
Lxrun.exe /install
```

Is it worth it?

It is freely available and the barriers to entry are pretty low. So I'd say yes.

If you need to play/develop for Windows Linux it can be a decent way to do so. It won't replace VMs anytime soon, but it is pretty cool in its own right.

WSL uses less resources than a full VM with Linux in it

Demo

Let's fire it up

Vim, xeyes, synaptic, firefox, google-chrome

Using xming currently, should probably migrate to VcXsrv, or
Cygwin X11

Links

Cygwin pointer to X11 Documentation

[Http://x.cygwin.com/docs/ug/cygwin-x-ug.pdf](http://x.cygwin.com/docs/ug/cygwin-x-ug.pdf)

Microsoft pointer to WSDL FAQ

<http://msdn.microsoft.com/en-us/commandline/wsl/faq>