

# Outils libres côté client

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## **Table des matières**

# 1 TP1 - Efficacité de l'environnement

## 1.1

Description	Raccourci
Changer d'onglet sur un terminal	Ctrl + Page up / Ctrl + Page down
Sélectionner un document sur google docs	Espace pour ouvrir le menu des documents puis tab pour sélectionner le document
Ouvrir une nouvelle fenêtre de l'élément en cours	Ctrl + shift + N
Définir une zone de capture d'écran	Fn + Maj + Impr.ecran
Commande clear	Ctrl + L
Ajouter un favori sur Firefox	Shift + D
Présentation des onglets ouverts	Super + S
Split vertical tmux	Ctrl+ B puis MAJ + %
Split horizontale tmux	Ctrl + B puis "
Changement de fenêtre tmux	Ctrl B + Flèches directionnelles
Vérouiller la session	Super + L
Avancer	Tab
Reculer dans un tableau	Shift + Tab
Agrandir / minimiser une fenêtre	Alt + F10

TABLE 1 – Raccourcis Linux.

## 1.2

Le site [Fastfingers](#) permet d'évaluer la vitesse de frappe.

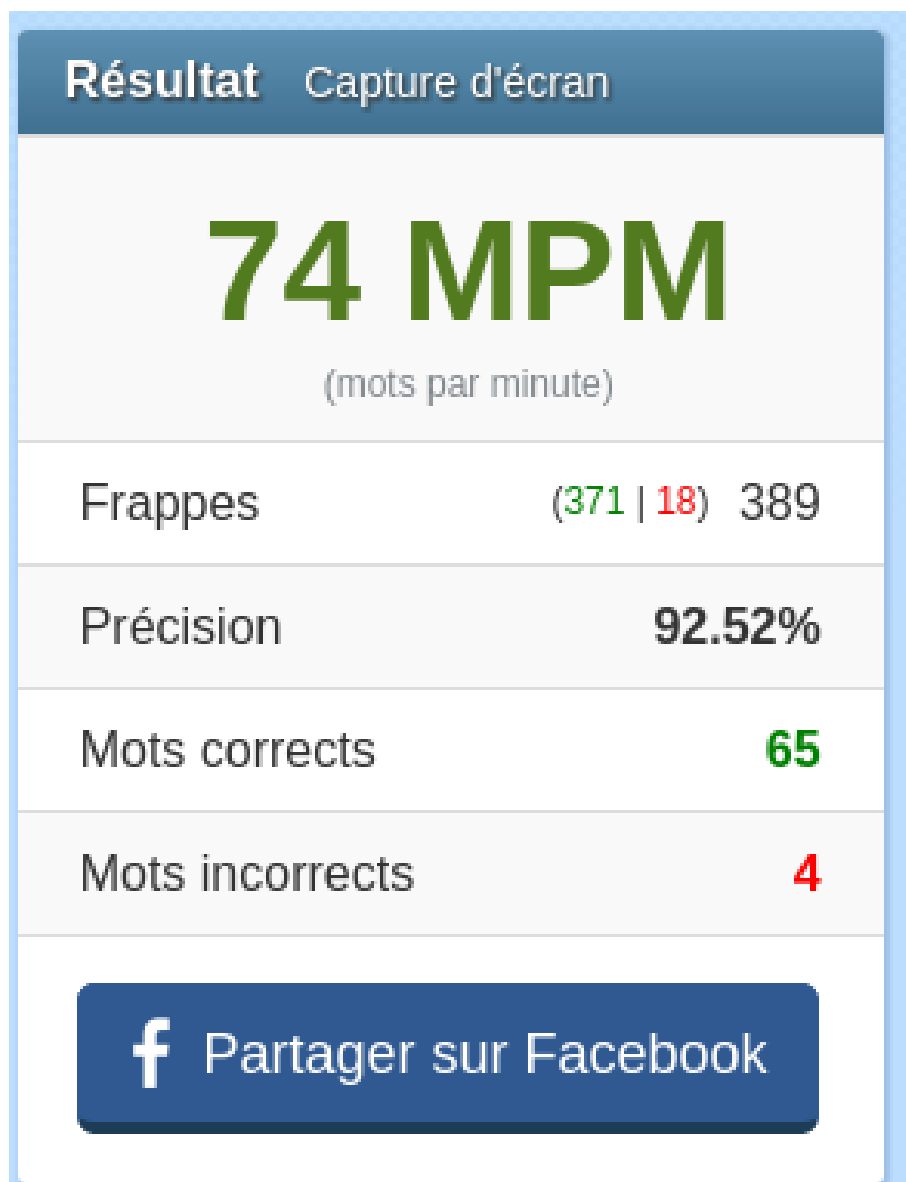


FIGURE 1 – Capture d'écran.

### 1.3

- Paramétrer GNU Readline pour être en mode Emacs :

```
set -o emacs
```

- Paramétrer Emacs pour être l'éditeur par défaut :

```
update-alternatives --config editor
```

### 1.4

- L'*history* peut contenir des informations sensibles comme des mots de passe ou d'autres commandes sensibles avec des privilèges élevées. Avoir un *history* court peut signifier que la personne utilise un autre shell (avec un autre *history*) ou que la personne a vidé son *history* (*history -c* avec des droits appropriés).
- Pour éviter de polluer l'*history* avec des commandes simples comme *ls*, *cd* ou *pwd*, on peut utiliser la commande suivante :

```
vagrant@bullseye:/etc$ update-alternatives --config editor
There are 3 choices for the alternative editor (providing /usr/bin/editor).
```

Selection	Path	Priority	Status
* 0	/bin/nano	40	auto mode
1	/bin/nano	40	manual mode
2	/usr/bin/vim.basic	30	manual mode
3	/usr/bin/vim.tiny	15	manual mode

FIGURE 2 – Capture d’écran.

```
export HISTIGNORE='ls:cd:pwd'
```

- Pour remettre ça à zéro tout cela, il suffit de laisser un *history* vide avec la commande suivante :

```
export HISTIGNORE=
```

## 1.5

- Fonction *mkcd* placée dans le fichier `~/.bashrc` :

```
#!/bin/bash
mkcd () {
    mkdir $1
    cd $1
}
```

- Fonction *gitemergency* placée dans le fichier `~/.bashrc` :

```
#!/bin/bash
gitemergency () {
    git add .
    git commit -m "commit d'urgence" $1
    git push
}
```

## 1.6

- Créer un script vide *backup.sh*.
- Ajouter le script suivant dans `/etc/bash_completion` :

```
#!/bin/bash
_backup() {
    local cur prev opts

    cur="${COMP_WORDS[COMP_CWORD]}"
    prev="${COMP_WORDS[COMP_CWORD-1]}"

    local files=("${cur}*" )

    case $COMP_CWORD in
        1) opts='getent passwd | cut -d: -f1 ';;
        2) opts="now tonight tomorrow";;
        3) opts="${files[@]}";;
        *);;
    esac

    COMPREPLY=()
    COMPREPLY=( $(compgen -W "$opts" -- "${cur}") )
```

```

return 0
}
complete -o nospace -F _backup backup

```

## 1.7

Après l'installation de *zsh*, on peut voir dans le fichier `.oh_my_zsh/themes/[theme_actuel]` de plugin *vagrant-prompt* son fonctionnement :

```

# vim:ft=zsh ts=2 sw=2 sts=2
#
# To display Vagrant infos on your prompt add the vagrant_prompt_info to the
# $PROMPT variable in your theme. Example:
#
# PROMPT='%{$fg[NCOLOR]%}%B%n%b%{$reset_color%}%{$fg[blue]%}%B%c/%b%{$reset_color%} $(vagrant_prompt_info)$($svn_prompt_info)$($git_prompt_info)%(!.#.$) '
#
# 'vagrant_prompt_info' makes use of some custom variables. This is an example
# definition:
#
# ZSH_THEME_VAGRANT_PROMPT_PREFIX="%{$fg_bold[blue]%}["
# ZSH_THEME_VAGRANT_PROMPT_SUFFIX="%{$fg_bold[blue]%}%{$reset_color%} "
# ZSH_THEME_VAGRANT_PROMPT_RUNNING="%{$fg_no_bold[green]%}●"
# ZSH_THEME_VAGRANT_PROMPT_POWEROFF="%{$fg_no_bold[red]%}●"
# ZSH_THEME_VAGRANT_PROMPT_SUSPENDED="%{$fg_no_bold[yellow]%}●"
# ZSH_THEME_VAGRANT_PROMPT_NOT_CREATED="%{$fg_no_bold[white]%}○"

function vagrant_prompt_info() {
  local vm_states vm_state
  if [[ -d .vagrant && -f Vagrantfile ]]; then
    vm_states=({(f)%$(vagrant status 2> /dev/null | sed -nE 's/^.*(saved|poweroff|running|not created) \([[:alnum:]]_+\)/\1/p'})})
    printf '%s' $ZSH_THEME_VAGRANT_PROMPT_PREFIX
    for vm_state in $vm_states; do
      case "$vm_state" in
        saved) printf '%s' $ZSH_THEME_VAGRANT_PROMPT_SUSPENDED ;;
        running) printf '%s' $ZSH_THEME_VAGRANT_PROMPT_RUNNING ;;
        poweroff) printf '%s' $ZSH_THEME_VAGRANT_PROMPT_POWEROFF ;;
        "not created") printf '%s' $ZSH_THEME_VAGRANT_PROMPT_NOT_CREATED ;;
      esac
    done
    printf '%s' $ZSH_THEME_VAGRANT_PROMPT_SUFFIX
  fi
}

```

FIGURE 3 – Capture d'écran.

Il suffit ensuite d'ajouter les variables en commentaires au theme actuel dans le fichier `.oh_my_zsh/themes/[theme_actuel]` :

```

# ZSH Theme - Preview: https://i.gyazo.com/8becc8a7ed5ab54a0262a470555c3eed.png
local return_code="%{?..%{$fg[red]%}%? ↵%{$reset_color%})"

PROMPT='%{$fg[green]%}%~%{$reset_color%} $(ruby_prompt_info) $(git_prompt_info)%
{$reset_color%}%B$%b '
R_PROMPT="%{$return_code}"

ZSH_THEME_GIT_PROMPT_PREFIX="%{$fg[yellow]%}<"
ZSH_THEME_GIT_PROMPT_SUFFIX="> %{$reset_color%}"

ZSH_THEME_RUBY_PROMPT_PREFIX="%{$fg[red]%}<"
ZSH_THEME_RUBY_PROMPT_SUFFIX="> %{$reset_color%}"

ZSH_THEME_VAGRANT_PROMPT_PREFIX="%{$fg_bold[blue]%}["
ZSH_THEME_VAGRANT_PROMPT_SUFFIX="%{$fg_bold[blue]%}%{$reset_color%} "
ZSH_THEME_VAGRANT_PROMPT_RUNNING="%{$fg_no_bold[green]%}●"
ZSH_THEME_VAGRANT_PROMPT_POWEROFF="%{$fg_no_bold[red]%}●"
ZSH_THEME_VAGRANT_PROMPT_SUSPENDED="%{$fg_no_bold[yellow]%}●"
ZSH_THEME_VAGRANT_PROMPT_NOT_CREATED="%{$fg_no_bold[white]%}○"

```

FIGURE 4 – Capture d'écran.

On rajoute le plugin dans le `.zshrc` et on redémarre *zsh* :

```

vkbida:~/ $ cd Documents/vagrant_vms
vkbida:vagrant_vms/ [●] $ cd CEPH
vkbida:CEPH/ $ cd multinode-ceph-vagrant-master
vkbida:multinode-ceph-vagrant-master/ [○○○○] $ cd ../../
vkbida:vagrant_vms/ [●] $ vagrant halt
==> default: Attempting graceful shutdown of VM...
vkbida:vagrant_vms/ [●] $

```

FIGURE 5 – Capture d'écran.

## 1.8

Script ajouté dans le fichier .zshrc :

```

function apache-shortcut() {
    status=$(sudo service apache2 status | grep active)
    if [ -z "$status" ]
    then
        echo "Lancement des services apache et MariaDb"
        sudo service apache2 start
    else
        echo "arrêt des services apache et MariaDb"
        sudo service apache2 stop
    fi
}
zle -N apache-shortcut
bindkey "\C-A" apache-shortcut_

```

FIGURE 6 – Capture d'écran.

## 1.9

- Guake : Peut s'activer et se désactiver avec une touche (F12) - Transparent - Coloré.
- Konsole : Petit et compact - Permet de configurer des profils - Gestion d'onglets.
- Termit : Compact - Gestion des onglets - Fonction de copier-coller - Gestion de différentes sessions.

## 2 TP2 - SSH

### 2.1

```
ssh alice@10.0.0.3
ssh bob@10.0.0.3
ssh carole@10.0.0.3
```



FIGURE 7 – Capture d’écran.

On constate que l’*history* local est vide car on se connecte pour la première fois sur la session d’un utilisateur d’une nouvelle machine.

### 2.2

```
cd ~/Documents/Outils_lib/vagrant/
ssh-keygen
ssh-copy-id alice@10.0.0.3
```

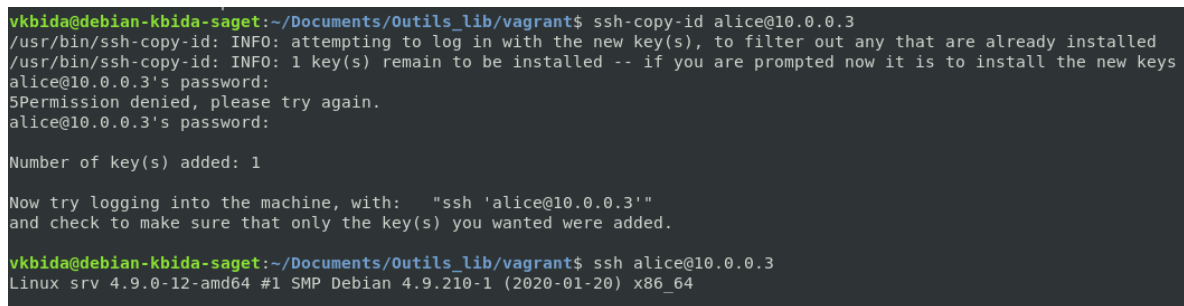


FIGURE 8 – Capture d’écran.

```
mkdir -p ~/.ssh
cat /vagrant/vag.pub >> ~/.ssh/authorized_keys
```

### 2.3

- Purger le fichier ~/.ssh/known\_hosts :  
echo "" > ~/.ssh/known\_hosts
- Ajouter les clés manuellement :  
cat /vagrant/vag.pub >> ~/.ssh/authorized\_keys

- Modifier le fichier de configuration SSH :

```
sudo vi ~/.ssh/config
```

- Ajouter :

```
Host bc
    Hostname 10.0.0.3
    User bob
```

- Connexion via SFTP :

```

vkbida@debian-kbida-saget:~/Documents/Utils_lib_cli/vagrant$ sftp alice@10.0.0.2
alice@10.0.0.2's password:
Connected to alice@10.0.0.2.
sftp> get /vagrant/testEnvoi
Fetching /vagrant/testEnvoi to testEnvoi
sftp> put testEnvoi
Uploading testEnvoi to /home/alice/testEnvoi
testEnvoi
sftp> exit
vkbida@debian-kbida-saget:~/Documents/Utils_lib_cli/vagrant$ vagrant ssh alice@10.0.0.2
The machine with the name 'alice@10.0.0.2' was not found configured for
vkbida@debian-kbida-saget:~/Documents/Utils_lib_cli/vagrant$ vagrant ssh cli
Linux cli 4.9.0-12-amd64 #1 SMP Debian 4.9.210-1 (2020-01-20) 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: Wed Feb  9 10:24:57 2022 from 10.0.2.2
vagrant@cli:~$ cd /home/alice/
vagrant@cli:~/home/alice$ ls
testEnvoi
vagrant@cli:~/home/alice$

```

FIGURE 9 – Capture d'écran.

- Connexion via SSHFS et vérification :

```

vkbida@debian-kbida-saget:~/Documents/Utils_lib_cli/vagrant$ sshfs alice@10.0.0.2:/home/alicecli/
alice@10.0.0.2's password:
vkbida@debian-kbida-saget:~/Documents/Utils_lib_cli/vagrant$ cd /alicecli/
vkbida@debian-kbida-saget:~/Documents/Utils_lib_cli/vagrant/alicecli$ ls
alice bob carol vagrant
vkbida@debian-kbida-saget:~/Documents/Utils_lib_cli/vagrant/alicecli$ cd /alice/
vkbida@debian-kbida-saget:~/Documents/Utils_lib_cli/vagrant/alicecli/alice$ ls
testEnvoi
vkbida@debian-kbida-saget:~/Documents/Utils_lib_cli/vagrant/alicecli/alice$ gedit testEnvoi
vkbida@debian-kbida-saget:~/Documents/Utils_lib_cli/vagrant/alicecli/alice$ cat testEnvoi
Bonjour tout le monde
vkbida@debian-kbida-saget:~/Documents/Utils_lib_cli/vagrant/alicecli/alice$ echo "test sshfs" > testEnvoi
vkbida@debian-kbida-saget:~/Documents/Utils_lib_cli/vagrant/alicecli/alice$ cat testEnvoi
test sshfs
vkbida@debian-kbida-saget:~/Documents/Utils_lib_cli/vagrant/alicecli/alice$ cd ../../
vkbida@debian-kbida-saget:~/Documents/Utils_lib_cli/vagrant$ ssh alice@10.0.0.2
alice@10.0.0.2's password:
Linux cli 4.9.0-12-amd64 #1 SMP Debian 4.9.210-1 (2020-01-20) 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.
alice@cli:~$ ls
testEnvoi
alice@cli:~$ cat testEnvoi
test sshfs
alice@cli:~$

```

FIGURE 10 – Capture d'écran.

## 2.4

- Sur la machine physique :

```
ssh -L 8000:srv.local:80 alice@cli.local
```

- Rester connecté sur *cli.local* avec l'utilisateur *alice*. Le serveur n'a normalement pas besoin d'utilisateur.



## 2.5

- Sur la machine physique :  

```
ssh -D 9000 srv.local  
sudo vi /etc/tsocks.conf
```
- Commenter les lignes suivantes (car *Vagrant* est en local) :  

```
#local = 192.168.0.0/255.255.255.0  
#local = 10.0.0.0/255.0.0.0
```
- Modifier la ligne suivante :  

```
server_port = 9000
```

## 2.6

- Sur la machine cliente :  

```
sudo apt install x11-apps  
sudo nano /etc/ssh/ssh_config
```
- Modifier la ligne suivante :  

```
# ForwardX11 yes
```
- Redémarrer le service :  

```
sudo systemctl restart sshd
```
- Sur la machine physique :  

```
ssh -X bob@10.0.0.2  
xeyes
```

## 2.7

- Sur la machine physique pour le *ProxyJump*, créer le fichier `.ssh/config` :
- Ajouter au fichier `.ssh/config` :  

```
Host cli  
    HostName 10.0.0.2  
    User bob  
  
Host srv  
    HostName 10.0.0.3  
    User alice  
    ProxyJump cli
```
- Dans le terminal :  

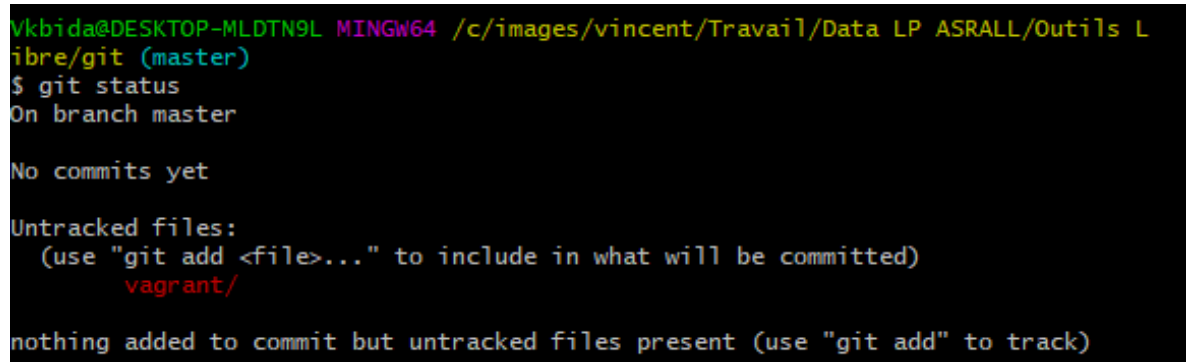
```
ssh srv
```
- Sur la machine physique pour le *ProxyCommand*, créer le fichier `.ssh/config` :
- Ajouter au fichier `.ssh/config` :  

```
Host cli  
    HostName 10.0.0.2  
    User bob  
  
Host srv  
    HostName 10.0.0.3  
    User alice  
    ProxyCommand ssh cli -W %h:%p
```
- Dans le terminal :  

```
ssh srv
```

### 3 TP3 - Git

#### 3.1



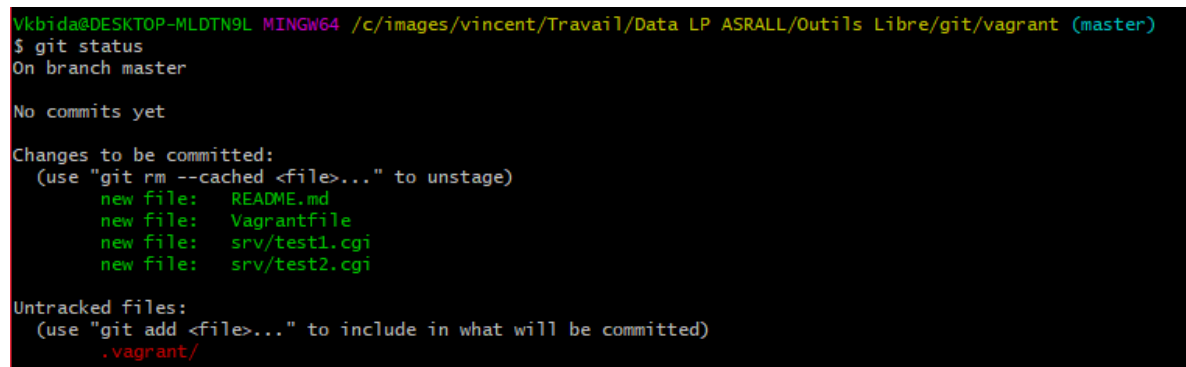
```
Vkbida@DESKTOP-MLDTN9L MINGW64 /c/images/vincent/Travail/Data LP ASRALL/Outils Libre/git (master)
$ git status
On branch master

No commits yet

Untracked files:
  (use "git add <file>..." to include in what will be committed)
    vagrant/

nothing added to commit but untracked files present (use "git add" to track)
```

FIGURE 11 – Capture d'écran.



```
Vkbida@DESKTOP-MLDTN9L MINGW64 /c/images/vincent/Travail/Data LP ASRALL/Outils Libre/git/vagrant (master)
$ git status
On branch master

No commits yet

Changes to be committed:
  (use "git rm --cached <file>..." to unstage)
    new file:   README.md
    new file:   Vagrantfile
    new file:   srv/test1.cgi
    new file:   srv/test2.cgi

Untracked files:
  (use "git add <file>..." to include in what will be committed)
    .vagrant/
```

FIGURE 12 – Capture d'écran.

```
Vkbida@DESKTOP-MLDTN9L MINGW64 /c/images/vincent/Travail/Data LP ASRALL/Outils Libre/git/vagrant (master)
$ git commit -m "Ajout du Vagrantfile et de ses fichiers de configuration"
[master (root-commit) 4f37bff] Ajout du Vagrantfile et de ses fichiers de configuration
21 files changed, 157 insertions(+)
create mode 100644 vagrant/.vagrant/machines/cli/virtualbox/action_provision
create mode 100644 vagrant/.vagrant/machines/cli/virtualbox/action_set_name
create mode 100644 vagrant/.vagrant/machines/cli/virtualbox/box_meta
create mode 100644 vagrant/.vagrant/machines/cli/virtualbox/creator_uid
create mode 100644 vagrant/.vagrant/machines/cli/virtualbox/id
create mode 100644 vagrant/.vagrant/machines/cli/virtualbox/index_uuid
create mode 100644 vagrant/.vagrant/machines/cli/virtualbox/private_key
create mode 100644 vagrant/.vagrant/machines/cli/virtualbox/synced_folders
create mode 100644 vagrant/.vagrant/machines/srv/virtualbox/action_provision
create mode 100644 vagrant/.vagrant/machines/srv/virtualbox/action_set_name
create mode 100644 vagrant/.vagrant/machines/srv/virtualbox/box_meta
create mode 100644 vagrant/.vagrant/machines/srv/virtualbox/creator_uid
create mode 100644 vagrant/.vagrant/machines/srv/virtualbox/id
create mode 100644 vagrant/.vagrant/machines/srv/virtualbox/index_uuid
create mode 100644 vagrant/.vagrant/machines/srv/virtualbox/private_key
create mode 100644 vagrant/.vagrant/machines/srv/virtualbox/synced_folders
create mode 100644 vagrant/.vagrant/rgloader/loader.rb
create mode 100644 vagrant/README.md
create mode 100644 vagrant/Vagrantfile
create mode 100644 vagrant/srv/test1.cgi
create mode 100644 vagrant/srv/test2.cgi
```

FIGURE 13 – Capture d'écran.

### 3.2

```
Vkbida@DESKTOP-MLDTN9L MINGW64 /c/images/vincent/Travail/Data LP ASRALL/Outils Libre/git/vagrant (master)
$ git checkout -b vagrant-branch
Switched to a new branch 'vagrant-branch'
```

FIGURE 14 – Capture d'écran.

```
Vkbida@DESKTOP-MLDTN9L MINGW64 /c/images/vincent/Travail/Data LP ASRALL/Outils Libre/git/vagrant (master)
$ git log
commit 4f37bff9293fde318fe2898c3884b2dfe38da204 (HEAD -> master)
Author: Pokill199 <vincentkvida@gmail.com>
Date: Thu Jan 13 09:40:57 2022 +0100

Ajout du Vagrantfile et de ses fichiers de configuration
```

FIGURE 15 – Capture d'écran.

```
Vkbida@DESKTOP-MLDTN9L MINGW64 /c/images/vincent/Travail/Data LP ASRALL/Outils Libre/git/vagrant (vagrant-branch)
$ git add -p Vagrantfile
warning: LF will be replaced by CRLF in vagrant/Vagrantfile.
The file will have its original line endings in your working directory
warning: LF will be replaced by CRLF in vagrant/Vagrantfile.
The file will have its original line endings in your working directory
warning: LF will be replaced by CRLF in vagrant/Vagrantfile.
The file will have its original line endings in your working directory
diff --git a/vagrant/Vagrantfile b/vagrant/Vagrantfile
index ea456ce..af8f307 100644
--- a/vagrant/Vagrantfile
+++ b/vagrant/Vagrantfile
@@ -12,6 +12,7 @@ Vagrant.configure("2") do |config|
   useradd --shell /bin/bash --create-home alice || true
   useradd --shell /bin/bash --create-home bob || true
   useradd --shell /bin/bash --create-home carol || true
+  useradd --shell /bin/bash --create-home patrick || true
   echo alice:1234 | chpasswd
   echo bob:azerty | chpasswd
   echo carol:secret | chpasswd
(1/2) Stage this hunk [y,n,q,a,d,j,g,/,e,?]? y
@@ -32,8 +33,9 @@ Vagrant.configure("2") do |config|
   b.vm.hostname = "srv"

   b.vm.provision "shell", inline: <<-SHELL
-   apt-get -y install apache2 ruby
+   apt-get -y install apache2 ruby php
+   a2enmod cgi
+   a2enmod php
   systemctl restart apache2.service
   cp /vagrant/srv/test1.cgi /usr/lib/cgi-bin/test1.cgi
   cp /vagrant/srv/test2.cgi /usr/lib/cgi-bin/test2.cgi
(2/2) Stage this hunk [y,n,q,a,d,k,g,/,s,e,?]? y
```

FIGURE 16 – Capture d'écran.

```
Vkbida@DESKTOP-MLDTN9L MINGW64 /c/images/vincent/Travail/Data LP ASRALL/Outils Libre/git/vagrant (vagrant-branch)
$ git commit -m "Ajout de patrick et de php"
[vagrant-branch b6b0932] Ajout de patrick et de php
1 file changed, 3 insertions(+), 1 deletion(-)
```

FIGURE 17 – Capture d'écran.

```
Vkbida@DESKTOP-MLDTN9L MINGW64 /c/images/vincent/Travail/Data LP ASRALL/Outils Libre/git/vagrant (vagrant-branch)
$ git checkout master
Switched to branch 'master'

Vkbida@DESKTOP-MLDTN9L MINGW64 /c/images/vincent/Travail/Data LP ASRALL/Outils Libre/git/vagrant (master)
$ git status
On branch master
nothing to commit, working tree clean
```

FIGURE 18 – Capture d'écran.

```

Vkbida@DESKTOP-MLDTN9L MINGW64 /c/images/vincent/Travail/Data LP ASRALL/Outils Libre/git/vagrant (master)
$ git merge vagrant-branch
Updating 7667de1..b6b0932
Fast-forward
 vagrant/Vagrantfile | 4 +++-
 1 file changed, 3 insertions(+), 1 deletion(-)

Vkbida@DESKTOP-MLDTN9L MINGW64 /c/images/vincent/Travail/Data LP ASRALL/Outils Libre/git/vagrant (master)
$ git log
commit b6b09320623591c24c40031037605ab373da05db (HEAD -> master, vagrant-branch)
Author: Pokill199 <vincentkbida@gmail.com>
Date: Thu Jan 13 10:09:13 2022 +0100

    Ajout de patrick et de php

commit 7667de1fbd5dbcd1905c27a677ac1ed47c30b0fa
Author: Pokill199 <vincentkbida@gmail.com>
Date: Thu Jan 13 09:51:12 2022 +0100

    Retirer les fichiers de config Vagrant

commit 4f37bff9293fde318fe2898c3884b2dfe38da204
Author: Pokill199 <vincentkbida@gmail.com>
Date: Thu Jan 13 09:40:57 2022 +0100

    Ajout du Vagrantfile et de ses fichiers de configuration

```

FIGURE 19 – Capture d'écran.

```

Vkbida@DESKTOP-MLDTN9L MINGW64 /c/images/vincent/Travail/Data LP ASRALL/Outils Libre/git/vagrant (master)
$ git branch -d vagrant-branch
Deleted branch vagrant-branch (was b6b0932).

```

FIGURE 20 – Capture d'écran.

### 3.3

```
Vkbida@DESKTOP-MLDTN9L MINGW64 /c/images/vincent/Travail/Data LP ASRALL/Outils Libre/git/vagrant (master)
$ git checkout -b forward-new-port
Switched to a new branch 'forward-new-port'

Vkbida@DESKTOP-MLDTN9L MINGW64 /c/images/vincent/Travail/Data LP ASRALL/Outils Libre/git/vagrant (forward-new-port)
$ git add Vagrantfile
warning: LF will be replaced by CRLF in vagrant/Vagrantfile.
The file will have its original line endings in your working directory

Vkbida@DESKTOP-MLDTN9L MINGW64 /c/images/vincent/Travail/Data LP ASRALL/Outils Libre/git/vagrant (forward-new-port)
$ git status
On branch forward-new-port
Changes to be committed:
  (use "git restore --staged <file>..." to unstage)
    modified:   Vagrantfile

Vkbida@DESKTOP-MLDTN9L MINGW64 /c/images/vincent/Travail/Data LP ASRALL/Outils Libre/git/vagrant (forward-new-port)
$ git commit -m "Forwarding sur le port 8080"
[forward-new-port d7024f3] Forwarding sur le port 8080
1 file changed, 1 insertion(+)
```

FIGURE 21 – Capture d'écran.

```
Vkbida@DESKTOP-MLDTN9L MINGW64 /c/images/vincent/Travail/Data LP ASRALL/Outils Libre/git/vagrant (forward-new-port)
$ git checkout master
Switched to branch 'master'

Vkbida@DESKTOP-MLDTN9L MINGW64 /c/images/vincent/Travail/Data LP ASRALL/Outils Libre/git/vagrant (master)
$ git status
On branch master
Changes not staged for commit:
  (use "git add <file>..." to update what will be committed)
  (use "git restore <file>..." to discard changes in working directory)
    modified:   Vagrantfile

no changes added to commit (use "git add" and/or "git commit -a")

Vkbida@DESKTOP-MLDTN9L MINGW64 /c/images/vincent/Travail/Data LP ASRALL/Outils Libre/git/vagrant (master)
$ git add Vagrantfile
warning: LF will be replaced by CRLF in vagrant/Vagrantfile.
The file will have its original line endings in your working directory

Vkbida@DESKTOP-MLDTN9L MINGW64 /c/images/vincent/Travail/Data LP ASRALL/Outils Libre/git/vagrant (master)
$ git commit -m "Port forwarding 8081"
[master afe5301] Port forwarding 8081
1 file changed, 1 insertion(+)
```

FIGURE 22 – Capture d'écran.

```
Vkbida@DESKTOP-MLDTN9L MINGW64 /c/images/vincent/Travail/Data LP ASRALL/Outils Libre/git/vagrant (master)
$ git merge forward-new-port
Auto-merging vagrant/Vagrantfile
CONFLICT (content): Merge conflict in vagrant/Vagrantfile
Automatic merge failed; fix conflicts and then commit the result.
```

FIGURE 23 – Capture d'écran.

```

SHELL
] config.vm.define "cli" do |b|
<<<<<<< HEAD
  config.vm.network "forwarded_port", guest: 80, host: 8081
=====
  config.vm.network "forwarded_port", guest: 80, host: 8080
>>>>>>> forward-new-port
  b.vm.box = "debian/contrib-stretch64"
  b.vm.network "private_network", ip: "10.0.0.2"
  b.vm.hostname = "cli"
end

```

FIGURE 24 – Capture d'écran.