Software FreedomAn Introduction to GNU/Linux

Andrew D. Hwang

ahwang@mathcs.holycross.edu

What's important in a car?

What's important in a car?

User features (comfort, stereo, appearance)

What's important in a car?

- User features (comfort, stereo, appearance)
- Capabilities (mileage, handling, speed)

What's important in a car?

- User features (comfort, stereo, appearance)
- Capabilities (mileage, handling, speed)
- Freedom (cost/availability of parts, ease of repairs)

What's important in a car?

- User features (comfort, stereo, appearance)
- Capabilities (mileage, handling, speed)
- Freedom (cost/availability of parts, ease of repairs)

What's important in computer software?

What's important in a car?

- User features (comfort, stereo, appearance)
- Capabilities (mileage, handling, speed)
- Freedom (cost/availability of parts, ease of repairs)

What's important in computer software?

Looks cool, easy to use

What's important in a car?

- User features (comfort, stereo, appearance)
- Capabilities (mileage, handling, speed)
- Freedom (cost/availability of parts, ease of repairs)

What's important in computer software?

- Looks cool, easy to use
- Stability, multi-tasking, networking, security...

What's important in a car?

- User features (comfort, stereo, appearance)
- Capabilities (mileage, handling, speed)
- Freedom (cost/availability of parts, ease of repairs)

What's important in computer software?

- Looks cool, easy to use
- Stability, multi-tasking, networking, security...
- Access to source code (which means...?)

An operating system (often known as "Linux") and a complete alternative to Windows, MacOS, Unix...

Q: What's GNU?

An operating system (often known as "Linux") and a complete alternative to Windows, MacOS, Unix...

Q: What's GNU? A: GNU's Not Unix!

A philosophy – Software Freedom is Paramount

(0) To run a program for any purpose

- (0) To run a program for any purpose
- (1) To study how a program works, and adapt it to your own needs

- (0) To run a program for any purpose
- (1) To study how a program works, and adapt it to your own needs
- (2) To redistribute copies of the program (sharing recipes)

- (0) To run a program for any purpose
- (1) To study how a program works, and adapt it to your own needs
- (2) To redistribute copies of the program (sharing recipes)
- (3) To improve the program and release improvements to the public (benefitting the whole community)

Applications

Applications

- Web browsers, email and chat clients, media players
- Office (word processor, spreadsheet, presentation)

Applications

- Web browsers, email and chat clients, media players
- Office (word processor, spreadsheet, presentation)
- Scientific software (LATEX, POV-Ray, geomview)

Applications

- Web browsers, email and chat clients, media players
- Office (word processor, spreadsheet, presentation)
- Scientific software (LATEX, POV-Ray, geomview)

Utilities (generally less familiar)

- Development tools (compilers, headers, libraries)
- Text editors (vi, emacs...)
- Scripting languages (bash, Perl, Python)
- File manipulation (cat, grep, less, sed, sort, tar, uniq...)

Hardware

- CPU, memory (RAM and storage), peripherals
- Purchased and owned

Hardware

- CPU, memory (RAM and storage), peripherals
- Purchased and owned

Software

Applications, utilities, the kernel (Linux)

Hardware

- CPU, memory (RAM and storage), peripherals
- Purchased and owned

Software

- Applications, utilities, the kernel (Linux)
- Licensed, not owned (users' rights?)

Hardware

- CPU, memory (RAM and storage), peripherals
- Purchased and owned

Software

- Applications, utilities, the kernel (Linux)
- Licensed, not owned (users' rights?)
- No warranty, no disclosure, most licenses are self-violating (can't examine without breaking seal)

Hardware

- CPU, memory (RAM and storage), peripherals
- Purchased and owned

Software

- Applications, utilities, the kernel (Linux)
- Licensed, not owned (users' rights?)
- No warranty, no disclosure, most licenses are self-violating (can't examine without breaking seal)
- Hardware is useless without software

Tends to demand more knowledge, curiosity (easier to fix problems when you know why they're occurring)

- Tends to demand more knowledge, curiosity (easier to fix problems when you know why they're occurring)
- Too much freedom of choice: Multiple semi-developed applications for a given purpose, relative lack of uniform interface (applies to all "third-party" software)

- Tends to demand more knowledge, curiosity (easier to fix problems when you know why they're occurring)
- Too much freedom of choice: Multiple semi-developed applications for a given purpose, relative lack of uniform interface (applies to all "third-party" software)
- Too much power: Default installations activate server software, which can be a security risk (easy to diasble, but must know how)

- Tends to demand more knowledge, curiosity (easier to fix problems when you know why they're occurring)
- Too much freedom of choice: Multiple semi-developed applications for a given purpose, relative lack of uniform interface (applies to all "third-party" software)
- Too much power: Default installations activate server software, which can be a security risk (easy to diasble, but must know how)
- Generally easier to use the keyboard instead of mouse (this frightens many people in the abstract)

- Tends to demand more knowledge, curiosity (easier to fix problems when you know why they're occurring)
- Too much freedom of choice: Multiple semi-developed applications for a given purpose, relative lack of uniform interface (applies to all "third-party" software)
- Too much power: Default installations activate server software, which can be a security risk (easy to diasble, but must know how)
- Generally easier to use the keyboard instead of mouse (this frightens many people in the abstract)
- Unsupported by ITS

Liberty and privacy: Control of your computer, assurance that software is not doing anything covert

- Liberty and privacy: Control of your computer, assurance that software is not doing anything covert
- Based on open standards: Facilitates interoperability, sharing information

- Liberty and privacy: Control of your computer, assurance that software is not doing anything covert
- Based on open standards: Facilitates interoperability, sharing information
- Wide range of mature, powerful applications, especially for scientific purposes and networking

- Liberty and privacy: Control of your computer, assurance that software is not doing anything covert
- Based on open standards: Facilitates interoperability, sharing information
- Wide range of mature, powerful applications, especially for scientific purposes and networking
- Stability (months of uptime), flexibility (configure without rebooting), security (access control built into the OS)

- Liberty and privacy: Control of your computer, assurance that software is not doing anything covert
- Based on open standards: Facilitates interoperability, sharing information
- Wide range of mature, powerful applications, especially for scientific purposes and networking
- Stability (months of uptime), flexibility (configure without rebooting), security (access control built into the OS)
- Price (cost of the medium), copying (encouraged), freedom from the enforced upgrade cycle

Further Reading

```
http://mathcs.holycross.edu/~ahwang/
current/gnu_linux.html
```