创建容器

docker create

docker create命令新建的工期处于停滞状态，可以使用docker start命令来启动它

选项	说明
-d	是否在后台运行容器，默认为否
-i	保持标准输入打开
-P	通过NAT机制将容器标记暴露的端口自动映射到本地主机的临时端口
-p	指定如何映射到本地主机端口
-t	分配一个终端
-v	挂载主机上的文件卷到容器内
--rm	容器推出后是否自动删除，不能跟-d同时使用
-e	指定容器内的环境变量
-h	指定容器内的主机名
--name	指定容器的别名
--cpu-shares	允许容器使用cpu资源的相对权重，默认一个容器能用满一个核的cpu
--cpuset-cpus	限制容器能使用哪些cpu核心
-m	限制容器内使用的内存，单位可以是b、k、m、g

docker run

除了创建容器后通过start命令来启动也可以通过docker run直接新建并启动容器。

- 启动一个容器

```
[root@docker-server ~]# docker run -it centos:latest bash
[root@4abaf8a399fe /]#
```

- 显示正在运行的容器

```
[root@docker-server ~]# docker ps
CONTAINER ID   IMAGE           COMMAND   CREATED          STATUS
PORTS     NAMES
4abaf8a399fe   centos:latest   "bash"    47 seconds ago   Up 46 seconds
      hardcore_perlman
```

- 显示所有容器，包括停止的所有容器

```
[root@docker-server ~]# docker ps
CONTAINER ID   IMAGE     COMMAND   CREATED   STATUS    PORTS     NAMES
[root@docker-server ~]# docker ps -a
CONTAINER ID   IMAGE           COMMAND   CREATED         STATUS
      PORTS     NAMES
4abaf8a399fe   centos:latest   "bash"    2 minutes ago   Exited (0) 9 seconds
ago             hardcore_perlman
```

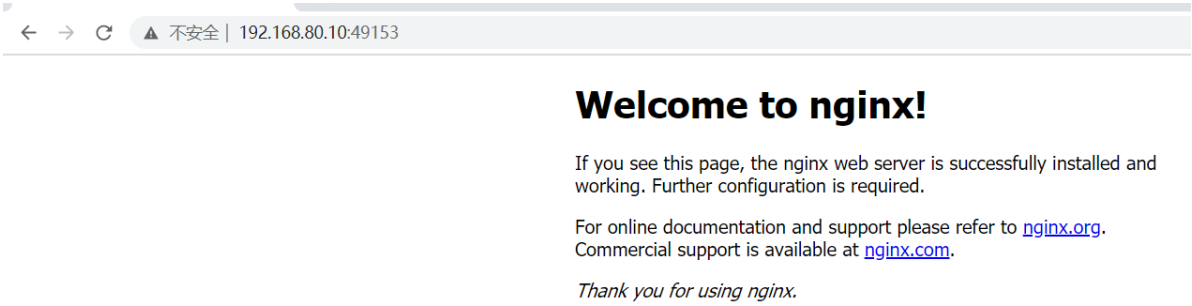
端口映射

- 前台启动随机映射端口

```
[root@docker-server ~]# docker pull nginx
[root@docker-server ~]# docker run -P nginx
# 随机映射端口，其实是从32768开始映射
[root@docker-server ~]# ss -tanl
State       Recv-Q Send-Q Local Address:Port               Peer Address:Port

LISTEN      0      128        *:22                    *:*
LISTEN      0      100    127.0.0.1:25                    *:*

LISTEN      0      128        *:49153                 *:*
LISTEN      0      128       :::22                   :::*
LISTEN      0      100      ::1:25                    :::*
LISTEN      0      128       :::49153                :::*
```



- 指定端口映射

```
# 方式1，本地端口80映射到容器80端口
[root@docker-server ~]# docker run -p 80:80 --name nginx-1 nginx:latest
# 方式2，本地ip：本地端口：容器端口
[root@docker-server ~]# docker run -p 192.168.175.10:80:80 --name nginx-1
nginx:latest
# 方式3，本地ip：本地随机端口：容器端口
[root@docker-server ~]# docker run -p 192.168.175.10::80 --name nginx-1
nginx:latest
# 方式4，本地ip：本地端口：容器端口/协议默认为tcp协议
[root@docker-server ~]# docker run -p 192.168.175.10:80:80/tcp --name nginx-1
nginx:latest

```

- 查看容器已经映射的端口

```
[root@docker-server ~]# docker port nginx-1
80/tcp -> 0.0.0.0:80
80/tcp -> :::80
```

后台启动容器

- 当容器前台启动时，前台进程退出容器也就退出，更多时候需要容器在后台启动

```
[root@docker-server ~]# docker run -d -P --name nginx-2 nginx
c75333168c0dad9094d94828c33998294f2809ae8c5b60881707d9cc33ea4893
```

- 传递运行命令

容器需要由一个前台运行的进程才能保持容器的运行，通过传递运行参数是一种方式，另外也可以在构建镜像的时候指定容器启动时运行的前台命令

```
[root@docker-server ~]# docker ps -a
CONTAINER ID   IMAGE     COMMAND   CREATED   STATUS    PORTS     NAMES
[root@docker-server ~]# docker run -d centos
9ef312d30f7a396ecb5c93b7b70e70a742f333bbe01e9112d6f22fc52aeb71b8
[root@docker-server ~]# docker ps
CONTAINER ID   IMAGE     COMMAND   CREATED   STATUS    PORTS     NAMES
[root@docker-server ~]# docker ps -a
CONTAINER ID   IMAGE     COMMAND       CREATED          STATUS
       PORTS     NAMES
9ef312d30f7a   centos    "/bin/bash"   12 seconds ago   Exited (0) 11
seconds ago              upbeat_noether
[root@docker-server ~]# docker run -d centos tail -f /etc/hosts
7b0700c01f9516f49e70ad92e7256d965e0fe4eb8ccc7b30676a03c1d8046c64
[root@docker-server ~]# docker ps
CONTAINER ID   IMAGE     COMMAND                  CREATED         STATUS
  PORTS     NAMES
7b0700c01f95   centos    "tail -f /etc/hosts"   3 seconds ago   Up 2 seconds
            charming_brahmagupta
```

- 单次运行，容器退出后自动删除

```
[root@docker-server ~]# docker run --name hello_world_test --rm hello-world

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/

[root@docker-server ~]# docker ps -a
CONTAINER ID   IMAGE     COMMAND   CREATED   STATUS    PORTS     NAMES
[root@docker-server ~]#
```

停止容器

暂停容器

- 挂起容器

```
[root@docker-server ~]# docker ps
CONTAINER ID   IMAGE     COMMAND                  CREATED          STATUS
    PORTS     NAMES
4c6344c46c80   nginx     "/docker-entrypoint.…"   8 seconds ago    Up 8
seconds   80/tcp    wizardly_hofstadter
[root@docker-server ~]# docker pause wizardly_hofstadter
wizardly_hofstadter
[root@docker-server ~]# docker ps
CONTAINER ID   IMAGE     COMMAND                  CREATED          STATUS
               PORTS     NAMES
4c6344c46c80   nginx     "/docker-entrypoint.…"   17 seconds ago   Up 16
seconds (Paused)   80/tcp    wizardly_hofstadter
```

- 取消挂起容器

```
[root@docker-server ~]# docker unpause wizardly_hofstadter
wizardly_hofstadter
[root@docker-server ~]# docker ps
CONTAINER ID   IMAGE     COMMAND                  CREATED          STATUS
     PORTS     NAMES
4c6344c46c80   nginx     "/docker-entrypoint.…"   33 seconds ago   Up 33
seconds   80/tcp    wizardly_hofstadter
```

终止容器

```
[root@docker-server ~]# docker ps
CONTAINER ID   IMAGE     COMMAND                  CREATED
STATUS              PORTS     NAMES
4c6344c46c80   nginx     "/docker-entrypoint.…"   About a minute ago   Up
About a minute   80/tcp    wizardly_hofstadter

[root@docker-server ~]# docker stop wizardly_hofstadter
wizardly_hofstadter
[root@docker-server ~]# docker ps -a
CONTAINER ID   IMAGE     COMMAND                  CREATED          STATUS
               PORTS     NAMES
4c6344c46c80   nginx     "/docker-entrypoint.…"   2 minutes ago    Exited (0)
5 seconds ago             wizardly_hofstadter
```

```
10
11 [root@docker-server ~]# docker start wizardly_hofstadter
12 wizardly_hofstadter
13 [root@docker-server ~]# docker ps -a
14 CONTAINER ID   IMAGE     COMMAND                  CREATED         STATUS
       PORTS     NAMES
15 4c6344c46c80   nginx     "/docker-entrypoint.…"   2 minutes ago   Up 2
   seconds   80/tcp    wizardly_hofstadter
```

删除容器

docker rm

- 删除正在运行的容器

```
1 [root@docker-server ~]# docker ps
2 CONTAINER ID   IMAGE           COMMAND   CREATED          STATUS          PORTS
      NAMES
3 dfd5ba20c3c6   centos:latest   "bash"    8 seconds ago    Up 6 seconds
      frosty_elbakyan
4 [root@docker-server ~]# docker rm -f dfd5ba20c3c6
5 dfd5ba20c3c6
```

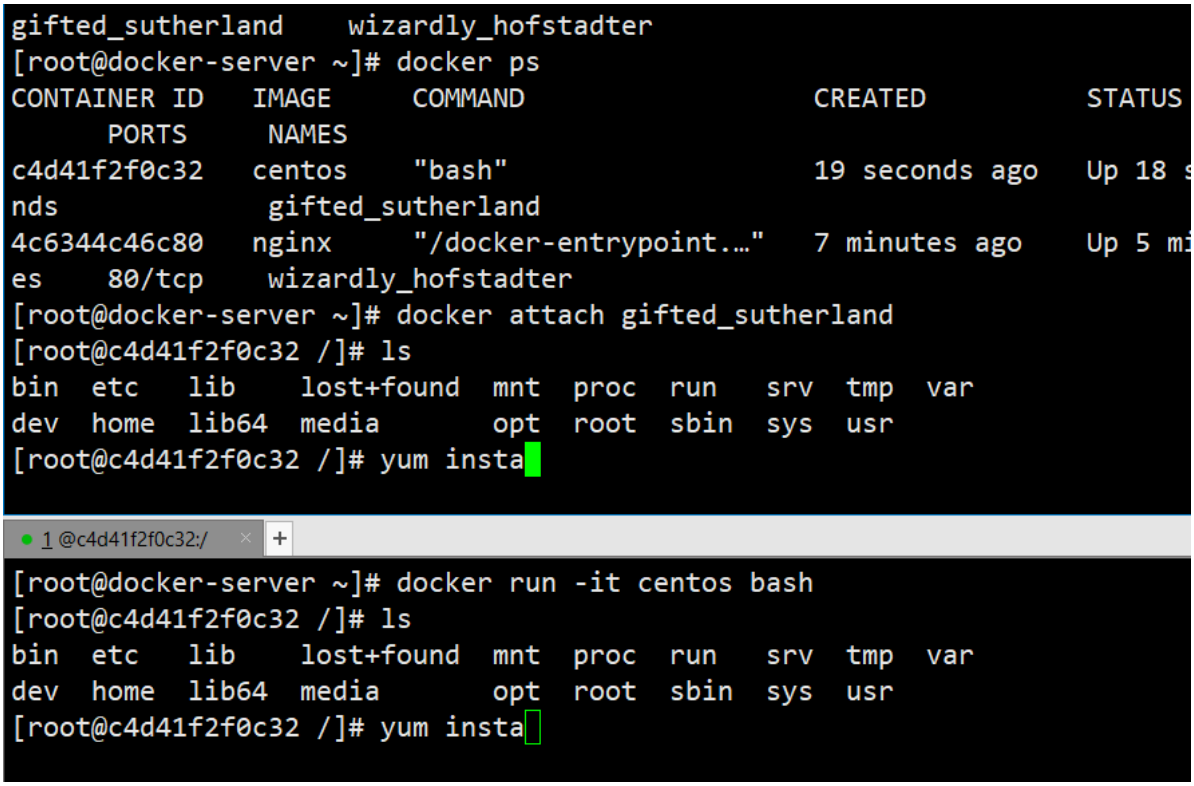
- 批量删除容器

```
1  [root@docker-server ~]# docker ps -a
2  CONTAINER ID   IMAGE     COMMAND                  CREATED          STATUS
       PORTS     NAMES
3  8e3cb314c9ad   nginx     "/docker-entrypoint.…"   4 seconds ago    Up 3
   seconds   80/tcp    pedantic_lovelace
4  4ab46864c8a3   nginx     "/docker-entrypoint.…"   5 seconds ago    Up 4
   seconds   80/tcp    beautiful_spence
5  26a154528469   nginx     "/docker-entrypoint.…"   5 seconds ago    Up 5
   seconds   80/tcp    serene_booth
6  2ecbf60d817a   nginx     "/docker-entrypoint.…"   6 seconds ago    Up 6
   seconds   80/tcp    dreamy_bassi
7  d73faf8c2f7d   nginx     "/docker-entrypoint.…"   8 seconds ago    Up 8
   seconds   80/tcp    beautiful_solomon
8  [root@docker-server ~]# docker ps -a -q
9  8e3cb314c9ad
10 4ab46864c8a3
11 26a154528469
12 2ecbf60d817a
13 d73faf8c2f7d
14 [root@docker-server ~]# docker rm -f `docker ps -a -q`
15 8e3cb314c9ad
16 4ab46864c8a3
17 26a154528469
18 2ecbf60d817a
19 d73faf8c2f7d
20 [root@docker-server ~]# docker ps -a
21 CONTAINER ID   IMAGE     COMMAND   CREATED   STATUS    PORTS     NAMES
```

进入容器

attach

所有使用此方式进入容器的操作都是同步显示的且exit容器将被关闭，且使用exit退出后容器关闭，不推荐使用



当有一个容器执行exit退出后会导致容器退出

exec

执行单次命令与进入容器，退出容器后容器还在运行

```
[root@docker-server ~]# docker run -d -it centos
129d518869d550e579bcff38608bae38209923dcbfab49c823d5e1473d38214a
[root@docker-server ~]# docker ps
CONTAINER ID   IMAGE     COMMAND       CREATED         STATUS        PORTS
  NAMES
129d518869d5   centos    "/bin/bash"   2 seconds ago   Up 1 second
  jovial_haibt
[root@docker-server ~]# docker exec -it jovial_haibt /bin/bash
[root@129d518869d5 /]# echo hello
hello
[root@129d518869d5 /]# exit
exit
[root@docker-server ~]# docker ps
CONTAINER ID   IMAGE     COMMAND       CREATED          STATUS
PORTS     NAMES
129d518869d5   centos    "/bin/bash"   46 seconds ago   Up 45 seconds
      jovial_haibt
```

nsenter

nsenter命令需要通过pid进入到容器内部，不过可以使用docker inspect获取到容器的pid

- 可以通过docker inspect获取到某个容器的进程id

```
[root@docker-server ~]# docker inspect -f "{{.State.Pid}}" 129d518869d5
7949
```

- 通过nsenter进入到容器内部

```
[root@docker-server ~]# nsenter -t 7949 -m -u -i -n -p
[root@129d518869d5 /]#
```

- 使用脚本方式进入

```
[root@docker-server ~]# cat docker_in.sh
#!/bin/bash
docker_in(){
DOCKER_ID=$1
PID=`docker inspect -f "{{.State.Pid}}" ${DOCKER_ID}`
nsenter -t ${PID} -m -u -i -n -p
}

docker_in $1
[root@docker-server ~]# chmod +x docker_in.sh
[root@docker-server ~]# ./docker_in.sh 129d518869d5
[root@129d518869d5 /]# exit
logout
[root@docker-server ~]# docker ps
CONTAINER ID   IMAGE     COMMAND       CREATED          STATUS
PORTS     NAMES
129d518869d5   centos    "/bin/bash"   14 minutes ago   Up 14 minutes
      jovial_haibt
[root@docker-server ~]#
```

指定容器DNS

dns服务，默认采用dns地址

一是通过将dns地址配置在宿主机上

二是将参数配置在docker启动脚本里面

```
[root@docker-server ~]# docker run -it --rm --dns 8.8.8.8 centos bash
[root@a6ce80126e75 /]# cat /etc/resolv.conf
nameserver 8.8.8.8
[root@a6ce80126e75 /]# ping www.baidu.com -c 1
PING www.a.shifen.com (180.101.49.11) 56(84) bytes of data.
64 bytes from 180.101.49.11 (180.101.49.11): icmp_seq=1 ttl=127 time=9.35 ms

--- www.a.shifen.com ping statistics ---
1 packets transmitted, 1 received, 0% packet loss, time 0ms
rtt min/avg/max/mdev = 9.346/9.346/9.346/0.000 ms
[root@a6ce80126e75 /]# exit
exit
```

导入导出容器

docker export

导出容器是指，导出一个已经创建的容器到一个文件，不管此时这个容器是否处于运行状态

```
[root@docker-server ~]# docker run -d -it centos
43f2397b9456d27a3b84dba0d79ae9a1dd8dddf40440d7d73fca71cddea0e10d
[root@docker-server ~]# docker ps
CONTAINER ID   IMAGE     COMMAND       CREATED          STATUS          PORTS
  NAMES
43f2397b9456   centos    "/bin/bash"   2 seconds ago    Up 2 seconds
  awesome_rubin
[root@docker-server ~]# docker export -o /opt/centos.tar 43f
[root@docker-server ~]# ll /opt/centos.tar
-rw------- 1 root root 216525312 6月   9 13:28 /opt/centos.tar
```

docker import

导出的文件可以使用docker import命令导入变成镜像

```
[root@docker-server ~]# docker import /opt/centos.tar mycentos:v1
sha256:acf250a6cabb56e0464102dabedb0a562f933facd3cd7b387e665459da46bf29
[root@docker-server ~]# docker images
REPOSITORY    TAG       IMAGE ID       CREATED          SIZE
mycentos      v1        acf250a6cabb   9 seconds ago    209MB
nginx         latest    d1a364dc548d   2 weeks ago      133MB
hello-world   latest    d1165f221234   3 months ago     13.3kB
centos        latest    300e315adb2f   6 months ago     209MB
```