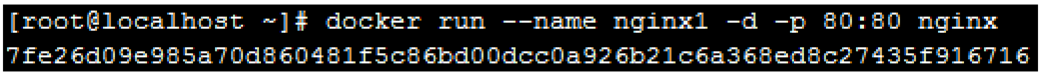
1.1 容器镜像

1.1.1 docker commit 构建镜像

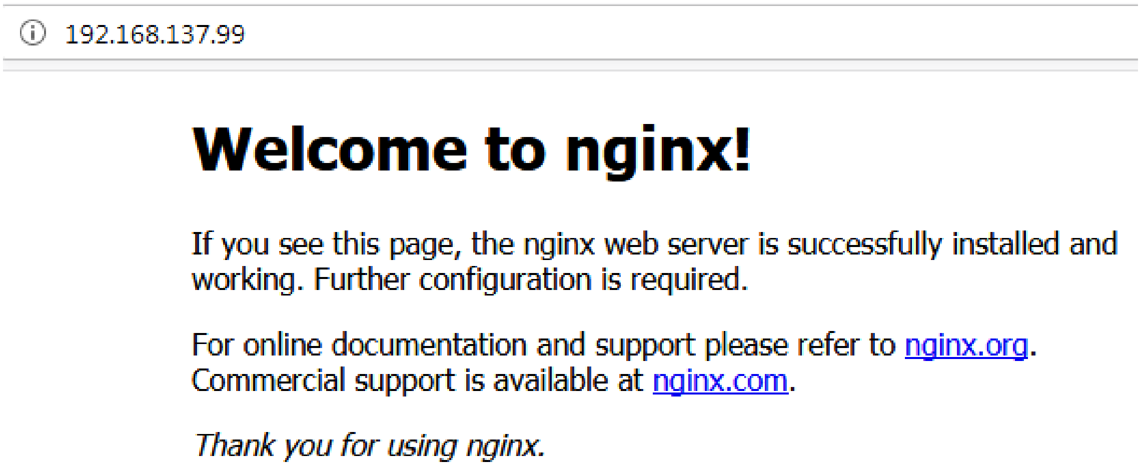
步骤 1 在后台运行一个 nginx 容器，取名为 nginx1，并映射到宿主机 80 端口。

```
[root@localhost ~]# docker run --name nginx1 -d -p 80:80 nginx
```



```
[root@localhost ~]# docker run --name nginx1 -d -p 80:80 nginx
7fe26d09e985a70d860481f5c86bd00dcc0a926b21c6a368ed8c27435f916716
```

步骤 2 在操作机上使用浏览器访问容器 nginx1。



192.168.137.99

Welcome to nginx!

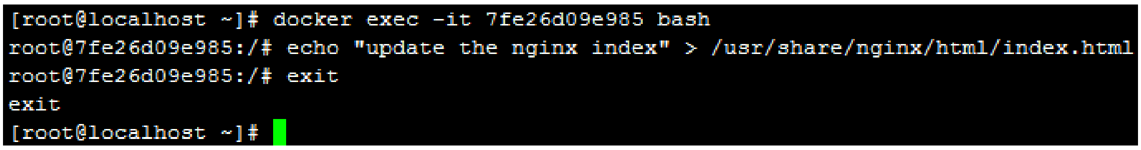
If you see this page, the nginx web server is successfully installed and working. Further configuration is required.

For online documentation and support please refer to nginx.org.
Commercial support is available at nginx.com.

Thank you for using nginx.

步骤 3 进入容器修改 nginx1 的 index.html 文件内容。

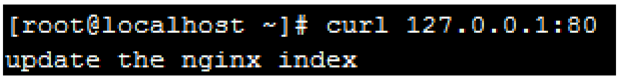
```
[root@localhost ~]# docker exec -it 7fe26d09e985 bash
```



```
[root@localhost ~]# docker exec -it 7fe26d09e985 bash
root@7fe26d09e985:/# echo "update the nginx index" > /usr/share/nginx/html/index.html
root@7fe26d09e985:/# exit
exit
[root@localhost ~]# 
```

步骤 4 验证 nginx1 容器内容修改成功。

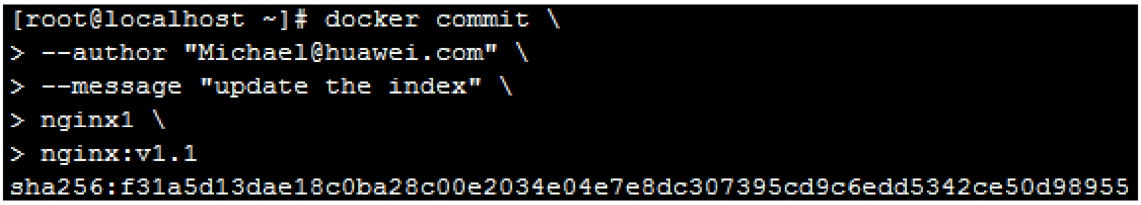
```
[root@localhost ~]# curl 127.0.0.1:80
```



```
[root@localhost ~]# curl 127.0.0.1:80
update the nginx index
```

步骤 5 将容器 nginx1 保存为镜像，新镜像命名为 nginx:v1.1。

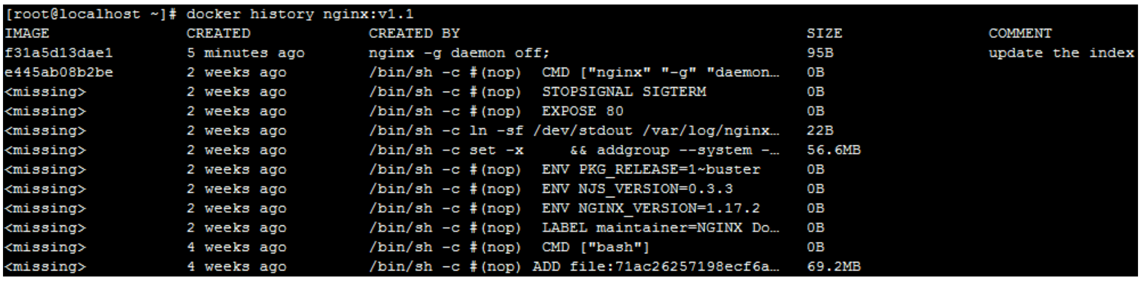
```
[root@localhost ~]# docker commit \
```



```
[root@localhost ~]# docker commit \
> --author "Michael@huawei.com" \
> --message "update the index" \
> nginx1 \
> nginx:v1.1
sha256:f31a5d13dae18c0ba28c00e2034e04e7e8dc307395cd9c6edd5342ce50d98955
```

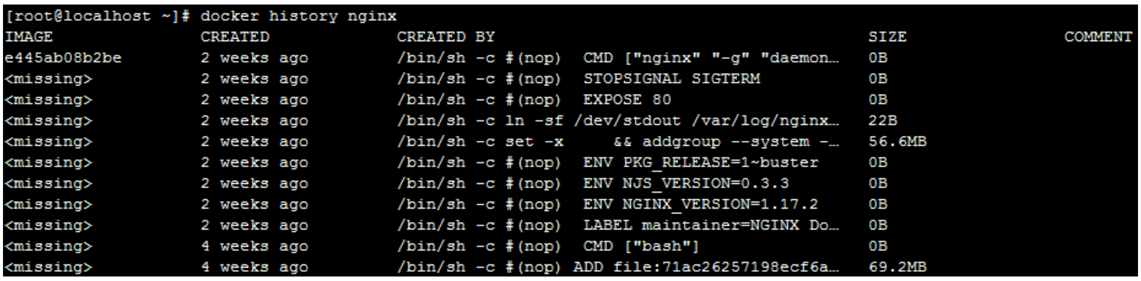
步骤 6 比较 nginx:v1.1 和 nginx:latest 两个镜像，发现 nginx:v1.1 多了一个镜像层。

```
[root@localhost ~]# docker history nginx:v1.1
```



```
[root@localhost ~]# docker history nginx:v1.1
IMAGE               CREATED             CREATED BY                                      SIZE                COMMENT
f31a5d13dae1        5 minutes ago       nginx -g daemon off;                            95B                 update the index
e445ab08b2be        2 weeks ago         /bin/sh -c #(nop)  CMD ["nginx" "-g" "daemon…   0B
<missing>           2 weeks ago         /bin/sh -c #(nop)  STOPSIGNAL SIGTERM           0B
<missing>           2 weeks ago         /bin/sh -c #(nop)  EXPOSE 80                    0B
<missing>           2 weeks ago         /bin/sh -c ln -sf /dev/stdout /var/log/nginx…   22B
<missing>           2 weeks ago         /bin/sh -c set -x     && addgroup --system -…   56.6MB
<missing>           2 weeks ago         /bin/sh -c #(nop)  ENV PKG_RELEASE=1~buster     0B
<missing>           2 weeks ago         /bin/sh -c #(nop)  ENV NJS_VERSION=0.3.3        0B
<missing>           2 weeks ago         /bin/sh -c #(nop)  ENV NGINX_VERSION=1.17.2     0B
<missing>           2 weeks ago         /bin/sh -c #(nop)  LABEL maintainer=NGINX Do…   0B
<missing>           4 weeks ago         /bin/sh -c #(nop)  CMD ["bash"]                 0B
<missing>           4 weeks ago         /bin/sh -c #(nop) ADD file:71ac26257198ecf6a…   69.2MB
```

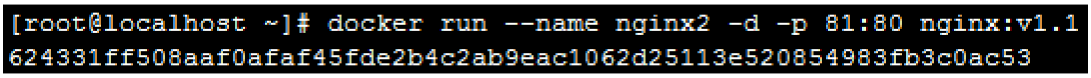
```
[root@localhost ~]# docker history nginx
```



```
[root@localhost ~]# docker history nginx
IMAGE               CREATED             CREATED BY                                      SIZE                COMMENT
e445ab08b2be        2 weeks ago         /bin/sh -c #(nop)  CMD ["nginx" "-g" "daemon…   0B
<missing>           2 weeks ago         /bin/sh -c #(nop)  STOPSIGNAL SIGTERM           0B
<missing>           2 weeks ago         /bin/sh -c #(nop)  EXPOSE 80                    0B
<missing>           2 weeks ago         /bin/sh -c ln -sf /dev/stdout /var/log/nginx…   22B
<missing>           2 weeks ago         /bin/sh -c set -x     && addgroup --system -…   56.6MB
<missing>           2 weeks ago         /bin/sh -c #(nop)  ENV PKG_RELEASE=1~buster     0B
<missing>           2 weeks ago         /bin/sh -c #(nop)  ENV NJS_VERSION=0.3.3        0B
<missing>           2 weeks ago         /bin/sh -c #(nop)  ENV NGINX_VERSION=1.17.2     0B
<missing>           2 weeks ago         /bin/sh -c #(nop)  LABEL maintainer=NGINX Do…   0B
<missing>           4 weeks ago         /bin/sh -c #(nop)  CMD ["bash"]                 0B
<missing>           4 weeks ago         /bin/sh -c #(nop) ADD file:71ac26257198ecf6a…   69.2MB
```

步骤 7 以镜像 nginx:v1.1 运行一个容器。

```
[root@localhost ~]# docker run --name nginx2 -d -p 81:80 nginx:v1.1
```



```
[root@localhost ~]# docker run --name nginx2 -d -p 81:80 nginx:v1.1
624331ff508aaf0afaf45fde2b4c2ab9eac1062d25113e520854983fb3c0ac53
```

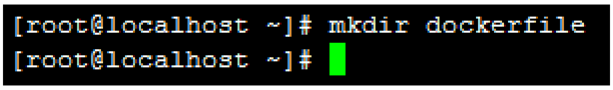
步骤 8 为方便后续实验，将本小节中的容器删除。

```
docker kill
docker rm
```

1.1.2 Dockerfile 构建镜像

步骤 1 在/root 目录下创建一个 dockerfile 文件夹

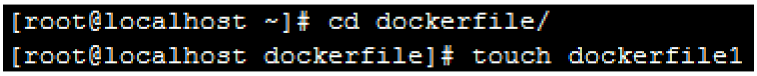
```
[root@localhost ~]# mkdir dockerfile
```



```
[root@localhost ~]# mkdir dockerfile
[root@localhost ~]# 
```

步骤 2 创建一个名为 dockerfile1 的 dockerfile 文件。

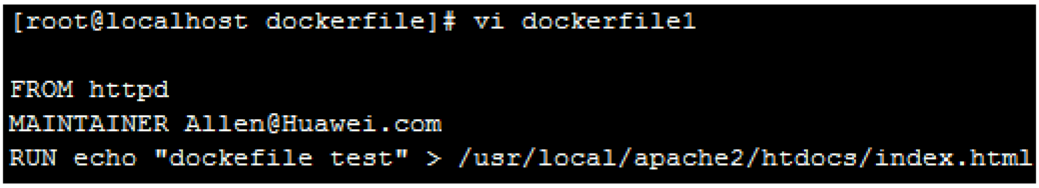
```
[root@localhost dockerfile]# touch dockerfile1
```



```
[root@localhost ~]# cd dockerfile/
[root@localhost dockerfile]# touch dockerfile1
```

步骤 3 使用 vi 编辑器编辑 dockerfile1，输入如下内容。

```
[root@localhost dockerfile]# vi dockerfile1
```

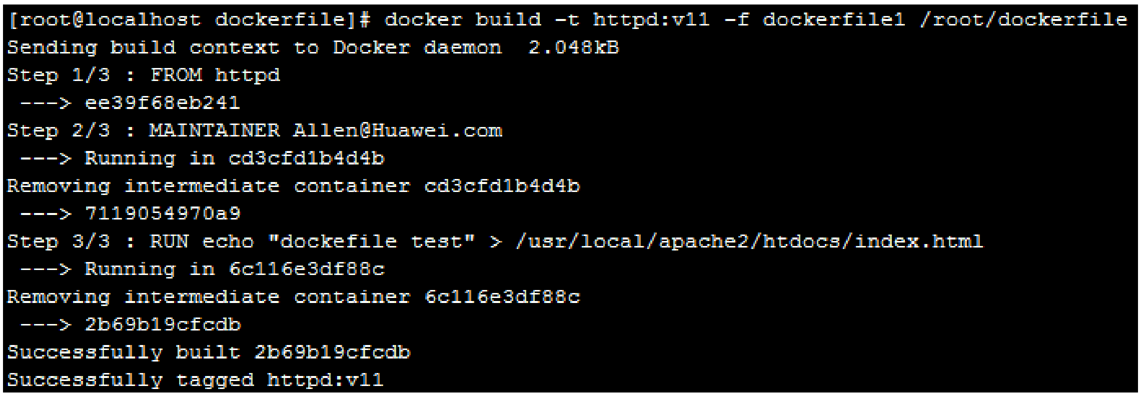


```
[root@localhost dockerfile]# vi dockerfile1

FROM httpd
MAINTAINER Allen@Huawei.com
RUN echo "dockefile test" > /usr/local/apache2/htdocs/index.html
```

步骤 4 构建镜像，镜像命名为 httpd:v11

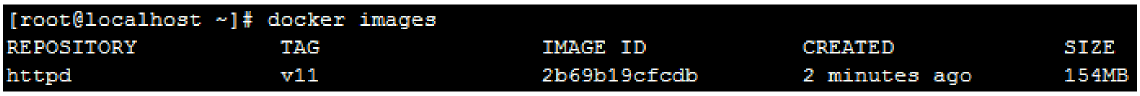
```
[root@localhost dockerfile]# docker build -t httpd:v11 -f dockerfile1
/root/dockerfile
```



```
[root@localhost dockerfile]# docker build -t httpd:v11 -f dockerfile1 /root/dockerfile
Sending build context to Docker daemon  2.048kB
Step 1/3 : FROM httpd
 ---> ee39f68eb241
Step 2/3 : MAINTAINER Allen@Huawei.com
 ---> Running in cd3cfd1b4d4b
Removing intermediate container cd3cfd1b4d4b
 ---> 7119054970a9
Step 3/3 : RUN echo "dockefile test" > /usr/local/apache2/htdocs/index.html
 ---> Running in 6c116e3df88c
Removing intermediate container 6c116e3df88c
 ---> 2b69b19cfcdb
Successfully built 2b69b19cfcdb
Successfully tagged httpd:v11
```

步骤 5 查看创建的镜像。

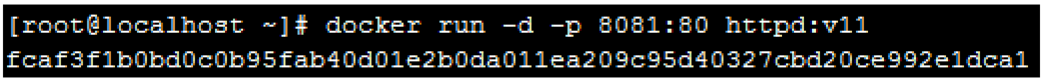
```
[root@localhost ~]# docker images
```



```
[root@localhost ~]# docker images
REPOSITORY          TAG                 IMAGE ID            CREATED             SIZE
httpd               v11                 2b69b19cfcdb        2 minutes ago       154MB
```

步骤 6 以镜像 httpd:v11 运行一个容器。

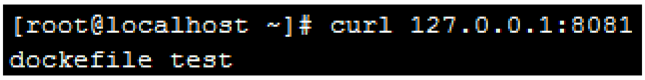
```
[root@localhost ~]# docker run -d -p 8081:80 httpd:v11
```



```
[root@localhost ~]# docker run -d -p 8081:80 httpd:v11
fcaf3f1b0bd0c0b95fab40d01e2b0da011ea209c95d40327cbd20ce992e1dca1
```

步骤 7 验证容器内容。

```
[root@localhost ~]# curl 127.0.0.1:8081
```



```
[root@localhost ~]# curl 127.0.0.1:8081
dockefile test
```

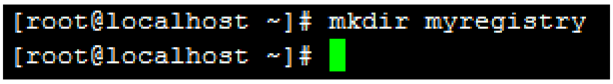
步骤 8 为方便后续实验，将本小节中的容器删除。

```
docker kill
docker rm
```

1.1.3 搭建私有 Registry

步骤 1 在/root 目录下创建一个 myregistry 文件夹，作为私有 Registry 的存储空间。

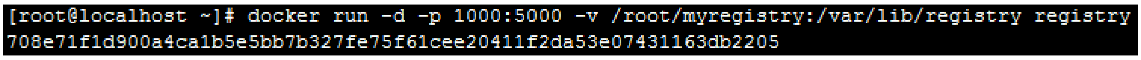
```
[root@localhost ~]# mkdir myregistry
```



```
[root@localhost ~]# mkdir myregistry
[root@localhost ~]# 
```

步骤 2 运行一个 registry 容器，并将主机 1000 端口映射到到其服务端口 5000。同时挂载步骤 1 中创建的文件夹作为 image 存储空间。

```
[root@localhost ~]# docker run -d -p 1000:5000 -v
/root/myregistry:/var/lib/registry registry
```

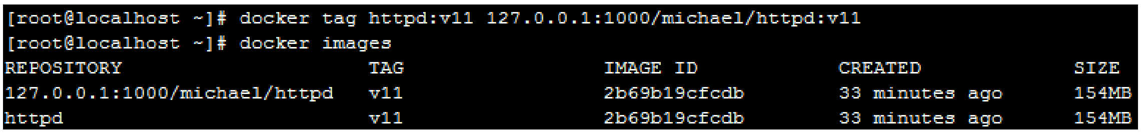


```
[root@localhost ~]# docker run -d -p 1000:5000 -v /root/myregistry:/var/lib/registry registry
708e71f1d900a4ca1b5e5bb7b327fe75f61cee20411f2da53e07431163db2205
```

步骤 3 将 httpd:v11 更改成 Registry 要求的格式：

[Registry-host]:[port]/[username]/[repository:tag]

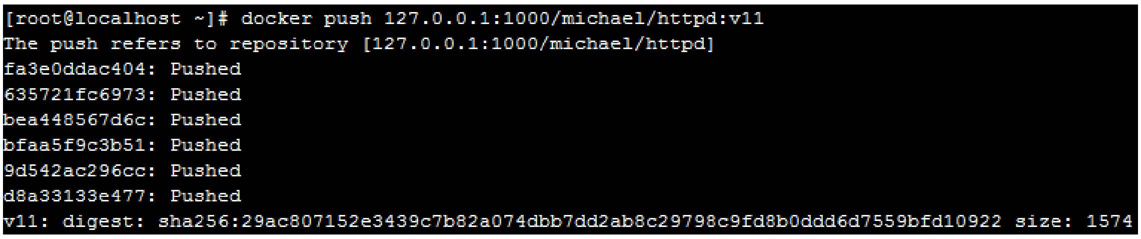
```
[root@localhost ~]# docker tag httpd:v11 127.0.0.1:1000/michael/httpd:v11
```



```
[root@localhost ~]# docker tag httpd:v11 127.0.0.1:1000/michael/httpd:v11
[root@localhost ~]# docker images
REPOSITORY                     TAG                 IMAGE ID            CREATED             SIZE
127.0.0.1:1000/michael/httpd   v11                 2b69b19cfcdb        33 minutes ago      154MB
httpd                          v11                 2b69b19cfcdb        33 minutes ago      154MB
```

步骤 4 将镜像 michael/httpd:v11 上传至 Registry。

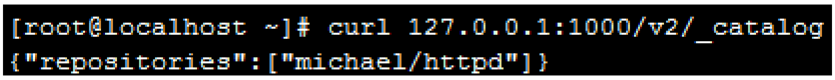
```
[root@localhost ~]# docker push 127.0.0.1:1000/michael/httpd:v11
```



```
[root@localhost ~]# docker push 127.0.0.1:1000/michael/httpd:v11
The push refers to repository [127.0.0.1:1000/michael/httpd]
fa3e0ddac404: Pushed
635721fc6973: Pushed
bea448567d6c: Pushed
bfaa5f9c3b51: Pushed
9d542ac296cc: Pushed
d8a33133e477: Pushed
v11: digest: sha256:29ac807152e3439c7b82a074dbb7dd2ab8c29798c9fd8b0ddd6d7559bfd10922 size: 1574
```

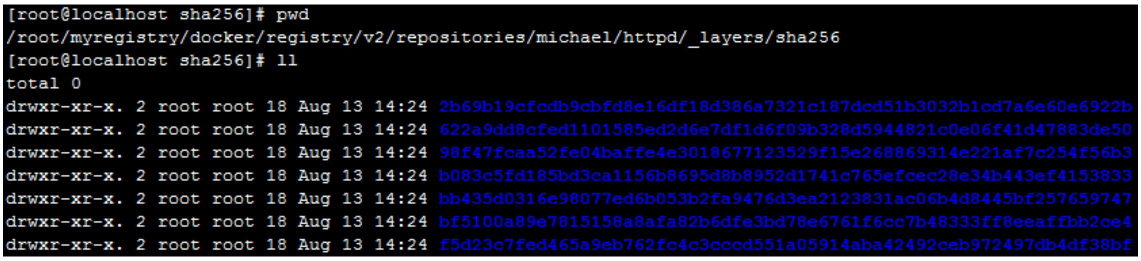
步骤 5 查看 Registry 中的镜像。

```
[root@localhost ~]# curl 127.0.0.1:1000/v2/_catalog
```



```
[root@localhost ~]# curl 127.0.0.1:1000/v2/_catalog
{"repositories":["michael/httpd"]}
```

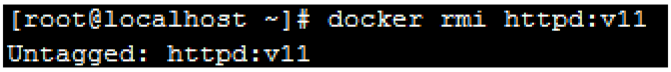
步骤 6 在/root/myregistry 目录中查看相应的镜像。



```
[root@localhost sha256]# pwd
/root/myregistry/docker/registry/v2/repositories/michael/httpd/_layers/sha256
[root@localhost sha256]# ll
total 0
drwxr-xr-x. 2 root root 18 Aug 13 14:24 2b69b19cfcdb9cbfd8e16df18d386a7321c187dcd51b3032b1cd7a6e60e6922b
drwxr-xr-x. 2 root root 18 Aug 13 14:24 622a9dd8cfed1101585ed2d6e7df1d6f09b328d5944821c0e06f41d47883de50
drwxr-xr-x. 2 root root 18 Aug 13 14:24 98f47fcaa52fe04baffe4e3018677123529f15e268869314e221af7c254f56b3
drwxr-xr-x. 2 root root 18 Aug 13 14:24 b083c5fd185bd3ca1156b8695d8b8952d1741c765efcec28e34b443ef4153833
drwxr-xr-x. 2 root root 18 Aug 13 14:24 bb435d0316e98077ed6b053b2fa9476d3ea2123831ac06b4d8445bf257659747
drwxr-xr-x. 2 root root 18 Aug 13 14:24 bf5100a89e7815158a8afa82b6dfe3bd78e6761f6cc7b48333ff8eeaffbb2ce4
drwxr-xr-x. 2 root root 18 Aug 13 14:24 f5d23c7fed465a9eb762fc4c3cccd551a05914aba42492ceb972497db4df38bf
```

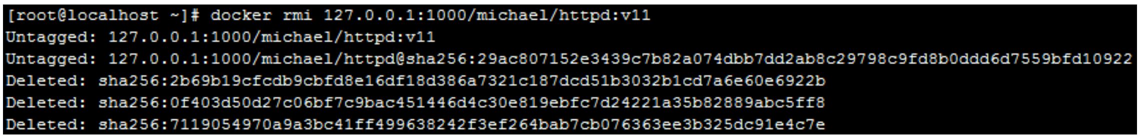
步骤 7　删除宿主机上的 httpd:v11 和 michael/httpd:v11 镜像。

```
[root@localhost ~]# docker rmi httpd:v11
```



```
[root@localhost ~]# docker rmi httpd:v11
Untagged: httpd:v11
```

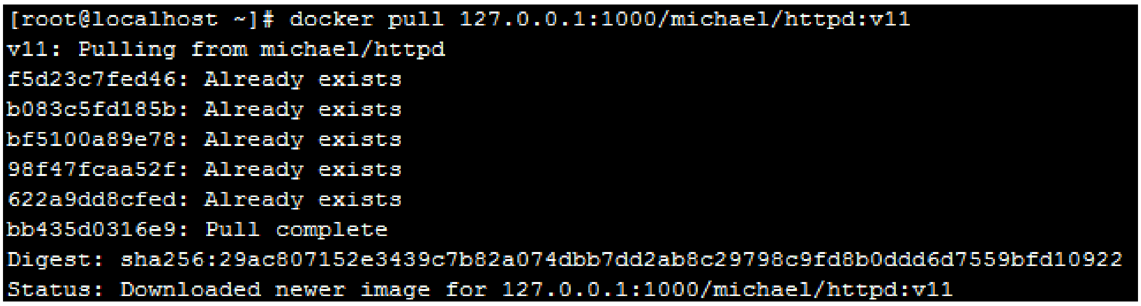
```
[root@localhost ~]# docker rmi 127.0.0.1:1000/michael/httpd:v11
```



```
[root@localhost ~]# docker rmi 127.0.0.1:1000/michael/httpd:v11
Untagged: 127.0.0.1:1000/michael/httpd:v11
Untagged: 127.0.0.1:1000/michael/httpd@sha256:29ac807152e3439c7b82a074dbb7dd2ab8c29798c9fd8b0ddd6d7559bfd10922
Deleted: sha256:2b69b19cfcdb9cbfd8e16df18d386a7321c187dcd51b3032b1cd7a6e60e6922b
Deleted: sha256:0f403d50d27c06bf7c9bac451446d4c30e819ebfc7d24221a35b82889abc5ff8
Deleted: sha256:7119054970a9a3bc41ff499638242f3ef264bab7cb076363ee3b325dc91e4c7e
```

步骤 8　从 Registry 下载镜像 michael/httpd:v11。

```
[root@localhost ~]# docker pull 127.0.0.1:1000/michael/httpd:v11
```



```
[root@localhost ~]# docker pull 127.0.0.1:1000/michael/httpd:v11
v11: Pulling from michael/httpd
f5d23c7fed46: Already exists
b083c5fd185b: Already exists
bf5100a89e78: Already exists
98f47fcaa52f: Already exists
622a9dd8cfed: Already exists
bb435d0316e9: Pull complete
Digest: sha256:29ac807152e3439c7b82a074dbb7dd2ab8c29798c9fd8b0ddd6d7559bfd10922
Status: Downloaded newer image for 127.0.0.1:1000/michael/httpd:v11
```