

# Lab 1: Introduction to Linux and GitHub



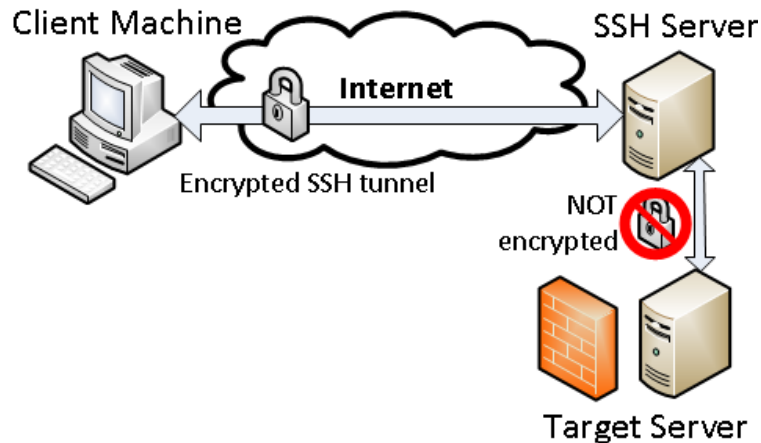
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Linux

## Remote login using SSH

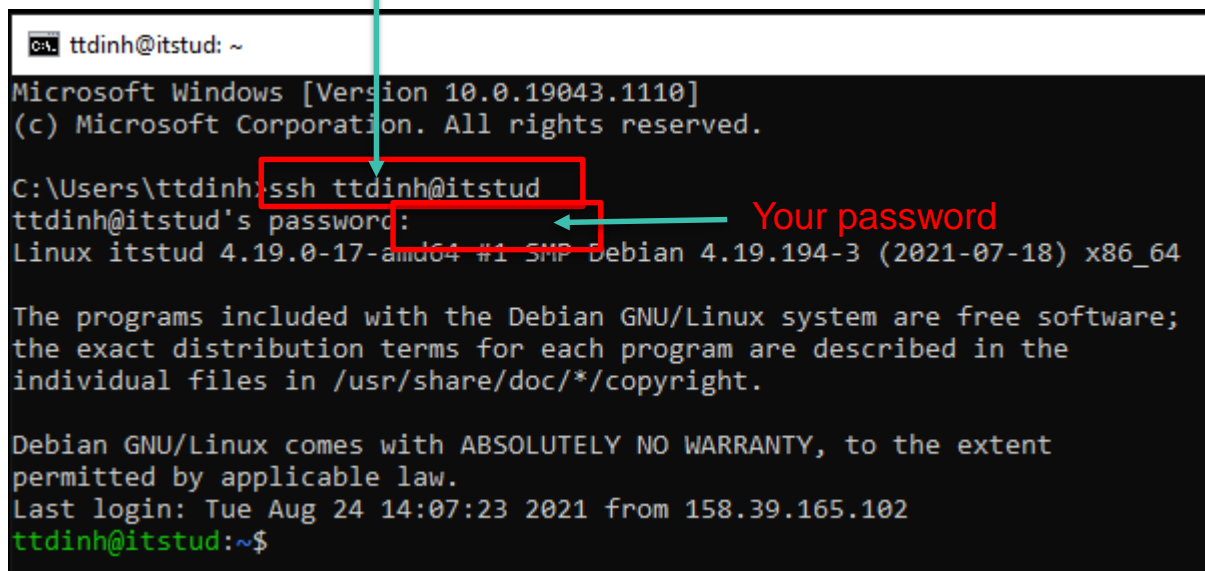
- **Secure Shell** (SSH) is a protocol for secure remote access to a machine over untrusted networks
- Use encryptions



(\*) Pictures taken from the Internet

# Remote login using SSH

Your HiOF username

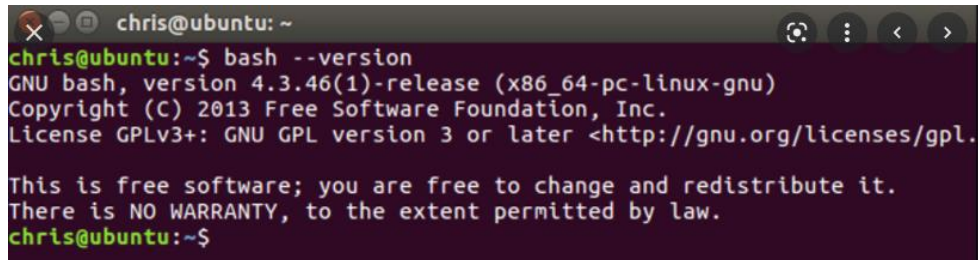


```
tt dinh@itstud: ~  
Microsoft Windows [Version 10.0.19043.1110]  
(c) Microsoft Corporation. All rights reserved.  
C:\Users\ttdinh> ssh tt dinh@itstud  
tt dinh@itstud's password:  
Linux itstud 4.19.0-17-amd64 #1 SMP Debian 4.19.194-3 (2021-07-18) x86_64  
  
The programs included with the Debian GNU/Linux system are free software;  
the exact distribution terms for each program are described in the  
individual files in /usr/share/doc/*/copyright.  
  
Debian GNU/Linux comes with ABSOLUTELY NO WARRANTY, to the extent  
permitted by applicable law.  
Last login: Tue Aug 24 14:07:23 2021 from 158.39.165.102  
tt dinh@itstud:~$
```

The screenshot shows a Windows command prompt where the user 'tt dinh' runs the command 'ssh tt dinh@itstud'. A red box highlights the username 'tt dinh' in the command, with a red arrow pointing to it from the text 'Your HiOF username'. Another red box highlights the password prompt 'tt dinh@itstud's password:', with a red arrow pointing to it from the text 'Your password'. The terminal output shows the user is logged into a Debian Linux system named 'itstud'.

# Command Line

- Command line in Linux is called a **shell**
- Shell
  - OS user interface
  - Text-based command
  - Allows users to control their computers using text-based commands
- Most Linux distributions use bash as default shell – **bash shell**



```
chris@ubuntu: ~  
chris@ubuntu:~$ bash --version  
GNU bash, version 4.3.46(1)-release (x86_64-pc-linux-gnu)  
Copyright (C) 2013 Free Software Foundation, Inc.  
License GPLv3+: GNU GPL version 3 or later <http://gnu.org/licenses/gpl.  
  
This is free software; you are free to change and redistribute it.  
There is NO WARRANTY, to the extent permitted by law.  
chris@ubuntu:~$
```

(\*) Pictures taken from the Internet

## Basic Linux command line: Files/folders

- **ls**: list files in the current folder
  - `$ ls`
  - `$ ls -a`
- **mkdir**: create a new folder
  - `$ mkdir <foldername>`
- **rmdir**: remove a directory
  - `$ rmdir <foldername>`
- **pwd**: show name of current directory
  - `$ pwd`
- **rm**: remove a file or a folder
  - `$ rm <filename>`
- **cd**: change directory
  - `$ cd <foldername>`
  - `$ cd ~`: move to the home folder
- **mv**: move/rename a file/directory
  - `$ mv <filename> <destinationFolder>`
- **cp**: copy a file
  - `$ mv <file1> <file2>`
- **cat**: print content of a file
  - `$ cat <filename>`
  - `$ cat <directory/filename>`

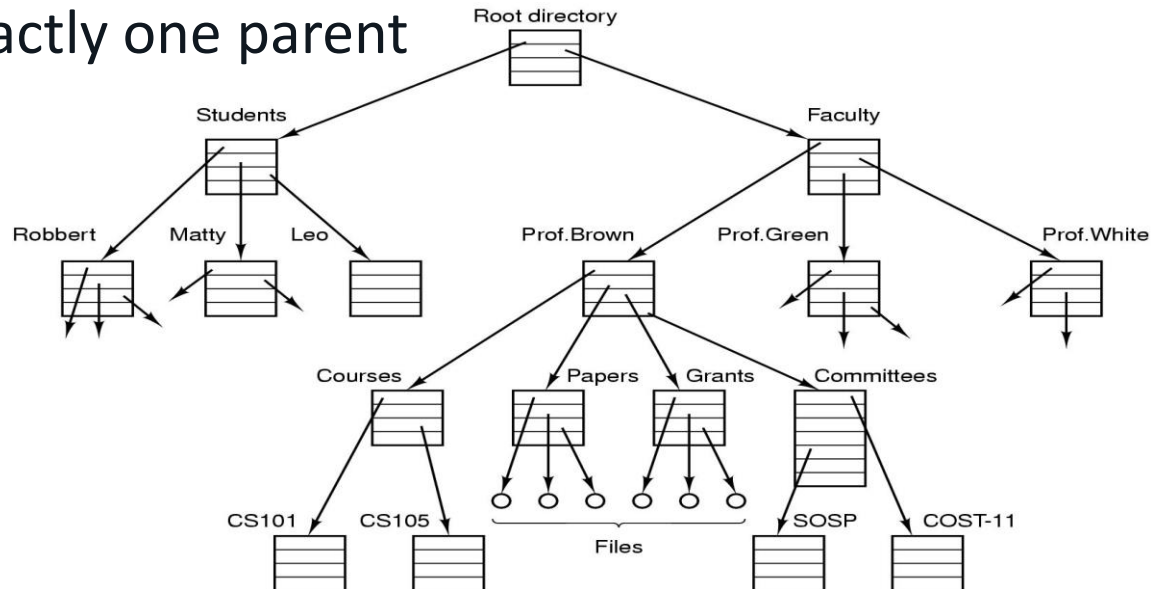
## Basic Linux command line: Search

- **which**: locate a command
  - `$ which ls`
- **whereis**: locate the binary, source, and manual page files for a command
  - `$ whereis ls`
- **locate**: list files in databases that match a pattern
  - `$ locate stdlib.h`
- **find**: search for a file in a directory hierarchy
  - `$find / | grep stdio.h`



# Directory

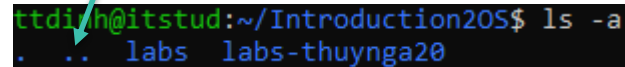
- Each user is given with a directory under home directory
- Example: /home/ttdinh/Introduction2OS
- Each directory has exactly one parent



## Current directory and parent directory

- Current directory is presented by single dot (.)
  - “.” : means “this directory”
- Parent directory is presented by double dot (..)
  - “..” : means “ directory above this one ”

Refer to parent directory



```
ttidi/h@itstud:~/Introduction20S$ ls -a
.  ..  labs  labs-thuynga20
```

Refer to current directory

## Absolute path and relative path

- Path: a position in a directory tree
- Absolute path:
  - Start from the root directory “/” or “~”
  - Example: /home/ttdinh/Introduction2OS
  - Unique
- Relative path:
  - Start from current working directory
  - Example: ./Introduction2OS/labs
  - Depend on current path

Manual pages

## Man page

- A documentation manual of different commands available in Unix or Unix-like OS
- Example:
  - `$ man ls`
  - Display manual for “ls” command

LS(1)

User Commands

LS(1)

## NAME

ls - list directory contents

## SYNOPSIS

ls [OPTION]... [FILE]...

## DESCRIPTION

List information about the FILES (the current directory by default). Sort entries alphabetically if none of -cftuvSUX nor --sort is specified.

Mandatory arguments to long options are mandatory for short options too.

-a, --all

do not ignore entries starting with .

-A, --almost-all

do not list implied . and ..

--author

with -l, print the author of each file

-b, --escape

print C-style escapes for nongraphic characters

--block-size=SIZE

with -l, scale sizes by SIZE when printing them; e.g., '--block-size=M'; see SIZE format below

GitHub

## GitHub

- Kind of distributed version control system (VCS)
- Clone an existing Git repository from another server:
- `$ git clone`

```
$ git clone git@github.com:Introduction20S/labs.git  
$ cd labs
```

- Working with remote:
- `$ git pull`
- `$ git push`



# Requirements

## Requirements for Lab1

### › Practices

- › Be familiar with some basic commands in Linux
- › Know how to clone, pull a repository from git repository
- › Know how to upload a file to git repository

### › Exercises

- › Do  $\geq 2/3$  exercises

