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.

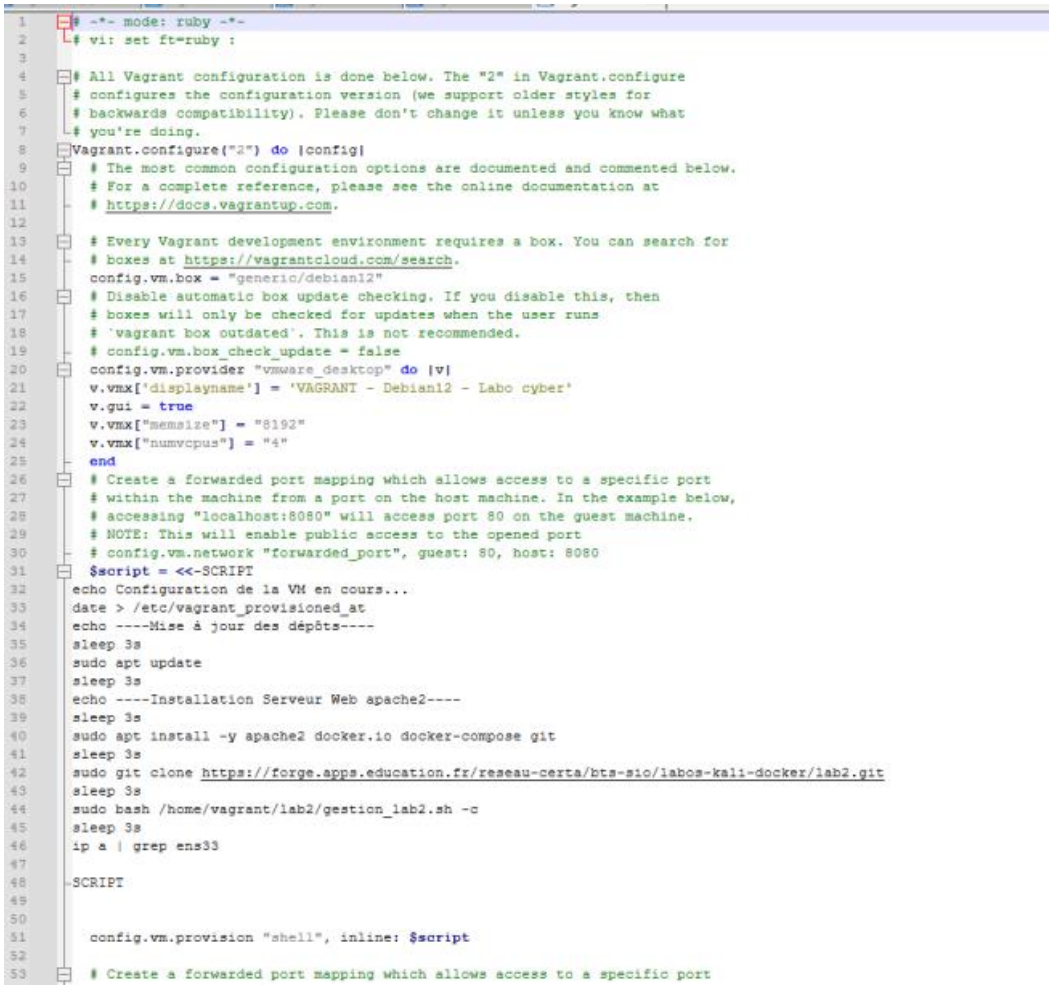
L'objectif est de simplifier et standardiser la création d'environnements de développement, tout en évitant les tâches manuelles répétitives.

Exemples de projets réalisés avec Vagrant :

1. Installation de Nginx sur Debian 12

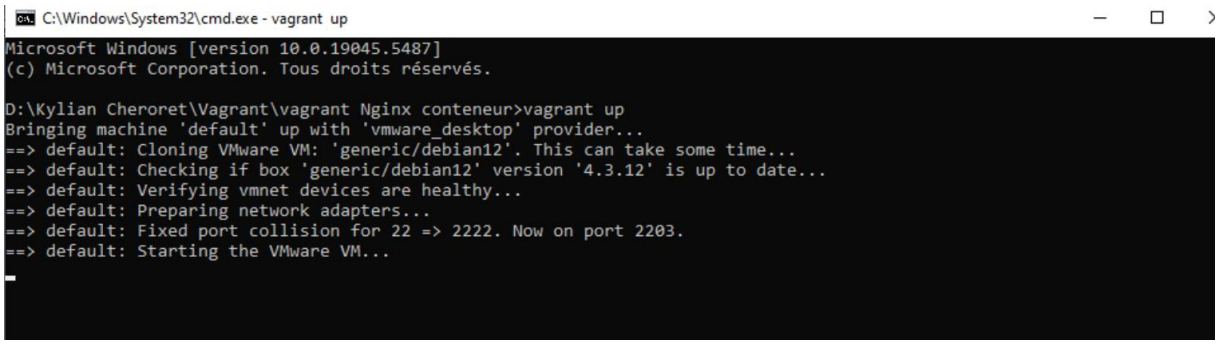
Dans le cadre d'un TP, un serveur Nginx a été déployé sur une VM tournant sous Debian 12. Ce projet avait pour but de créer un environnement isolé dédié à la configuration et au test d'un serveur web.

Script Vagrant utilisé :

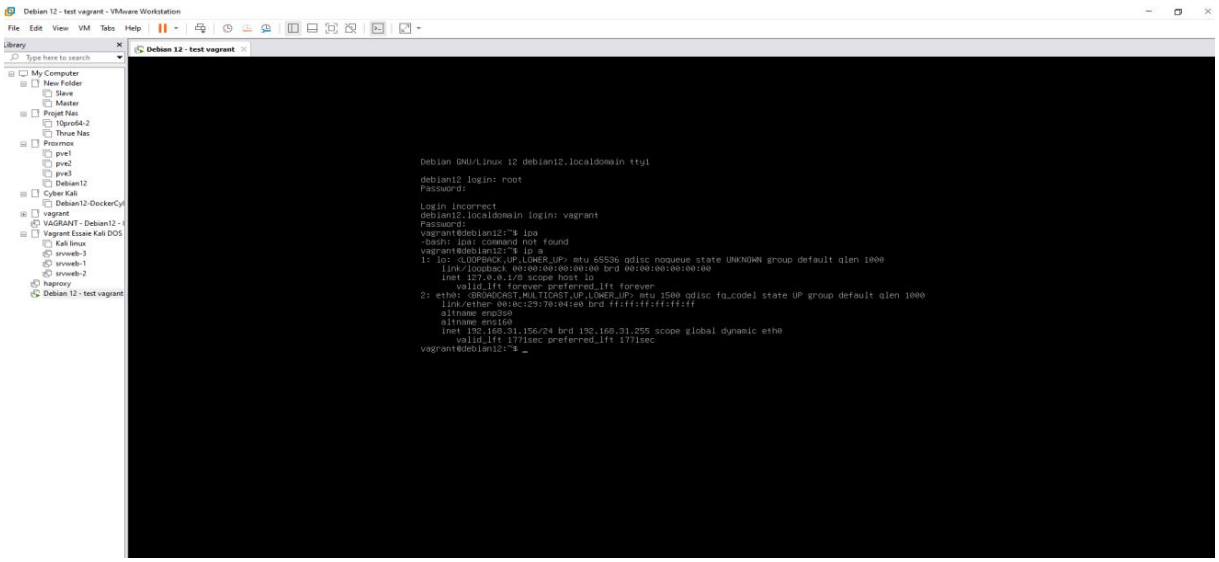


```
# -*- mode: ruby -*-
# vi: set ft=ruby :

# All Vagrant configuration is done below. The "2" in Vagrant.configure
# configures the configuration version (we support older styles for
# backwards compatibility). Please don't change it unless you know what
# you're doing.
Vagrant.configure("2") do |config|
  # The most common configuration options are documented and commented below.
  # For a complete reference, please see the online documentation at
  # https://docs.vagrantup.com.

  # Every Vagrant development environment requires a box. You can search for
  # boxes at https://vagrantcloud.com/search.
  config.vm.box = "generic/debian12"
  # Disable automatic box update checking. If you disable this, then
  # boxes will only be checked for updates when the user runs
  # `vagrant box outdated`. This is not recommended.
  # config.vm.box_check_update = false
  config.vm.provider "vmware_desktop" do |v|
  v.vmx['displayname'] = 'VAGRANT - Debian12 - Labo cyber'
  v.gui = true
  v.vmx["memsize"] = "8192"
  v.vmx["numvcpus"] = "4"
  end
  # Create a forwarded port mapping which allows access to a specific port
  # within the machine from a port on the host machine. In the example below,
  # accessing "localhost:8080" will access port 80 on the guest machine.
  # NOTE: This will enable public access to the opened port
  # config.vm.network "forwarded_port", guest: 80, host: 8080
  $script = <<-SCRIPT
echo Configuration de la VM en cours...
date > /etc/vagrant_provisioned_at
echo ----Mise à jour des dépôts----
sleep 3s
sudo apt update
sleep 3s
echo ----Installation Serveur Web apache2----
sleep 3s
sudo apt install -y apache2 docker.io docker-compose git
sleep 3s
sudo git clone https://forge.apps.education.fr/reseau-certa/bts-sio/labos-kali-docker/lab2.git
sleep 3s
sudo bash /home/vagrant/lab2/gestion_lab2.sh -c
sleep 3s
ip a | grep ens33

SCRIPT


  config.vm.provision "shell", inline: $script

  # Create a forwarded port mapping which allows access to a specific port
```

Commande de démarrage des machines :



Les Machines Virtuelles créées :

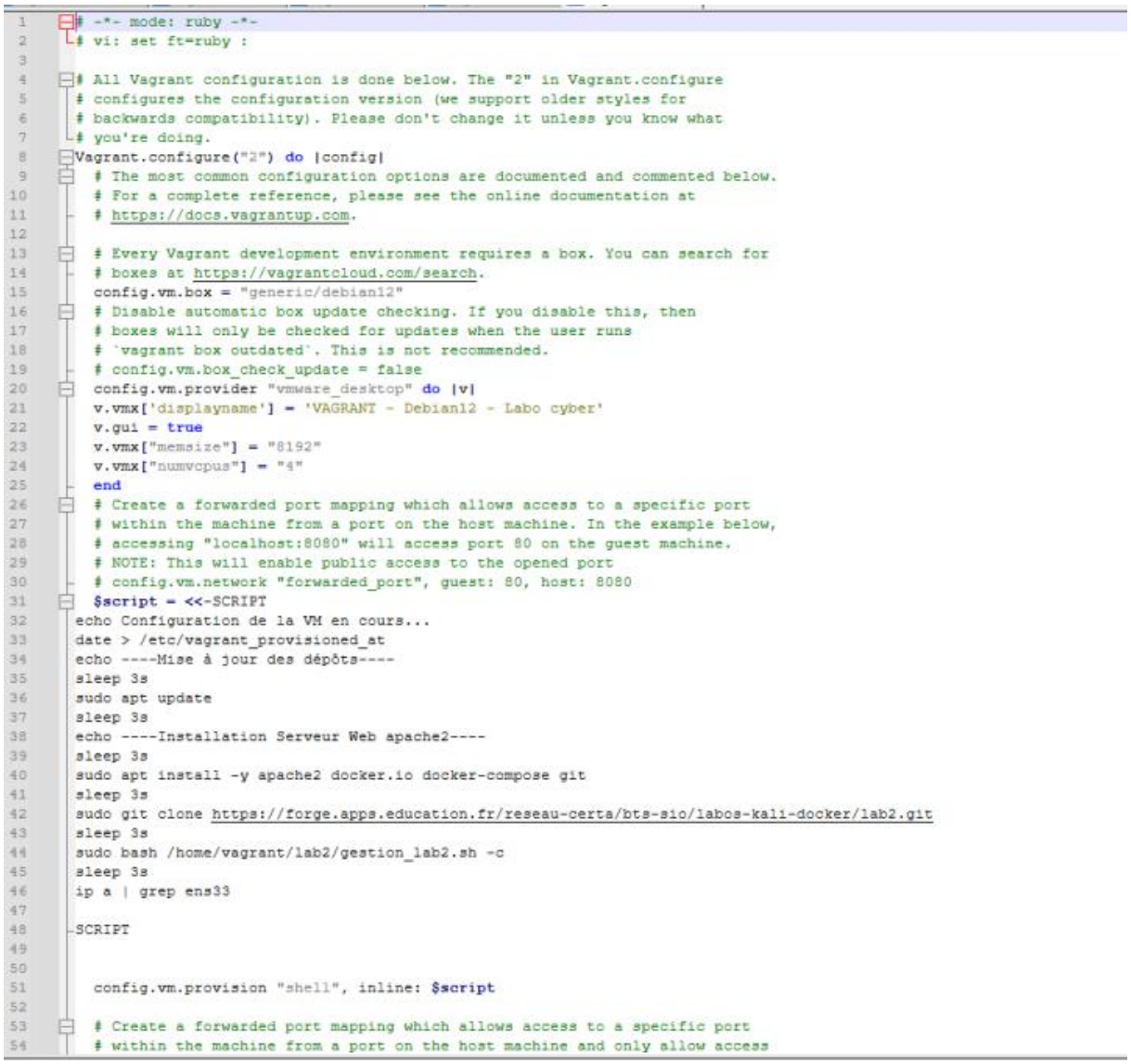


2. Laboratoire Cyber- Attaque MITM avec Vagrant

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.

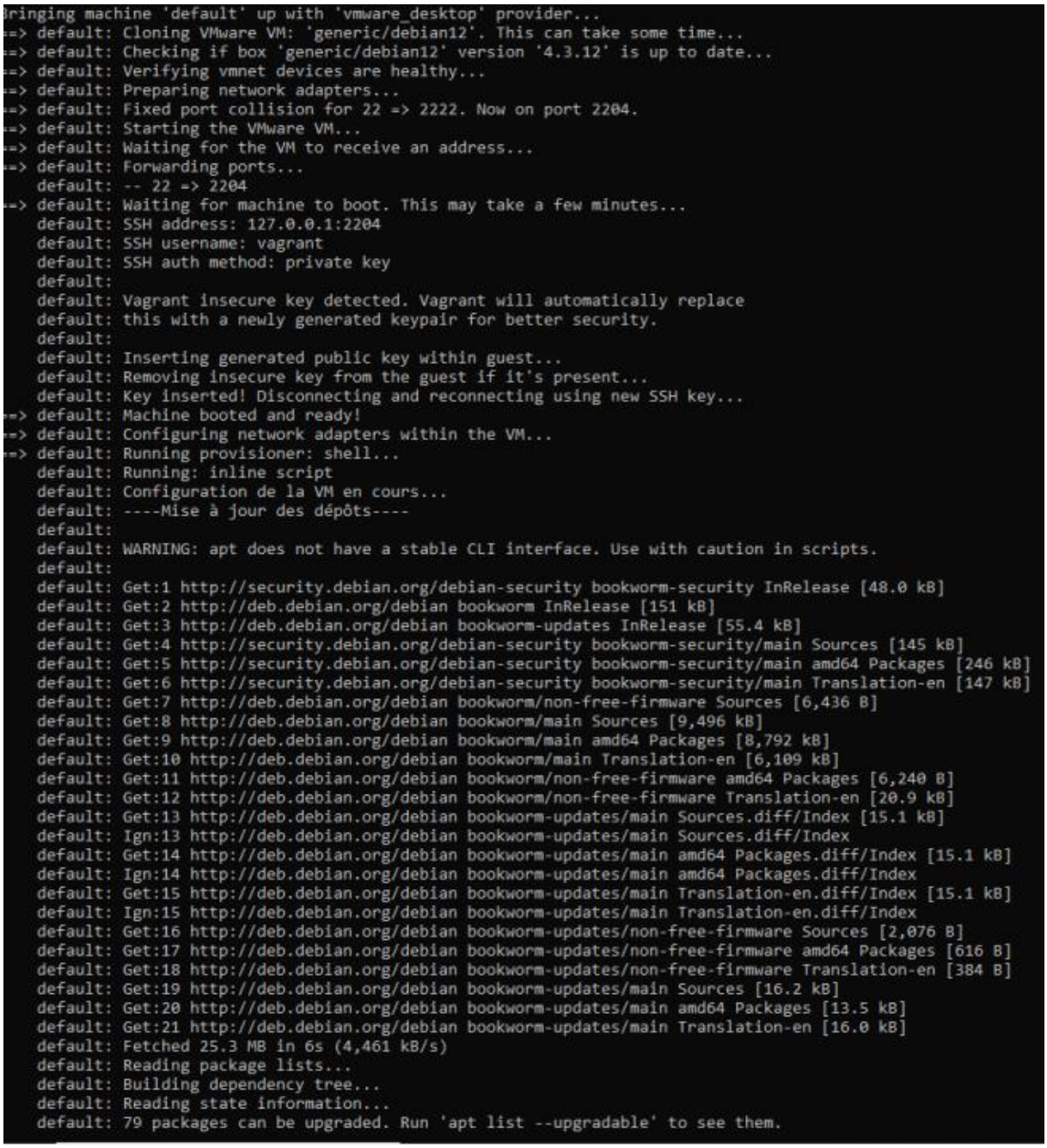
Le Script Vagrant :

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



```
# -*- mode: ruby -*-
# vi: set ft=ruby :

# All Vagrant configuration is done below. The "2" in Vagrant.configure
# configures the configuration version (we support older styles for
# backwards compatibility). Please don't change it unless you know what
# you're doing.
Vagrant.configure("2") do |config|
  # The most common configuration options are documented and commented below.
  # For a complete reference, please see the online documentation at
  # https://docs.vagrantup.com.

  # Every Vagrant development environment requires a box. You can search for
  # boxes at https://vagrantcloud.com/search.
  config.vm.box = "generic/debian12"
  # Disable automatic box update checking. If you disable this, then
  # boxes will only be checked for updates when the user runs
  # `vagrant box outdated`. This is not recommended.
  # config.vm.box_check_update = false
  config.vm.provider "vmware_desktop" do |v|
  v.vmx['displayname'] = 'VAGRANT - Debian12 - Labo cyber'
  v.gui = true
  v.vmx["memsize"] = "8192"
  v.vmx["numvcpus"] = "4"
  end
  # Create a forwarded port mapping which allows access to a specific port
  # within the machine from a port on the host machine. In the example below,
  # accessing "localhost:8080" will access port 80 on the guest machine.
  # NOTE: This will enable public access to the opened port
  # config.vm.network "forwarded_port", guest: 80, host: 8080
  $script = <<-SCRIPT
echo Configuration de la VM en cours...
date > /etc/vagrant_provisioned_at
echo ----Mise à jour des dépôts----
sleep 3s
sudo apt update
sleep 3s
echo ----Installation Serveur Web apache2----
sleep 3s
sudo apt install -y apache2 docker.io docker-compose git
sleep 3s
sudo git clone https://forge.apps.education.fr/reseau-certs/bts-sio/labos-kali-docker/lab2.git
sleep 3s
sudo bash /home/vagrant/lab2/gestion_lab2.sh -c
sleep 3s
ip a | grep ens33

SCRIPT


  config.vm.provision "shell", inline: $script

  # Create a forwarded port mapping which allows access to a specific port
  # within the machine from a port on the host machine and only allow access
```

Les VM et l'environnement Vagrant se crée grace 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.
```