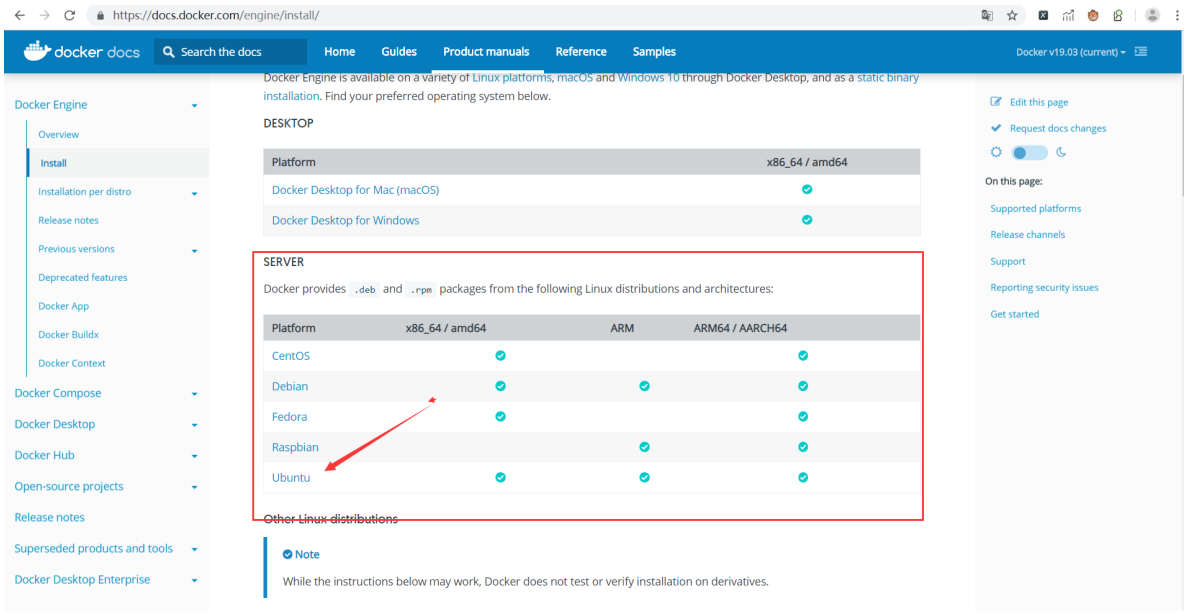
Docker的安装

docker官网下载文档：https://docs.docker.com/engine/install/

官网即有详细步骤




```
$ sudo apt-get update

$ sudo apt-get install \
    apt-transport-https \
    ca-certificates \
    curl \
    gnupg-agent \
    software-properties-common
```

换镜像网站，阿里云镜像~，百度即有

```
$ sudo add-apt-repository \
   "deb [arch=amd64] https://download.docker.com/linux/ubuntu \
   $(lsb_release -cs) \
   stable"
```

```
  $ sudo apt-get update
  $ sudo apt-get install docker-ce docker-ce-cli containerd.io
```

这样子就下载完毕了~

Docker的常用命令

帮助命令

```
docker version    # 显示docker版本信息
docker info       #显示docker的系统信息，包括镜像和容器的数量
docker 命令 --help  #帮助命令
```

帮助文档的地址：https://docs.docker.com/engine/reference/commandline/

镜像命令

查看镜像

```
docker images    #查看所有本地的主机上的镜像
```

可添加以下参数

名称，简写	默认	描述
`--all , -a`		显示所有图像（默认隐藏中间图像）
`--digests`		显示摘要
`--filter , -f`		根据提供的条件过滤输出
`--format`		使用Go模板打印漂亮的图像
`--no-trunc`		不要截断输出
`--quiet , -q`		仅显示数字ID

```
(Django) ubuntu@VM-0-11-ubuntu:~$ docker images
REPOSITORY          TAG                 IMAGE ID            CREATED             SIZE
hello-world         latest              bf756fb1ae65        5 months ago        13.3kB
(Django) ubuntu@VM-0-11-ubuntu:~$
```

- REPOSITORY 镜像的仓库源
- TAG 镜像的标签
- IMAGE ID 镜像的ID
- CREATED 镜像创建时间
- SIZE 镜像的大小

搜索镜像

```
docker search #搜索镜像
```

名称，简写	默认	描述
`--automated`		不推荐使用 仅显示自动构建
`--filter , -f`		根据提供的条件过滤输出
`--format`		使用Go模板进行漂亮的打印搜索
`--limit`	25	最多搜索结果数
`--no-trunc`		不要截断输出
`--stars , -s`		不推荐使用 仅显示至少x个星标

例子：

```
docker search --filter=STARS=3000   #只显示收藏数大于3000的镜像
```

下载镜像

```
docker pull #下载镜像
```

名称，简写	默认	描述
`--all-tags , -a`		下载存储库中所有标记的图像
`--disable-content-trust`	true	跳过图像验证
`--platform`		实验（守护程序） API 1.32+ 如果服务器支持多平台，则设置平台
`--quiet , -q`		禁止详细输出

例子如下：

```
docker pull mysql:版本号 #不指定版本就默认最新
```

删除镜像

```
docker rmi -f 镜像id ...   #删除指定id的镜像 可以指定多个
```

```
docker rmi -f $(docker images -aq)  #删除全部镜像
```

容器命令

下载一个centos容器

```
docker pull centos
```

新建容器并且启动

```
docker run [参数] image

#参数
--name="容器名字"
-d                  #后台方式运行
-it                 #使用交互方式运行，进入容器查看内容
-p [port]           #指定容器端口
    -p ip:主机端口:容器端口
    -p 主机端口:容器端口（常用）
```

测试，启动并进入容器

```
(Django) ubuntu@VM-0-11-ubuntu:~$ docker run -it centos /bin/bash
[root@42d35bbf701f /]#
```

退出容器，返回主机

- 停止并退出

```
[root@42d35bbf701f /]# exit
exit
(Django) ubuntu@VM-0-11-ubuntu:~$
```

- 退出不停止

  ```
  Ctrl+P+Q  #退出不停止
  ```

查看正在运行的容器

```
docker ps        #查看正在运行的容器
docker ps -a     #查看曾经运行和正在运行的容器
docker ps -q     #只显示容器id
```

删除容器

```
docker rm 容器id                #删除指定容器，不能删除正在运行，需要的话加 -f
docker rm -f $(docker ps -aq) #删除所有容器
docker ps -a -q|xargs docker rm #删除所有容器
```

启动和停止容器

```
docker start 容器id       #启动容器
docker restart 容器id     #重启容器
docker stop 容器id        #停止容器
docker kill 容器id        #强制杀掉容器
```

常用其它命令

后台启动容器

```
docker run -d [镜像名字]  #必须有前台进程，不然docker会停止这个容器
```

查看日志

```
docker logs 容器id
```

名称，简写	默认	描述
`--details`		显示提供给日志的其他详细信息
`--follow , -f`		跟踪日志输出
`--since`		显示自时间戳记以来的日志（例如2013-01-02T13：23：37）或相对记录（例如42m的42分钟）
`--tail`	all	从日志末尾开始显示的行数
`--timestamps , -t`		显示时间戳
`--until`		API 1.35以上 在时间戳（例如2013-01-02T13：23：37）或相对（例如42m持续42分钟）之前显示日志

查看容器中的进程信息

```
docker top 容器id
```

查看容器的元数据

```
 docker inspect 容器id
(Django) ubuntu@VM-0-11-ubuntu:~$ docker inspect 42d35bbf701f
[
    {
        "Id":
"42d35bbf701f860a6c41c317a3f8ba505dd7e51131d032d82972f84c50edf07b",
        "Created": "2020-06-22T09:31:27.601199783Z",
        "Path": "/bin/bash",
        "Args": [],
        "State": {
            "Status": "exited",
            "Running": false,
            "Paused": false,
            "Restarting": false,
            "OOMKilled": false,
            "Dead": false,
```

```
            "Pid": 0,
            "ExitCode": 0,
            "Error": "",
            "StartedAt": "2020-06-22T09:31:28.311467148Z",
            "FinishedAt": "2020-06-22T09:32:58.279179076Z"
        },
        "Image":
"sha256:831691599b88ad6cc2a4abbd0e89661a121aff14cfa289ad840fd3946f274f1f",
        "ResolvConfPath":
"/var/lib/docker/containers/42d35bbf701f860a6c41c317a3f8ba505dd7e51131d032d82972
f84c50edf07b/resolv.conf",
        "HostnamePath":
"/var/lib/docker/containers/42d35bbf701f860a6c41c317a3f8ba505dd7e51131d032d82972
f84c50edf07b/hostname",
        "HostsPath":
"/var/lib/docker/containers/42d35bbf701f860a6c41c317a3f8ba505dd7e51131d032d82972
f84c50edf07b/hosts",
        "LogPath":
"/var/lib/docker/containers/42d35bbf701f860a6c41c317a3f8ba505dd7e51131d032d82972
f84c50edf07b/42d35bbf701f860a6c41c317a3f8ba505dd7e51131d032d82972f84c50edf07b-
json.log",
        "Name": "/vigorous_mclaren",
        "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,
            "CapAdd": null,
            "CapDrop": null,
            "Capabilities": null,
            "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",
            "ConsoleSize": [
                0,
                0
            ],
            "Isolation": "",
            "CpuShares": 0,
            "Memory": 0,
            "NanoCpus": 0,
            "CgroupParent": "",
            "BlkioWeight": 0,
            "BlkioWeightDevice": [],
            "BlkioDeviceReadBps": null,
            "BlkioDeviceWriteBps": null,
            "BlkioDeviceReadIOps": null,
            "BlkioDeviceWriteIOps": null,
            "CpuPeriod": 0,
            "CpuQuota": 0,
            "CpuRealtimePeriod": 0,
            "CpuRealtimeRuntime": 0,
            "CpusetCpus": "",
            "CpusetMems": "",
            "Devices": [],
            "DeviceCgroupRules": null,
            "DeviceRequests": null,
            "KernelMemory": 0,
            "KernelMemoryTCP": 0,
            "MemoryReservation": 0,
            "MemorySwap": 0,
            "MemorySwappiness": null,
            "OomKillDisable": false,
            "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/overlay2/6d069fdf8f59b9f40d9b58a8763be9d175388eb1a2fba96c027c13
c3afd14030-
init/diff:/var/lib/docker/overlay2/48350764eff43bc5420b124476024e2e711b5af19886a
11f68728ff5a276f95a/diff",
                "MergedDir":
"/var/lib/docker/overlay2/6d069fdf8f59b9f40d9b58a8763be9d175388eb1a2fba96c027c13
c3afd14030/merged",
                "UpperDir":
"/var/lib/docker/overlay2/6d069fdf8f59b9f40d9b58a8763be9d175388eb1a2fba96c027c13
c3afd14030/diff",
                "WorkDir":
"/var/lib/docker/overlay2/6d069fdf8f59b9f40d9b58a8763be9d175388eb1a2fba96c027c13
c3afd14030/work"
            },
            "Name": "overlay2"
        },
        "Mounts": [],
        "Config": {
            "Hostname": "42d35bbf701f",
            "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": "centos",
            "Volumes": null,
            "WorkingDir": "",
            "Entrypoint": null,
            "OnBuild": null,
            "Labels": {
                "org.label-schema.build-date": "20200611",
                "org.label-schema.license": "GPLv2",
                "org.label-schema.name": "CentOS Base Image",
                "org.label-schema.schema-version": "1.0",
                "org.label-schema.vendor": "CentOS"
            }
        },
        "NetworkSettings": {
            "Bridge": "",
```

```
            "SandboxID":
"9cbf4bd004965b0a688a82a3b6c050e40eb237d0e97cf13a7c21513d3d8f80b4",
            "HairpinMode": false,
            "LinkLocalIPv6Address": "",
            "LinkLocalIPv6PrefixLen": 0,
            "Ports": {},
            "SandboxKey": "/var/run/docker/netns/9cbf4bd00496",
            "SecondaryIPAddresses": null,
            "SecondaryIPv6Addresses": null,
            "EndpointID": "",
            "Gateway": "",
            "GlobalIPv6Address": "",
            "GlobalIPv6PrefixLen": 0,
            "IPAddress": "",
            "IPPrefixLen": 0,
            "IPv6Gateway": "",
            "MacAddress": "",
            "Networks": {
                "bridge": {
                    "IPAMConfig": null,
                    "Links": null,
                    "Aliases": null,
                    "NetworkID":
"7e5669cd2425fe9d76f4d09d96c70dfb4d873d3006e7d7fb8f0240f79874aa01",
                    "EndpointID": "",
                    "Gateway": "",
                    "IPAddress": "",
                    "IPPrefixLen": 0,
                    "IPv6Gateway": "",
                    "GlobalIPv6Address": "",
                    "GlobalIPv6PrefixLen": 0,
                    "MacAddress": "",
                    "DriverOpts": null
                }
            }
        }
    }
]
```


进入正在运行的容器

```
docker exec -it 容器id  /bin/bash #进入容器开启一个新的终端

docker attach  #进入容器正在执行的终端
```

从容器拷贝文件到主机

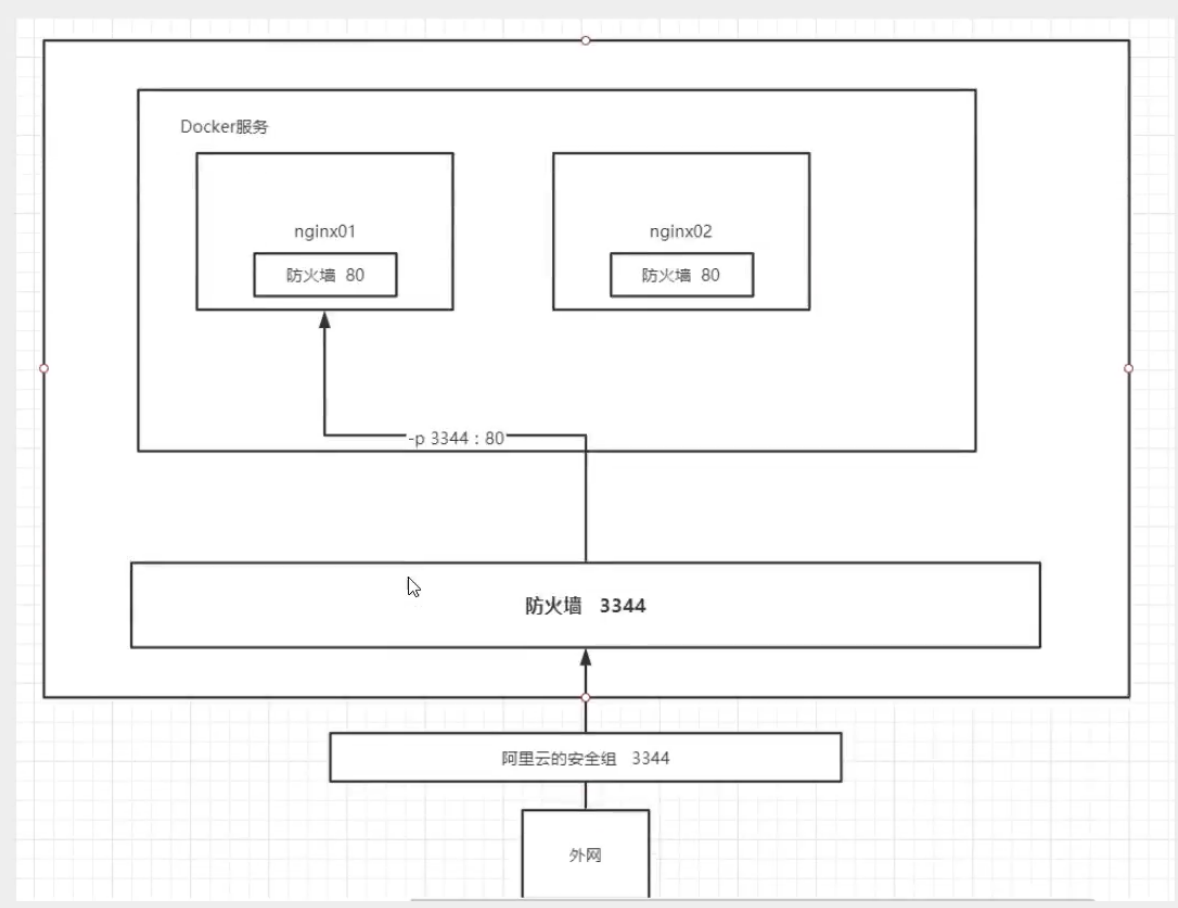
```
docker cp 容器id:容器内文件路径 要存的主机的路径
```

Docker使用步骤

安装Nginx

1. 搜索镜像，可以去hub.docker.com查看 或者 docker search nginx
2. 下载 docker pull nginx
3. docker run -d --name nginx01 -p 3344:80 nginx

   -d 后台运行 --name 命名 -p：3344为主机端口，80为容器内端口



安装tomcat

```
docker run -it --rm tomcat:9.0
--rm #用完即删，可用于测试
```

发现tomcat是被阉割的，Linux命令少了，webapp没了

安装ES

```
docker run -d --name es7.6.2 -p 9200:9200 -p 9300:9300 elasticsearch:7.6.2
# 但是启动一个ES需要1.2G太占内存，需要限制内存
docker run -d --name es7.6.2 -p 9200:9200 -p 9300:9300 -e ES_JAVA_OPTS="-Xms64m
-Xmx512m" elasticsearch:7.6.2

docker stats #查看占用内存

# 限制ES运行的内存最小为64M,最大为512M
```

```
CONTAINER ID        NAME                CPU %               MEM USAGE / LIMIT     MEM %               NET I/O
        BLOCK I/O           PIDS
670ab8a42b02        youth               0.08%               213.5MiB / 1.79GiB    11.65%              180kB / 748
kB        0B / 0B             30
```

可视化

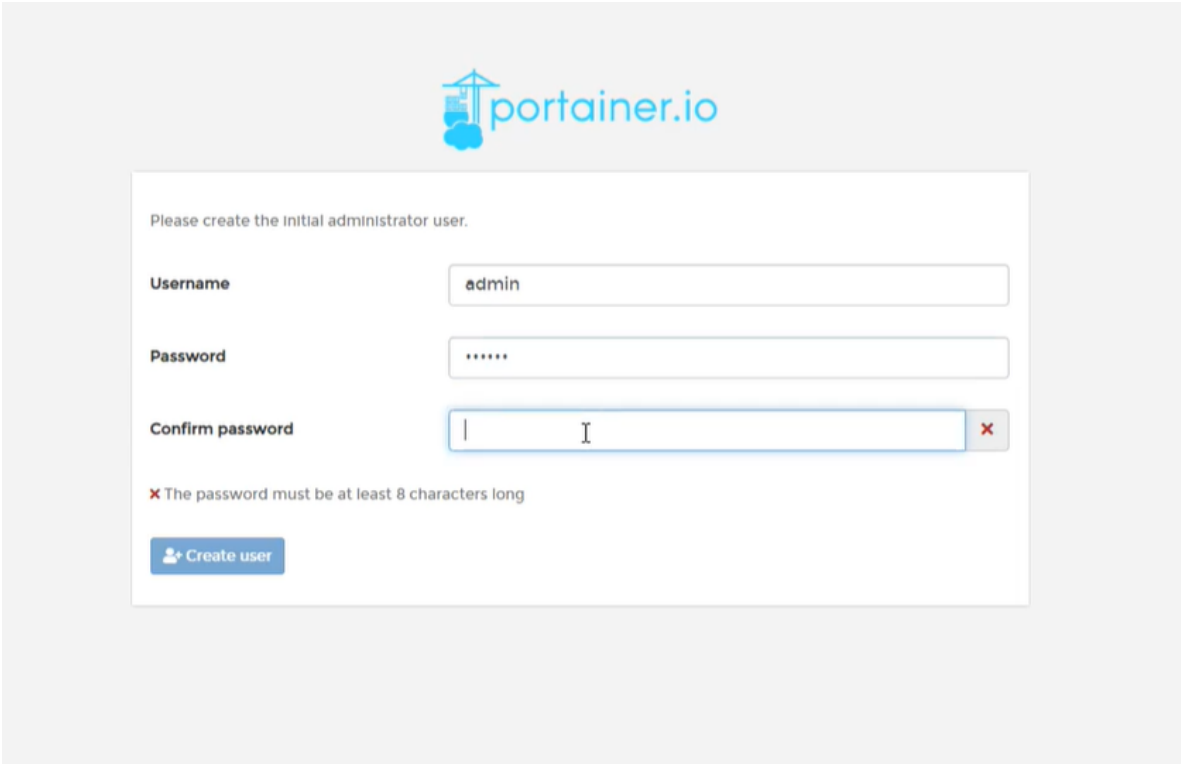
- portainer

  Docker图形化界面管理工具！提供后台模板供操作

  ```
  docker run -d -p 8088:9000 \
  --restart=always -v /var/run/docker.sock:/var/run/docker.sock --
  privileged=true portainer/portainer
  ```

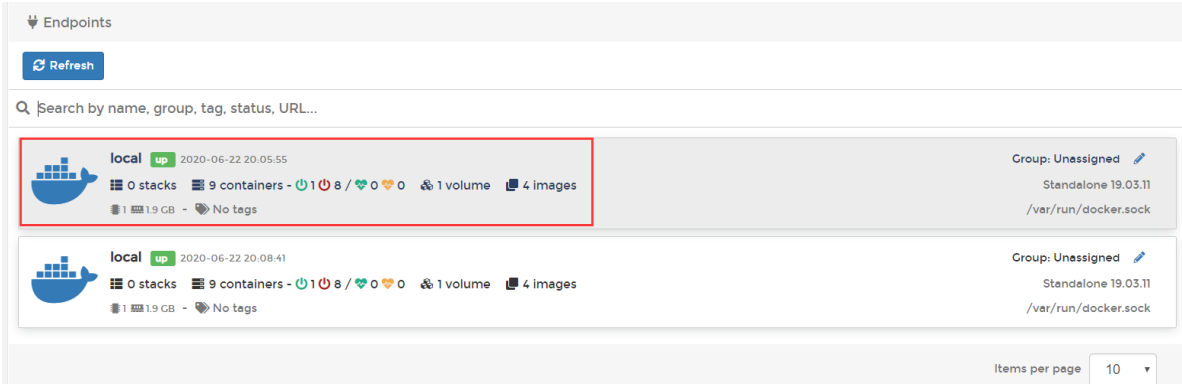
  直接访问 服务器ip:8088

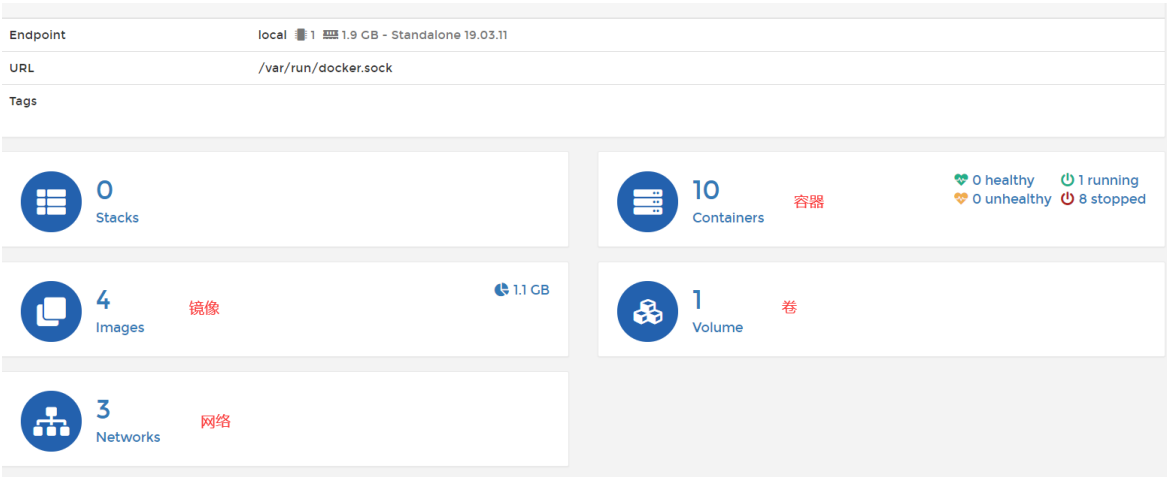
  打开设置密码，创建用户



选择本地，点击连接

点击进入本地管理面板





commit镜像

```
docker commit -m="描述" -a="作者" 容器id 目标镜像名:版本号
```

例子:

```
docker commit -m="add webapps" -a="hzh" f96291cf94a4 tomcat02:1.0
```

容器数据卷

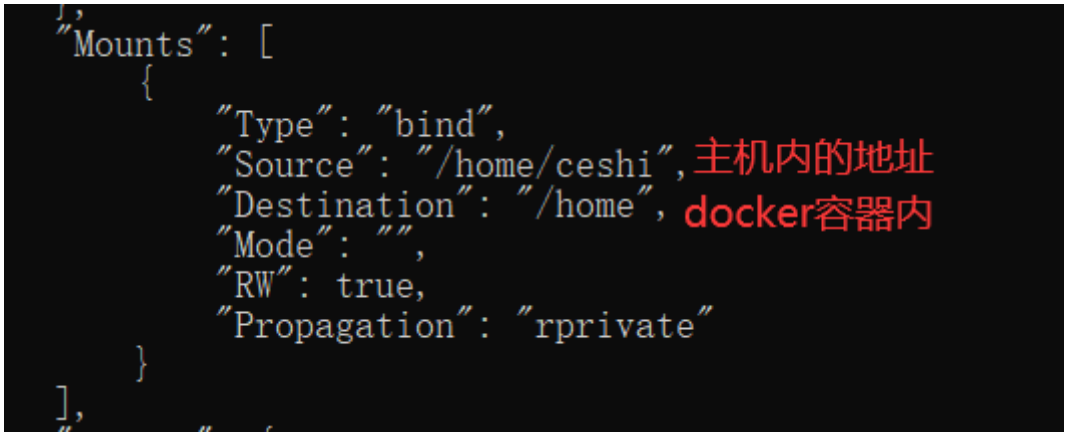
容器的持久化和同步操作！容器之间的数据也可以共享

> 方式一：使用命令来挂载 -v

```
docker run -it -v -p 主机目录路径:容器内目录路径
```

测试：

```
docker run -it -v /home/ceshi:/home centos /bin/bash
```



查看挂载

```
docker volume ls
```

```
docker run -d -P -v 卷名:容器内路径 镜像名
```

具名挂载，如上面这样写，没有指定主机路径的，默认放在主机

```
/var/lib/docker/volume/挂载名/_data
```

```
-v 容器内路径   #匿名挂载
-v 卷名:容器内路径 #具名挂载
-v 主机路径:容器内路径 #指定路径挂载
```

扩展：

容器权限管理：ro只能通过主机操作，容器无法修改。

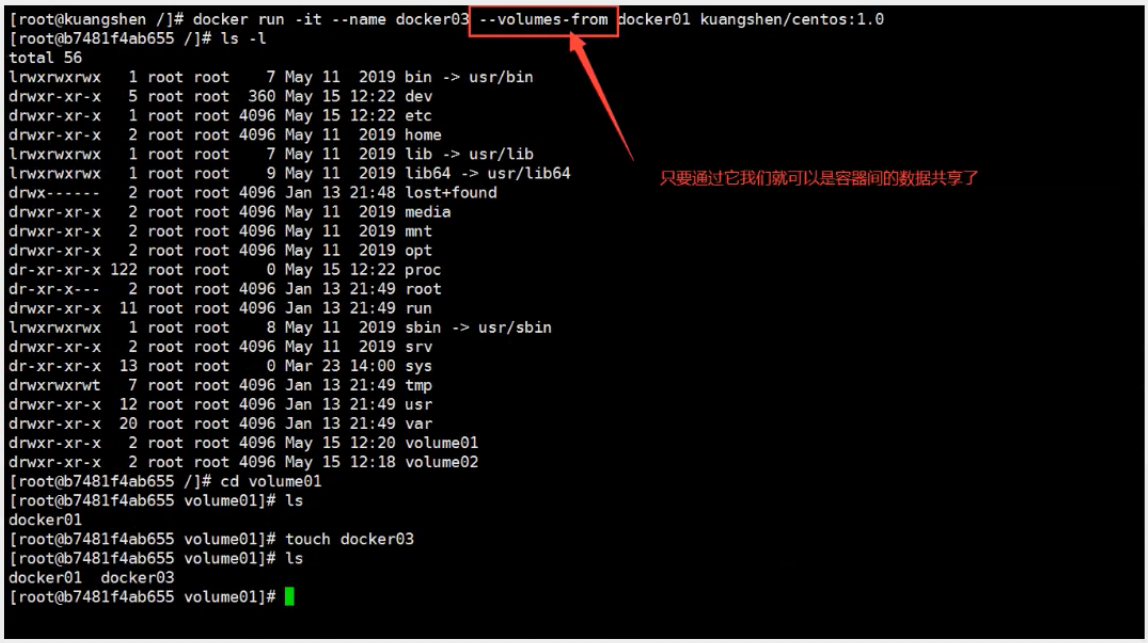
```
docker run -d -P -v 卷名:容器内路径:ro 镜像名 #只读
docker run -d -P -v 卷名:容器内路径:rw 镜像名 #可读可写!
```

安装MySQL

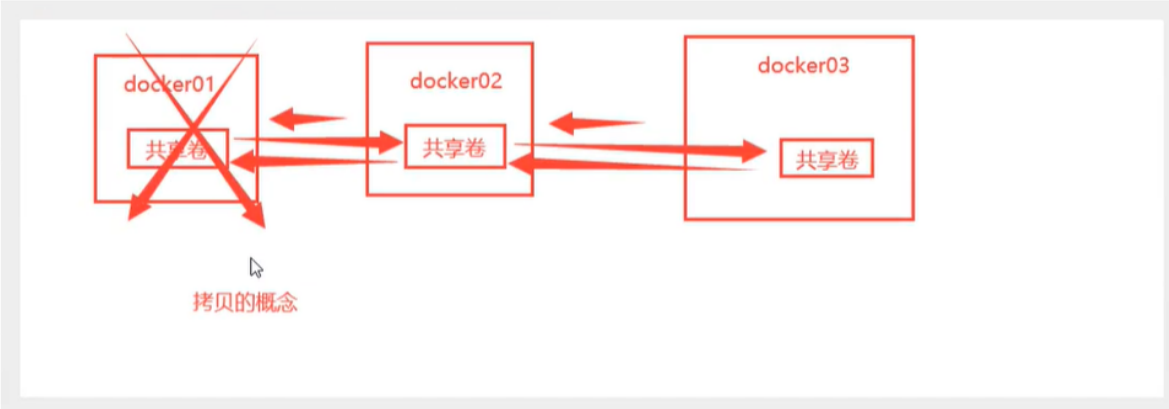
```
docker run -d -p 3333:3306 -v /home/ubuntu/mysql/conf:/etc/mysql/conf.d -v
/home/ubuntu/mysql/data:/var/lib/mysql -e MYSQL_ROOT_PASSWORD=123456 --name
mysql01 mysql:5.7


-d 后台运行
-p 端口映射
-v 卷挂载
-e 环境配置
--name 容器名字

# 启动后 用服务器3333端口连接MySQL数据库
```

容器间的数据共享(备份)

```
--volumes-from 父容器 镜像id
```



容器之间数据共享，删除父容器，其它容器数据依旧存在！其实是复制的共享卷~



多个MySQL实现数据共享

```
docker run -d -p 3333:3306 -v /home/ubuntu/mysql/conf:/etc/mysql/conf.d -v
/home/ubuntu/mysql/data:/var/lib/mysql -e MYSQL_ROOT_PASSWORD=123456 --name
mysql01 mysql:5.7


docker run -d -p 3334:3306 -e MYSQL_ROOT_PASSWORD=123456 --name mysql02 --
volumes-from mysql01 mysql:5.7
```

要直到所有共享卷的容器都关闭，才可能结束数据卷的生命周期

DockerFile

DockerFile介绍

dockerfile是用来构建dokcer镜像的文件!命令参数脚本!

1. 编写dockfile文件
2. docker build 构建成一个镜像
3. docker run 运行镜像
4. docker push 发布镜像 ===>DockerHub，阿里云仓库

例子：

centos 7：https://github.com/CentOS/sig-cloud-instance-images/blob/b521221b5c8ac3ac88698e77941a2414ce6e778d/docker/Dockerfile

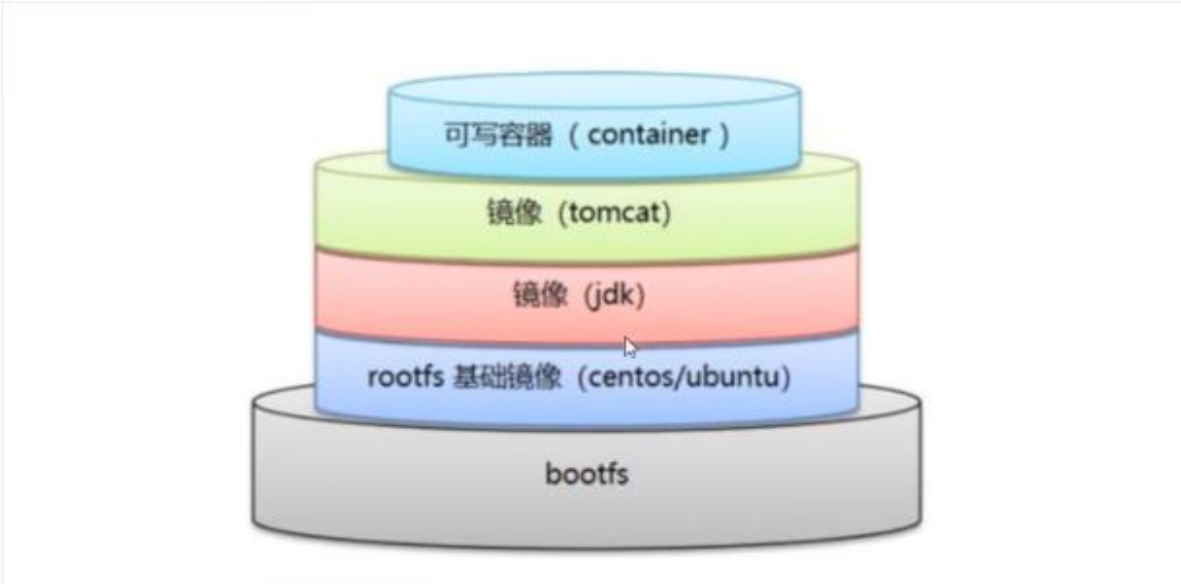
15 lines (13 sloc) | 516 Bytes — Raw | Blame | History

```
FROM scratch
ADD centos-7-x86_64-docker.tar.xz /

LABEL \
    org.label-schema.schema-version="1.0" \
    org.label-schema.name="CentOS Base Image" \
    org.label-schema.vendor="CentOS" \
    org.label-schema.license="GPLv2" \
    org.label-schema.build-date="20200504" \
    org.opencontainers.image.title="CentOS Base Image" \
    org.opencontainers.image.vendor="CentOS" \
    org.opencontainers.image.licenses="GPL-2.0-only" \
    org.opencontainers.image.created="2020-05-04 00:00:00+01:00"

CMD ["/bin/bash"]
```

DockerFile构建过程

编写要点

1. 指令关键字都是大写字母
2. 执行从上到下
3. #为注释
4. 每一个指令都是一层镜像，且会提交

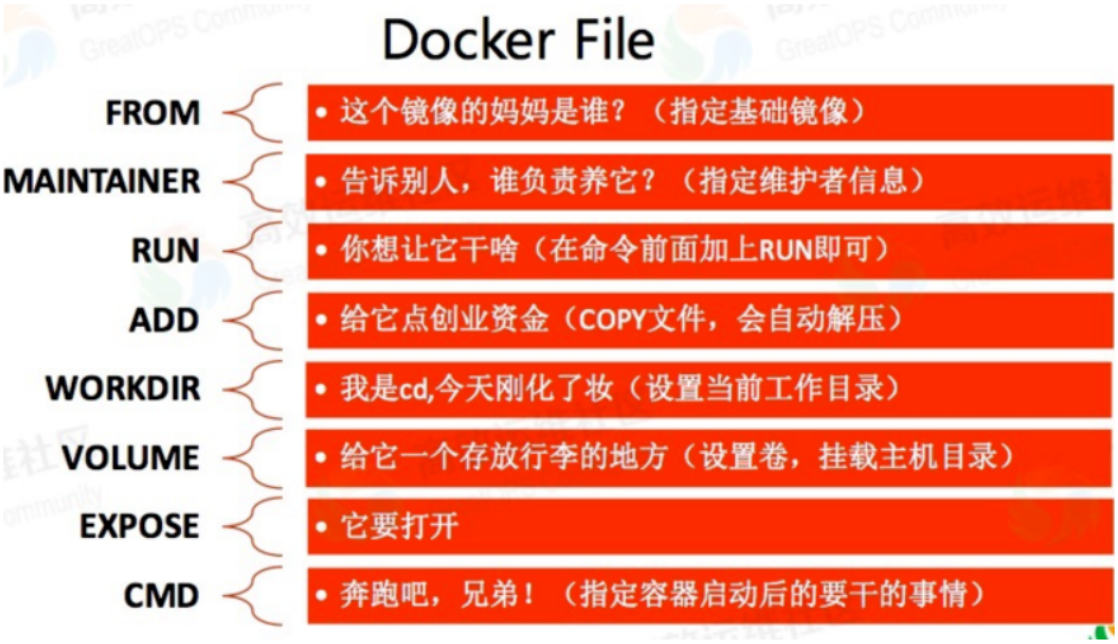


DockerImages就是通过DockFile构建生成的镜像，最终运行和发布的产品。

Docker容器是镜像运行起来的提供服务器

DockerFile的指令

指令	描述
FROM	构建新镜像是基于哪个镜像
MAINTAINER	镜像维护者姓名或邮箱地址
RUN	构建镜像时运行的Shell命令
COPY	拷贝文件或目录到镜像中
ENV	设置环境变量
USER	为RUN、CMD和ENTRYPOINT执行命令指定运行用户
EXPOSE	声明容器运行的服务端口
HEALTHCHECK	容器中服务健康检查
WORKDIR	为RUN、CMD、ENTRYPOINT、COPY和ADD设置工作目录
ENTRYPOINT	运行容器时执行，如果有多个ENTRYPOINT指令，最后一个生效
CMD	运行容器时执行，如果有多个CMD指令，最后一个生效



> 创建一个自己的centos镜像

```
FROM centos
MAINTAINER Himit_zh<372347736@qq.com>

ENV MYPATH /usr/local
WORKDIR $MYPATH

RUN yum -y install vim
RUN yum -y install net-tools

EXPOSE 80

CMD echo $MYPATH
CMD echo "-----end----"
CMD /bin/bash

```

```
docker build -f dockerfile文件路径 -t 镜像名:[tag版本号] .
```

> centos+tomcat+jdk1.8的镜像

```
FROM centos
MAINTAINET kuangshen<24736743@qq.com>

COPY readme.txt /usr/local/readme.txt

ADD jdk-8u11-linux-x64.tar.gz /usr/local/
ADD apache-tomcat-9.0.22.tar.gz /usr/local/

RUN yum -y install vim

ENV MYPATH /usr/local
WORKDIR $MYPATH

ENV JAVA_HOME /usr/local/jdk1.8.0_11
ENV CLASSPATH $JAVA_HOME/lib/dt.jar:$JAVA_HOME/lib/tools.jar
ENV CATALINA_HOME /usr/local/apache-tomcat-9.0.22
ENV CATALINA_BASH /usr/local/apache-tomcat-9.0.22
ENV PATH $PATH:$JAVA_HOME/bin:$CATALINA_HOME/lib:$CATALINA_HOME/bin

EXPOSE 8080

CMD /usr/local/apache-tomcat-9.0.22/bin/startup.sh && tail -F /url/local/apache-tomcat-9.0.22/bin/logs/catalina.out
```

```
[root@kuangshen tomcat]# docker build -t diytomcat .
```

```
[root@kuangshen tomcat]# docker run -d -p 9090:8080 --name kuangshentomcat2 -v /home/kuangshen/build/tomcat/test:/usr/local/apache-tomcat-9.0.22/webapps/test -v /home/kuangshen/build/tomcat/tomcatlogs/:/usr/local/apache-tomcat-9.0.22/logs diytomcat
```

发布镜像

```
docker login -u 账号 -p 密码
```

```
docker push hub账户名/tomcat02:1.0
docker push hub账户名/镜像名:tag
```

镜像名字一定要命名为 hub账户名/镜像名 不然会提交仓库失败!

Docker网络

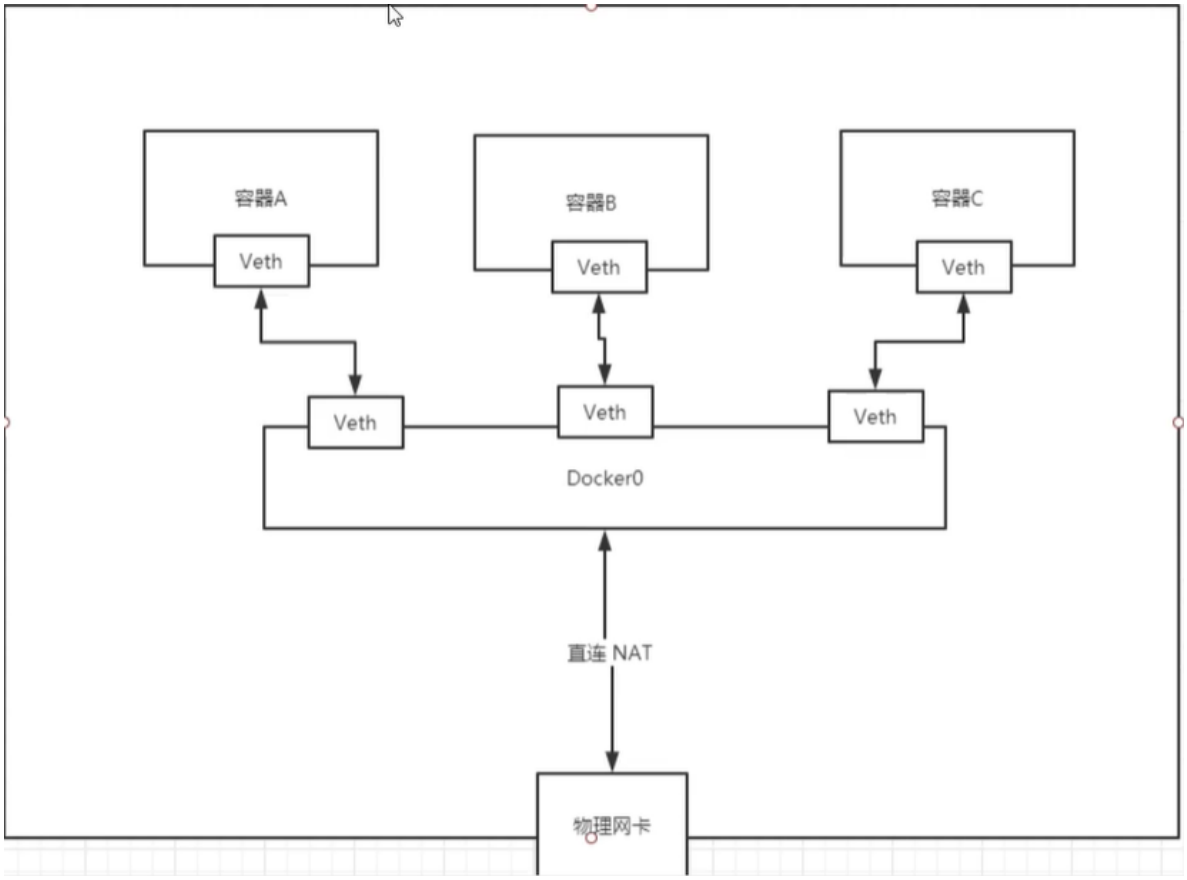
```
(Django) ubuntu@VM-0-11-ubuntu:~$ ip addr
1: lo: <LOOPBACK,UP,LOWER_UP> mtu 65536 qdisc noqueue state UNKNOWN group default q
len 1000
    link/loopback 00:00:00:00:00:00 brd 00:00:00:00:00:00
    inet 127.0.0.1/8 scope host lo
       valid_lft forever preferred_lft forever                    本机回环地址
    inet6 ::1/128 scope host
       valid_lft forever preferred_lft forever
2: eth0: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc fq_codel state UP group d
efault qlen 1000
    link/ether 52:54:00:ae:3d:b6 brd ff:ff:ff:ff:ff:ff
    inet 172.16.0.11/20 brd 172.16.15.255 scope global eth0
       valid_lft forever preferred_lft forever                    腾讯云内网地址
    inet6 fe80::5054:ff:feae:3db6/64 scope link
       valid_lft forever preferred_lft forever
3: docker0: <NO-CARRIER,BROADCAST,MULTICAST,UP> mtu 1500 qdisc noqueue state DOWN g
roup default
    link/ether 02:42:b8:41:51:ed brd ff:ff:ff:ff:ff:ff
    inet 172.17.0.1/16 brd 172.17.255.255 scope global docker0
       valid_lft forever preferred_lft forever
    inet6 fe80::42:b8ff:fe41:51ed/64 scope link                   docker0地址
       valid_lft forever preferred_lft forever
(Django) ubuntu@VM-0-11-ubuntu:~$
```

测试

Linux可以ping通docker容器内部网络

> 原理

1. 我们每启动一个docker容器, docker就会给docker容器分配一个ip ,我们只要安装了docker ,就会有一个网卡docker0，桥接模式,使用的技术是veth-pair技术!
2. veth-pair 就是一对虚拟设备接口，成对存在的,一段连着协议，一段彼此相连。
3. 容器之间也是利用veth-pair技术，也可以互相ping通的。



容器的转发都是经过linux中的docker0，docker0为网桥~ 可生成65535个容器网卡地址~

--link

```
docker run -d -P --name 新容器名 --link 已存在容器名 镜像名

#这样启动，即可用ping 容器名 ，无需要指定ip，但是只能新容器ping通旧容器，因为旧容器没有绑定新容器~
```

不支持使用--link

docker0不支持容器名连接

自定义网络

```
(Django) ubuntu@VM-0-11-ubuntu:~$ docker network ls
NETWORK ID          NAME                DRIVER              SCOPE
32f4184eb74c        bridge              bridge              local
093d29ffd7c2        host                host                local
dc180a12d863        none                null                local
(Django) ubuntu@VM-0-11-ubuntu:~$
```

网络模式

bridge ： 桥接 docker (默认)

none ： 不配置网络

host： 和宿主机共享网络

container： 容器内网络连通！（用的少！）

```
                        segment
(Django) ubuntu@VM-0-11-ubuntu:~$ docker network create --driver bridge --subnet 192.168.0.0/16 --gateway 192.168.0.1 mynet
```

```
docker network create --driver bridge --subnet 192.168.0.0/16 --gateway
192.168.0.1 mynet

#创建自定义docker网络
# --driver 定义模式
# --subnet 子网掩码 192.168.0.1 ~192.168.255.255
# --gateway 网关地址
# mynet 名字
```

```
        "Containers": {
            "68e6142449d8bbb8a30aaae87bf314bc8322033b9801d6e7d5d5ddcd956088f6": {
                "Name": "tomcat-net-01",
                "EndpointID": "93b3bc5c755b43f433b3ca20e3f3a1a168c6f96abaacd8e655ce
1b66b5e311a2",
                "MacAddress": "02:42:c0:a8:00:02",
                "IPv4Address": "192.168.0.2/16",
                "IPv6Address": ""
            },
            "ef21e6310b2f1d99b702f30c7d8df88a8b8a32982f0ca2f0b3ade3132fed4418": {
                "Name": "tomcat-net-02",
                "EndpointID": "d6935f18e9d618c9e002898edf840535cfd617dab3675f979c55
5f51996aef5a",
                "MacAddress": "02:42:c0:a8:00:03",
                "IPv4Address": "192.168.0.3/16",
                "IPv6Address": ""
            }
        },
        "Options": {},
        "Labels": {}
    }
```

```
(Django) ubuntu@VM-0-11-ubuntu:~$ docker exec -it tomcat-net-01 ping tomcat-net-02
PING tomcat-net-02 (192.168.0.3) 56(84) bytes of data.
64 bytes from tomcat-net-02.mynet (192.168.0.3): icmp_seq=1 ttl=64 time=0.079 ms
64 bytes from tomcat-net-02.mynet (192.168.0.3): icmp_seq=2 ttl=64 time=0.067 ms
64 bytes from tomcat-net-02.mynet (192.168.0.3): icmp_seq=3 ttl=64 time=0.074 ms
64 bytes from tomcat-net-02.mynet (192.168.0.3): icmp_seq=4 ttl=64 time=0.064 ms
64 bytes from tomcat-net-02.mynet (192.168.0.3): icmp_seq=5 ttl=64 time=0.081 ms
64 bytes from tomcat-net-02.mynet (192.168.0.3): icmp_seq=6 ttl=64 time=0.065 ms
64 bytes from tomcat-net-02.mynet (192.168.0.3): icmp_seq=7 ttl=64 time=0.060 ms
64 bytes from tomcat-net-02.mynet (192.168.0.3): icmp_seq=8 ttl=64 time=0.064 ms
64 bytes from tomcat-net-02.mynet (192.168.0.3): icmp_seq=9 ttl=64 time=0.078 ms
64 bytes from tomcat-net-02.mynet (192.168.0.3): icmp_seq=10 ttl=64 time=0.067 ms
```

发现自定义网络内的容器可以用容器名ping通

不用使用--link

网络连通

```
(Django) ubuntu@VM-0-11-ubuntu:~$ docker network connect --help

Usage:  docker network connect [OPTIONS] NETWORK CONTAINER

Connect a container to a network

Options:
      --alias strings           Add network-scoped alias for the container
      --driver-opt strings      driver options for the network
      --ip string               IPv4 address (e.g., 172.30.100.104)
      --ip6 string              IPv6 address (e.g., 2001:db8::33)
      --link list               Add link to another container
      --link-local-ip strings   Add a link-local address for the container
(Django) ubuntu@VM-0-11-ubuntu:~$
```

> 测试 tomcat-01 =>>mynet网络

```
docker run -d -P --name tomcat-01 tomcat
docker network  inspect mynet
--net 自定义网络名
```

查看mynet网络信息发现，原来是tomcat-01被加到mynet里面了

```
        "Containers": {
            "15a45199098b2c65039457c1736271526e1cee51ca3e34d0b34db55ea2078265": {
                "Name": "tomcat-01",
                "EndpointID": "4585b2a0dca61ac4fe7a806499ef5fd416ad1e42116c56beb71e
ea9dd9787fad",
                "MacAddress": "02:42:c0:a8:00:04",
                "IPv4Address": "192.168.0.4/16",
                "IPv6Address": ""
            },
```

> 验证

```
(Django) ubuntu@VM-0-11-ubuntu:~$ docker exec -it tomcat-01 ping tomcat-net-01
PING tomcat-net-01 (192.168.0.2) 56(84) bytes of data.
64 bytes from tomcat-net-01.mynet (192.168.0.2): icmp_seq=1 ttl=64 time=0.086 ms
64 bytes from tomcat-net-01.mynet (192.168.0.2): icmp_seq=2 ttl=64 time=0.083 ms
64 bytes from tomcat-net-01.mynet (192.168.0.2): icmp_seq=3 ttl=64 time=0.072 ms
64 bytes from tomcat-net-01.mynet (192.168.0.2): icmp_seq=4 ttl=64 time=0.085 ms
64 bytes from tomcat-net-01.mynet (192.168.0.2): icmp_seq=5 ttl=64 time=0.065 ms
```

发现docker01网络中的tomcat01成功连通mynet网络中的tomcat-net-01，实现了容器连通网络。

部署Redis集群

```
docker network create redis --subnet 172.38.0.0/16
```

```
# xshell脚本创建

for port in $(seq 1 6); \
do \
mkdir -p /home/ubuntu/mydata/redis/node-${port}/conf
touch /home/ubuntu/mydata/redis/node-${port}/conf/redis.conf
cat << EOF >/home/ubuntu/mydata/redis/node-${port}/conf/redis.conf
port 6379
```

```
bind 0.0.0.0
cluster-enabled yes
cluster-config-file nodes.conf
cluster-node-timeout 5000
cluster-announce-ip 172.38.0.1${port}
cluster-announce-port 6379
cluster-announce-bus-port 16379
appendonly yes
EOF
done
```

启动redis容器

```
docker run -p 6371:6379 -p 16371:16379 --name redis-1 \
-v /mydata/redis/node-1/data:/data \
-v /mydata/redis/node-1/conf/redis.conf:/etc/redis/redis.conf \
-d --net redis --ip 172.38.0.11 redis:5.0.9-alpine3.11 redis-server
/etc/redis/redis.conf

docker run -p 6372:6379 -p 16372:16379 --name redis-2 \
-v /mydata/redis/node-2/data:/data \
-v /mydata/redis/node-2/conf/redis.conf:/etc/redis/redis.conf \
-d --net redis --ip 172.38.0.12 redis:5.0.9-alpine3.11 redis-server
/etc/redis/redis.conf

docker run -p 6373:6379 -p 16373:16379 --name redis-3 \
-v /mydata/redis/node-3/data:/data \
-v /mydata/redis/node-3/conf/redis.conf:/etc/redis/redis.conf \
-d --net redis --ip 172.38.0.13 redis:5.0.9-alpine3.11 redis-server
/etc/redis/redis.conf


for port in $(seq 1 6); \
do \
docker run -p 637${port}:6379 -p 1637${port}:16379 --name redis-${port} \
-v /mydata/redis/node-${port}/data:/data \
-v /mydata/redis/node-${port}/conf/redis.conf:/etc/redis/redis.conf \
-d --net redis --ip 172.38.0.1${port} redis:5.0.9-alpine3.11 redis-server
/etc/redis/redis.conf
done
```

配置集群

```
redis-cli --cluster create 172.38.0.11:6379 172.38.0.12:6379 172.38.0.12:6379
172.38.0.12:6379 172.38.0.
13:6379 172.38.0.14:6379 172.38.0.15:6379 --cluster-replicas 1
```