

Welcome

A Basic Overview and Introduction to

Linux Package Management

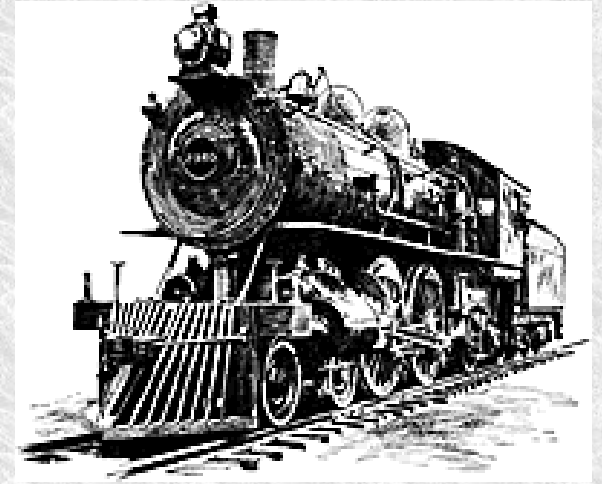
By Stan Reichardt

stanr@sluug.org

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Disclaimer

- ...like a locomotive
- Many (similar but different)
- Fast moving
- Complex parts
- Another one coming any minute
- I have ridden locomotives
- I am NOT a locomotive engineer



Begin The Train Wreck



Definitions

- A **file archiver** is a computer program that combines a number of files together into one archive file, or a series of archive files, for easier transportation or storage.
- **Metadata** is data (or information) about other data (or information).

File Archivers

Base	Package	Tool	Front Ends	
			CLI	GUI
tar	.tar, .tar.gz, .tgz, .tar.Z, .taz, .tar.bz2, .tbz2, .tbz, .tb2, .tar.lzma, .tlz, .tar.xz, .txz, .tz	tar	tar	file roller
zip	.zip	zip gzip gunzip	zip gzip gunzip	file roller

- Archive file

http://en.wikipedia.org/wiki/Archive_file

- Comparison of file archivers

http://en.wikipedia.org/wiki/Comparison_of_file_archivers

tar

- These files end with **.tar** suffix.
- Compressed tar files end with “.t” variations:
.tar.gz, .tgz, .tar.Z, .taz, .tar.bz2, .tbz2, .tbz, .tb2,
.tar.lzma, .tlz, .tar.xz, .txz, .tz
- Originally intended for transferring files to and from tape, it is still used on disk-based storage to combine files before they are compressed.
- tar (file format)

<http://en.wikipedia.org/wiki/.tar>

tarball

- A tar file or compressed tar file is commonly referred to as a tarball.
- The "tarball" format combines tar archives with a file-based compression scheme (usually gzip).
- Commonly used for source and binary distribution on Unix-like platforms, widely available elsewhere.

zip

- These files end with **.zip** suffix.
- Compression reduces the consumption of expensive resources, such as hard disk space or transmission bandwidth.
- Zip is the most widely used compression format on Microsoft Windows. Commonly used on Macintosh and Unix systems too.
- zip (file format)

<http://en.wikipedia.org/wiki/.zip>

More Definitions

- **Packages** are bundles of software and *metadata* such as the software's full name, description of its purpose, version number, vendor, checksum, and a list of dependencies necessary for the software to run properly.
- A **package management system** is a collection of tools to automate the process of installing, upgrading, configuring, and removing software *packages* from a computer.

Package Management Systems

- **Different Linux distributions may use different Package Management Systems.**
- They are the primary method used to install software on Linux-based systems.
- They provide a complete and consistent method of installing software.
- They are sometimes incorrectly referred to as installers (they do much more).
- Package Management System

http://en.wikipedia.org/wiki/Package_management

Systems and Tools

Base	Package	Tool	Front Ends	
			CLI	GUI
dpkg	.deb	apt	apt-get aptitude dselect jigdo	synaptic
rpm	.rpm	rpm apt-rpm YUM ZYpp	rpm apt-rpm yum yast pcon urpmi <i>jigdo ???</i>	yumex KYum yast gnome- packagekit kpackagekit pup [pirut] <i>pyjigdo ???</i>

Dependency Problems

- Executable programs are derived from source code and libraries.
- The make process requires the description of all dependencies between those files.
- Broken, extraneous, faulty, forgotten, or incompatible dependencies cause programming mistakes or bugs.
- Dependency Hell

http://en.wikipedia.org/wiki/Dependency_hell

Version Numbers

- Partial solution to dependency problems.
- Naming conventions are inconsistent.
-

Repositories

- A repository looks like a collection of files, plus an index.
- Centralized repositories by distribution.
- Repositories may be structured differently.
- Cryptographically signed with GPG keys to authenticate identity.
- Software Repository

http://en.wikipedia.org/wiki/Software_repository

Major Differences

- The Fedora Project encourages free and open source to the extent that no proprietary software can be included in Fedora.
- Although Ubuntu is also committed to free software, it adopts a more pragmatic position by making it easy for users to install non-free software. ***Easy doesn't mean simple, because there are licensing choices to be made.***

Ubuntu Repository Types

- 1.Main** - holds officially supported software.
- 2.Restricted** - not available under a completely free license.
- 3.Universe** - isn't official, but is maintained by the community.
- 4.Multiverse** - many "multiverse" wares (e.g., closed-source drivers required to play DVDs on an open-source system) are not free-like-speech.

Upgrade Suppression

- Version pinning
-

dpkg

- These packages end with **.deb** suffix.
- Used by Debian based distos
 - Debian, Ubuntu, Knoppix, Mepis Mint, DSL

- .deb

<http://en.wikipedia.org/wiki/.deb>

- dpkg

<http://en.wikipedia.org/wiki/Dpkg>

rpm

- These packages end with **.rpm** suffix.
- Used by Red Hat based distros
 - Fedora, openSUSE, Mandriva, PCLinuxOS
- Be aware of two forked versions both claiming to be official version.
- RPM Package Manager

http://en.wikipedia.org/wiki/RPM_Package_Manager

Other PMS Examples

- Other Package Management Systems
 - TBZ – FreeBSD
 - TXZ – Slackware
 - PET – Puppy
 - Entropy – Sabayon
 - Packman – Arch

<http://www.distrowatch.com/>

http://en.wikipedia.org/wiki/Comparison_of_Linux_Live_CDs#Package_management_and_installation

- http://en.wikipedia.org/wiki/Comparison_of_Linux_Live_CDs#Package_management_and_installation

Help Selecting Applications

- Some Linux distributions like Linux Mint even offer a companion website to help you pick and rate software.
- Some sites are dedicated to finding alternative applications.
- A collection of links for finding applications:
http://hzwlug.sluug.org/cdrom.html#finding_apps

Extras

- APTonCD - create discs with backup copies of the packages installed on your system or when Internet not available.
- alien - a computer program that converts between different Linux package formats.
- jigdo – a downloader and updater
 - Ubuntu, Fedora, Solaris, and FreeBSD

Lists of Applications

- You get a nice list of tens of thousands of pieces of software to install, and you just pick what you like.

Security

- Risk of infection by virus, spyware, or other malware installed surreptitiously.
- Applications are your biggest Security Risks
<http://www.itworld.com/security/78462/applicat>

<http://www.itworld.com/security/78462/applications-are-your-biggest-security-risks>

MS Windows

- Diminishing experience.
- Lacks centralized application repository
- Crude single-use individual installers
- Too frequent reboot required



Mac OS X

- No experience.
- **.pkg** - installer
- fink, derives partially from dpkg/apt and partially from ports.
 - <http://www.finkproject.org/>
 - <http://en.wikipedia.org/wiki/Fink>
- MacPorts, formerly called DarwinPorts, originated from the OpenDarwin project.
 - <http://www.macports.org/>
 - <http://en.wikipedia.org/wiki/MacPorts>

Built In Help

- `apropos (man -k)`
 - `example~$ apropos package`
 - `example~$ man -k package`
- `man pages`
 - `example~$ man tar`
 - `example~$ man zip`
 - `example~$ man gzip`
- `(p)info`
 - `example~$ pinfo gzip`

Internet References

- List of Archive Formats

http://en.wikipedia.org/wiki/List_of_archive_formats

- Can Linux manage updates and upgrades more easily than Windows?

<http://www.betanews.com/article/Can-Linux-manage-updates-and-upgrades-more-easily-than-Windows/1247737560>

<http://www.betanews.com/article/Can-Linux-manage-updates-and-upgrades-more-easily-than-Windows/1247737560>

- List of installation software

http://en.wikipedia.org/wiki/List_of_installation_software

More Internet

- Software package

[http://en.wikipedia.org/wiki/Software_package_\(installation\)](http://en.wikipedia.org/wiki/Software_package_(installation))

- Dependency

[http://en.wikipedia.org/wiki/Coupling_\(computer_science\)](http://en.wikipedia.org/wiki/Coupling_(computer_science))

- Windows 7 review — from a Free Software activist

<http://blogs.fsfe.org/rca/?p=21>

- Worse is Better

http://en.wikipedia.org/wiki/Worse_is_better

- Here Be Dragons

http://en.wikipedia.org/wiki/Here_be_dragons

Questions

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