

## *Introduction to Linux*

### 1 Overview of Linux

### 2 Login

#### Exercise 1: First commands

List of usefull links: [Putty Tunnelier](#)

List of usefull commands:

<code>ls</code>	list files
<code>cd</code>	change directory
<code>pwd</code>	path of the current
<code>man</code>	get help on commands
<code>apropos</code>	search for a command and print a brief description
<code>echo</code>	print the arguments in the terminal

- Connect to the remote machine `scitascours1.epfl.ch`.
- Check your current folder and your files.
- Check the help of `ls` (Q to quit).

### 3 File-system

#### Exercise 2: Directory structure

- Show directory structure under the root folder
- Change directory to the root folder and list the content

#### Exercise 3: Relative/absolute path

- Try the command `ls -a`
- List the parent folder of your home
- List the root folder with a relative path

- To what correspond the folder `../../../../`

#### Exercise 4: File handling commands

<code>cp</code>	copy files
<code>mv</code>	move/rename files
<code>rm</code>	remove file <b>caution no trash</b>
<code>mkdir</code>	create a folder
<code>cat</code>	print the content of file, used to concatenate
<code>touch</code>	update the date of a file, used to create empty files
<code>tail/head</code>	print the end/beginning of a file
<code>more/less</code>	print the content of a file “more or less the same”
<code>grep</code>	search a string in a file
<code>find</code>	find a file
<code>file</code>	the type of file based on content

- Test the different commands (do not forget you can check the help with `man <command>`)
- Create a directory named `exercise_linux`
- Copy the file `CodingStyle` from your home folder into the `exercise_linux` folder
- Check the content of this file
- Print the last 3 lines
- Find the lines containing the word “coding” independently of the case
- Rename the file as `KernelCodingStyle`
- Copy the folder `exercise_linux` to `exo_linux`
- Remove the folder `exercise_linux`

#### Exercise 5: Permissions

Partial results of the command `ls -l CodingStyle`

```
-rw- r-- r-- richart scitas-ge CodingStyle
```

u User permissions  
g Group permissions  
o Other users permissions

- or 0	Permission not granted
r or 4	Read/List permission
w or 2	Write/Create permission
x or 1	Execute/Traverse permission
<span style="background-color: #ffe0b2;">chmod</span>	change permissions
<span style="background-color: #ffe0b2;">chgrp</span>	change main group
<span style="background-color: #ffe0b2;">chown</span>	change ownership
<span style="background-color: #ffe0b2;">newgrp</span>	login with a new group as main group
<span style="background-color: #ffe0b2;">id</span>	print user and group ids

- Print your ids
- Check the permissions of your home folders
- Change the the default group of the file `KernelCodingStyle` to `users`
- Remove the list permission on `exo_linux`
- Try to list the `exo_linux` folder of someone that as completed the previous step

## 4 Shell

### Exercise 6: Expansions

<span style="background-color: #ffe0b2;">touch</span>	change the date of a file used to create new files
<span style="background-color: #ffe0b2;">echo</span>	print to the screen
<span style="background-color: #ffe0b2;">export</span>	make a variable known in all the new subprocess

- Try the command `touch file{0,1,2}{0,1,2,3,4,5}.log`
- List your home folder with a tilde expression
- Set a variable `FOO` to the content of your choice and print its content

- Try the commands:
 

```
touch foo bar
touch "foo bar"
export BROL=brol
touch "foo bar $BROL"
touch 'foo bar $BROL'
```
- List all file of the form `file<number>.log`
- List the files `file<number>.log` where <number> is any number with last digit 2,3 or 4
- Remove the previous files using the results of the ls command

### Exercise 7: Redirection

<code>date</code>		print the date
<code>wc</code>		wc count the numbers of lines/words/characters in a file

Syntax for redirections:

- `command > file` redirect the standard output to file
  - `command 2> file` redirect the standard error to file
  - `command < file` redirect file to the standard input
  - `command1 | command2` redirect the stdout of `command1` in stdin of `command2`
- Redirect the content of the `date` command in the `date.log` file
  - Count the number of words generated by the command `date` with the help of the command `wc`
  - Redirect the error output for the command `ls / tmp`

### Exercise 8: Execution

<code>ps</code>		list the running processes
<code>jobs</code>		list the jobs running in the current shell
<code>kill</code>		kill processes
<code>bg</code>		resume jobs in background
<code>fg</code>		resume jobs in foreground

- Run the command `(sleep 5; echo Slept well)`
- Run the command `(sleep 5; echo Slept well)&`

- Now you have 5 seconds to check the pid with `ps`
- If you still have spare seconds kill the process before it print on screen

## 5 Editing files

### Exercise 9: Execution

```
- nano
  Ctrl-o | save file
  Ctrl-x | quit

- vi
  i | insert
  esc | go back to command mode
  :wq | save and quit
  :q! | force quit

- emacs
  Ctrl-x Ctrl-s | save file
  Ctrl-x Ctrl-c | quit
```

- Try this editors

## 6 Scripts

### Exercise 10: Shell scripts

- Write a script that print `Hello World`, wait 2seconds and then print the date
- Make your script executable
- Run it