Introduction to Linux Shell

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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

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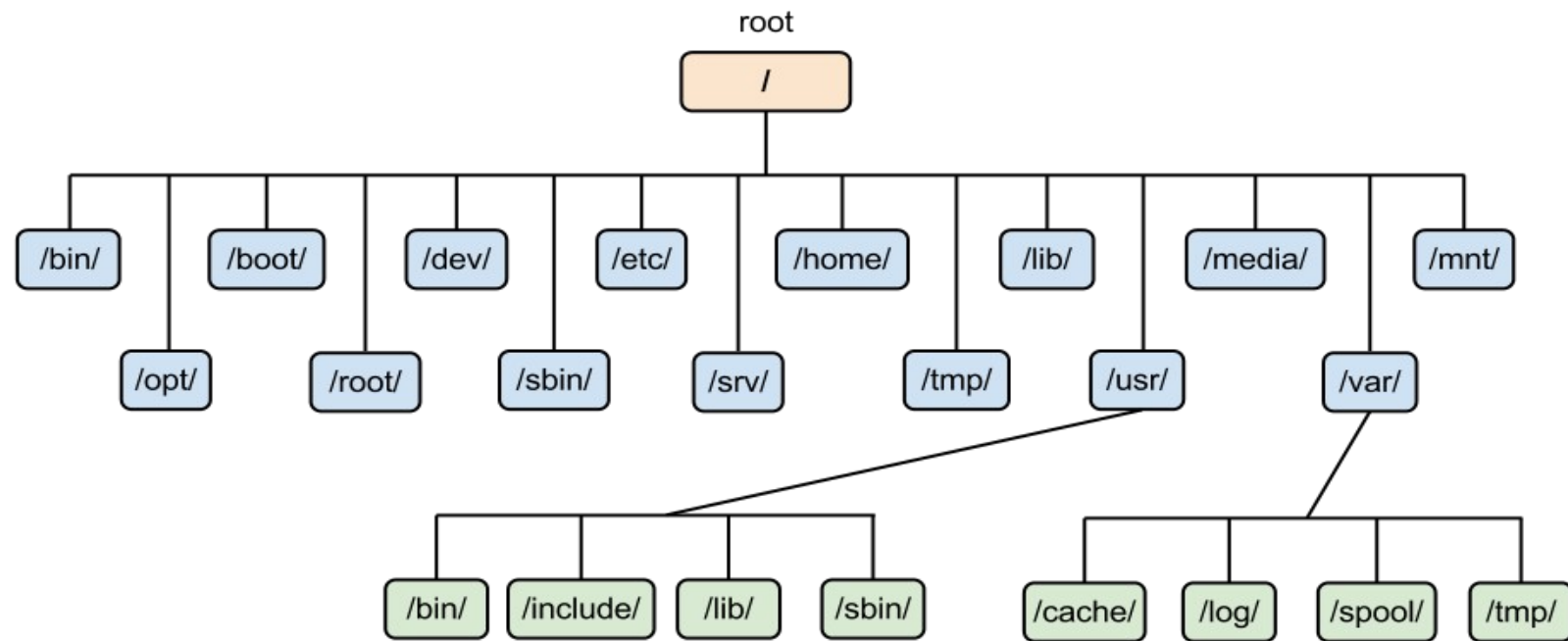**Presentation**

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

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Introduction
Understanding *$PATH* variable

- A *$PATH* is a environment variable that list all directories 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: '**>**'
  - **...**

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