Introduction to Linux
TPC NA 2017

Tom Browder [tom.browder@gmail.com]

Northwest Florida Linux User Group [nwflug.org]

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Preliminaries

My background

- I'm a retired USAF fighter pilot (1987-12-31), and retired engineer (2016-01-01) with ManTech International Corporation (http://mantech.com)
- I've used Unix and GNU/Linux and FOSS professionally for over 23 years
- I still use them daily in my personal projects as well as my work on FOSS projects
- Perl 6 is my programmimg language of choice (since 1993)
- My favorite hobby is supporting the development of Perl 6

- Three color calendars
- Three B and W calendars

This link will get you to some public files for the calendar:

<https://computertechnwf.org/2017/sessions/>

Introduction to Linux

What is Linux?

- Powerful, free operating system (O/S or OS) that can be used in place of Windows or Mac
- Usually packaged with thousands of free software packages to suit nearly every interest
- Note there are other free OSs

Why use Linux?

- Command-line-interface (CLI) that permits complex pipeline tasks and GUI-less programming
- All aspects of the system are accessible to the user, including the source code

- Cloud service providers
- Data warehouses
- Web servers
- High Performance Computing (HPC) facilities
- Especially valuable as a modern slide-rule or calculator for scientists, mathematicians, engineers, and analytical professionals in all fields

Some terminology

- OS (or O/S): Operating System (the executive program and all its suppporting programs)
- FOSS: Free and Open Source Software
- GNU: "Gnu's Not Unix," a brand of the Free Software Foundation
- Linux: the name of the kernel (executive program)
- distro: a GNU/Linux distribution
- GUI: Graphical User Interface
- CLI: Command Line Interface

A distro is a collection of

- a Linux kernel (the executive program)
- hundreds of small utility CLI programs
- a subset of the thousands of free application programs ("apps")

Which distro is for you?

- Hundreds are available
- <http://distrowatch.com> can help you decide
- One of the most popular is Ubuntu
- My favorite is Debian with the Mate desktop
- Distros can be divided into groups by their package formats and management systems
    - Debian: 'deb' format, 'aptitude' package manager
    - Fedora: 'rpm' format, 'yum' package manager
    - there are many others: ...

Getting and testing Linux distros (distributions)

Several methods (covered in next session)

- VirtualBox
- Live CD/DVD
- Bootable USB drive
- Spare or main computer (native install; dual or single boot)

Becoming Familiar with FOSS

Many people are responsible for our current technology, but these are particularly noteworthy in the FOSS arena:

- Windows is not my OS of choice, but I thank **Bill Gates** for making the PC widely available
- For Linux and FOSS we need to thank:
    - **Richard Stallman** (originator of the Free Software Foundation and much GNU software)
    - **Linus Torvalds** (originator of the Linux kernel)

Motivation

Why do we recommend and use FOSS?

- Source is available for inspection
- Fixes are available from the community of developers
- Two major variants:
    - Free for non-commercial use
    - Free for any use
- Why do developers work on FOSS?
    - Fun, pride, self-interest, altruism, competition
    - Some are paid by companies with a vested interest in a particular FOSS project
- Why do companies give it away?
    - Constrained by licensing
    - Sell support services
- Doesn't it seem like socialism?

Fundamentals

- A user should be familiar with getting around his or her computer and the Internet and with:
  - Files and directories (folders)
  - Searching (local and web)
  - Downloading and installing
  - Browsing
  - Getting help
  - Command line use (maybe)

Installation

For merely using a program, most programs should be installed with your distro's package manager.

For building from source you will have to download from the appropriate Internet source:

- Like the Biblical Tree of Knowledge
    - Good
        - Infinite resources for good
    - Evil
        - Criminals, terrorists, and mischief makers abound
- You **must** be on the alert
- Encrypted communications (**https**) (BIG push on it now)
- Download authentication
- DNS spoofing
    - **google.com** translates to an IP address by a DNS server
    - DNS servers can be hijacked
    - Familiar home pages can be hijacked

- Use check sums to check downloaded files
- Use public key encryption when appropriate

Tour of free programs and resources

Use my free handout available online at
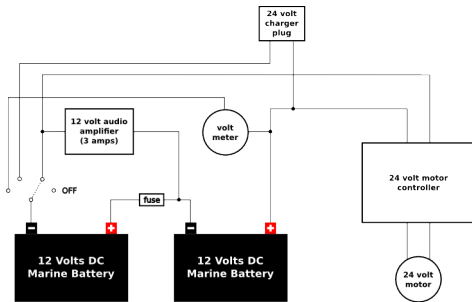
- $<$https://computertechnwf.org$>$

Some brief looks

Replacement for Corel Draw or Adobe Illustrator or Adobe InDesign

A quick look. . .

Here is one of my drawings: a circuit diagram exported as a bitmap.

Tom Browder's current proposed wiring diagram using the Ride Trains motor controller/sound system.
2015-05-09

Replacement for Photoshop

I use all the time for preparing images for my websites. I crop all my images to a small square and then scale to 100x100 pixels to use as thumb nails.

A quick look. . .

Gimp

We look at one of my sites for an example output (report 2014-08-23).

<https://psrr.info/pauls-reports.html>

Replacement for Quicken

I've used it for at least eight years now, and have never looked back to Quicken!

A quick look. . .

Replacement for Microsoft Office

- Not perfect, but improving all the time

A quick look. . .

Summary

- Today we have looked at Linux and a few of the thousands of free programs available for Linux (and Windows and Mac).
- There is something out there for nearly any interest. I encourage you to venture forth, have fun, and expand your knowledge and skills.

- I am glad to help via e-mail (please mention TPC NA 2017 in the subject):
    - [**tom.browder@gmail.com**]