

Procédure Vagrant

Objet :

Cette procédure a pour objectif de guider l'utilisateur dans la mise en place d'un environnement de développement virtuel avec Vagrant.

Elle détaille les étapes nécessaires à l'installation, à la configuration et à l'exécution d'une machine virtuelle. Grâce à Vagrant, il devient facile de reproduire un environnement de travail cohérent et portable.

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Introduction à Vagrant

Vagrant est un outil open-source permettant de créer et gérer des machines virtuelles de manière simple et reproductible. Il s'appuie sur un fichier de configuration appelé **Vagrantfile**, qui automatise le déploiement d'environnements de développement sur des hyperviseurs comme **VirtualBox**, **VMware** ou **Docker**.

Vagrant facilite le travail en équipe en garantissant que tous les développeurs travaillent dans un environnement identique. Il permet également d'intégrer des outils de provisioning comme **Ansible**, **Chef** ou **Puppet**, afin d'automatiser la configuration des machines.

Un **script Vagrant** permet notamment de :

- Définir l'image du système d'exploitation (par exemple : Ubuntu, Debian).
- Spécifier les ressources allouées à la machine (RAM, CPU, etc.).
- Partager des dossiers entre la machine hôte et la VM pour un échange de fichiers plus facile.
- Automatiser l'installation de logiciels (ex : Nginx, Docker) dès le lancement de la VM.

L'objectif est de simplifier et standardiser la création d'environnements de développement, tout en évitant les tâches manuelles répétitives.

Exemples de projets réalisés avec Vagrant :

1. Installation de Nginx sur Debian 12

Dans le cadre d'un TP, un serveur Nginx a été déployé sur une VM tournant sous Debian 12. Ce projet avait pour but de créer un environnement isolé dédié à la configuration et au test d'un serveur web.

Script Vagrant utilisé :

```

1  # -*- mode: ruby -*-
2  # vi: set ft=ruby :
3
4  # All Vagrant configuration is done below. The "2" in Vagrant.configure
5  # configures the configuration version (we support older styles for
6  # backwards compatibility). Please don't change it unless you know what
7  # you're doing.
8  Vagrant.configure("2") do |config|
9    # The most common configuration options are documented and commented below.
10   # For a complete reference, please see the online documentation at
11   # https://docs.vagrantup.com.
12
13   # Every Vagrant development environment requires a box. You can search for
14   # boxes at https://vagrantcloud.com/search.
15   config.vm.box = "generic/debian12"
16
17   # Disable automatic box update checking. If you disable this, then
18   # boxes will only be checked for updates when the user runs
19   # 'vagrant box outdated'. This is not recommended.
20   # config.vm.box_check_update = false
21
22   config.vm.provider "vmware_desktop" do |v|
23     v.vmx["displayname"] = "VAGRANT - Debian12 - Labo cyber"
24     v.gui = true
25     v.vmx["memsize"] = "8192"
26     v.vmx["numvcpus"] = "4"
27   end
28
29   # Create a forwarded port mapping which allows access to a specific port
30   # within the machine from a port on the host machine. In the example below,
31   # accessing "localhost:8080" will access port 80 on the guest machine.
32   # NOTE: This will enable public access to the opened port
33   # config.vm.network "forwarded_port", guest: 80, host: 8080
34
35   $script = <<-SCRIPT
36   echo Configuration de la VM en cours...
37   date > /etc/vagrant_provisioned_at
38   echo ----Mise à jour des dépôts----
39   sleep 3s
40   sudo apt update
41   sleep 3s
42   echo ----Installation Serveur Web apache2----
43   sleep 3s
44   sudo apt install -y apache2 docker.io docker-compose git
45   sleep 3s
46   sudo git clone https://forge.apps.education.fr/reseau-certa/bts-sio/labs-kali-docker/lab2.git
47   sleep 3s
48   sudo bash /home/vagrant/lab2/gestion_lab2.sh -c
49   sleep 3s
50   ip a | grep ens33
51
52   -SCRIPT
53
54   config.vm.provision "shell", inline: $script
55
56   # Create a forwarded port mapping which allows access to a specific port

```

Commande de démarrage des machines :

```
C:\Windows\System32\cmd.exe - vagrant up
Microsoft Windows [version 10.0.19045.5487]
(c) Microsoft Corporation. Tous droits réservés.

D:\Kylia Cheroret\Vagrant\vagrant Nginx conteneur>vagrant up
Bringing machine 'default' up with 'vmware_desktop' provider...
==> default: Cloning VMWare VM: 'generic/debian12'. This can take some time...
==> default: Checking if box 'generic/debian12' version '4.3.12' is up to date...
==> default: Verifying vmnet devices are healthy...
==> default: Preparing network adapters...
==> default: Fixed port collision for 22 => 2222. Now on port 2203.
==> default: Starting the VMWare VM...
_
```

Les Machines Virtuelles créées :

```
Debian 12 - test vagrant - VMware Workstation
File Edit View VM Tools Help
Debian 12 - test vagrant
Library
Type here to search
My Computer
New Folder
Slave
Master
Project Nas
VBoxHead-2
Throne Nas
Proxmox
priv1
priv2
priv3
Debian12
Debian12-DeckerCy
vagrant
VAGRANT-Debian12-1
Vagrant Essai Kali DOS
Kali linux
unweb-3
unweb-1
unweb-2
hadoop
Debian 12 - test vagrant

Debian GNU/Linux 12 debian12.localdomain tty1
debian12 login: root
Password:
Login incorrect
debian12.localdomain login: vagrant
Password:
vagrant@debian12:~$ ipa
-bash: ipa: command not found
vagrant@debian12:~$ ip a
1: lo: <LOOPBACK,UP,LOWER_UP> mtu 65536 qdisc noqueue state UNKNOWN group default qlen 1000
    link/loopback 8:0:0:0:0:0 brd 8:0:0:0:0:0
    inet 127.0.0.1/8 scope host lo
        valid_lft forever preferred_lft forever
2: eth0: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc fq_codel state UP group default qlen 1000
    link/ether 08:00:27:12:34:56 brd ff:ff:ff:ff:ff:ff
    altname ens33
    altname ens160
    inet 192.168.31.156/24 brd 192.168.31.255 scope global dynamic eth0
        valid_lft 1771sec preferred_lft 1771sec
vagrant@debian12:~$ _
```

2. Laboratoire Cyber- Attaque MITM avec Vagrant

Une autre réalisation importante a été la mise en place d'un laboratoire en cybersécurité pour tester une attaque Man-in-the-Middle (MITM). Ce laboratoire a été configuré à l'aide de Vagrant pour créer plusieurs machines virtuelles interconnectées, où nous avons simulé l'attaque.

Le Script Vagrant :

Ici un script trouvé sur le net qui sert à crée l'environnement

```

1  # -*- mode: ruby -*-
2  # vi: set ft=ruby :
3
4  # All Vagrant configuration is done below. The "2" in Vagrant.configure
5  # configures the configuration version (we support older styles for
6  # backwards compatibility). Please don't change it unless you know what
7  # you're doing.
8  Vagrant.configure("2") do |config|
9    # The most common configuration options are documented and commented below.
10   # For a complete reference, please see the online documentation at
11   # https://docs.vagrantup.com.
12
13   # Every Vagrant development environment requires a box. You can search for
14   # boxes at https://vagrantcloud.com/search.
15   config.vm.box = "generic/debian12"
16   # Disable automatic box update checking. If you disable this, then
17   # boxes will only be checked for updates when the user runs
18   # 'vagrant box outdated'. This is not recommended.
19   # config.vm.box_check_update = false
20   config.vm.provider "vmware_desktop" do |v|
21     v.vmx["displayname"] = 'VAGRANT - Debian12 - Labo cyber'
22     v.gui = true
23     v.vmx["memsize"] = "8192"
24     v.vmx["numvcpus"] = "4"
25   end
26   # Create a forwarded port mapping which allows access to a specific port
27   # within the machine from a port on the host machine. In the example below,
28   # accessing "localhost:8080" will access port 80 on the guest machine.
29   # NOTE: This will enable public access to the opened port
30   # config.vm.network "forwarded_port", guest: 80, host: 8080
31
32   $script = <<-SCRIPT
33   echo Configuration de la VM en cours...
34   date > /etc/vagrant_provisioned_at
35   echo ----Mise à jour des dépôts----
36   sleep 3s
37   sudo apt update
38   sleep 3s
39   echo ----Installation Serveur Web apache2----
40   sleep 3s
41   sudo apt install -y apache2 docker.io docker-compose git
42   sleep 3s
43   sudo git clone https://forge.apps.education.fr/reseau-certs/bts-sio/labs-kali-docker/lab2.git
44   sleep 3s
45   sudo bash /home/vagrant/lab2/gestion_lab2.sh -c
46   sleep 3s
47   ip a | grep ens33
48   -SCRIPT
49
50   config.vm.provision "shell", inline: $script
51
52   # Create a forwarded port mapping which allows access to a specific port
53   # within the machine from a port on the host machine and only allow access
54

```


Les VM et l'environnement Vagrant se crée grâce à la commande « **Vagrant up** » en bash.

```

bringing machine 'default' up with 'vmware_desktop' provider...
==> default: Cloning VMware VM: 'generic/debian12'. This can take some time...
==> default: Checking if box 'generic/debian12' version '4.3.12' is up to date...
==> default: Verifying vmnet devices are healthy...
==> default: Preparing network adapters...
==> default: Fixed port collision for 22 => 2222. Now on port 2204.
==> default: Starting the VMware VM...
==> default: Waiting for the VM to receive an address...
==> default: Forwarding ports...
default: -- 22 => 2204
==> default: Waiting for machine to boot. This may take a few minutes...
default: SSH address: 127.0.0.1:2204
default: SSH username: vagrant
default: SSH auth method: private key
default:
default: Vagrant insecure key detected. Vagrant will automatically replace
default: this with a newly generated keypair for better security.
default:
default: Inserting generated public key within guest...
default: Removing insecure key from the guest if it's present...
default: Key inserted! Disconnecting and reconnecting using new SSH key...
==> default: Machine booted and ready!
==> default: Configuring network adapters within the VM...
==> default: Running provisioner: shell...
default: Running: inline script
default: Configuration de la VM en cours...
default: ----Mise à jour des dépôts----
default:
default: WARNING: apt does not have a stable CLI interface. Use with caution in scripts.
default:
default: Get:1 http://security.debian.org/debian-security bookworm-security InRelease [48.0 kB]
default: Get:2 http://deb.debian.org/debian bookworm InRelease [151 kB]
default: Get:3 http://deb.debian.org/debian bookworm-updates InRelease [55.4 kB]
default: Get:4 http://security.debian.org/debian-security bookworm-security/main Sources [145 kB]
default: Get:5 http://security.debian.org/debian-security bookworm-security/main amd64 Packages [246 kB]
default: Get:6 http://security.debian.org/debian-security bookworm-security/main Translation-en [147 kB]
default: Get:7 http://deb.debian.org/debian bookworm/non-free-firmware Sources [6,436 B]
default: Get:8 http://deb.debian.org/debian bookworm/main Sources [9,496 kB]
default: Get:9 http://deb.debian.org/debian bookworm/main amd64 Packages [8,792 kB]
default: Get:10 http://deb.debian.org/debian bookworm/main Translation-en [6,109 kB]
default: Get:11 http://deb.debian.org/debian bookworm/non-free-firmware amd64 Packages [6,240 B]
default: Get:12 http://deb.debian.org/debian bookworm/non-free-firmware Translation-en [20.9 kB]
default: Get:13 http://deb.debian.org/debian bookworm-updates/main Sources.diff/Index [15.1 kB]
default: Ign:13 http://deb.debian.org/debian bookworm-updates/main Sources.diff/Index
default: Get:14 http://deb.debian.org/debian bookworm-updates/main amd64 Packages.diff/Index [15.1 kB]
default: Ign:14 http://deb.debian.org/debian bookworm-updates/main amd64 Packages.diff/Index
default: Get:15 http://deb.debian.org/debian bookworm-updates/main Translation-en.diff/Index [15.1 kB]
default: Ign:15 http://deb.debian.org/debian bookworm-updates/main Translation-en.diff/Index
default: Get:16 http://deb.debian.org/debian bookworm-updates/non-free-firmware Sources [2,076 B]
default: Get:17 http://deb.debian.org/debian bookworm-updates/non-free-firmware amd64 Packages [616 B]
default: Get:18 http://deb.debian.org/debian bookworm-updates/non-free-firmware Translation-en [384 B]
default: Get:19 http://deb.debian.org/debian bookworm-updates/main Sources [16.2 kB]
default: Get:20 http://deb.debian.org/debian bookworm-updates/main amd64 Packages [13.5 kB]
default: Get:21 http://deb.debian.org/debian bookworm-updates/main Translation-en [16.0 kB]
default: Fetched 25.3 MB in 6s (4,461 kB/s)
default: Reading package lists...
default: Building dependency tree...
default: Reading state information...
default: 79 packages can be upgraded. Run 'apt list --upgradable' to see them.

```