SLUUG November 2020
Co-residency: Windows and Linux on the same computer.

Co-residency: Windows and Linux on the same computer.
SLUUG; Ken Johnson (contact-point@pobox.com)

Thank you for coming to the November Linux meeting on the third Thursday.

About Me

I work as an independent consultant performing system and small network administration, and writing specialized technical documentation.

I first set up co-resident systems in the late 1990s, needing something better than Windows for Workgroups for running certain network device tests.

XML or SGML based mil-spec documents

Run the Visual C++ debugger or read a switchbox schematic.

Generate 'picture books' for custom test program sets using Python and MS Word.

RedHat(ish) CDs from CheapBytes.com, for anyone who remembers them. Before I switched to Debian/Mint/Ubuntu/Bunsen Labs.

Acknowledgements

Stan Reichardt gave freely of his time to educate me on some of the issues around setting up newcomers to Linux.

Phil Bunch was happy to answer my questions about Windows O/S versions still in circulation, as seen at local meetings.

Stan, Phil, and some others run several monthly meetings that are targeted at or give preference to Linux newcomers.

Their comments and advice were especially relevant for this presentation.

Co-Residency, Overview

What are the ways to accomplish this goal?

Pros and Cons

Details on the newest option(s): WSL

Emphasis on solutions for newcomers

Co-residency: Windows and Linux on the same computer.
SLUUG; Ken Johnson (contact-point@pobox.com)

This started out as a session about Windows Subsystem for Linux, or WSL.

WSL is new, but is it technically interesting?

Does it solve problems easier/better/cheaper/faster than other approaches?

To help you make that judgment for your use case, WSL is presented here in the context of other available solutions.

System Requirements - Software

Host OS Version (7, 8, 10)

Host OS features (Home vs. Pro)

Host OS Addressing (32 bit vs. 64 Bit)

What does it take to set up a Co-Resident environment?

Phil Bunch says it has been a long time since anyone brought an XP system in for a Linux inoculation.

No one wants Vista.

No recent Windows Client OS has PAE support.

(Unlike Linux)

System Requirements - Hardware

CPU Addressing – 32 vs. 64

CPU Virtualization Support (details later)

Memory Size

Historically, I find I have been most likely to discard/upgrade systems because of memory size limits.

Recently, I have upgraded two systems for CPU features (other than speed).

With the exception of some recent laptops and Chromebooks, disk size can usually be changed.

Outline

External Media <<<

Dual Boot

Virtual Machines

System Call Translation

Why this order?

In rough order of invasiveness to your current Windows setup.

Not necessarily the same as order of risk.

The last two are similar, I think, so VMs first because it has some material that fits as a prerequisite to System Call Translation.

External Media

Knoppix, SysRescueCD, various Live DVDs

pendrivelinux.com

SSD vs. USB thumbdrive vs SD card

Easily understood

Some media in SD physical format has wear leveling; a very small number of expensive thumbdrives do as well.

Performance hit, but USB3 is pretty fast. An external USB3 SSD is probably faster than an internal HDD.

Outline

External Media

Dual Boot <<<

Virtual Machines

System Call Translation

Reminder of where we have been and where we are going.

Dual Boot

LILO circa 1998

Grub makes it better

GPT-style disks make it better

Easily understood – A or B

Lilo seemed like magic in 1998.

Grub, especially Grub2, is better.

GPT labeled disks avoid the Extended Partition / Logical Partition mess:

– linked list of EBRs

– change in partition alignment between XP and Vista. Ugh.

Dual Boot

Widely used

Subject to unexpected/unexplained failures

Can be difficult for newcomers to repair

Co-residency: Windows and Linux on the same computer.
SLUUG; Ken Johnson (contact-point@pobox.com)

I have used this for years.

I agree with all of the points on the previous slide.

And the points on this slide.

Yet I yield to Stan's appraisal wrt suitability for newcomers.

Outline

External Media

Dual Boot

Virtual Machines <<<

System Call Translation

Reminder of where we have been and where we are going.

Virtual Machines

Hardware Support

Examples

Co-residency: Windows and Linux on the same computer.
SLUUG; Ken Johnson (contact-point@pobox.com)

VM – Hardware Support

None – Atom processors in netbooks (2008)

Some – Core 2 Duo E8500 (2008)

Full – i-series 2nd generation and later (circa 2011+), Pentium and Celeron processors (circa 2014+), most AMD processors since 2011? (and some before).

"Linux works well on old hardware; it works best on mainstream hardware."

– Ken Johnson, Feb 2017, at a STLLUG presentation

None – Optiplex 360 (64bits, 4 GB max mem)

Some – Thinkpad X200S (8 GB max mem)
– Lenovo tower (16 GB max mem)

Full – Thinkpad X120e (16GB max mem)

Virtual Machines – Examples

VirtualBox

WSL 2

Hyper-V

VirtualBox is the old-timer

WSL 2 is a special case of Hyper-V

Hyper-V is a general purpose VM, similar to VirtualBox

VirtualBox (6.x current)

Recommended by Stan!

Requirements: 64-bit Windows, 8 or 10

VirtualBox 5.2 supports 32-bit Windows W7

The 'old favorite' – the one to beat

Stan says:

Free as in Beer.

Easy to Install

Easy to use – many online HowTos

Performance OK

Installs in many environments

WSL 2

System Requirements

Distributions

Features

Demo

WSL 2 – System Requirements

64-bit Windows 10 Pro

Full CPU virtualization support

Disk space & memory – discuss

WSL Distributions (1/2)

Alpine WSL

Debian

Kali Linux

OpenSUSE Leap 15.2

OpenSUSE-Leap-15-1

These are the free as in beer options at
the Microsoft Store. I do not know of other places to
get distributions, nor do I know how to make your
own.

WSL Distributions (2/2)

SUSE Linux Enterprise Server 15 SP1

SUSE Linux Enterprise Server 15 SP2

Ubuntu 18.04 LTS

Ubuntu 20.04 LTS

… from the Microsoft Store

WSL 2 – Features

Bash command prompt

Access to Windows file system

Windows access to WSL 2 filesystem

If what you need is the Linux command-line tools for program development, text processing, or your particular situation, this may be a good approach.

WSL 2 – Features

Installation and setup well documented

Specific to a user

No official desktop support

WSL 2 – Demo

Co-residency: Windows and Linux on the same computer.
SLUUG; Ken Johnson (contact-point@pobox.com)

Hyper-V

System Requirements

Distributions – Any

Features

Demo

Co-residency: Windows and Linux on the same computer.
SLUUG; Ken Johnson (contact-point@pobox.com)

Hyper-V is the virtual machine software that comes with Windows 10 Pro, 64 bit.

Hyper-V – System Requirements

64-bit Windows 10 Pro

Full CPU virtualization support

Hyper-V – Features

‘QuickCreate’ features Ubuntu 18.04 and 20.04

Install via Control Panel | Programs and
Features | Turn Windows Features on or off

Difficult to use on Domain-member systems –
error 0x80070569. Rebooting might help.

On systems that are domain members, with
somewhat restrictive group policies, Hyper-V is
difficult to use. Being Local Admin is <u>not</u> sufficient.

Hyper-V – Features

On hosts with DHCP addresses, external internet access (for updates, for example) 'just works'. Hosts with static IP addresses need custom configuration.

Guest memory configuration options not well documented. Every article I found described an earlier version of the memory configuration options.

Hyper-V – Demo

Co-residency: Windows and Linux on the same computer.
SLUUG; Ken Johnson (contact-point@pobox.com)

Outline

External Media

Dual Boot

Virtual Machines

System Call Translation <<<

Reminder of where we have been and where we are going.

System Call Translation

CoLinux

WSL 1

(Wine?)

CoLinux

Windows 2000 and Windows XP

32-bits

Low resource systems – XP netbooks

CPUs with no Virtualization support

Intel Atom Netbooks

Optiplex 360

OBE – Windows XP is finally gone. Anyone still using Linux on those netbooks is probably <u>not</u> also using Windows.

WSL 1

System Requirements

Distributions – same as WSL 2

Features

Demo

Co-residency: Windows and Linux on the same computer.
SLUUG; Ken Johnson (contact-point@pobox.com)

Introduced W10 1607

WSL 1 – System Requirements

64-Bit Windows 10

Memory and Disk

Pro not required

Advanced Virtualization not required

WSL 1 – Features

Bash command prompt

Access to Windows file system

Windows access to WSL 1 filesystem

If what you need is the Linux command-line tools for program development, text processing, or your particular situation, this may be a good approach.

WSL 1 – Features

Installation and setup well documented

Specific to a user

No official desktop support

There are online accounts of getting full desktop environments (Mate, LDXE, others) to run with WSL 1. I think that very well may be possible, but not easy. In my experiments, I could launch a desktop (I tried Mate, with Debian), but Firefox, as an example, did not work. Efforts to improve the situation by following advice to fix up dbus or other things actually seemed to make things worse. I can't recommend this approach based on what I know now.

WSL 1 – Demo

(Command-line demo)

Wine

Wine will run many applications for Windows.

appdb.winehq.org has applications ratings

Older applications – ratings may not be current

Out of our emphasis for tonight.

Questions?

External Media

Dual Boot

Virtual Machines

System Call Translation

Co-residency: Windows and Linux on the same computer.
SLUUG; Ken Johnson (contact-point@pobox.com)

Another chance to ask questions, with a reminder of where we have been.

SLUUG November 2020
Co-residency: Windows and Linux on the same computer.