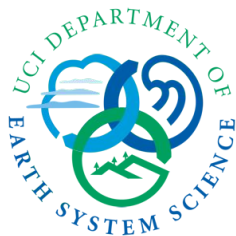




NCO Introduction

Week 2 The Beauty of Linux



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Half-baked seminar
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Pre-seminar

1. Access to Linux system
2. Download examples
3. Get familiar with basic Linux commands

Outlines

1. Customize your working environment
2. Useful commands: `grep`, `sed` and `cut`

History of Linux

1970

UNIX

Bell Labs

Alcatel-Lucent
(AT&T)



Ken Thompson (Left)
Dennis Ritchie (Right)

Everything is FILE

1980

BSD

Bill Joy
UC Berkeley

System V (AT&T)
AIX (IBM)

GNU Project
Richard Stallman



1990

GNU/Linux

Linus Torvald



History of Linux

1970

UNIX

1980

BSD

1990

SunOS

GNU/Linux

"Free software" is a matter of liberty, not price. To understand the concept, you should think of "free speech", not "free beer". "Free software" refers to the users' freedom to run, copy, distribute, study, change, and improve the software

-- Richard Stallman



Ken Thompson (Left)
Dennis Ritchie (Right)

GNU Project

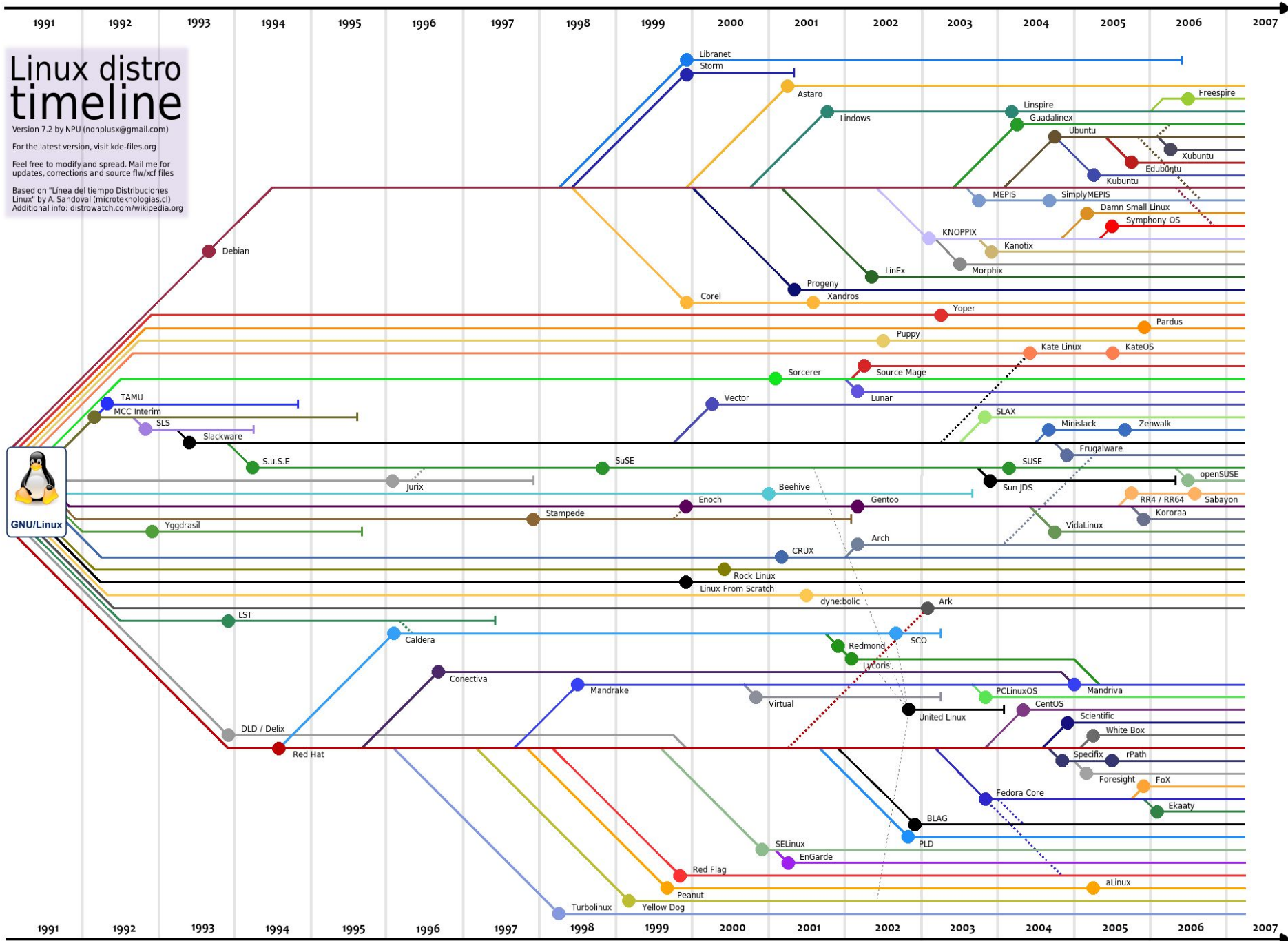
Richard Stallman



Everything is FILE



Based on "Línea del tiempo Distribuciones Linux" by A. Sandoval (microtecnologias.cl)
Additional info: distrowatch.com/wikipedia.org



Connect to a Linux system

1. PC
2. Account on Linux servers

(Use UCI HPC as example in this seminar)

```
$ ssh wenshanw@hpc.oit.uci.edu  
(enter your password)
```

Basic commands

- `ls` : List Directory Contents
- `cd` : Change Directory
- `mv` : Move
- `cp` : Copy
- **`rm` : Remove** (opt: trash-cli)
- `cat` : Concatenation

ls : List Directory Contents

- Options: -a, -l, -t, -r
- Permissions
- Tab: auto-completion
- Globbing (wildcards)

cd: Change Directory

- Tab: auto-completion
- `cd;` `cd ~;` `cd ..;` `cd -`
- `pwd`

Preferences `.bashrc`

- Alias
- Settings: eg, prompt color
- Environmental variables: eg, PATH
- Commands: eg, module

Useful commands: grep

grep: print lines matching a pattern

```
$ grep -ir '[pattern]' *
```

grep practice

```
$ grep -n 'the' grep_practice.txt
```

Find out the line numbers of:

1. Lines including 'the'
2. Lines not including 'the'
3. Lines starting with 'the'
4. Lines including numbers

Search Keyword: regular expression

sed: find and replace

sed: stream editor for filtering and transforming text

```
$ sed 's/[old pattern]/[new pattern]'
```

- Change 'apple' to 'orange'
- Output your results to a file
- Sample script: `ncoworkshop/script/submit.sh`

cut : extract portion of texts

cut : remove sections from each line of files

```
$ cut -d '[delimiter]' -f [number of blocks]
$ cut -c [number of col]
```

1. Take the third station
2. Take the first to the third stations
3. Take the col 2-5

Pipe | combine commands

Command 1 | Command 2 | Command n >> output

```
$ grep '[pattern]' | cut -d ...  
$ sed ... | cut ...  
$ ls ... | grep ... | cut ...
```

- 1, What are the third words of lines including number?
- 2, What are the names of GC-Net stations?

Reference

- 鸟哥的Linux私房菜, http://vbird.dic.ksu.edu.tw/linux_basic/linux_basic.php#part1