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DOF602 - Démarrer avec Docker

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Présentation de Docker

Virtualisation et Containérisation

La virtualisation classique nécessite l'utilisation d'un hyperviseur :



Docker est une application de virtualisation légère lancée en 2013 qui utilise des **images** et des **conteneurs**.

Docker est composé de trois éléments : un serveur, un client et un ou plusieurs Repositories ou Dépôts :



Une **image** est un paquet exécutable contenant tout ce qu'il est nécessaire afin d'exécuter un logiciel donné, incluant :

- le code
- un runtime
- des bibliothèques,
- des variables d'environnement
- des fichiers de configuration

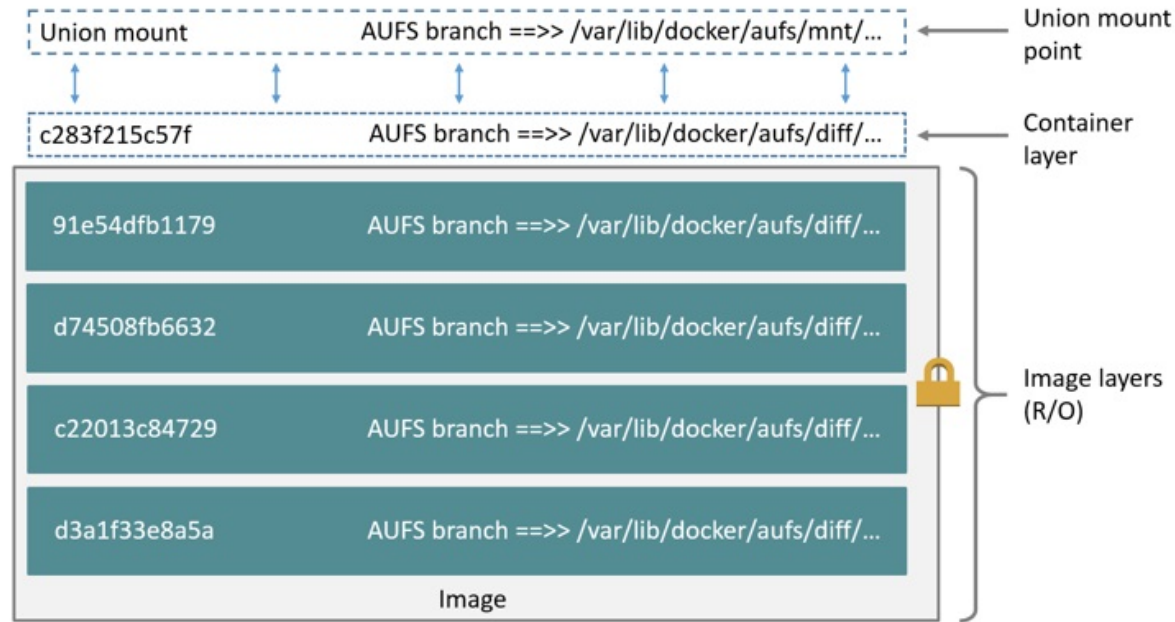
Un **conteneur** est une instance de l'image en cours d'exécution en mémoire. Elle est isolée de l'environnement de l'hôte par défaut mais peut accéder à des fichiers et de ports de l'hôte selon la configuration.

Les conteneurs exécutent des applications nativement en utilisant le noyau de la machine hôte. De ce fait les performances d'un conteneur sont supérieures à celles d'une machine virtuelle qui doit passer par un hyperviseur pour accéder aux ressources de la machine hôte.



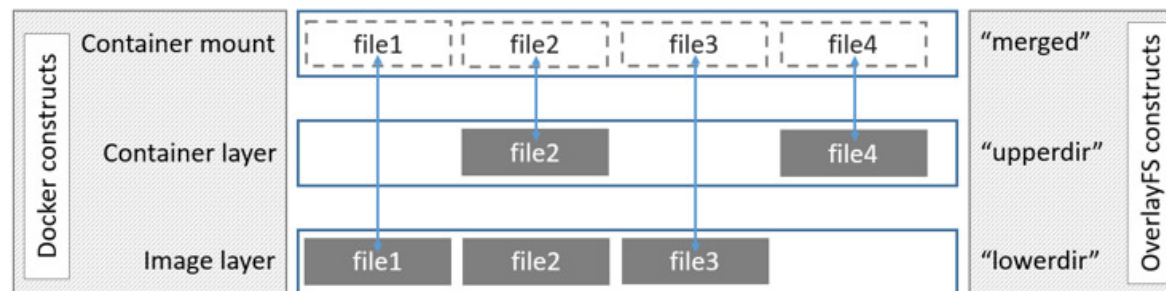
Le Système de Fichier AUFS

Pour gérer le système de fichiers du conteneur, Docker utilisait au départ le filesystem AUFS. AUFS est un système de fichiers de la famille UnionFS. Un système de fichier de type UnionFS assemble des répertoires multiples les uns sur les autres pour ensuite les présenter sous forme d'un répertoire unique contenant les objets les plus récents grâce à un union mount. Les répertoires sous AUFS sont appelés des **branches** et se trouvent dans **/var/lib/docker/aufs** :



OverlayFS et Overlay2

Le système de fichiers AUFS a été ensuite remplacé dans Docker par le système de fichiers **OverlayFS**. Ce système de fichiers combine deux répertoires appelés **Layers**. Le layer inférieur porte le nom **lowerdir** tandis que le niveau au dessus est appelé le **upperdir**. La vue unifiée porte le nom **merged**. Dans le cas où les layers de conteneur et de l'image contiennent le même objet, le conteneur "gagne" et cache l'objet dans l'image :



Le système de fichiers OverlayFS ne sait gérer que deux niveaux. Ceci implique une utilisation excessive d'inodes dans la cas d'une image à de niveaux multiples car chaque image doit résider dans son propre repertoire qui se situe dans **/var/lib/docker/overlay**. Des liens physiques sont ensuite utilisés pour référencer des données dans les niveaux inférieurs.

Cette limitation a donné lieu à l'introduction du système de fichiers **Overlay2** actuellement utilisé par Docker. Overlay2 est capable de gérer 128 layers.

Important - Notez que Docker peut aussi utiliser le système de fichiers BTRFS.

Docker Daemon et Docker Engine

Le Docker Daemon, appelé **dockerd**, accompagné du REST API et du Docker CLI s'appellent collectivement le **Docker Engine** :

- Le Docker Daemon est le serveur,
- Le Docker CLI est le client,
- Le REST API permet la communication entre le serveur et le client.

Le Docker Engine peut utiliser des **plugins**. Ces plugins, disponibles pour téléchargement à partir du **Docker Registry** public, appelé le **Docker Hub**, ajoutent des fonctionnalités supplémentaires au Docker Engine. Actuellement, des plugins existent pour :

- Volumes (le partage et la réutilisation de volumes entre conteneurs, des sauvegardes et de la migration),
- Network
- Authorization
- Cloud (AWS, GCP et Azure)
- Jenkins

Il est aussi possible de créer son propre plugin.

Docker CE et Docker EE

Docker CE

Docker existe en deux versions **Docker CE** (Docker Community Edition) et **Docker EE** (Docker Enterprise Edition).

Docker CE est :

- un logiciel libre,
- gratuit.

Docker CE vient en deux sous-versions :

- **Stable** - mis à jour tous les trois mois. La stabilité est garantie,
- **Edge** - mis à jour tous les mois et contient des nouvelles fonctionnalités mais parfois au prix de la stabilité.

Docker EE

Docker EE est :

- plus puissant que la version Docker CE,
- disponible pour des processeurs différents (x86-64, ARM, IBM Z, s390x IBM Z).

Docker EE comprend :

- Docker Engine Enterprise,
 - le Docker Engine qui bénéficie de support commercial. Il permet de créer de images et des conteneurs,
- Docker Universal Control Plane (UCP),
 - est divisé en deux composants : UCP Worker et UCP Manager,
 - permet le déploiement des applications et est conçu pour la haute disponibilité,
 - permet de lier plusieurs noeuds de type UCP Manager en tant que cluster,
- Docker Trusted Registry (DTR),
 - une solution de stockage sécurisée des images,

- est conçu pour une scalabilité horizontale,
- Docker Desktop Enterprise (DDE),
 - une application Windows et Mac permettant la construction locale d'images Docker, le support de multiples IDE et l'intégration native de Docker avec l'OS.

Docker EE est disponible en trois sous-versions, appelées des **Tiers** :

- **Basic** - (support Docker officiel (J) et des conteneurs et plugins certifiés),
 - \$1 500 par noeud par an (2022),
- **Standard** - (Basic + la gestion avancée des images et des conteneurs, le support de l'authentification des utilisateurs via LDAP/AD, le RBAC),
 - \$3 000 par noeud par an (2022),
- **Advanced** - (Standard + l'analyse de sécurité et la surveillance continue des vulnérabilités),
 - \$3 500 par noeud par an (2022).

Pour consulter les différences entre les deux versions, consultez le lien <https://docs.docker.com/engine/installation/>.

Docker et Mirantis

Docker EE a été acquis par la société **Mirantis** en novembre 2019.

De ce fait Mirantis a renommé certains composants de Docker EE :

- Docker Enterprise/UCP -> Mirantis Kubernetes Engine (MKE),
- Docker Trusted Registry (DTR) -> Mirantis Secure Registry (MSR),
- Docker Engine Enterprise -> Mirantis container Runtime,
- Docker Enterprise Container Cloud -> Mirantis Container Cloud.

LAB #1 - Travailler avec Docker

Docker est disponible pour Windows™ et Mac en tant que binaire :

Platform	x86_64 / amd64
Docker Desktop for macOS	pkg
Docker Desktop for Windows™	exe ou msi

Docker est disponible pour Linux en tant que paquet rpm ou deb :

Platform	x86_64 / amd64	ARM	ARM64 / AARCH64
CentOS	rpm		rpm
Fedora	rpm		rpm
Debian	deb	deb	deb
Ubuntu	deb	deb	deb
Raspian		deb	deb

Les paquets sont disponibles soit à partir du dépôt Docker soit dans le gestionnaire des paquets de l'OS. Docker peut aussi être installé en utilisant des scripts automatisés fournis par Docker.

Veuillez noter que depuis le changement de noms des paquets Docker, il convient de désinstaller toute version antérieure de Docker avant de procéder à l'installation de la version courante :

Par exemple sous Debian et Ubuntu :

```
# apt-get remove docker docker-engine docker.io containerd runc
```

Sous CentOS et Fedora :

```
# yum remove docker docker-client docker-client-latest docker-latest docker-common docker-engine docker-logrotate docker-latest-logrotate
```

Docker est disponible dans trois canaux :

- **Stable,**
 - La dernière version GA (General Availability),
- **Test,**
 - La version en pre-release,

- **Nightly**,
 - Une version instable de travaux en cours.

1.1 - Installer docker sous Linux

1.1.1 - Debian 11

Docker n'est pas dans le dépôts de Debian. Afin de l'installer il convient d'ajouter le dépôt de docker. Premièrement, il est nécessaire d'installer les paquets permettant à Debian d'utiliser un dépôt en https :

```
root@debian11:~# apt-get update
...
root@debian11:~# apt-get install apt-transport-https ca-certificates curl gnupg2 software-properties-common
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
ca-certificates is already the newest version (20210119).
gnupg2 is already the newest version (2.2.27-2+deb11u2).
The following packages were automatically installed and are no longer required:
 libopengl0 linux-headers-5.10.0-15-amd64 linux-headers-5.10.0-15-common
Use 'apt autoremove' to remove them.
The following additional packages will be installed:
 python3-distro-info python3-software-properties unattended-upgrades
Suggested packages:
 bsd-mailx default-mta | mail-transport-agent needrestart powermgmt-base
The following NEW packages will be installed:
 apt-transport-https curl python3-distro-info python3-software-properties
 software-properties-common unattended-upgrades
0 upgraded, 6 newly installed, 0 to remove and 0 not upgraded.
Need to get 661 kB of archives.
After this operation, 1,567 kB of additional disk space will be used.
Do you want to continue? [Y/n] y
```

Téléchargez la clef GPG officielle de docker :

```
root@debian11:~# curl -fsSL https://download.docker.com/linux/debian/gpg | apt-key add -
Warning: apt-key is deprecated. Manage keyring files in trusted.gpg.d instead (see apt-key(8)).
OK
```

Vérifiez que l'ID de la clef est **9DC8 5822 9FC7 DD38 854A E2D8 8D81 803C 0EBF CD88** :

```
root@debian11:~# apt-key fingerprint 0EBFCD88
Warning: apt-key is deprecated. Manage keyring files in trusted.gpg.d instead (see apt-key(8)).
pub  rsa4096 2017-02-22 [SCEA]
     9DC8 5822 9FC7 DD38 854A  E2D8 8D81 803C 0EBF CD88
uid  [ unknown] Docker Release (CE deb) <docker@docker.com>
sub  rsa4096 2017-02-22 [S]
```

Ajoutez le dépôt **stable** de docker :

```
root@debian11:~# add-apt-repository "deb [arch=amd64] https://download.docker.com/linux/debian $(lsb_release -cs)
stable"
```

Important - Notez que la commande **lsb_release -cs** retourne le nom de la distribution Debian, à savoir dans ce cas **stretch**.

Installez maintenant le paquet **docker-ce** :

```
root@debian11docker:~# apt-get update
...
root@debian11:~# apt-get install docker-ce
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
```

```
The following packages were automatically installed and are no longer required:
 libopengl0 linux-headers-5.10.0-15-amd64 linux-headers-5.10.0-15-common
Use 'apt autoremove' to remove them.
The following additional packages will be installed:
 containerd.io docker-buildx-plugin docker-ce-cli docker-ce-rootless-extras
 docker-compose-plugin git git-man liberror-perl libslirp0 pigz slirp4netns
Suggested packages:
 aufs-tools cgroupfs-mount | cgroup-lite git-daemon-run | git-daemon-sysvinit
 git-doc git-el git-email git-gui gitk gitweb git-cvs git-mediawiki git-svn
The following NEW packages will be installed:
 containerd.io docker-buildx-plugin docker-ce docker-ce-cli
 docker-ce-rootless-extras docker-compose-plugin git git-man liberror-perl
 libslirp0 pigz slirp4netns
0 upgraded, 12 newly installed, 0 to remove and 0 not upgraded.
Need to get 121 MB of archives.
After this operation, 452 MB of additional disk space will be used.
Do you want to continue? [Y/n] y
```

Dernièrement, vérifiez la version de Docker client et serveur :

```
root@debian11:~# docker version
Client: Docker Engine - Community
 Version:           24.0.5
 API version:       1.43
 Go version:        go1.20.6
 Git commit:        ced0996
 Built:             Fri Jul 21 20:35:45 2023
 OS/Arch:           linux/amd64
 Context:           default

Server: Docker Engine - Community
 Engine:
  Version:           24.0.5
  API version:       1.43 (minimum version 1.12)
```

```
Go version:      go1.20.6
Git commit:      a61e2b4
Built:          Fri Jul 21 20:35:45 2023
OS/Arch:        linux/amd64
Experimental:    false
containerd:
  Version:       1.6.22
  GitCommit:     8165feabfdfe38c65b599c4993d227328c231fca
runc:
  Version:       1.1.8
  GitCommit:     v1.1.8-0-g82f18fe
docker-init:
  Version:       0.19.0
  GitCommit:     de40ad0
```

Important - Notez que le paquet `docker-ce` a besoin des paquets `containerd.io` et `docker-ce-cli`. Notez aussi que la procédure ci-dessus installe la version la plus récente de Docker.

Dans le cas où vous souhaitez installer une version différente, il convient d'abord de constater les versions disponibles :

```
root@debian11:~# apt-cache madison docker-ce
docker-ce | 5:24.0.5-1~debian.11~bullseye | https://download.docker.com/linux/debian bullseye/stable amd64
Packages
docker-ce | 5:24.0.4-1~debian.11~bullseye | https://download.docker.com/linux/debian bullseye/stable amd64
Packages
docker-ce | 5:24.0.3-1~debian.11~bullseye | https://download.docker.com/linux/debian bullseye/stable amd64
Packages
docker-ce | 5:24.0.2-1~debian.11~bullseye | https://download.docker.com/linux/debian bullseye/stable amd64
Packages
docker-ce | 5:24.0.1-1~debian.11~bullseye | https://download.docker.com/linux/debian bullseye/stable amd64
```

Packages

docker-ce | 5:24.0.0-1~debian.11~bullseye | <https://download.docker.com/linux/debian> bullseye/stable amd64

Packages

docker-ce | 5:23.0.6-1~debian.11~bullseye | <https://download.docker.com/linux/debian> bullseye/stable amd64

Packages

docker-ce | 5:23.0.5-1~debian.11~bullseye | <https://download.docker.com/linux/debian> bullseye/stable amd64

Packages

docker-ce | 5:23.0.4-1~debian.11~bullseye | <https://download.docker.com/linux/debian> bullseye/stable amd64

Packages

docker-ce | 5:23.0.3-1~debian.11~bullseye | <https://download.docker.com/linux/debian> bullseye/stable amd64

Packages

docker-ce | 5:23.0.2-1~debian.11~bullseye | <https://download.docker.com/linux/debian> bullseye/stable amd64

Packages

docker-ce | 5:23.0.1-1~debian.11~bullseye | <https://download.docker.com/linux/debian> bullseye/stable amd64

Packages

docker-ce | 5:23.0.0-1~debian.11~bullseye | <https://download.docker.com/linux/debian> bullseye/stable amd64

Packages

docker-ce | 5:20.10.24~3-0~debian-bullseye | <https://download.docker.com/linux/debian> bullseye/stable amd64

Packages

docker-ce | 5:20.10.23~3-0~debian-bullseye | <https://download.docker.com/linux/debian> bullseye/stable amd64

Packages

docker-ce | 5:20.10.22~3-0~debian-bullseye | <https://download.docker.com/linux/debian> bullseye/stable amd64

Packages

docker-ce | 5:20.10.21~3-0~debian-bullseye | <https://download.docker.com/linux/debian> bullseye/stable amd64

Packages

docker-ce | 5:20.10.20~3-0~debian-bullseye | <https://download.docker.com/linux/debian> bullseye/stable amd64

Packages

docker-ce | 5:20.10.19~3-0~debian-bullseye | <https://download.docker.com/linux/debian> bullseye/stable amd64

Packages

docker-ce | 5:20.10.18~3-0~debian-bullseye | <https://download.docker.com/linux/debian> bullseye/stable amd64

Packages

docker-ce | 5:20.10.17~3-0~debian-bullseye | <https://download.docker.com/linux/debian> bullseye/stable amd64

Packages

docker-ce | 5:20.10.16~3-0~debian-bullseye | <https://download.docker.com/linux/debian> bullseye/stable amd64

```
Packages
docker-ce | 5:20.10.15~3-0~debian-bullseye | https://download.docker.com/linux/debian bullseye/stable amd64
Packages
docker-ce | 5:20.10.14~3-0~debian-bullseye | https://download.docker.com/linux/debian bullseye/stable amd64
Packages
docker-ce | 5:20.10.13~3-0~debian-bullseye | https://download.docker.com/linux/debian bullseye/stable amd64
Packages
docker-ce | 5:20.10.12~3-0~debian-bullseye | https://download.docker.com/linux/debian bullseye/stable amd64
Packages
docker-ce | 5:20.10.11~3-0~debian-bullseye | https://download.docker.com/linux/debian bullseye/stable amd64
Packages
docker-ce | 5:20.10.10~3-0~debian-bullseye | https://download.docker.com/linux/debian bullseye/stable amd64
Packages
docker-ce | 5:20.10.9~3-0~debian-bullseye | https://download.docker.com/linux/debian bullseye/stable amd64
Packages
docker-ce | 5:20.10.8~3-0~debian-bullseye | https://download.docker.com/linux/debian bullseye/stable amd64
Packages
docker-ce | 5:20.10.7~3-0~debian-bullseye | https://download.docker.com/linux/debian bullseye/stable amd64
Packages
docker-ce | 5:20.10.6~3-0~debian-bullseye | https://download.docker.com/linux/debian bullseye/stable amd64
Packages
```

Dans le cas où vous souhaiteriez installer la version **24.0.1** de Docker, la commande d'installation deviendrait :

```
# apt-get install docker-ce=5:24.0.1-1~debian.11~bullseye docker-ce-cli=5:24.0.1-1~debian.11~bullseye
containerd.io
```

Si vous préférez utiliser le script d'installation de Docker, il convient d'abord de le télécharger :

Important - Notez que ces scripts ne doivent pas être utilisés dans un environnement de production.

```
root@debian11:~# curl -fsSL https://get.docker.com -o get-docker.sh
```

```
root@debian11:~# ls  
get-docker.sh
```

Ensuite, il convient d'exécuter le script :

```
root@debian11:~# chmod +x get-docker.sh
```

```
root@debian11:~# ./get-docker.sh  
# Executing docker install script, commit: c2de0811708b6d9015ed1a2c80f02c9b70c8ce7b  
Warning: the "docker" command appears to already exist on this system.
```

If you already have Docker installed, this script can cause trouble, which is why we're displaying this warning and provide the opportunity to cancel the installation.

If you installed the current Docker package using this script and are using it again to update Docker, you can safely ignore this message.

```
You may press Ctrl+C now to abort this script.  
+ sleep 20  
^C
```

Important - Notez l'utilisation de **^C** pour ne PAS continuer l'exécution du script.

Démarrez un conteneur de l'image hello-world :

```
root@debian11:~# docker run hello-world  
Unable to find image 'hello-world:latest' locally
```

```
latest: Pulling from library/hello-world
719385e32844: Pull complete
Digest: sha256:dcba6daec718f547568c562956fa47e1b03673dd010fe6ee58ca806767031d1c
Status: Downloaded newer image for hello-world:latest
```

Hello from Docker!

This message shows that your installation appears to be working correctly.

To generate this message, Docker took the following steps:

1. The Docker client contacted the Docker daemon.
2. The Docker daemon pulled the "hello-world" image from the Docker Hub.
(amd64)
3. The Docker daemon created a new container from that image which runs the executable that produces the output you are currently reading.
4. The Docker daemon streamed that output to the Docker client, which sent it to your terminal.

To try something more ambitious, you can run an Ubuntu container with:

```
$ docker run -it ubuntu bash
```

Share images, automate workflows, and more with a free Docker ID:

<https://hub.docker.com/>

For more examples and ideas, visit:

<https://docs.docker.com/get-started/>

Important - Notez que si l'image servant à générer le conteneur n'est pas présente sur le système hôte, celle-ci est téléchargée automatiquement depuis un dépôt (par défaut le dépôt **docker.io**) en utilisant la commande **docker pull**.

1.1.2 - CentOS 8

Connectez-vous à votre VM **CentOS_10.0.2.45_SSH** à partir de votre VM **Debian_10.0.2.46_SSH** :

```
root@debian11:~# ssh -l trainee 10.0.2.45
The authenticity of host '10.0.2.45 (10.0.2.45)' can't be established.
ECDSA key fingerprint is SHA256:Q7T/CP0SLiMbMAIgVzTuEHegYS/spPE5zzQchCHD5Vw.
Are you sure you want to continue connecting (yes/no/[fingerprint])? yes
Warning: Permanently added '10.0.2.45' (ECDSA) to the list of known hosts.
trainee@10.0.2.45's password: trainee
Activate the web console with: systemctl enable --now cockpit.socket

Last login: Wed Nov 15 05:24:16 2023 from 10.0.2.1
[trainee@centos8 ~]$
```

Devenez root :

```
[trainee@centos8 ~]$ su -
Password: fenestros
[root@centos8 ~]#
```

Ajouter le dépôt de docker :

```
[root@centos8 ~]# yum install -y yum-utils
Last metadata expiration check: 0:05:37 ago on Fri 18 Aug 2023 15:53:49 CEST.
Package yum-utils-4.0.21-3.el8.noarch is already installed.
Dependencies resolved.
Nothing to do.
Complete!

[root@centos8 ~]# yum-config-manager --add-repo https://download.docker.com/linux/centos/docker-ce.repo
Adding repo from: https://download.docker.com/linux/centos/docker-ce.repo
```

Supprimez le paquet **podman** et installez **Docker** :

```
[root@centos8 ~]# yum remove podman
Dependencies resolved.
=====
Package            Arch    Version                                Repository    Size
=====
Removing:
podman              x86_64  3.3.1-9.module_el8.5.0+988+b1f0b741    @appstream   48 M
Removing dependent packages:
cockpit-podman      noarch  33-1.module_el8.5.0+890+6b136101        @appstream   438 k
Removing unused dependencies:
conmon              x86_64  2:2.0.29-1.module_el8.5.0+890+6b136101  @appstream   164 k
podman-catatonit   x86_64  3.3.1-9.module_el8.5.0+988+b1f0b741    @appstream   760 k

Transaction Summary
=====
Remove 4 Packages

Freed space: 49 M
Is this ok [y/N]: y
Running transaction check
Transaction check succeeded.
Running transaction test
Transaction test succeeded.
Running transaction
  Preparing           :                               1/1
  Running scriptlet: cockpit-podman-33-1.module_el8.5.0+890+6b136101.noarch 1/1
  Erasing            : cockpit-podman-33-1.module_el8.5.0+890+6b136101.noarch 1/4
  Erasing            : podman-3.3.1-9.module_el8.5.0+988+b1f0b741.x86_64    2/4
  Running scriptlet: podman-3.3.1-9.module_el8.5.0+988+b1f0b741.x86_64    2/4
  Erasing            : podman-catatonit-3.3.1-9.module_el8.5.0+988+b1f0b741.x86_6 3/4
  Erasing            : conmon-2:2.0.29-1.module_el8.5.0+890+6b136101.x86_64 4/4
  Running scriptlet: conmon-2:2.0.29-1.module_el8.5.0+890+6b136101.x86_64 4/4
```

```

Verifying      : cockpit-podman-33-1.module_el8.5.0+890+6b136101.noarch      1/4
Verifying      : common-2:2.0.29-1.module_el8.5.0+890+6b136101.x86_64        2/4
Verifying      : podman-3.3.1-9.module_el8.5.0+988+b1f0b741.x86_64        3/4
Verifying      : podman-catatonit-3.3.1-9.module_el8.5.0+988+b1f0b741.x86_6 4/4

```

Installed products updated.

Removed:

```

cockpit-podman-33-1.module_el8.5.0+890+6b136101.noarch
common-2:2.0.29-1.module_el8.5.0+890+6b136101.x86_64
podman-3.3.1-9.module_el8.5.0+988+b1f0b741.x86_64
podman-catatonit-3.3.1-9.module_el8.5.0+988+b1f0b741.x86_64

```

Complete!

```
[root@centos8 ~]# yum install docker-ce docker-ce-cli containerd.io --allowrasing
```

```
Last metadata expiration check: 0:05:43 ago on Fri 18 Aug 2023 16:04:20 CEST.
```

Dependencies resolved.

```

=====
Package                Arch   Version                               Repository      Size
=====
Installing:
containerd.io          x86_64 1.6.22-3.1.el8                       docker-ce-stable 34 M
  replacing runc.x86_64 1.0.2-1.module_el8.5.0+911+f19012f9
docker-ce              x86_64 3:24.0.5-1.el8                       docker-ce-stable 24 M
docker-ce-cli         x86_64 1:24.0.5-1.el8                       docker-ce-stable 7.2 M
Installing dependencies:
docker-ce-rootless-extras x86_64 24.0.5-1.el8                       docker-ce-stable 4.9 M
libcgroup              x86_64 0.41-19.el8                         baseos           70 k
Installing weak dependencies:
docker-buildx-plugin   x86_64 0.11.2-1.el8                       docker-ce-stable 13 M
docker-compose-plugin  x86_64 2.20.2-1.el8                       docker-ce-stable 13 M
Removing dependent packages:
buildah                x86_64 1.22.3-2.module_el8.5.0+911+f19012f9
                                                                @appstream      28 M

```

```
containers-common          noarch 2:1-2.module_el8.5.0+890+6b136101
                              @appstream                236 k
```

Transaction Summary

```
=====
Install  7 Packages
Remove   2 Packages
```

```
Total download size: 96 M
Is this ok [y/N]: y
```

Transaction Summary

```
=====
Install  7 Packages
Remove   2 Packages
```

```
Total download size: 96 M
Is this ok [y/N]: y
```

Downloading Packages:

(1/7): libcgrou-0.41-19.el8.x86_64.rpm	279 kB/s	70 kB	00:00
(2/7): docker-buildx-plugin-0.11.2-1.el8.x86_64.rpm	3.2 MB/s	13 MB	00:04
(3/7): docker-ce-cli-24.0.5-1.el8.x86_64.rpm	3.1 MB/s	7.2 MB	00:02
(4/7): docker-ce-24.0.5-1.el8.x86_64.rpm	2.0 MB/s	24 MB	00:11
(5/7): containerd.io-1.6.22-3.1.el8.x86_64.rpm	1.6 MB/s	34 MB	00:20
(6/7): docker-ce-rootless-extras-24.0.5-1.el8.x86_64.	322 kB/s	4.9 MB	00:15
(7/7): docker-compose-plugin-2.20.2-1.el8.x86_64.rpm	961 kB/s	13 MB	00:13

```
-----
Total                                3.7 MB/s | 96 MB    00:25
Docker CE Stable - x86_64            67 kB/s | 1.6 kB    00:00
```

Importing GPG key 0x621E9F35:

```
  Userid      : "Docker Release (CE rpm) <docker@docker.com>"
  Fingerprint: 060A 61C5 1B55 8A7F 742B 77AA C52F EB6B 621E 9F35
  From        : https://download.docker.com/linux/centos/gpg
```

```
Is this ok [y/N]: y
```

```
Key imported successfully
Running transaction check
Transaction check succeeded.
Running transaction test
Transaction test succeeded.
Running transaction
  Preparing      :                                1/1
  Installing     : docker-compose-plugin-2.20.2-1.el8.x86_64 1/10
  Running scriptlet: docker-compose-plugin-2.20.2-1.el8.x86_64 1/10
  Installing     : docker-buildx-plugin-0.11.2-1.el8.x86_64 2/10
  Running scriptlet: docker-buildx-plugin-0.11.2-1.el8.x86_64 2/10
  Installing     : docker-ce-cli-1:24.0.5-1.el8.x86_64 3/10
  Running scriptlet: docker-ce-cli-1:24.0.5-1.el8.x86_64 3/10
  Installing     : containerd.io-1.6.22-3.1.el8.x86_64 4/10
  Running scriptlet: containerd.io-1.6.22-3.1.el8.x86_64 4/10
  Running scriptlet: libcgroupp-0.41-19.el8.x86_64 5/10
  Installing     : libcgroupp-0.41-19.el8.x86_64 5/10
  Running scriptlet: libcgroupp-0.41-19.el8.x86_64 5/10
  Installing     : docker-ce-rootless-extras-24.0.5-1.el8.x86_64 6/10
  Running scriptlet: docker-ce-rootless-extras-24.0.5-1.el8.x86_64 6/10
  Installing     : docker-ce-3:24.0.5-1.el8.x86_64 7/10
  Running scriptlet: docker-ce-3:24.0.5-1.el8.x86_64 7/10
  Erasing        : buildah-1.22.3-2.module_el8.5.0+911+f19012f9.x86_64 8/10
  Erasing        : containers-common-2:1-2.module_el8.5.0+890+6b136101.noar 9/10
  Obsoleting     : runc-1.0.2-1.module_el8.5.0+911+f19012f9.x86_64 10/10
  Running scriptlet: runc-1.0.2-1.module_el8.5.0+911+f19012f9.x86_64 10/10
  Verifying      : libcgroupp-0.41-19.el8.x86_64 1/10
  Verifying      : containerd.io-1.6.22-3.1.el8.x86_64 2/10
  Verifying      : runc-1.0.2-1.module_el8.5.0+911+f19012f9.x86_64 3/10
  Verifying      : docker-buildx-plugin-0.11.2-1.el8.x86_64 4/10
  Verifying      : docker-ce-3:24.0.5-1.el8.x86_64 5/10
  Verifying      : docker-ce-cli-1:24.0.5-1.el8.x86_64 6/10
  Verifying      : docker-ce-rootless-extras-24.0.5-1.el8.x86_64 7/10
  Verifying      : docker-compose-plugin-2.20.2-1.el8.x86_64 8/10
```



```
docker-ce.x86_64 3:23.0.2-1.el8 docker-ce-stable
docker-ce.x86_64 3:23.0.1-1.el8 docker-ce-stable
docker-ce.x86_64 3:23.0.0-1.el8 docker-ce-stable
docker-ce.x86_64 3:20.10.9-3.el8 docker-ce-stable
docker-ce.x86_64 3:20.10.8-3.el8 docker-ce-stable
docker-ce.x86_64 3:20.10.7-3.el8 docker-ce-stable
docker-ce.x86_64 3:20.10.6-3.el8 docker-ce-stable
docker-ce.x86_64 3:20.10.5-3.el8 docker-ce-stable
docker-ce.x86_64 3:20.10.4-3.el8 docker-ce-stable
docker-ce.x86_64 3:20.10.3-3.el8 docker-ce-stable
docker-ce.x86_64 3:20.10.24-3.el8 docker-ce-stable
docker-ce.x86_64 3:20.10.2-3.el8 docker-ce-stable
docker-ce.x86_64 3:20.10.23-3.el8 docker-ce-stable
docker-ce.x86_64 3:20.10.22-3.el8 docker-ce-stable
docker-ce.x86_64 3:20.10.21-3.el8 docker-ce-stable
docker-ce.x86_64 3:20.10.20-3.el8 docker-ce-stable
docker-ce.x86_64 3:20.10.19-3.el8 docker-ce-stable
docker-ce.x86_64 3:20.10.18-3.el8 docker-ce-stable
docker-ce.x86_64 3:20.10.17-3.el8 docker-ce-stable
docker-ce.x86_64 3:20.10.16-3.el8 docker-ce-stable
docker-ce.x86_64 3:20.10.15-3.el8 docker-ce-stable
docker-ce.x86_64 3:20.10.14-3.el8 docker-ce-stable
docker-ce.x86_64 3:20.10.1-3.el8 docker-ce-stable
docker-ce.x86_64 3:20.10.13-3.el8 docker-ce-stable
docker-ce.x86_64 3:20.10.12-3.el8 docker-ce-stable
docker-ce.x86_64 3:20.10.11-3.el8 docker-ce-stable
docker-ce.x86_64 3:20.10.10-3.el8 docker-ce-stable
docker-ce.x86_64 3:20.10.0-3.el8 docker-ce-stable
docker-ce.x86_64 3:19.03.15-3.el8 docker-ce-stable
docker-ce.x86_64 3:19.03.14-3.el8 docker-ce-stable
docker-ce.x86_64 3:19.03.13-3.el8 docker-ce-stable
Available Packages
```

```
[root@centos8 ~]# yum list docker-ce-cli --showduplicates | sort -r
```


Last metadata expiration check: 0:08:33 ago on Thu 14 Dec 2023 09:52:33 EST.

docker-ce-cli.x86_64	1:24.0.7-1.el8	docker-ce-stable
docker-ce-cli.x86_64	1:24.0.6-1.el8	docker-ce-stable
docker-ce-cli.x86_64	1:24.0.5-1.el8	docker-ce-stable
docker-ce-cli.x86_64	1:24.0.4-1.el8	docker-ce-stable
docker-ce-cli.x86_64	1:24.0.3-1.el8	docker-ce-stable
docker-ce-cli.x86_64	1:24.0.2-1.el8	docker-ce-stable
docker-ce-cli.x86_64	1:24.0.1-1.el8	docker-ce-stable
docker-ce-cli.x86_64	1:24.0.0-1.el8	docker-ce-stable
docker-ce-cli.x86_64	1:23.0.6-1.el8	docker-ce-stable
docker-ce-cli.x86_64	1:23.0.5-1.el8	docker-ce-stable
docker-ce-cli.x86_64	1:23.0.4-1.el8	docker-ce-stable
docker-ce-cli.x86_64	1:23.0.3-1.el8	docker-ce-stable
docker-ce-cli.x86_64	1:23.0.2-1.el8	docker-ce-stable
docker-ce-cli.x86_64	1:23.0.1-1.el8	docker-ce-stable
docker-ce-cli.x86_64	1:23.0.0-1.el8	docker-ce-stable
docker-ce-cli.x86_64	1:20.10.9-3.el8	docker-ce-stable
docker-ce-cli.x86_64	1:20.10.8-3.el8	docker-ce-stable
docker-ce-cli.x86_64	1:20.10.7-3.el8	docker-ce-stable
docker-ce-cli.x86_64	1:20.10.6-3.el8	docker-ce-stable
docker-ce-cli.x86_64	1:20.10.5-3.el8	docker-ce-stable
docker-ce-cli.x86_64	1:20.10.4-3.el8	docker-ce-stable
docker-ce-cli.x86_64	1:20.10.3-3.el8	docker-ce-stable
docker-ce-cli.x86_64	1:20.10.24-3.el8	docker-ce-stable
docker-ce-cli.x86_64	1:20.10.2-3.el8	docker-ce-stable
docker-ce-cli.x86_64	1:20.10.23-3.el8	docker-ce-stable
docker-ce-cli.x86_64	1:20.10.22-3.el8	docker-ce-stable
docker-ce-cli.x86_64	1:20.10.21-3.el8	docker-ce-stable
docker-ce-cli.x86_64	1:20.10.20-3.el8	docker-ce-stable
docker-ce-cli.x86_64	1:20.10.19-3.el8	docker-ce-stable
docker-ce-cli.x86_64	1:20.10.18-3.el8	docker-ce-stable
docker-ce-cli.x86_64	1:20.10.17-3.el8	docker-ce-stable
docker-ce-cli.x86_64	1:20.10.16-3.el8	docker-ce-stable
docker-ce-cli.x86_64	1:20.10.15-3.el8	docker-ce-stable

```
docker-ce-cli.x86_64      1:20.10.14-3.el8      docker-ce-stable
docker-ce-cli.x86_64      1:20.10.1-3.el8       docker-ce-stable
docker-ce-cli.x86_64      1:20.10.13-3.el8     docker-ce-stable
docker-ce-cli.x86_64      1:20.10.12-3.el8     docker-ce-stable
docker-ce-cli.x86_64      1:20.10.11-3.el8     docker-ce-stable
docker-ce-cli.x86_64      1:20.10.10-3.el8     docker-ce-stable
docker-ce-cli.x86_64      1:20.10.0-3.el8      docker-ce-stable
docker-ce-cli.x86_64      1:19.03.15-3.el8     docker-ce-stable
docker-ce-cli.x86_64      1:19.03.14-3.el8     docker-ce-stable
docker-ce-cli.x86_64      1:19.03.13-3.el8     docker-ce-stable
Available Packages
```

Dans le cas où vous souhaiteriez installer la version **24.0.4** de Docker, la commande d'installation deviendrait :

```
# yum install docker-ce-3:24.0.4-1.el8 docker-ce-cli-1:24.0.4-1.el8 containerd.io
```

Si vous préférez utiliser le script d'installation de Docker, il convient d'abord de le télécharger :

Important - Notez que ces scripts ne doivent pas être utilisés dans un environnement de production.

```
[root@centos8 ~]# curl -fsSL https://get.docker.com -o get-docker.sh
```

```
[root@centos8 ~]# ls
anaconda-ks.cfg      Downloads      Music          Videos
CentOS-8.1.1911-x86_64-boot.iso  get-docker.sh  Pictures
Desktop              home           Public
Documents            initial-setup-ks.cfg  Templates
```

Ensuite, il convient d'exécuter le script :

```
[root@centos8 ~]# chmod +x get-docker.sh

[root@centos8 ~]# ./get-docker.sh
# Executing docker install script, commit: c2de0811708b6d9015ed1a2c80f02c9b70c8ce7b
Warning: the "docker" command appears to already exist on this system.

If you already have Docker installed, this script can cause trouble, which is
why we're displaying this warning and provide the opportunity to cancel the
installation.

If you installed the current Docker package using this script and are using it
again to update Docker, you can safely ignore this message.

You may press Ctrl+C now to abort this script.
+ sleep 20
^C
```

Important - Notez l'utilisation de **^C** pour ne PAS continuer l'exécution du script.

Démarrez un conteneur de l'image hello-world :

```
[root@centos8 ~]# docker run hello-world
Unable to find image 'hello-world:latest' locally
latest: Pulling from library/hello-world
719385e32844: Pull complete
Digest: sha256:dcba6daec718f547568c562956fa47e1b03673dd010fe6ee58ca806767031d1c
Status: Downloaded newer image for hello-world:latest

Hello from Docker!
This message shows that your installation appears to be working correctly.
```

To generate this message, Docker took the following steps:

1. The Docker client contacted the Docker daemon.
2. The Docker daemon pulled the "hello-world" image from the Docker Hub.
(amd64)
3. The Docker daemon created a new container from that image which runs the executable that produces the output you are currently reading.
4. The Docker daemon streamed that output to the Docker client, which sent it to your terminal.

To try something more ambitious, you can run an Ubuntu container with:

```
$ docker run -it ubuntu bash
```

Share images, automate workflows, and more with a free Docker ID:

<https://hub.docker.com/>

For more examples and ideas, visit:

<https://docs.docker.com/get-started/>

Important - Notez que si l'image servant à générer le conteneur n'est pas présente sur le système hôte, celle-ci est téléchargée automatiquement depuis un dépôt (par défaut le dépôt **docker.io**) en utilisant la commande **docker pull**.

1.2 - Démarrer un Conteneur

Démarrez un conteneur de l'image ubuntu:latest en mode interactif grâce à l'utilisation des options **-i** et **-t** en lui passant en argument **bash** pour que celui-ci soient lancé au démarrage du conteneur :

```
root@debian11:~# docker run -it ubuntu bash
Unable to find image 'ubuntu:latest' locally
```

```
latest: Pulling from library/ubuntu
b237fe92c417: Pull complete
Digest: sha256:ec050c32e4a6085b423d36ecd025c0d3ff00c38ab93a3d71a460ff1c44fa6d77
Status: Downloaded newer image for ubuntu:latest

root@83b0d8979a33:/# ls
bin boot dev etc home lib lib32 lib64 libx32 media mnt opt proc root run sbin srv sys tmp usr
var

root@83b0d8979a33:/# cat /etc/lsb-release
DISTRIB_ID=Ubuntu
DISTRIB_RELEASE=22.04
DISTRIB_CODENAME=jammy
DISTRIB_DESCRIPTION="Ubuntu 22.04.3 LTS"
```

Important - Notez que dans ce cas le conteneur est lancé avec comme argument **bash** qui lancera `/bin/bash` dans le conteneur.

Consulter la liste des paquets installés dans le conteneur ubuntu :

```
root@83b0d8979a33:/# dpkg -l
Desired=Unknown/Install/Remove/Purge/Hold
| Status=Not/Inst/Conf-files/Unpacked/halF-conf/Half-inst/trig-aWait/Trig-pend
|/ Err?=(none)/Reinst-required (Status,Err: uppercase=bad)
||/ Name                    Version                Architecture Description
+++-----+-----+-----+-----+-----+-----+
=====
ii adduser                   3.118ubuntu5          all                add and remove users and groups
ii apt                       2.4.9                 amd64              commandline package manager
ii base-files                12ubuntu4.4          amd64              Debian base system miscellaneous
files
```

ii base-passwd password and group files	3.5.52build1	amd64	Debian base system master
ii bash	5.1-6ubuntu1	amd64	GNU Bourne Again SHell
ii bsdtails	1:2.37.2-4ubuntu3	amd64	basic utilities from 4.4BSD-Lite
ii coreutils	8.32-4.1ubuntu1	amd64	GNU core utilities
ii dash	0.5.11+git20210903+057cd650a4ed-3build1	amd64	POSIX-compliant shell
ii debconf system	1.5.79ubuntu1	all	Debian configuration management
ii debianutils to Debian	5.5-1ubuntu2	amd64	Miscellaneous utilities specific
ii diffutils	1:3.8-0ubuntu2	amd64	File comparison utilities
ii dpkg	1.21.1ubuntu2.2	amd64	Debian package management system
ii e2fsprogs utilities	1.46.5-2ubuntu1.1	amd64	ext2/ext3/ext4 file system
ii findutils find, xargs	4.8.0-1ubuntu3	amd64	utilities for finding files--
ii gcc-12-base:amd64 (base package)	12.3.0-1ubuntu1~22.04	amd64	GCC, the GNU Compiler Collection
ii gpgv verification tool	2.2.27-3ubuntu2.1	amd64	GNU privacy guard - signature
ii grep	3.7-1build1	amd64	GNU grep, egrep and fgrep
ii gzip	1.10-4ubuntu4.1	amd64	GNU compression utilities
ii hostname name or domain name	3.23ubuntu2	amd64	utility to set/show the host
ii init-system-helpers systems	1.62	all	helper tools for all init
ii libacl1:amd64 library	2.3.1-1	amd64	access control list - shared
ii libapt-pkg6.0:amd64 library	2.4.9	amd64	package management runtime
ii libattr1:amd64 shared library	1:2.5.1-1build1	amd64	extended attribute handling -
ii libaudit-common auditing - common files	1:3.0.7-1build1	all	Dynamic library for security

ii libaudit1:amd64 auditing	1:3.0.7-1build1	amd64	Dynamic library for security
ii libblkid1:amd64	2.37.2-4ubuntu3	amd64	block device ID library
ii libbz2-1.0:amd64 compressor library - runtime	1.0.8-5build1	amd64	high-quality block-sorting file
ii libc-bin	2.35-0ubuntu3.1	amd64	GNU C Library: Binaries
ii libc6:amd64	2.35-0ubuntu3.1	amd64	GNU C Library: Shared libraries
ii libcap-ng0:amd64 library	0.7.9-2.2build3	amd64	An alternate POSIX capabilities
ii libcap2:amd64 (library)	1:2.44-1ubuntu0.22.04.1	amd64	POSIX 1003.1e capabilities
ii libcom-err2:amd64	1.46.5-2ubuntu1.1	amd64	common error description library
ii libcrypt1:amd64	1:4.4.27-1	amd64	libcrypt shared library
ii libdb5.3:amd64 [runtime]	5.3.28+dfsg1-0.8ubuntu3	amd64	Berkeley v5.3 Database Libraries
ii libdebconfclient0:amd64 System (C-implementation library)	0.261ubuntu1	amd64	Debian Configuration Management
ii libext2fs2:amd64 libraries	1.46.5-2ubuntu1.1	amd64	ext2/ext3/ext4 file system
ii libffi8:amd64 library runtime	3.4.2-4	amd64	Foreign Function Interface
ii libgcc-s1:amd64	12.3.0-1ubuntu1~22.04	amd64	GCC support library
ii libgcrypt20:amd64 library	1.9.4-3ubuntu3	amd64	LGPL Crypto library - runtime
ii libgmp10:amd64 library	2:6.2.1+dfsg-3ubuntu1	amd64	Multiprecision arithmetic
ii libgnutls30:amd64 library	3.7.3-4ubuntu1.2	amd64	GNU TLS library - main runtime
ii libgpg-error0:amd64 library	1.43-3	amd64	GnuPG development runtime
ii libgssapi-krb5-2:amd64 krb5 GSS-API Mechanism	1.19.2-2ubuntu0.2	amd64	MIT Kerberos runtime libraries -
ii libhogweed6:amd64 (public-key cryptos)	3.7.3-1build2	amd64	low level cryptographic library

ii libidn2-0:amd64 (IDNA2008/TR46) library	2.3.2-2build1	amd64	Internationalized domain names
ii libk5crypto3:amd64 Crypto Library	1.19.2-2ubuntu0.2	amd64	MIT Kerberos runtime libraries -
ii libkeyutils1:amd64 (library)	1.6.1-2ubuntu3	amd64	Linux Key Management Utilities
ii libkrb5-3:amd64	1.19.2-2ubuntu0.2	amd64	MIT Kerberos runtime libraries
ii libkrb5support0:amd64 Support library	1.19.2-2ubuntu0.2	amd64	MIT Kerberos runtime libraries -
ii liblz4-1:amd64 library - runtime	1.9.3-2build2	amd64	Fast LZ compression algorithm
ii liblzma5:amd64	5.2.5-2ubuntu1	amd64	XZ-format compression library
ii libmount1:amd64	2.37.2-4ubuntu3	amd64	device mounting library
ii libncurses6:amd64 handling	6.3-2ubuntu0.1	amd64	shared libraries for terminal
ii libncursesw6:amd64 handling (wide character support)	6.3-2ubuntu0.1	amd64	shared libraries for terminal
ii libnettle8:amd64 (symmetric and one-way cryptos)	3.7.3-1build2	amd64	low level cryptographic library
ii libnsl2:amd64 NIS(YP) and NIS+	1.3.0-2build2	amd64	Public client interface for
ii libp11-kit0:amd64 coordinating access to PKCS#11 modules - runtime	0.24.0-6build1	amd64	library for loading and
ii libpam-modules:amd64 for PAM	1.4.0-11ubuntu2.3	amd64	Pluggable Authentication Modules
ii libpam-modules-bin for PAM - helper binaries	1.4.0-11ubuntu2.3	amd64	Pluggable Authentication Modules
ii libpam-runtime library	1.4.0-11ubuntu2.3	all	Runtime support for the PAM
ii libpam0g:amd64 library	1.4.0-11ubuntu2.3	amd64	Pluggable Authentication Modules
ii libpcre2-8-0:amd64 Expression Library- 8 bit runtime files	10.39-3ubuntu0.1	amd64	New Perl Compatible Regular
ii libpcre3:amd64	2:8.39-13ubuntu0.22.04.1	amd64	Old Perl 5 Compatible Regular

Expression Library - runtime files				
ii	libprocps8:amd64	2:3.3.17-6ubuntu2	amd64	library for accessing process information from /proc
ii	libseccomp2:amd64	2.5.3-2ubuntu2	amd64	high level interface to Linux seccomp filter
ii	libselinux1:amd64	3.3-1build2	amd64	SELinux runtime shared libraries
ii	libsemanage-common	3.3-1build2	all	Common files for SELinux policy management libraries
ii	libsemanage2:amd64	3.3-1build2	amd64	SELinux policy management library
ii	libsepol2:amd64	3.3-1build1	amd64	SELinux library for manipulating binary security policies
ii	libsmartcols1:amd64	2.37.2-4ubuntu3	amd64	smart column output alignment library
ii	libss2:amd64	1.46.5-2ubuntu1.1	amd64	command-line interface parsing library
ii	libssl3:amd64	3.0.2-0ubuntu1.10	amd64	Secure Sockets Layer toolkit - shared libraries
ii	libstdc++6:amd64	12.3.0-1ubuntu1~22.04	amd64	GNU Standard C++ Library v3
ii	libsystemd0:amd64	249.11-0ubuntu3.9	amd64	systemd utility library
ii	libtasn1-6:amd64	4.18.0-4build1	amd64	Manage ASN.1 structures (runtime)
ii	libtinfo6:amd64	6.3-2ubuntu0.1	amd64	shared low-level terminfo library for terminal handling
ii	libtirpc-common	1.3.2-2ubuntu0.1	all	transport-independent RPC library - common files
ii	libtirpc3:amd64	1.3.2-2ubuntu0.1	amd64	transport-independent RPC library
ii	libudev1:amd64	249.11-0ubuntu3.9	amd64	libudev shared library
ii	libunistring2:amd64	1.0-1	amd64	Unicode string library for C
ii	libuuid1:amd64	2.37.2-4ubuntu3	amd64	Universally Unique ID library
ii	libxxhash0:amd64	0.8.1-1	amd64	shared library for xxhash
ii	libzstd1:amd64	1.4.8+dfsg-3build1	amd64	fast lossless compression algorithm

```

ii login 1:4.8.1-2ubuntu2.1 amd64 system login tools
ii logsave 1.46.5-2ubuntu1.1 amd64 save the output of a command in
a log file
ii lsb-base 11.1.0ubuntu4 all Linux Standard Base init script
functionality
ii mawk 1.3.4.20200120-3 amd64 Pattern scanning and text
processing language
ii mount 2.37.2-4ubuntu3 amd64 tools for mounting and
manipulating filesystems
ii ncurses-base 6.3-2ubuntu0.1 all basic terminal type definitions
ii ncurses-bin 6.3-2ubuntu0.1 amd64 terminal-related programs and
man pages
ii passwd 1:4.8.1-2ubuntu2.1 amd64 change and administer password
and group data
ii perl-base 5.34.0-3ubuntu1.2 amd64 minimal Perl system
ii procs 2:3.3.17-6ubuntu2 amd64 /proc file system utilities
ii sed 4.8-1ubuntu2 amd64 GNU stream editor for
filtering/transforming text
ii sensible-utils 0.0.17 all Utilities for sensible
alternative selection
ii sysvinit-utils 3.01-1ubuntu1 amd64 System-V-like utilities
ii tar 1.34+dfsg-1ubuntu0.1.22.04.1 amd64 GNU version of the tar archiving
utility
ii ubuntu-keyring 2021.03.26 all GnuPG keys of the Ubuntu archive
ii usrmerge 25ubuntu2 all Convert the system to the merged
/usr directories scheme
ii util-linux 2.37.2-4ubuntu3 amd64 miscellaneous system utilities
ii zlib1g:amd64 1:1.2.11.dfsg-2ubuntu9.2 amd64 compression library - runtime
root@83b0d8979a33:/# exit
exit
root@debian11:~#

```

Les options de la commande docker run peuvent être visualisées avec la commande :

```
root@debian11:~# docker run --help
```

```
Usage: docker run [OPTIONS] IMAGE [COMMAND] [ARG...]
```

```
Create and run a new container from an image
```

```
Aliases:
```

```
docker container run, docker run
```

```
Options:
```

```
  --add-host list           Add a custom host-to-IP mapping (host:ip)
  --annotation map         Add an annotation to the container (passed through to the OCI runtime)
  (default map[])
  -a, --attach list        Attach to STDIN, STDOUT or STDERR
  --blkio-weight uint16    Block IO (relative weight), between 10 and 1000, or 0 to disable (default
0)
  --blkio-weight-device list  Block IO weight (relative device weight) (default [])
  --cap-add list           Add Linux capabilities
  --cap-drop list         Drop Linux capabilities
  --cgroup-parent string   Optional parent cgroup for the container
  --cgroupns string       Cgroup namespace to use (host|private)
                          'host': Run the container in the Docker host's cgroup namespace
                          'private': Run the container in its own private cgroup namespace
                          '': Use the cgroup namespace as configured by the
                              default-cgroupns-mode option on the daemon (default)
  --cidfile string        Write the container ID to the file
  --cpu-period int        Limit CPU CFS (Completely Fair Scheduler) period
  --cpu-quota int         Limit CPU CFS (Completely Fair Scheduler) quota
  --cpu-rt-period int     Limit CPU real-time period in microseconds
  --cpu-rt-runtime int    Limit CPU real-time runtime in microseconds
  -c, --cpu-shares int    CPU shares (relative weight)
  --cpus decimal          Number of CPUs
  --cpuset-cpus string    CPUs in which to allow execution (0-3, 0,1)
  --cpuset-mems string    MEMs in which to allow execution (0-3, 0,1)
```

```
-d, --detach                Run container in background and print container ID
--detach-keys string       Override the key sequence for detaching a container
--device list              Add a host device to the container
--device-cgroup-rule list  Add a rule to the cgroup allowed devices list
--device-read-bps list     Limit read rate (bytes per second) from a device (default [])
--device-read-iops list    Limit read rate (IO per second) from a device (default [])
--device-write-bps list    Limit write rate (bytes per second) to a device (default [])
--device-write-iops list   Limit write rate (IO per second) to a device (default [])
--disable-content-trust    Skip image verification (default true)
--dns list                 Set custom DNS servers
--dns-option list         Set DNS options
--dns-search list         Set custom DNS search domains
--domainname string        Container NIS domain name
--entrypoint string        Overwrite the default ENTRYPOINT of the image
-e, --env list             Set environment variables
--env-file list            Read in a file of environment variables
--expose list              Expose a port or a range of ports
--gpus gpu-request         GPU devices to add to the container ('all' to pass all GPUs)
--group-add list           Add additional groups to join
--health-cmd string        Command to run to check health
--health-interval duration Time between running the check (ms|s|m|h) (default 0s)
--health-retries int       Consecutive failures needed to report unhealthy
--health-start-period duration Start period for the container to initialize before starting health-
retries countdown (ms|s|m|h) (default 0s)
--health-timeout duration Maximum time to allow one check to run (ms|s|m|h) (default 0s)
--help                     Print usage
-h, --hostname string      Container host name
--init                     Run an init inside the container that forwards signals and reaps processes
-i, --interactive          Keep STDIN open even if not attached
--ip string                IPv4 address (e.g., 172.30.100.104)
--ip6 string               IPv6 address (e.g., 2001:db8::33)
--ipc string               IPC mode to use
--isolation string         Container isolation technology
--kernel-memory bytes      Kernel memory limit
```

```
-l, --label list          Set meta data on a container
--label-file list        Read in a line delimited file of labels
--link list              Add link to another container
--link-local-ip list     Container IPv4/IPv6 link-local addresses
--log-driver string      Logging driver for the container
--log-opt list           Log driver options
--mac-address string     Container MAC address (e.g., 92:d0:c6:0a:29:33)
-m, --memory bytes       Memory limit
--memory-reservation bytes Memory soft limit
--memory-swap bytes      Swap limit equal to memory plus swap: '-1' to enable unlimited swap
--memory-swappiness int  Tune container memory swappiness (0 to 100) (default -1)
--mount mount           Attach a filesystem mount to the container
--name string           Assign a name to the container
--network network       Connect a container to a network
--network-alias list    Add network-scoped alias for the container
--no-healthcheck        Disable any container-specified HEALTHCHECK
--oom-kill-disable      Disable OOM Killer
--oom-score-adj int     Tune host's OOM preferences (-1000 to 1000)
--pid string            PID namespace to use
--pids-limit int        Tune container pids limit (set -1 for unlimited)
--platform string       Set platform if server is multi-platform capable
--privileged            Give extended privileges to this container
-p, --publish list      Publish a container's port(s) to the host
-P, --publish-all      Publish all exposed ports to random ports
--pull string           Pull image before running ("always", "missing", "never") (default
"missing")
-q, --quiet             Suppress the pull output
--read-only             Mount the container's root filesystem as read only
--restart string        Restart policy to apply when a container exits (default "no")
--rm                   Automatically remove the container when it exits
--runtime string        Runtime to use for this container
--security-opt list     Security Options
--shm-size bytes        Size of /dev/shm
--sig-proxy             Proxy received signals to the process (default true)
```

```
--stop-signal string      Signal to stop the container
--stop-timeout int        Timeout (in seconds) to stop a container
--storage-opt list        Storage driver options for the container
--sysctl map              Sysctl options (default map[])
--tmpfs list              Mount a tmpfs directory
-t, --tty                 Allocate a pseudo-TTY
--ulimit ulimit           Ulimit options (default [])
-u, --user string         Username or UID (format: <name|uid>[:<group|gid>])
--usersns string          User namespace to use
--uts string              UTS namespace to use
-v, --volume list         Bind mount a volume
--volume-driver string    Optional volume driver for the container
--volumes-from list       Mount volumes from the specified container(s)
-w, --workdir string       Working directory inside the container
```

1.3 - Consulter la Liste des Conteneurs et Images

Pour consulter tous les conteneurs, utilisez la commande **docker ps** avec l'option **-a** :

```
root@debian11:~# docker ps -a
CONTAINER ID   IMAGE          COMMAND          CREATED          STATUS              PORTS          NAMES
83b0d8979a33   ubuntu        "bash"          4 minutes ago   Exited (0) 2 minutes ago
5d17db3bbb20   hello-world   "/hello"        16 hours ago   Exited (0) 16 hours ago   charming_hoover
```

Important - Notez que chaque conteneur peut être référencé par son **CONTAINER ID** ou par son **NAME**.

Pour consulter la liste des images, utilisez la commande **docker images** :

```
root@debian11:~# docker images
```

REPOSITORY	TAG	IMAGE ID	CREATED	SIZE
ubuntu	latest	01f29b872827	2 weeks ago	77.8MB
hello-world	latest	9c7a54a9a43c	3 months ago	13.3kB

Important - Notez que chaque image est référencée par son IMAGE ID.

1.4 - Rechercher une Image dans un Dépôt

Pour rechercher une image docker dans le dépôt par défaut, utilisez la commande **docker search** :

```
root@debian11:~# docker search --filter=stars=5 centos
```

NAME	DESCRIPTION	STARS	OFFICIAL	AUTOMATED
centos	DEPRECATED; The official build of CentOS.	7627	[OK]	
kasmweb/centos-7-desktop	CentOS 7 desktop for Kasm Workspaces	40		
couchbase/centos7-systemd	centos7-systemd images with additional debug...	8		[OK]
dokken/centos-7	CentOS 7 image for kitchen-dokken	5		
eclipse/centos_jdk8	CentOS, JDK8, Maven 3, git, curl, nmap, mc, ...	5		[OK]
dokken/centos-stream-9		6		

Important - Notez que chaque image est référencée par la colonne NAME. Le NAME est sous le format **repository/mainteneur/nom** sauf dans le cas où il s'agit de l'image "officielle" de l'éditeur au quel cas le format est simplement **repository/nom**. La notion de STARS (étoiles) vient de Docker Hub et est une indication de la satisfaction de la communauté.

1.5 - Supprimer un Conteneur d'une Image

Pour supprimer un conteneur d'une image, il convient d'utiliser la commande **docker rm** en référencant le conteneur soit par son **NAME** soit par son **CONTAINER ID** :

```
root@debian11:~# docker ps -a
CONTAINER ID   IMAGE          COMMAND        CREATED        STATUS          PORTS          NAMES
83b0d8979a33   ubuntu        "bash"        5 minutes ago Exited (0) 4 minutes ago
5d17db3bbb20   hello-world   "/hello"      16 hours ago  Exited (0) 16 hours ago          charming_hoover

root@debian11:~# docker rm upbeat_diffie
upbeat_diffie

root@debian11:~# docker ps -a
CONTAINER ID   IMAGE          COMMAND        CREATED        STATUS          PORTS          NAMES
5d17db3bbb20   hello-world   "/hello"      16 hours ago  Exited (0) 16 hours ago          charming_hoover

root@debian11:~# docker images
REPOSITORY    TAG          IMAGE ID       CREATED        SIZE
ubuntu        latest      01f29b872827  2 weeks ago   77.8MB
hello-world   latest      9c7a54a9a43c  3 months ago  13.3kB
```

Important - Notez que dans le cas de l'utilisation du CONTAINER ID, il n'est pas nécessaire d'utiliser la totalité de l'ID. Par exemple, dans le cas ci-dessus, le CONTAINER ID du conteneur **upbeat_diffie** était **83b0d8979a33**. La commande de suppression aurait pu utiliser **83b0d8979a33**, **83b0d8** ou même **83b**.

1.6 -Créer une Image à partir d'un Conteneur Modifié

Modifier un conteneur d'une image :

```
root@debian11:~# docker run -it ubuntu

root@4377355f88c2:/# ls
bin boot dev etc home lib lib32 lib64 libx32 media mnt opt proc root run sbin srv sys tmp usr
var

root@4377355f88c2:/# rm -rf /home

root@4377355f88c2:/# ls
bin boot dev etc lib lib32 lib64 libx32 media mnt opt proc root run sbin srv sys tmp usr var

root@4377355f88c2:/# exit
exit
root@debian11:~#
```

Important - Notez ici la suppression du répertoire **home** dans le conteneur **4377355f88c2**.

Consultez la différence entre le conteneur et l'image de base :

```
root@debian11:~# docker ps -a
```

CONTAINER ID	IMAGE	COMMAND	CREATED	STATUS	PORTS	NAMES
4377355f88c2	ubuntu	"/bin/bash"	About a minute ago	Exited (0)	About a minute ago	
romantic_northcutt						
5d17db3bbb20	hello-world	"/hello"	16 hours ago	Exited (0)	16 hours ago	
charming_hoover						

```
root@debian11:~# docker diff romantic_northcutt
C /root
A /root/.bash_history
D /home
```

Important - La sortie de la commande **docker diff** comporte des lettres dont les significations sont les suivantes : C = Create, D = Delete, A = Add.

Créez un autre conteneur à partir de l'image de base :

```
root@debian11:~# docker run -it ubuntu

root@e4caf92a5ceb:/# ls
bin boot dev etc home lib lib32 lib64 libx32 media mnt opt proc root run sbin srv sys tmp usr
var

root@e4caf92a5ceb:/# exit
exit

root@debian11:~#
```

Important - Dans ce nouveau conteneur, le répertoire **/home** est présent compte tenu du fait qu'il a été généré à partir de l'image d'origine, inchangée depuis sa compilation.

Créez maintenant l'image **ubuntu_1** à partir du premier conteneur ubuntu (dans le cas ci-dessous - **romantic_northcutt**) en utilisant la commande **docker commit** :

```
root@debian11:~# docker ps -a
CONTAINER ID   IMAGE          COMMAND          CREATED          STATUS          PORTS          NAMES
e4caf92a5ceb   ubuntu        "/bin/bash"     44 seconds ago  Exited (0) 32 seconds ago
affectionate_ishizaka
4377355f88c2   ubuntu        "/bin/bash"     6 hours ago     Exited (0) 6 hours ago
romantic_northcutt
5d17db3bbb20   hello-world   "/hello"        22 hours ago    Exited (0) 22 hours ago
charming_hoover

root@debian11:~# docker commit romantic_northcutt ubuntu_1
sha256:50d66f88b992b65d0a38c4b662fbdcc906477916240a90d214b35a42b939ea5f

root@debian11:~# docker images
REPOSITORY    TAG          IMAGE ID        CREATED          SIZE
ubuntu_1      latest      50d66f88b992   13 seconds ago  77.8MB
ubuntu        latest      01f29b872827   2 weeks ago     77.8MB
hello-world   latest      9c7a54a9a43c   3 months ago    13.3kB

root@debian11:~#
```

1.7 - Supprimer une Image

Créez maintenant un conteneur à partir de la nouvelle image **ubuntu_1** :

```
root@debian11:~# docker run -it ubuntu_1

root@86e777ebaf2b:/# ls
bin boot dev etc lib lib32 lib64 libx32 media mnt opt proc root run sbin srv sys tmp usr var

root@86e777ebaf2b:/# exit
exit

root@debian11:~#
```

Important - Notez l'absence du répertoire **home** dans le conteneur **904215fb79b4**.

Essayez de supprimer l'image **ubuntu_1** :

```
root@debian11:~# docker rmi ubuntu_1
Error response from daemon: conflict: unable to remove repository reference "ubuntu_1" (must force) - container
86e777ebaf2b is using its referenced image 50d66f88b992

root@debian11:~# docker ps -a
CONTAINER ID   IMAGE          COMMAND                  CREATED          STATUS          PORTS          NAMES
86e777ebaf2b   ubuntu_1      "/bin/bash"             About a minute ago  Exited (0)     About a minute ago  focused_colden
e4caf92a5ceb   ubuntu       "/bin/bash"             7 minutes ago     Exited (0)     7 minutes ago      affectionate_ishizaka
4377355f88c2   ubuntu       "/bin/bash"             6 hours ago       Exited (0)     6 hours ago        romantic_northcutt
5d17db3bbb20   hello-world   "/hello"                22 hours ago      Exited (0)     22 hours ago       charming_hoover
```

Important - Notez qu'il n'est pas possible de supprimer l'image **ubuntu_1** tant que le conteneur **86e777ebaf2b** soit actif.

Supprimez donc le conteneur identifié par le message d'erreur (dans le cas ci-dessus - **focused_colden**) ainsi que l'image **ubuntu_1** :

```
root@debian11:~# docker rm focused_colden
focused_colden
```

```
root@debian11:~# docker ps -a
CONTAINER ID   IMAGE          COMMAND          CREATED          STATUS          PORTS          NAMES
e4caf92a5ceb   ubuntu        "/bin/bash"     10 minutes ago  Exited (0) 9 minutes ago
affectionate_ishizaka
4377355f88c2   ubuntu        "/bin/bash"     6 hours ago     Exited (0) 6 hours ago
romantic_northcutt
5d17db3bbb20   hello-world   "/hello"        22 hours ago    Exited (0) 22 hours ago
charming_hoover

root@debian11:~# docker rmi ubuntu_1
Untagged: ubuntu_1:latest
Deleted: sha256:50d66f88b992b65d0a38c4b662fbdcc906477916240a90d214b35a42b939ea5f
Deleted: sha256:c5fdbeldd17356fd868456c44949e0ca50c78a610a8917d7ad6ab372aeebce20

root@debian11:~# docker images
REPOSITORY    TAG          IMAGE ID        CREATED          SIZE
ubuntu        latest      01f29b872827   2 weeks ago     77.8MB
hello-world   latest      9c7a54a9a43c   3 months ago    13.3kB
```

Pour pouvoir supprimer tous les conteneurs, listez-les par leur **Container ID** :

```
root@debian11:~# docker ps -aq
e4caf92a5ceb
4377355f88c2
5d17db3bbb20
```

Supprimer toutes les conteneurs :

```
root@debian11:~# docker rm `docker ps -aq`
e4caf92a5ceb
4377355f88c2
5d17db3bbb20

root@debian11:~# docker ps -aq
```

```
root@debian11:~#
```

Pour supprimer un conteneur dès la fin de son exécution, utilisez l'option **-rm** :

```
root@debian11:~# docker run -it --rm ubuntu

root@3b3d4d7be82b:/# ls
bin boot dev etc home lib lib32 lib64 libx32 media mnt opt proc root run sbin srv sys tmp usr
var

root@3b3d4d7be82b:/# exit
exit

root@debian11:~# docker ps -aq

root@debian11:~#
```

1.8 - Créer un Conteneur avec un Nom Spécifique

Créez maintenant un conteneur avec un nom spécifique :

```
root@debian11:~# docker run -it --name=ittraining ubuntu

root@d838ea83033e:/# ls
bin boot dev etc home lib lib32 lib64 libx32 media mnt opt proc root run sbin srv sys tmp usr
var

root@d838ea83033e:/# exit
exit

root@debian11:~# docker ps -a
CONTAINER ID   IMAGE          COMMAND                  CREATED        STATUS          PORTS          NAMES
```

d838ea83033e	ubuntu	"/bin/bash"	12 seconds ago	Exited (0) 4 seconds ago	ittraining
--------------	--------	-------------	----------------	--------------------------	------------

Pour obtenir de l'information concernant un conteneur, utilisez la commande **docker inspect** :

```
root@debian11:~# docker inspect ittraining
[
  {
    "Id": "d838ea83033e6a5b324676ed6734e7ff9c69084dd453c52eedd367f31bcb83f3",
    "Created": "2023-08-19T11:47:56.464134219Z",
    "Path": "/bin/bash",
    "Args": [],
    "State": {
      "Status": "exited",
      "Running": false,
      "Paused": false,
      "Restarting": false,
      "OOMKilled": false,
      "Dead": false,
      "Pid": 0,
      "ExitCode": 0,
      "Error": "",
      "StartedAt": "2023-08-19T11:47:57.979606971Z",
      "FinishedAt": "2023-08-19T11:48:04.066624168Z"
    },
    "Image": "sha256:01f29b872827fa6f9aed0ea0b2ede53aea4ad9d66c7920e81a8db6d1fd9ab7f9",
    "ResolvConfPath":
"/var/lib/docker/containers/d838ea83033e6a5b324676ed6734e7ff9c69084dd453c52eedd367f31bcb83f3/resolv.conf",
    "HostnamePath":
"/var/lib/docker/containers/d838ea83033e6a5b324676ed6734e7ff9c69084dd453c52eedd367f31bcb83f3/hostname",
    "HostsPath":
"/var/lib/docker/containers/d838ea83033e6a5b324676ed6734e7ff9c69084dd453c52eedd367f31bcb83f3/hosts",
    "LogPath":
"/var/lib/docker/containers/d838ea83033e6a5b324676ed6734e7ff9c69084dd453c52eedd367f31bcb83f3/d838ea83033e6a5b324676ed6734e7ff9c69084dd453c52eedd367f31bcb83f3-json.log",
```

```
"Name": "/ittraining",
"RestartCount": 0,
"Driver": "overlay2",
"Platform": "linux",
"MountLabel": "",
"ProcessLabel": "",
"AppArmorProfile": "docker-default",
"ExecIDs": null,
"HostConfig": {
  "Binds": null,
  "ContainerIDFile": "",
  "LogConfig": {
    "Type": "json-file",
    "Config": {}
  },
  "NetworkMode": "default",
  "PortBindings": {},
  "RestartPolicy": {
    "Name": "no",
    "MaximumRetryCount": 0
  },
  "AutoRemove": false,
  "VolumeDriver": "",
  "VolumesFrom": null,
  "ConsoleSize": [
    59,
    210
  ],
  "CapAdd": null,
  "CapDrop": null,
  "CgroupnsMode": "private",
  "Dns": [],
  "DnsOptions": [],
  "DnsSearch": [],
```



```
"ExtraHosts": null,  
"GroupAdd": null,  
"IpcMode": "private",  
"Cgroup": "",  
"Links": null,  
"OomScoreAdj": 0,  
"PidMode": "",  
"Privileged": false,  
"PublishAllPorts": false,  
"ReadOnlyRootfs": false,  
"SecurityOpt": null,  
"UTSMode": "",  
"UsernsMode": "",  
"ShmSize": 67108864,  
"Runtime": "runc",  
"Isolation": "",  
"CpuShares": 0,  
"Memory": 0,  
"NanoCpus": 0,  
"CgroupParent": "",  
"BlkioWeight": 0,  
"BlkioWeightDevice": [],  
"BlkioDeviceReadBps": [],  
"BlkioDeviceWriteBps": [],  
"BlkioDeviceReadIOps": [],  
"BlkioDeviceWriteIOps": [],  
"CpuPeriod": 0,  
"CpuQuota": 0,  
"CpuRealtimePeriod": 0,  
"CpuRealtimeRuntime": 0,  
"CpusetCpus": "",  
"CpusetMems": "",  
"Devices": [],  
"DeviceCgroupRules": null,
```

```
    "DeviceRequests": null,  
    "MemoryReservation": 0,  
    "MemorySwap": 0,  
    "MemorySwappiness": null,  
    "OomKillDisable": null,  
    "PidsLimit": null,  
    "Ulimits": null,  
    "CpuCount": 0,  
    "CpuPercent": 0,  
    "IOMaximumIOps": 0,  
    "IOMaximumBandwidth": 0,  
    "MaskedPaths": [  
        "/proc/asound",  
        "/proc/acpi",  
        "/proc/kcore",  
        "/proc/keys",  
        "/proc/latency_stats",  
        "/proc/timer_list",  
        "/proc/timer_stats",  
        "/proc/sched_debug",  
        "/proc/scsi",  
        "/sys/firmware"  
    ],  
    "ReadonlyPaths": [  
        "/proc/bus",  
        "/proc/fs",  
        "/proc/irq",  
        "/proc/sys",  
        "/proc/sysrq-trigger"  
    ]  
},  
"GraphDriver": {  
    "Data": {  
        "LowerDir":
```

```
"/var/lib/docker/overlay2/b8f594ac72f3c9a57be0645a8d5686259ff8799d341626458808d999e35fbf8f -
init/diff:/var/lib/docker/overlay2/f932b6b3764a556a570060fd607da5e9082eb6d816e3568574a6104ebc80df5e/diff",
    "MergedDir":
"/var/lib/docker/overlay2/b8f594ac72f3c9a57be0645a8d5686259ff8799d341626458808d999e35fbf8f/merged",
    "UpperDir":
"/var/lib/docker/overlay2/b8f594ac72f3c9a57be0645a8d5686259ff8799d341626458808d999e35fbf8f/diff",
    "WorkDir":
"/var/lib/docker/overlay2/b8f594ac72f3c9a57be0645a8d5686259ff8799d341626458808d999e35fbf8f/work"
  },
  "Name": "overlay2"
},
"Mounts": [],
"Config": {
  "Hostname": "d838ea83033e",
  "Domainname": "",
  "User": "",
  "AttachStdin": true,
  "AttachStdout": true,
  "AttachStderr": true,
  "Tty": true,
  "OpenStdin": true,
  "StdinOnce": true,
  "Env": [
    "PATH=/usr/local/sbin:/usr/local/bin:/usr/sbin:/usr/bin:/sbin:/bin"
  ],
  "Cmd": [
    "/bin/bash"
  ],
  "Image": "ubuntu",
  "Volumes": null,
  "WorkingDir": "",
  "Entrypoint": null,
  "OnBuild": null,
  "Labels": {
```

```
        "org.opencontainers.image.ref.name": "ubuntu",
        "org.opencontainers.image.version": "22.04"
    }
},
"NetworkSettings": {
    "Bridge": "",
    "SandboxID": "8896374679af4eed6bc5825722ef4f1d802910fba2d12cd87c777fad1338ebac",
    "HairpinMode": false,
    "LinkLocalIPv6Address": "",
    "LinkLocalIPv6PrefixLen": 0,
    "Ports": {},
    "SandboxKey": "/var/run/docker/netns/8896374679af",
    "SecondaryIPAddresses": null,
    "SecondaryIPv6Addresses": null,
    "EndpointID": "",
    "Gateway": "",
    "GlobalIPv6Address": "",
    "GlobalIPv6PrefixLen": 0,
    "IPAddress": "",
    "IPPrefixLen": 0,
    "IPv6Gateway": "",
    "MacAddress": "",
    "Networks": {
        "bridge": {
            "IPAMConfig": null,
            "Links": null,
            "Aliases": null,
            "NetworkID": "33b1d61a638b6114462bd420314077791ed32b132a4536ad7725420a58e11d3f",
            "EndpointID": "",
            "Gateway": "",
            "IPAddress": "",
            "IPPrefixLen": 0,
            "IPv6Gateway": "",
            "GlobalIPv6Address": "",
```

```
        "GlobalIPv6PrefixLen": 0,  
        "MacAddress": "",  
        "DriverOpts": null  
    }  
  }  
}
```

1.9 - Exécuter une Commande dans un Conteneur

Pour exécuter une commande spécifique dans un conteneur, passez la commande en argument :

```
root@debian11:~# docker run --rm ubuntu env  
PATH=/usr/local/sbin:/usr/local/bin:/usr/sbin:/usr/bin:/sbin:/bin  
HOSTNAME=9b7b7547c023  
HOME=/root  
  
root@debian11:~#
```

1.10 - Injecter des Variables d'Environnement dans un Conteneur

Pour injecter une ou des variables d'environnement dans un conteneur, utilisez un fichier pré-établi :

```
root@debian11:~# vi env.list  
  
root@debian11:~# cat env.list  
EDITOR=vim  
HOSTNAME=ubuntudocker  
  
root@debian11:~# docker run --rm --env-file=env.list ubuntu env
```

```
PATH=/usr/local/sbin:/usr/local/bin:/usr/sbin:/usr/bin:/sbin:/bin
HOSTNAME=ubuntudocker
EDITOR=vim
HOME=/root

root@debian11:~#
```

1.11 - Modifier le Nom d'Hôte d'un Conteneur

Pour modifier le nom d'hôte d'un conteneur, utilisez l'option **-h** :

```
root@debian11:~# docker run -it --rm -h ubuntudocker ubuntu

root@ubuntudocker:/# hostname
ubuntudocker

root@ubuntudocker:/# exit
exit
```

1.12 - Mapper des Ports d'un Conteneur

Démarrer un conteneur de nginx sur le port localhost 81 :

```
root@debian11:~# docker run -it -p 81:80 nginx
Unable to find image 'nginx:latest' locally
latest: Pulling from library/nginx
52d2b7f179e3: Pull complete
fd9f026c6310: Pull complete
055fa98b4363: Pull complete
96576293dd29: Pull complete
a7c4092be904: Pull complete
```

```
e3b6889c8954: Pull complete
da761d9a302b: Pull complete
Digest: sha256:104c7c5c54f2685f0f46f3be607ce60da7085da3eaa5ad22d3d9f01594295e9c
Status: Downloaded newer image for nginx:latest

^C

root@debian11:~#
```

Notez que c'est bloquant. Le fait d'avoir utiliser ^C a interrompu le processus du conteneur :

```
root@debian11:~# docker ps -a
CONTAINER ID   IMAGE     COMMAND                  CREATED        STATUS              PORTS          NAMES
37cb0af1e97f   nginx    "/docker-entrypoint...." 46 seconds ago Created
intelligent_fermi
d838ea83033e   ubuntu  "/bin/bash"             5 minutes ago  Exited (0) 5 minutes ago
ittraining
```

1.13 - Démarrer un Conteneur en mode Détaché

Démarrez maintenant le conteneur de nginx en mode détaché grâce à l'utilisation de l'option **-d** :

```
root@debian11:~# docker run -d -p 81:80 nginx
5c2fe852965f700fff2d11baff034557c4956a7cd5eb54c51967d362415a76b4

root@debian11:~# docker ps -a
CONTAINER ID   IMAGE     COMMAND                  CREATED        STATUS              PORTS          NAMES
5c2fe852965f   nginx    "/docker-entrypoint...." 8 seconds ago  Up 6 seconds
0.0.0.0:81->80/tcp, :::81->80/tcp  priceless_yonath
37cb0af1e97f   nginx    "/docker-entrypoint...." About a minute ago Created
intelligent_fermi
d838ea83033e   ubuntu  "/bin/bash"             5 minutes ago  Exited (0) 5 minutes ago
```

ittraining

1.14 - Accéder aux Services d'un Conteneur de l'Extérieur

Installez le navigateur texte **lynx** :

```
root@debian11:~# apt-get install lynx
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
The following packages were automatically installed and are no longer required:
  libopengl0 linux-headers-5.10.0-15-amd64 linux-headers-5.10.0-15-common
Use 'apt autoremove' to remove them.
The following additional packages will be installed:
  lynx-common
The following NEW packages will be installed:
  lynx lynx-common
0 upgraded, 2 newly installed, 0 to remove and 0 not upgraded.
Need to get 1,844 kB of archives.
After this operation, 5,768 kB of additional disk space will be used.
Do you want to continue? [Y/n] y
```

Vérifiez que nginx répond aux requetes :

```
root@debian11:~# lynx --dump http://localhost:81
      Welcome to nginx!

If you see this page, the nginx web server is successfully installed
and working. Further configuration is required.

For online documentation and support please refer to [1]nginx.org.
Commercial support is available at [2]nginx.com.
```



```
Thank you for using nginx.
```

References

1. <http://nginx.org/>
2. <http://nginx.com/>

```
root@debian11:~#
```

1.15 - Arrêter et Démarrer un Conteneur

Arrêtez le conteneur nginx :

```
root@debian11:~# docker ps -a
```

CONTAINER ID	IMAGE	COMMAND	CREATED	STATUS	PORTS	NAMES
5c2fe852965f	nginx	"/docker-entrypoint...."	2 minutes ago	Up 2 minutes	0.0.0.0:81->80/tcp,	
:::81->80/tcp	priceless_yonath					
37cb0af1e97f	nginx	"/docker-entrypoint...."	3 minutes ago	Created		
intelligent_fermi						
d838ea83033e	ubuntu	"/bin/bash"	8 minutes ago	Exited (0) 8 minutes ago		ittraining

```
root@debian11:~# docker stop 5c2f
5c2f

root@debian11:~# docker ps -a
```

CONTAINER ID	IMAGE	COMMAND	CREATED	STATUS	PORTS	NAMES
5c2fe852965f	nginx	"/docker-entrypoint...."	3 minutes ago	Exited (0) 5 seconds ago		priceless_yonath
37cb0af1e97f	nginx	"/docker-entrypoint...."	4 minutes ago	Created		
intelligent_fermi						
d838ea83033e	ubuntu	"/bin/bash"	8 minutes ago	Exited (0) 8 minutes ago		ittraining

Démarrez de nouveau le conteneur de nginx :

```
root@debian11:~# docker start 5c2f
5c2f

root@debian11:~# docker ps -a
CONTAINER ID   IMAGE          COMMAND                  CREATED        STATUS          PORTS
NAMES
5c2fe852965f   nginx         "/docker-entrypoint...." 3 minutes ago  Up 2 seconds   0.0.0.0:81->80/tcp,
:::81->80/tcp   priceless_yonath
37cb0af1e97f   nginx         "/docker-entrypoint...." 4 minutes ago  Created
intelligent_fermi
d838ea83033e   ubuntu       "/bin/bash"             9 minutes ago  Exited (0) 9 minutes ago
ittraining
```

1.16 - Utiliser des Signaux avec un Conteneur

Utilisez un signal pour tuer le processus du conteneur de nginx :

```
root@debian11:~# docker kill -s 9 5c2f
5c2f

root@debian11:~# docker ps -a
CONTAINER ID   IMAGE          COMMAND                  CREATED        STATUS          PORTS          NAMES
5c2fe852965f   nginx         "/docker-entrypoint...." 5 minutes ago  Exited (137) 5 seconds ago
priceless_yonath
37cb0af1e97f   nginx         "/docker-entrypoint...." 6 minutes ago  Created
intelligent_fermi
d838ea83033e   ubuntu       "/bin/bash"             11 minutes ago  Exited (0) 11 minutes ago
ittraining
```

Redémarrez le conteneur :

```
root@debian11:~# docker start 5c2f
5c2f
```

```
root@debian11:~# docker ps -a
CONTAINER ID   IMAGE     COMMAND                  CREATED        STATUS        PORTS
NAMES
5c2fe852965f   nginx    "/docker-entrypoint...." 6 minutes ago  Up 2 seconds  0.0.0.0:81->80/tcp, :::81->80/tcp   priceless_yonath
37cb0af1e97f   nginx    "/docker-entrypoint...." 7 minutes ago  Created
intelligent_fermi
d838ea83033e   ubuntu   "/bin/bash"             11 minutes ago Exited (0) 11 minutes ago
ittraining
```

```
root@debian11:~# docker restart 5c2f
5c2f
```

```
root@debian11:~# docker ps -a
CONTAINER ID   IMAGE     COMMAND                  CREATED        STATUS        PORTS
NAMES
5c2fe852965f   nginx    "/docker-entrypoint...." 6 minutes ago  Up 2 seconds  0.0.0.0:81->80/tcp, :::81->80/tcp   priceless_yonath
37cb0af1e97f   nginx    "/docker-entrypoint...." 7 minutes ago  Created
intelligent_fermi
d838ea83033e   ubuntu   "/bin/bash"             12 minutes ago Exited (0) 12 minutes ago
ittraining
```

1.17 - Forcer la Suppression d'un Conteneur en cours d'Exécution

Supprimez un conteneur en cours d'exécution :

```
root@debian11:~# docker rm 5c2f
Error response from daemon: You cannot remove a running container
```

```
5c2fe852965f700fff2d11baff034557c4956a7cd5eb54c51967d362415a76b4. Stop the container before attempting removal or force remove
```

```
root@debian11:~# docker ps -a
CONTAINER ID   IMAGE     COMMAND                  CREATED        STATUS              PORTS
NAMES
5c2fe852965f   nginx    "/docker-entrypoin...."  7 minutes ago  Up 58 seconds      0.0.0.0:81->80/tcp, :::81->80/tcp  priceless_yonath
37cb0af1e97f   nginx    "/docker-entrypoin...."  8 minutes ago  Created
intelligent_fermi
d838ea83033e   ubuntu   "/bin/bash"             13 minutes ago Exited (0) 12 minutes ago
ittraining
```

```
root@debian11:~# docker rm -f 5c2f
5c2f
```

```
root@debian11:~# docker ps -a
CONTAINER ID   IMAGE     COMMAND                  CREATED        STATUS              PORTS      NAMES
37cb0af1e97f   nginx    "/docker-entrypoin...."  8 minutes ago  Created
intelligent_fermi
d838ea83033e   ubuntu   "/bin/bash"             13 minutes ago Exited (0) 13 minutes ago
ittraining
```

1.18 - Utilisation Simple d'un Volume

Créez le fichier index.html et placez-le dans le répertoire /root/www :

```
root@debian11:~# vi index.html

root@debian11:~# cat index.html
<html>
<body>
<center>Accueil du site nginx</center>
```

```
</body>
</html>

root@debian11:~# mv index.html www/

root@debian11:~#
```

Indiquez au conteneur que son répertoire **/usr/share/nginx/html/** est remplacé par le répertoire **/root/www/** de la machine hôte :

```
root@debian11:~# docker run -d -p 81:80 -v /root/www:/usr/share/nginx/html:ro nginx
5bec576b4b69b3dbd4cb58305a80d5ac94d42312b486e99dac94f82ba6541e3c

root@debian11:~# lynx --dump http://localhost:81
                Accueil du site nginx

root@debian11:~#
```

Important - Notez ici l'utilisation de **ro** - lecture seule.

1.19 - Télécharger une image sans créer un conteneur

Téléchargez l'image de centos sans créer un conteneur :

```
root@debian11:~# docker pull centos
Using default tag: latest
latest: Pulling from library/centos
a1d0c7532777: Pull complete
Digest: sha256:a27fd8080b517143cbbbab9dfb7c8571c40d67d534bbdee55bd6c473f432b177
Status: Downloaded newer image for centos:latest
```

```
docker.io/library/centos:latest
```

Vérifiez le contenu de l'image en créant un conteneur :

```
root@debian11:~# docker run -it centos bash

[root@b45b7b136f06 /]# cat /etc/redhat-release
CentOS Linux release 8.4.2105

[root@b45b7b136f06 /]# rpm -qa | more
crypto-policies-20210209-1.gitbfb6bed.el8_3.noarch
python3-pip-wheel-9.0.3-19.el8.noarch
ncurses-base-6.1-7.20180224.el8.noarch
dnf-data-4.4.2-11.el8.noarch
dhcp-common-4.3.6-44.0.1.el8.noarch
centos-gpg-keys-8-2.el8.noarch
centos-linux-repos-8-2.el8.noarch
filesystem-3.8-3.el8.x86_64
pcre2-10.32-2.el8.x86_64
ncurses-libs-6.1-7.20180224.el8.x86_64
glibc-common-2.28-151.el8.x86_64
bash-4.4.19-14.el8.x86_64
zlib-1.2.11-17.el8.x86_64
bzip2-libs-1.0.6-26.el8.x86_64
libgpg-error-1.31-1.el8.x86_64
elfutils-libelf-0.182-3.el8.x86_64
libcom_err-1.45.6-1.el8.x86_64
libxml2-2.9.7-9.el8.x86_64
expat-2.2.5-4.el8.x86_64
libuuid-2.32.1-27.el8.x86_64
chkconfig-1.13-2.el8.x86_64
gmp-6.1.2-10.el8.x86_64
libattr-2.4.48-3.el8.x86_64
coreutils-single-8.30-8.el8.x86_64
```

```
sed-4.5-2.el8.x86_64
libcap-ng-0.7.9-5.el8.x86_64
libsmartcols-2.32.1-27.el8.x86_64
lz4-libs-1.8.3-2.el8.x86_64
file-libs-5.33-16.el8_3.1.x86_64
p11-kit-0.23.22-1.el8.x86_64
cracklib-2.9.6-15.el8.x86_64
libunistring-0.9.9-3.el8.x86_64
libassuan-2.5.1-3.el8.x86_64
keyutils-libs-1.5.10-6.el8.x86_64
libnl3-3.5.0-1.el8.x86_64
p11-kit-trust-0.23.22-1.el8.x86_64
pcre-8.42-4.el8.x86_64
systemd-libs-239-45.el8.x86_64
dbus-tools-1.12.8-12.el8.x86_64
libusbx-1.0.23-4.el8.x86_64
ca-certificates-2020.2.41-80.0.el8_2.noarch
libdb-5.3.28-40.el8.x86_64
iproute-5.9.0-4.el8.x86_64
libdb-utils-5.3.28-40.el8.x86_64
tpm2-tss-2.3.2-3.el8.x86_64
xz-5.2.4-3.el8.x86_64
ethtool-5.8-5.el8.x86_64
libsemanage-2.9-6.el8.x86_64
dbus-daemon-1.12.8-12.el8.x86_64
libfdisk-2.32.1-27.el8.x86_64
mpfr-3.1.6-1.el8.x86_64
gnutls-3.6.14-7.el8_3.x86_64
snappy-1.1.8-3.el8.x86_64
libmetalink-0.1.3-7.el8.x86_64
libksba-1.3.5-7.el8.x86_64
ipcalc-0.2.4-4.el8.x86_64
libseccomp-2.5.1-1.el8.x86_64
gawk-4.2.1-2.el8.x86_64
```

```
--More--  
[q]  
[root@b45b7b136f06 /]#
```

1.20 - S'attacher à un conteneur en cours d'exécution

Arrêtez le conteneur. Démarrez le conteneur puis rattachiez-vous au conteneur :

```
[root@b45b7b136f06 /]# exit  
exit  
  
root@debian11:~# docker ps -a  
CONTAINER ID   IMAGE     COMMAND                  CREATED        STATUS          PORTS  
NAMES  
b45b7b136f06   centos    "bash"                  3 minutes ago Exited (0) 8 seconds ago  
quizzical_cray  
5bec576b4b69   nginx     "/docker-entypoint...." 4 minutes ago Up 4 minutes  
0.0.0.0:81->80/tcp, :::81->80/tcp elegant_shockley  
37cb0af1e97f   nginx     "/docker-entypoint...." 27 minutes ago Created  
intelligent_fermi  
d838ea83033e   ubuntu   "/bin/bash"            32 minutes ago Exited (0) 31 minutes ago  
ittraining  
  
root@debian11:~# docker start b45b  
b45b  
  
root@debian11:~# docker attach b45b  
  
[root@b45b7b136f06 /]# ls  
bin dev etc home lib lib64 lost+found media mnt opt proc root run sbin srv sys tmp usr var  
  
[root@b45b7b136f06 /]#
```


1.21 - Installer un logiciel dans le conteneur

Réparez les dépôts de CentOS 8 :

```
[root@b45b7b136f06 /]# sed -i 's/mirrorlist/#mirrorlist/g' /etc/yum.repos.d/CentOS-Linux-*
```

```
[root@b45b7b136f06 /]# sed -i 's|#baseurl=http://mirror.centos.org|baseurl=http://vault.centos.org|g' /etc/yum.repos.d/CentOS-Linux-*
```

```
[root@b45b7b136f06 /]# yum upgrade -y
```

```
...
```

Créez le fichier **/etc/yum.repos.d/mongodb-org-4.2.repo** :

```
[root@b45b7b136f06 /]# vi /etc/yum.repos.d/mongodb-org-4.2.repo
```

```
[root@b45b7b136f06 /]# cat /etc/yum.repos.d/mongodb-org-4.2.repo
```

```
[mongodb-org-4.2]
name=MongoDB Repository
baseurl=https://repo.mongodb.org/yum/redhat/$releasever/mongodb-org/4.2/x86_64/
gpgcheck=1
enabled=1
gpgkey=https://www.mongodb.org/static/pgp/server-4.2.as[mongodb-org-4.2]
name=MongoDB Repository
baseurl=https://repo.mongodb.org/yum/redhat/$releasever/mongodb-org/4.2/x86_64/
gpgcheck=1
enabled=1
gpgkey=https://www.mongodb.org/static/pgp/server-4.2.asc
```

Installez mongo :

```
[root@b45b7b136f06 /]# yum install -y mongodb-org
```

```
...
```



```
2023-08-19T13:53:35.327+0000 I CONTROL [initandlisten]
2023-08-19T13:53:35.327+0000 I CONTROL [initandlisten] ** WARNING: Access control is not enabled for the
database.
2023-08-19T13:53:35.327+0000 I CONTROL [initandlisten] **          Read and write access to data and
configuration is unrestricted.
2023-08-19T13:53:35.327+0000 I CONTROL [initandlisten] ** WARNING: You are running this process as the root
user, which is not recommended.
2023-08-19T13:53:35.327+0000 I CONTROL [initandlisten]
2023-08-19T13:53:35.327+0000 I CONTROL [initandlisten]
2023-08-19T13:53:35.327+0000 I CONTROL [initandlisten] ** WARNING: /sys/kernel/mm/transparent_hugepage/enabled
is 'always'.
2023-08-19T13:53:35.327+0000 I CONTROL [initandlisten] **          We suggest setting it to 'never'
2023-08-19T13:53:35.327+0000 I CONTROL [initandlisten]
---
Enable MongoDB's free cloud-based monitoring service, which will then receive and display
metrics about your deployment (disk utilization, CPU, operation statistics, etc).

The monitoring data will be available on a MongoDB website with a unique URL accessible to you
and anyone you share the URL with. MongoDB may use this information to make product
improvements and to suggest MongoDB products and deployment options to you.

To enable free monitoring, run the following command: db.enableFreeMonitoring()
To permanently disable this reminder, run the following command: db.disableFreeMonitoring()
---
>
```

Sortez de mongo et du conteneur :

```
> exit
bye
[root@b45b7b136f06 /]# exit
exit
```

```
root@debian11:~#
```

1.22 - Utilisation de la commande docker commit

Créez maintenant une nouvelle image à partir de votre conteneur :

```
root@debian11:~# docker ps -a
CONTAINER ID   IMAGE     COMMAND                  CREATED        STATUS              PORTS
NAMES
b45b7b136f06   centos    "bash"                  2 hours ago   Exited (0) 31 seconds ago
quizzical_cray
5bec576b4b69   nginx    "/docker-entrypoint...." 2 hours ago   Up 2 hours          0.0.0.0:81->80/tcp,
:::81->80/tcp   elegant_shockley
37cb0af1e97f   nginx    "/docker-entrypoint...." 2 hours ago   Created
intelligent_fermi
d838ea83033e   ubuntu   "/bin/bash"            2 hours ago   Exited (0) 2 hours ago
ittraining

root@debian11:~# docker commit b45b ittraining/mongodb
sha256:0ebd6759e69e3c345087dea3c9743a9d0fad81ca750842f1ff0004cbffabd8ae

root@debian11:~#
```

Supprimez le conteneur utilisé pour créer l'image :

```
root@debian11:~# docker rm b45b
b45b

root@debian11:~# docker ps -a
CONTAINER ID   IMAGE     COMMAND                  CREATED        STATUS              PORTS
NAMES
5bec576b4b69   nginx    "/docker-entrypoint...." 2 hours ago   Up 2 hours          0.0.0.0:81->80/tcp,
:::81->80/tcp   elegant_shockley
```

```
37cb0af1e97f  nginx  "/docker-entrypoint...."  2 hours ago  Created
intelligent_fermi
d838ea83033e  ubuntu  "/bin/bash"  2 hours ago  Exited (0) 2 hours ago
ittraining
```

Utilisez la nouvelle image pour lancer un conteneur nommé **mongo** :

```
root@debian11:~# docker run -it --name mongo ittraining/mongod

[root@0c597fe7b628 /]# ls /usr/bin/mongo*
/usr/bin/mongo /usr/bin/mongod /usr/bin/mongodump /usr/bin/mongoexport /usr/bin/mongofiles
/usr/bin/mongoimport /usr/bin/mongorestore /usr/bin/mongos /usr/bin/mongostat /usr/bin/mongotop

[root@0c597fe7b628 /]# ps aux
USER          PID %CPU %MEM    VSZ   RSS TTY      STAT START   TIME COMMAND
root           1  0.0  0.0  15100  3704 pts/0    Ss   14:01   0:00 bash
root          18  0.0  0.0  47604  3696 pts/0    R+   14:01   0:00 ps aux
```

Editez le fichier /etc/bashrc :

```
[root@0c597fe7b628 /]# echo "/usr/bin/mongod --config /etc/mongod.conf &" >> /etc/bashrc

[root@0c597fe7b628 /]# tail /etc/bashrc
    fi
done

    unset i
    unset -f pathmunge
fi

fi
# vim:ts=4:sw=4
/usr/bin/mongod --config /etc/mongod.conf &
```

```
[root@0c597fe7b628 /]#
```

Consultez la liste des conteneurs et relevez le CONTAINER ID du conteneur **mongo** :

```
[root@0c597fe7b628 /]# exit
exit
```

```
root@debian11:~# docker ps -a
CONTAINER ID   IMAGE                COMMAND                  CREATED        STATUS
PORTS         NAMES
0c597fe7b628   ittraining/mongodb  "bash"                  About a minute ago  Exited (0) 7 seconds ago
mongo
5bec576b4b69   nginx               "/docker-entrypoint...." 2 hours ago      Up 2 hours
0.0.0.0:81->80/tcp, :::81->80/tcp  elegant_shockley
37cb0af1e97f   nginx               "/docker-entrypoint...." 2 hours ago      Created
intelligent_fermi
d838ea83033e   ubuntu             "/bin/bash"             2 hours ago      Exited (0) 2 hours ago
ittraining

root@debian11:~#
```

Utilisez la commande commit pour "sauvegarder" la modification dans l'image :

```
root@debian11:~# docker commit 0c59 ittraining/mongodb
sha256:3daa95515db6c3f1bd7e30a29c52d3bd5ea14207c05d9401bc2da91d54adbb3f
```

Démarrez de nouveau le conteneur pour vérifier que mongod fonctionne :

```
root@debian11:~# docker rm 0c59
0c59

root@debian11:~# docker ps -a
CONTAINER ID   IMAGE                COMMAND                  CREATED        STATUS        PORTS
NAMES
```



```
/etc/apt/sources.list.d/mongodb-org-4.0.list
deb [trusted=yes] http://repo.mongodb.org/apt/debian stretch/mongodb-org/4.0 main

root@debian11:~# apt-get update
...
```

Cette fois, installez uniquement le client de mongodb :

```
root@debian11:~# apt-get install mongodb-org-shell
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
The following packages were automatically installed and are no longer required:
  libopengl0 linux-headers-5.10.0-15-amd64 linux-headers-5.10.0-15-common
Use 'apt autoremove' to remove them.
The following NEW packages will be installed:
  mongodb-org-shell
0 upgraded, 1 newly installed, 0 to remove and 5 not upgraded.
Need to get 9,970 kB of archives.
After this operation, 40.3 MB of additional disk space will be used.
Get:1 http://repo.mongodb.org/apt/debian stretch/mongodb-org/4.0/main amd64 mongodb-org-shell amd64 4.0.28 [9,970 kB]
Fetched 9,970 kB in 1s (10.8 MB/s)
Selecting previously unselected package mongodb-org-shell.
(Reading database ... 166761 files and directories currently installed.)
Preparing to unpack .../mongodb-org-shell_4.0.28_amd64.deb ...
Unpacking mongodb-org-shell (4.0.28) ...
Setting up mongodb-org-shell (4.0.28) ...
Processing triggers for man-db (2.9.4-2) ...
```

Notez qu'à ce stade le conteneur ne possède pas d'adresse IP car il n'est pas démarré :

```
root@debian11:~# docker inspect mongo | grep IP
  "LinkLocalIPv6Address": "",
```

```
"LinkLocalIPv6PrefixLen": 0,  
"SecondaryIPAddresses": null,  
"SecondaryIPv6Addresses": null,  
"GlobalIPv6Address": "",  
"GlobalIPv6PrefixLen": 0,  
"IPAddress": "",  
"IPPrefixLen": 0,  
"IPv6Gateway": "",  
  "IPAMConfig": null,  
  "IPAddress": "",  
  "IPPrefixLen": 0,  
  "IPv6Gateway": "",  
  "GlobalIPv6Address": "",  
  "GlobalIPv6PrefixLen": 0,
```

Démarrez donc le conteneur et cherchez l'adresse IP de celui-ci :

```
root@debian11:~# docker start mongo  
mongo  
  
root@debian11:~# docker inspect mongo | grep IP  
"LinkLocalIPv6Address": "",  
"LinkLocalIPv6PrefixLen": 0,  
"SecondaryIPAddresses": null,  
"SecondaryIPv6Addresses": null,  
"GlobalIPv6Address": "",  
"GlobalIPv6PrefixLen": 0,  
"IPAddress": "172.17.0.3",  
"IPPrefixLen": 16,  
"IPv6Gateway": "",  
  "IPAMConfig": null,  
  "IPAddress": "172.17.0.3",  
  "IPPrefixLen": 16,  
  "IPv6Gateway": "",
```

```
"GlobalIPv6Address": "",
"GlobalIPv6PrefixLen": 0,
```

```
root@debian11:~#
```

Connectez-vous maintenant à votre mongodb à partir de la machine hôte :

```
root@debian11:~# mongo --host 172.17.0.3
MongoDB shell version v4.0.28
connecting to: mongodb://172.17.0.3:27017/?gssapiServiceName=mongodb
Implicit session: session { "id" : UUID("c1fadd17-a76c-4ca2-aa0e-b06498c55ba5") }
MongoDB server version: 4.2.24
WARNING: shell and server versions do not match
Welcome to the MongoDB shell.
For interactive help, type "help".
For more comprehensive documentation, see
  http://docs.mongodb.org/
Questions? Try the support group
  http://groups.google.com/group/mongodb-user
Server has startup warnings:
2023-08-19T14:43:49.070+0000 I CONTROL [initandlisten]
2023-08-19T14:43:49.070+0000 I CONTROL [initandlisten] ** WARNING: Access control is not enabled for the
database.
2023-08-19T14:43:49.070+0000 I CONTROL [initandlisten] **           Read and write access to data and
configuration is unrestricted.
2023-08-19T14:43:49.070+0000 I CONTROL [initandlisten] ** WARNING: You are running this process as the root
user, which is not recommended.
2023-08-19T14:43:49.070+0000 I CONTROL [initandlisten]
2023-08-19T14:43:49.070+0000 I CONTROL [initandlisten]
2023-08-19T14:43:49.070+0000 I CONTROL [initandlisten] ** WARNING: /sys/kernel/mm/transparent_hugepage/enabled
is 'always'.
2023-08-19T14:43:49.070+0000 I CONTROL [initandlisten] **           We suggest setting it to 'never'
2023-08-19T14:43:49.070+0000 I CONTROL [initandlisten]
---
```

Enable MongoDB's free cloud-based monitoring service, which will then receive and display metrics about your deployment (disk utilization, CPU, operation statistics, etc).

The monitoring data will be available on a MongoDB website with a unique URL accessible to you and anyone you share the URL with. MongoDB may use this information to make product improvements and to suggest MongoDB products and deployment options to you.

To enable free monitoring, run the following command: `db.enableFreeMonitoring()`

To permanently disable this reminder, run the following command: `db.disableFreeMonitoring()`

```
> exit
```

```
bye
```

```
root@debian11:~#
```