

Introduction to Free/Open Source Software (FOSS)

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Presentation Will Cover

- **What is FOSS?**
- **A brief history of free software**
- **FOSS licensing**
- **Importance and benefits of FOSS**



About the Speaker

- **Member Malaysian National Computer Confederation (MNCC)**
- **Founding member of Malaysian Open-Source Group, MNCC-OSSIG, PIKOM-OSSIG**
- **Chair, SIRIM Technical Committee on Information Security Standards**
- **Independent consultant in areas of:**
 - ♦ **open source development**
 - ♦ **information systems security**

What is Free/Open Source Software (FOSS)?

Free Software

Open-source software (OSS) has its history in free software

- **Free as in **freedom** not RM 0.00 !!!!**
- **Early programmers exchanged software freely (often with source code)**
- **The technologies and protocols which gave rise to the Internet were created largely by free software and the culture associated with it**

Free as in Freedom

What is free software?

Freedom to run, copy, distribute, study, change and improve the software.

- Freedom to run the program, for any purpose
- Freedom to study how the program works, and adapt it to your needs
- Freedom to redistribute copies so you can help others
- Freedom to improve the program, and release your improvements to the public

Access to the source code is needed to realise most of the above.



Free Software Foundation
www.fsf.org

Free Software and Freeware

Do not confuse free software with freeware

- **Freeware refers to software in which the owner allows it to be freely distributed without any charge.**
- **Source is usually not given and modifications to it are not allowed by others.**

A Very Brief History of Free Software

[Sourced mainly from:

Eric S. Raymond's "A Brief History of Hackerdom"

(www.catb.org/~esr/writings/hacker-history/)]

The Early Programmers

- Embodied a technical culture of computer enthusiasts
- Passionate about programming and the software that they *crafted*
- The early programmers were typically engineers or physicists
- Worked on huge mainframes and coded in machine language, assembler and FORTRAN
- Possibly even toggled in an entire operating system using front-panel switches only!!
- These were the original hackers

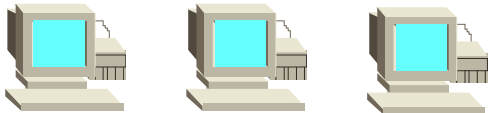
(Note: Hackers are different from crackers!!)

The Early Hackers

By early 1980s two main groups of hackers:

UNIX-based hackers - VAXes and UNIX wkstns

- Based in universities and research institutions
- Developed many of the software for driving the Internet e.g. networking and services
- Exchange of free software over Internet



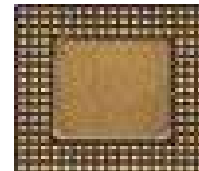
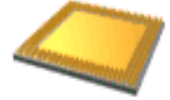
PC-based hackers - Apple DOS, CP/M, MSDOS



- Hobbyists, self-taught, games crackers
- Software exchange via BBS, computer clubs, physical floppy disks
- BBS culture - freeware, shareware, public-domain

From 1980s through Early 1990s

- The microprocessors grew in power
- MSDOS dominated PCs using Intel CPUs resulting in new generation of hackers on PCs
- Proprietary UNIX wars --> a fragmented UNIX environment. PCs with ever increasing power, relative ease-of-use and abundance of software made inroads.
- With the the arrival of 32-bit CPUs for PCs --> a fully functional UNIX system could run on PC hardware.



The Early 1990s

- Many incompatible versions of UNIXes were being marketed
- UNIX for PC-class machines available commercially. But prices were still expensive
- In the meantime, the power and influence of MSDOS and MSWindows on the PC grew



- PC-based networks using Ethernet LANs proliferated and UNIX seemed to be headed the way of the dinosaurs (extinction) ...

Until ...

The rise of free UNIXes, Linux and the Internet



www.goldenbooks.com

The Early Free UNIXes

- **Free Software Foundation - founded by Richard Stallman in 1983**
- **GNU (GNU is not UNIX) - a UNIX operating system clone using only free software.**
- **Apart from the kernel, GNU managed to deliver almost all of the parts of the OS --> excellent OS and system software development toolkit.**



- **BSD UNIX ported to 386-PC architecture computers.**
- **From these several free UNIXes developed e.g. FreeBSD, NetBSD, OpenBSD**



- **Still, on PCs large numbers of young people exposed mainly to MSDOS/MSWindows**



The Birth of Linux

- 1991- Linux Torvalds, a student at Helsinki University, started development of a free UNIX kernel for 386 PCs using FSF toolkit.
- Project attracted many Internet hackers.
- Became a full-featured *free* UNIX work-alike.
- Most of the work was concentrated on the kernel.
- Much of the other supporting software taken from GNU, hence a more appropriate name is GNU/Linux.
- From the start Linux made it easy for MSDOS users to co-exist and/or migrate to it.
- Linux attracted many hackers and users, both from the UNIX and non-UNIX sides.



The Linux Model

Complex software usually developed in a controlled, coordinated way by a relatively small, tightly-knit group of people.

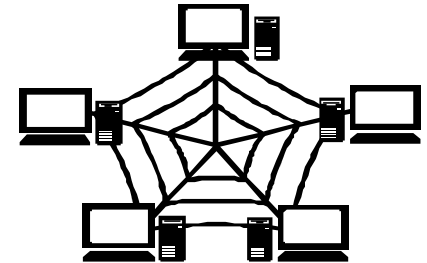
Not Linux!



- **Hacked on by huge numbers of volunteers coordinating only through the Internet**
- **Quality maintained by releasing very often and getting fast feedback from many users.**
- **In this manner only good quality code and useful features are used.**

The Internet Explosion

- The Internet exploded with the introduction of the WWW. Its multimedia support and ease-of-use resulted in non-techies going online.



- Hackers which created much of the underlying Internet technologies are much sought after for their technical skills in this "new" frontier.



- UNIX computers found wide deployment as Internet servers. The free UNIXes and work-alikes running on x86, e.g. xBSD and Linux, found widespread popular use.



The Internet Explosion

Many Internet services originally developed on xNIX and distributed as free software. xNIX-based servers function well as Internet servers.

Many of the basic Internet services run on free software e.g.

- **Apache - web server**
- **BIND - Name-to-IP resolution server**
- **Sendmail - mail transport agent**

Free Software powers the Internet to this day!!

Using Free Software

- **Success of Internet caused many techies to try and use the free software powering the Internet internally**
- **Met with resistance from management and non-technical people**
- **Term "free software" leads to negative perceptions and connotations especially to business and corporate users**

"How can anything be good if it is free (i.e. has no monetary value attached to it)?!!!"

Open Source Software (OSS)

- **Need to overcome many of the negative perceptions associated with the use of the name "free software"**
- **Need to allay fears of businesses over FSF's uncompromising attitude towards non-free software**
- **Term open-source software was coined to refer to free software**
- **Definition of the term OSS available from the Open Source Initiative (OSI):**

www.opensource.org/docs/definition.php

Free Software or Open Source Software?

FSF prefers retaining term "free software"

- **Emphasis on the "freedom" aspect and less chance of ideals of free software lost/forgotten**
- **Open source gives impression that source code availability is equivalent to free software**
- **Less tolerant of proprietariness and commercialism creeping into free software**

Many in ICT industry prefer term OSS

- **Wide acceptance among mainstream ICT industry and public**
- **Perceived as more "friendly" towards businesses and also less of a socio-political movement**

Free Software or Open Source Software?

Which term should we use?



- OSS has gained a lot of attention
- Many positive perceptions
- Acceptance by mainstream and businesses

Should not argue or worry too much over the philosophical aspects. In reality the two terms can be used interchangeably for everyday usage

IMHO use OSS or if you want to be politically correct use:

Free/Open Source Software - FOSS!!

FOSS Licensing

Free/Open Source Software Licensing

The OSI recognises over 30 licenses as Open Source Licenses. FSF recognises many of these as Free Software Licenses too.

Free/Open Source Software licensing falls into 2 main types:

- **Copylefted**
- **Non-copylefted**

Copylefted Software

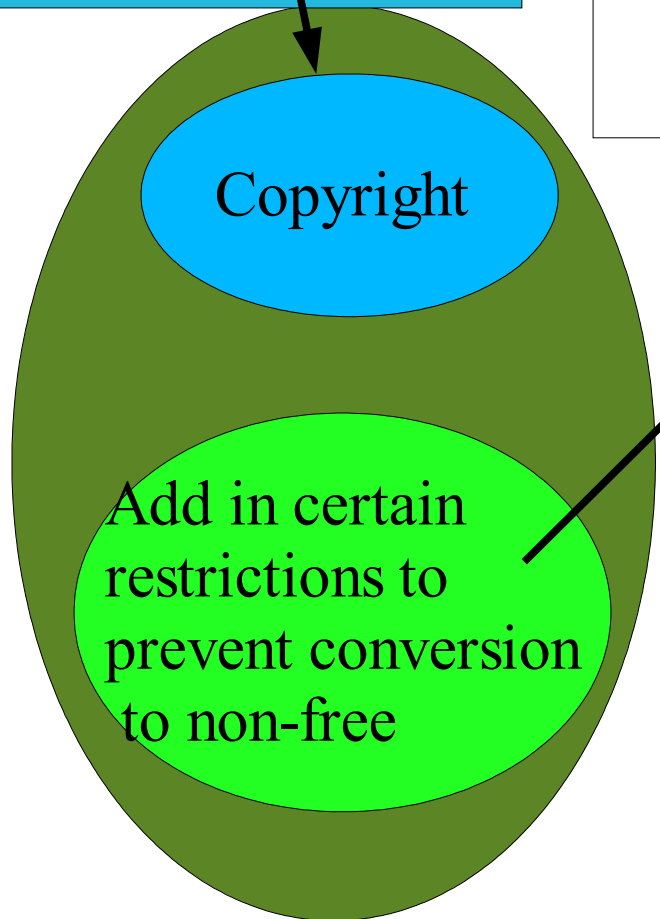
What is there to stop someone from converting a free software to non-free software?

- **Copyleft is used to prevent this.**

Copylefted Software

The creator/owner maintains copyright on the software

**What is there to stop someone from converting a free software to non-free software?
Copyleft is used to prevent this.**



Eg:

- Anyone who redistributes the software, with or without changes, must pass along the freedom to further copy and change it.
- Guarantees that every user has freedom.
- E.g. GNU General Public License (GPL) - free software and copyleft license
- Linux is distributed under a GNU GPL license

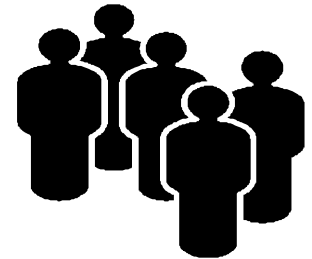
Non-copylefted Software

- Much more permissive licensing than copyleft
- Permission to redistribute and modify
- Permission to *add additional restrictions* to its further distribution and modification
- This means that it is possible for someone to take such software and make it proprietary with or without modifications.
- e.g. X11 (and XFree86) license, BSD License, Apache License

Importance and Benefits of FOSS

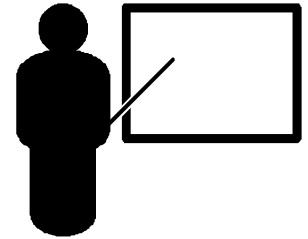
Importance of FOSS

- Freedom to learn, redistribute and enhance
- Prevents single vendor and technology lock-in
- Promotion and preservation of open standards
- Peer review and feedback will lead to:
 - More robust and reliable software
 - Better security and faster bug fixes
- Promotes environment for positive competition, self-learning, exploring and co-operation
- Benefits poorer societies - affordable and accessible software running on affordable computers and networks



Benefits of FOSS to Developing Countries

Today, most technical products driven by software, crucial for developing countries to cope with this increased dependence on software.

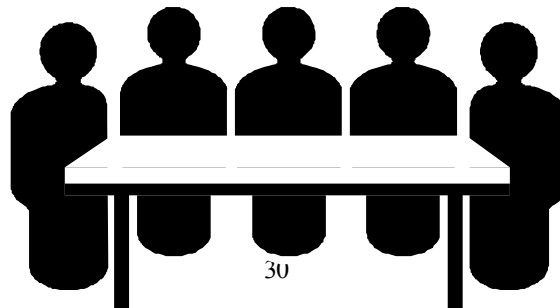


FOSS and associated models/eco-systems provides affordable and feasible means to achieve this.

- Ability to "look under the hood" and learn
- Conducive for technical and system development
- Ability to **L**earn, **I**nnovate and **i**n**V**ent (**LIVE**)
- Less dependence on software and technologies where we can have no control/say

Benefits of FOSS to Developing Countries

- **Encourages positive traits - competition, self-help, and mutual co-operation**
- **Local developers to learn and participate in systems software development**
- **Builds up a critical mass of good coders**
- **Ability to localise software oneself – benefits non-English-speaking countries**
- **Creates an eco-system to stimulate and build up the local software industry**



Summary

- **Free software is not a new phenomenon. It was widely used even before open source became fashionable**
- **FOSS offers a viable alternative to proprietary software in many cases**
- **Copyleft licensing to prevent hijacking of Free Software into proprietary software**
- **FOSS promotes open standards and open technologies, allows users the freedom to choose the appropriate software for use**
- **Developing countries have numerous benefits if they use FOSS**

Thank you!

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