
# IX International Course of Massive Data Analysis FOR GENOMICS

## Introduction to Linux Shell

EMBL-EBI

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Presentation

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# Introduction
## What is GNU/Linux and the Shell?

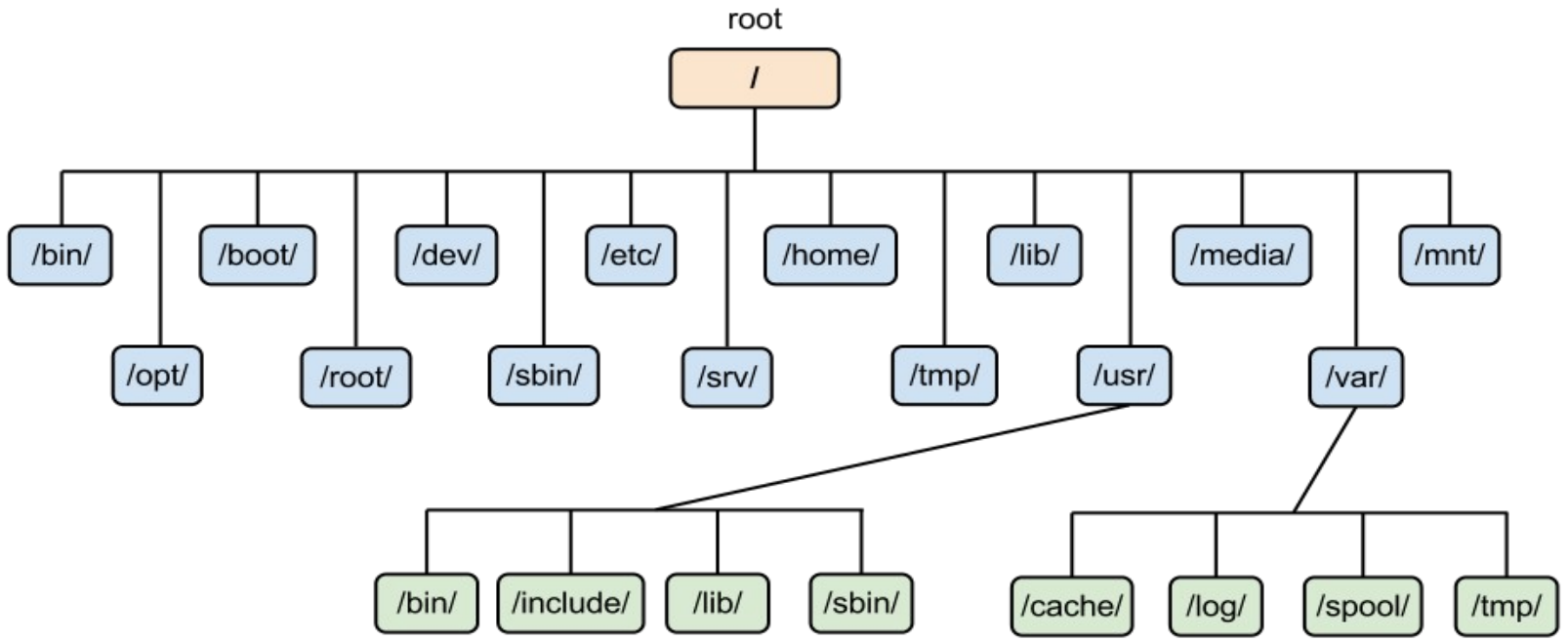
- GNU/Linux is a **free** and **open-source** operating system developed by thousands of contributors and led by *Linus Torvalds* since the beginning in 1991
- Linux ***shells*** (commonly *Bash*) allow users to execute more than 200 commands and to write pipelines in the *Shell Script* programming language to automatize tasks
- Linux is widely used in research and super computers, more than 96% of super computers use Linux:
  - http://www.top500.org/statistics/list
- It's an essential tool for bioinformatics and big data analysis and research

# Introduction
## Why we use Linux?

- Linux offers:
  - Ease to program and work with big data
  - Stability
  - Security
  - Low price
  - High-performance computing
  - ...
- Usually visual graphical interfaces to software does not exist

# Introduction
## Linux filesystem

- All paths start at '***/***' called ***root***, no *C:* or *D:* like in Windows. Similar to other Unix-like systems such as Mac OS
- Users home folders under '***/home***', ie. */home/participant*

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# Introduction
## Understanding *paths*

- A ***path*** identifies uniquely a file or directory in the file system.
- The character '***/***' is used to concatenate directories
- **IMPORTANT -** Two types of paths:
  - **Absolute**: Always start with '***/***' which is the root folder. Example:
    - *ls /home/participant/Desktop*
  - **Relative**: All paths not beginning with '***/***' but with a file o folder name. Example
    - *ls Desktop*
- *'Tab'* key is your friend, auto-completes the paths for you if you press twice

# Introduction
## Understanding *$PATH* variable

- A ***$PATH*** is a environment variable that list all directories in the system with *binaries* (executable programs)
- You can see the list by executing:
  - *echo $PATH*
- All binaries in one of these directories can be executed automatically in the shell, no absolute path is needed
- You can use '*Tab*' key twice to autocomplete the binary name

# Most useful commands
## Working with files and directories

- Many tutorials and documentation:
  - http://linuxcommand.org/learning_the_shell.php
- Inline help in the shell using command '***man***', ie. *man ls*
- Some useful ***shell commands***:
  - cd
  - ls
  - mkdir and rm
  - pwd
  - mv
  - cp
  - less, head and tail
  - tree
  - Output redirection: '**>**'
  - grep
  - **...**

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