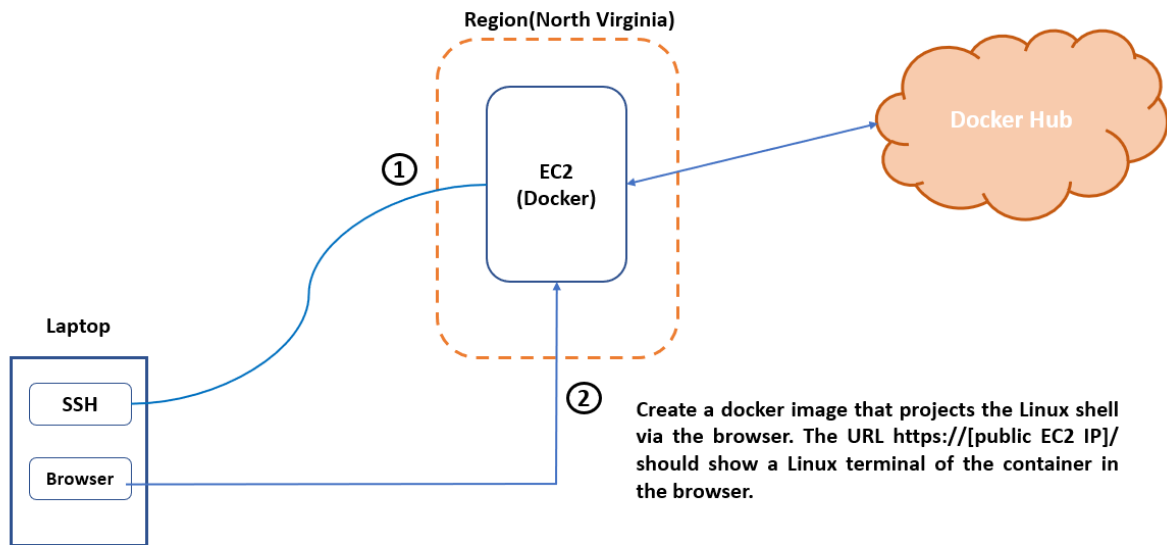


Docker | Images, containers, scripts

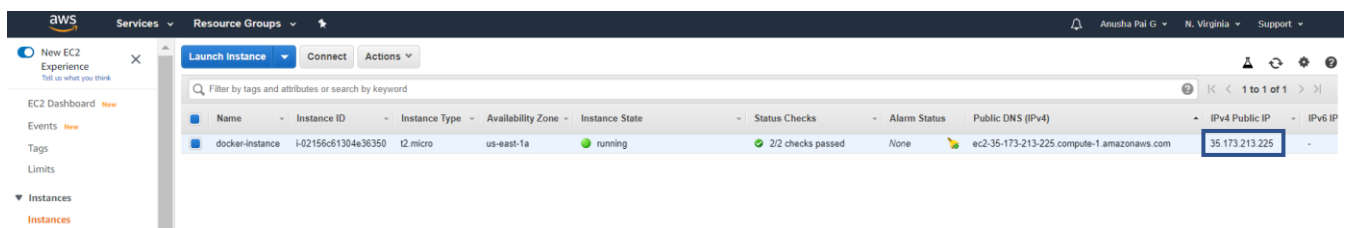
Setup an EC2 instance with Docker, create multiple containers from existing images, create a custom image using Docker file.

FINAL OUTCOME



How to do it?

1. Create an Ubuntu EC2 instance and install docker



```
ubuntu@ip-172-31-86-208:~$ sudo apt update -y > update.txt
WARNING: apt does not have a stable CLI interface. Use with caution in scripts.

ubuntu@ip-172-31-86-208:~$ echo $?
0
ubuntu@ip-172-31-86-208:~$ sudo apt install docker.io -y > docker.txt
WARNING: apt does not have a stable CLI interface. Use with caution in scripts.

ubuntu@ip-172-31-86-208:~$ echo $?
0
ubuntu@ip-172-31-86-208:~$ id ubuntu
uid=1000(ubuntu) gid=1000(ubuntu) groups=1000(ubuntu),4(adm),20(dialout),24(cdrom),25(floppy),27(sudo),29(audio),30(dip),44(video),46(plugindev),108(lxd),114(netdev)
ubuntu@ip-172-31-86-208:~$ grep docker /etc/group
docker:x:115:
ubuntu@ip-172-31-86-208:~$ sudo usermod -aG docker ubuntu
ubuntu@ip-172-31-86-208:~$ id ubuntu
uid=1000(ubuntu) gid=1000(ubuntu) groups=1000(ubuntu),4(adm),20(dialout),24(cdrom),25(floppy),27(sudo),29(audio),30(dip),44(video),46(plugindev),108(lxd),114(netdev),115(docker)
```

```

ubuntu@ip-172-31-86-208:~$ docker version
Client:
 Version:      19.03.6
 API version:  1.40
 Go version:   go1.12.17
 Git commit:   369ce74a3c
 Built:        Fri Feb 28 23:45:43 2020
 OS/Arch:     linux/amd64
 Experimental: false

Server:
 Engine:
  Version:      19.03.6
  API version:  1.40 (minimum version 1.12)
  Go version:   go1.12.17
  Git commit:   369ce74a3c
  Built:        Wed Feb 19 01:06:16 2020
  OS/Arch:     linux/amd64
  Experimental: false
 containerd:
  Version:      1.3.3-0ubuntu1~18.04.2
  GitCommit:
 runc:
  Version:      spec: 1.0.1-dev
  GitCommit:
 docker-init:
  Version:      0.18.0
  GitCommit:

ubuntu@ip-172-31-86-208:~$ docker images
REPOSITORY          TAG                 IMAGE ID            CREATED             SIZE
ubuntu@ip-172-31-86-208:~$ docker ps -a
CONTAINER ID        IMAGE               COMMAND             CREATED             STATUS             PORTS             NAMES
ubuntu@ip-172-31-86-208:~$ docker run --rm -d busybox
Unable to find image 'busybox:latest' locally
latest: Pulling from library/busybox
9c075fe2c773: Pull complete
Digest: sha256:c3dbcbbf6261c620d133312aee9e858b45e1b686efbcead7b34d9aae58a37378
Status: Downloaded newer image for busybox:latest
502c653d21fb6d1d20c410ddf8843750325c2f0231f3a4d34bbbf568fcc0a790

```

```

ubuntu@ip-172-31-86-208:~$ docker images
REPOSITORY          TAG                 IMAGE ID            CREATED             SIZE
busybox             latest             edabd795951a       2 days ago         1.22MB
ubuntu@ip-172-31-86-208:~$ docker ps -a
CONTAINER ID        IMAGE               COMMAND             CREATED             STATUS             PORTS             NAMES
ubuntu@ip-172-31-86-208:~$

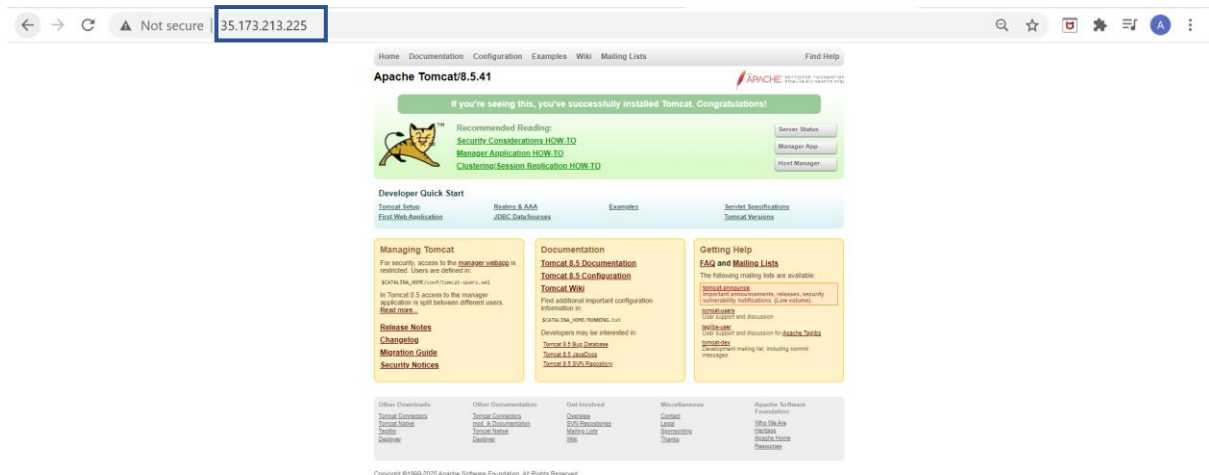
```

2. Run a tomcat container with JRE8

```

ubuntu@ip-172-31-86-208:~$ docker run -d -p 80:8080 tomcat:jre8
Unable to find image 'tomcat:jre8' locally
jre8: Pulling from library/tomcat
c5e155d5ald1: Pull complete
221d80d00ae9: Pull complete
4250b3117dca: Pull complete
d1370422ab93: Pull complete
deb6b03222ca: Pull complete
9cdea8d70cc3: Pull complete
968505be14db: Pull complete
04b5c270ac81: Pull complete
301d76fcab1f: Pull complete
57ca7a0b9e79: Pull complete
3c1d6826d7a3: Pull complete
Digest: sha256:7cdf9dca1472da80e7384403c57b0632753a3a5cdf4f310fc39462e08af8ef39
Status: Downloaded newer image for tomcat:jre8
a7b3d54d42463c2811c93a2d258101d0401b465973a0b25862a02d24ea27f893
ubuntu@ip-172-31-86-208:~$ docker ps
CONTAINER ID        IMAGE               COMMAND             CREATED             STATUS             PORTS             NAMES
a7b3d54d4246       tomcat:jre8        "catalina.sh run"   8 seconds ago      Up 7 seconds      0.0.0.0:80->8080/tcp tender_hopper
ubuntu@ip-172-31-86-208:~$

```



3. Inject a sample web application in Tomcat

```
ubuntu@ip-172-31-86-208:~$ docker ps
CONTAINER ID        IMAGE               COMMAND             CREATED             STATUS              PORTS               NAMES
a7b3d5d4d4246      tomcat:jre8        "catalina.sh run"   3 minutes ago       Up 2 minutes       0.0.0.0:80->8080/tcp tender_hopper

ubuntu@ip-172-31-86-208:~$ docker stop a7
a7

ubuntu@ip-172-31-86-208:~$ docker ps -a
CONTAINER ID        IMAGE               COMMAND             CREATED             STATUS              PORTS               NAMES
a7b3d5d4d4246      tomcat:jre8        "catalina.sh run"   3 minutes ago       Exited (143) 3 seconds ago                       tender_hopper

ubuntu@ip-172-31-86-208:~$ cd /opt/
ubuntu@ip-172-31-86-208:~$ mkdir helloworld
ubuntu@ip-172-31-86-208:~$ cd helloworld/
ubuntu@ip-172-31-86-208:~$ wget https://storage.googleapis.com/skl-training/aws-codelabs/aws-intro/HelloWorld.war
--2020-09-03 13:04:18-- https://storage.googleapis.com/skl-training/aws-codelabs/aws-intro/HelloWorld.war
Resolving storage.googleapis.com (storage.googleapis.com)... 172.217.12.240, 172.217.9.208, 172.217.7.240, ...
Connecting to storage.googleapis.com (storage.googleapis.com)|172.217.12.240|:443... connected.
HTTP request sent, awaiting response... 200 OK
Length: 9852807 (9.4M) [application/octet-stream]
Saving to: 'HelloWorld.war'

HelloWorld.war      100%[=====] 9.40M  6.85MB/s  in 1.4s

2020-09-03 13:04:22 (6.85 MB/s) - 'HelloWorld.war' saved [9852807/9852807]

ubuntu@ip-172-31-86-208:~$ ls
HelloWorld.war
```

```
ubuntu@ip-172-31-86-208:~$ cat Dockerfile
FROM tomcat:jre8
MAINTAINER Anusha
COPY HelloWorld.war /usr/local/tomcat/webapps/
ubuntu@ip-172-31-86-208:~$ docker build -t helloworld .
Sending build context to Docker daemon 9.855MB
Step 1/3 : FROM tomcat:jre8
----> 3639174793ba
Step 2/3 : MAINTAINER Anusha
----> Running in 61eab11a73d5
Removing intermediate container 61eab11a73d5
----> ddd67b860131
Step 3/3 : COPY HelloWorld.war /usr/local/tomcat/webapps/
----> 05e00912c211
Successfully built 05e00912c211
Successfully tagged helloworld:latest
ubuntu@ip-172-31-86-208:~$ docker images
REPOSITORY          TAG                 IMAGE ID            CREATED             SIZE
helloworld           latest             05e00912c211       6 seconds ago      473MB
busybox              latest             edabd795951a       2 days ago         1.22MB
tomcat               jre8              3639174793ba       15 months ago      463MB

ubuntu@ip-172-31-86-208:~$ docker run -d -p 80:8080 helloworld
e1d9082013e6d1bd7620f2da690496c46adc039ba265dcbf2cec52c9f577c4c1
ubuntu@ip-172-31-86-208:~$ docker ps
CONTAINER ID        IMAGE               COMMAND             CREATED             STATUS              PORTS               NAMES
e1d9082013e6        helloworld         "catalina.sh run"   4 seconds ago       Up 3 seconds       0.0.0.0:80->8080/tcp reverent_khorana

ubuntu@ip-172-31-86-208:~$
```

← → ↻ ⚠ Not secure 35.173.213.225/HelloWorld/ 🔍 ☆ 📄 ⚙ ⌵ Ⓐ ⋮

Welcome!

If you are reading this message then the installation has gone well and the application is running. Congratulations!
You may want to sign in using the credentials that you see below the text boxes to experience voice enabled services from Google.

Login

Type in your first name

Password

The password is hard coded as admin123

Application version - v1

4. Create a custom HTTP image & run a sample website

```
ubuntu@ip-172-31-86-208:~$ docker ps
CONTAINER ID        IMAGE               COMMAND             CREATED             STATUS              PORTS               NAMES
e1d9082613e6        helloworld         "catalina.sh run"   About a minute ago  Up About a minute  0.0.0.0:80->8080/tcp  reverent_khorana

ubuntu@ip-172-31-86-208:~$ docker stop e1
e1
ubuntu@ip-172-31-86-208:~$ docker ps -a
CONTAINER ID        IMAGE               COMMAND             CREATED             STATUS              PORTS               NAMES
e1d9082613e6        helloworld         "catalina.sh run"   2 minutes ago       Exited (143) 4 seconds ago                  reverent_khorana
a7b3d5d4d4246        tomcat:jre8        "catalina.sh run"   12 minutes ago       Exited (143) 9 minutes ago                  tender_hopper

ubuntu@ip-172-31-86-208:~$ cd /opt/
ubuntu@ip-172-31-86-208:/opt$ mkdir smartfin
ubuntu@ip-172-31-86-208:/opt$ cd smartfin
ubuntu@ip-172-31-86-208:/opt/smartfin$ wget https://storage.googleapis.com/skl-training/docker/smart_finance.tar.gz
--2020-09-03 13:12:16--  https://storage.googleapis.com/skl-training/docker/smart_finance.tar.gz
Resolving storage.googleapis.com (storage.googleapis.com)... 172.253.63.128, 172.217.164.176, 172.217.164.144, ...
Connecting to storage.googleapis.com (storage.googleapis.com)[172.253.63.128]:443... connected.
HTTP request sent, awaiting response... 200 OK
Length: 249203 (243K) [application/gzip]
Saving to: 'smart_finance.tar.gz'

smart_finance.tar.gz           100%[=====] 243.36K  --.-KB/s   in 0.01s

2020-09-03 13:12:16 (23.4 MB/s) - 'smart_finance.tar.gz' saved [249203/249203]

ubuntu@ip-172-31-86-208:/opt/smartfin$ ls
smart_finance.tar.gz
ubuntu@ip-172-31-86-208:/opt/smartfin$ tar -xvzf smart_finance.tar.gz
site/images/ico-fax.png
site/images/arrow.png
site/images/dotted-line.gif
site/images/ico1.png
site/images/ico-med-3.png
site/images/project-section-img.gif
site/images/logo.gif
site/images/ico4.png
site/index.html
site/images/login-button.gif
site/images/login-bottom-bg.gif
site/images/projectimg3.jpg
site/images/photo-about.jpg
site/images/main-links-left-bg.gif
```

```
ubuntu@ip-172-31-86-208:/opt/smartfin$ ls
site smart_finance.tar.gz
ubuntu@ip-172-31-86-208:/opt/smartfin$ cd site/
ubuntu@ip-172-31-86-208:/opt/smartfin/site$ ls
about-us.html contact-us.html css images index.html privacy.html projects.html services.html support.html
ubuntu@ip-172-31-86-208:/opt/smartfin/site$ |
```

```

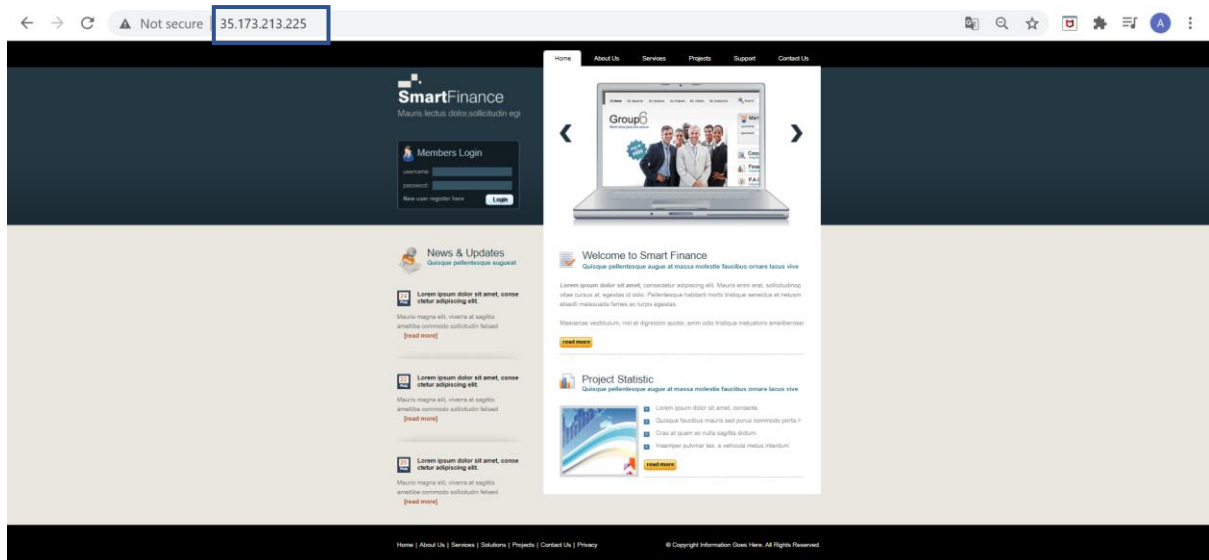
ubuntu@ip-172-31-86-208:/opt/smartfin$ cat Dockerfile
FROM httpd
MAINTAINER Anusha
RUN mv /usr/local/apache2/htdocs/index.html /usr/local/apache2/htdocs/index.html_old
COPY /site/. /usr/local/apache2/htdocs/
ubuntu@ip-172-31-86-208:/opt/smartfin$ docker build -t smartfin .
Sending build context to Docker daemon   596kB
Step 1/4 : FROM httpd
latest: Pulling from library/httpd
bf5952930446: Pull complete
3d3fecf6569b: Pull complete
b5fc3125d912: Pull complete
679d69c01e90: Pull complete
76291586768e: Pull complete
Digest: sha256:3cbdff4bc16681541885ccf1524a532afa28d2a6578ab7c2d5154a7abc182379
Status: Downloaded newer image for httpd:latest
--> a6ea92c35c43
Step 2/4 : MAINTAINER Anusha
--> Running in a0ad15c83d71
Removing intermediate container a0ad15c83d71
--> d9f02a16818f
Step 3/4 : RUN mv /usr/local/apache2/htdocs/index.html /usr/local/apache2/htdocs/index.html_old
--> Running in 410b0f157aa9
Removing intermediate container 410b0f157aa9
--> feaa8e74fa3a
Step 4/4 : COPY /site/. /usr/local/apache2/htdocs/.
--> e93654481a72
Successfully built e93654481a72
Successfully tagged smartfin:latest
ubuntu@ip-172-31-86-208:/opt/smartfin$ docker images
REPOSITORY          TAG                 IMAGE ID            CREATED             SIZE
smartfin             latest              e93654481a72        6 seconds ago      166MB
helloworld           latest              05e00912c211        16 minutes ago     473MB
busybox              latest              edabd795951a        2 days ago         1.22MB
httpd                latest              a6ea92c35c43        4 weeks ago        166MB
tomcat               jre8               3639174793ba        15 months ago      463MB
ubuntu@ip-172-31-86-208:/opt/smartfin$ |

```

```

ubuntu@ip-172-31-86-208:/opt/smartfin$ docker images
REPOSITORY          TAG                 IMAGE ID            CREATED             SIZE
smartfin             latest              e93654481a72        36 seconds ago     166MB
helloworld           latest              05e00912c211        16 minutes ago     473MB
busybox              latest              edabd795951a        2 days ago         1.22MB
httpd                latest              a6ea92c35c43        4 weeks ago        166MB
tomcat               jre8               3639174793ba        15 months ago      463MB
ubuntu@ip-172-31-86-208:/opt/smartfin$ docker run -d -p 80:80 smartfin
dc18ce06f989bda74899f36a572672df407fdca4958bb26885f9ec94ebd19cd9
ubuntu@ip-172-31-86-208:/opt/smartfin$ |

```



5. Create a shell in a box image and run the container to have the containers terminal accessible from the local browser

```

ubuntu@ip-172-31-86-208:~$ docker pull debian
Using default tag: latest
latest: Pulling from library/debian
d6ff36c9ec48: Pull complete
Digest: sha256:1e74c92df240634a39d050a5e23fb18f45df30846bb222f543414da180b47a5d
Status: Downloaded newer image for debian:latest
docker.io/library/debian:latest
ubuntu@ip-172-31-86-208:~$ docker run -it debian bash
root@44f1bbcf8772:/# apt update -y > /dev/null

WARNING: apt does not have a stable CLI interface. Use with caution in scripts.

root@44f1bbcf8772:/# apt upgrade -y > /dev/null

WARNING: apt does not have a stable CLI interface. Use with caution in scripts.

root@44f1bbcf8772:/# apt install wget curl openssl apt-utils procs -y > /dev/null

WARNING: apt does not have a stable CLI interface. Use with caution in scripts.

debconf: delaying package configuration, since apt-utils is not installed
root@44f1bbcf8772:/# adduser guest
Adding user `guest' ...
Adding new group `guest' (1000) ...
Adding new user `guest' (1000) with group `guest' ...
Creating home directory `/home/guest' ...
Copying files from `/etc/skel' ...
New password:
Retype new password:
passwd: password updated successfully
Changing the user information for guest
Enter the new value, or press ENTER for the default
  Full Name []:
  Room Number []:
  Work Phone []:
  Home Phone []:
  Other []:
Is the information correct? [Y/n] Y
root@44f1bbcf8772:/#

```

```

ubuntu@ip-172-31-86-208:~$ docker ps -a

```

CONTAINER ID	IMAGE	COMMAND	CREATED	STATUS	PORTS	NAMES
44f1bbcf8772	debian	"bash"	2 minutes ago	Exited (0) 4 seconds ago		funny_black
dc18ce06f989	smartfin	"httpd-toforeground"	20 minutes ago	Exited (0) 17 minutes ago		bold_kepler
eid9082013e6	helloworld	"catalina.sh run"	37 minutes ago	Exited (143) 35 minutes ago		reverent_khorana
a7b3d54d4246	tomcat:jre8	"catalina.sh run"	48 minutes ago	Exited (143) 44 minutes ago		tender_hopper

```

ubuntu@ip-172-31-86-208:~$ docker commit -m "SIAB debian" -a "Anusha" funny_black siab
sha256:6dbecf7dc05f7a5b30d5d3f0b945ed4b29af372632dcdad1939e2bddd17f8618
ubuntu@ip-172-31-86-208:~$ docker images

```

REPOSITORY	TAG	IMAGE ID	CREATED	SIZE
siab	latest	6dbecf7dc05f	4 seconds ago	152MB
smartfin	latest	e936504081a72	22 minutes ago	166MB
helloworld	latest	05e00912c211	38 minutes ago	473MB
busybox	latest	edabd795951a	2 days ago	1.22MB
httpd	latest	a6ea92c35c43	4 weeks ago	166MB
debian	latest	ee11c54e6bb7	4 weeks ago	114MB
tomcat	jre8	3639174793ba	15 months ago	463MB

```

ubuntu@ip-172-31-86-208:~$

```

```

ubuntu@ip-172-31-86-208:/opt/siab$ cat SIABDockerfile
FROM siab
MAINTAINER Anusha
RUN apt install shellinabox -y
CMD service shellinabox start && tail -f /dev/null
ubuntu@ip-172-31-86-208:/opt/siab$ docker build -t shellinabox -f SIABDockerfile .
Sending build context to Docker daemon  2.048kB
Step 1/4 : FROM siab
----> 6dbecf7dc05f
Step 2/4 : MAINTAINER Anusha
----> Running in dc05ad34e5ce
Removing intermediate container dc05ad34e5ce
----> f7cc2a535855
Step 3/4 : RUN apt install shellinabox -y
----> Running in da8c02e59aea
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following NEW packages will be installed:
  shellinabox
0 upgraded, 1 newly installed, 0 to remove and 0 not upgraded.
Need to get 126 kB of archives.
After this operation, 518 kB of additional disk space will be used.
Get:1 http://deb.debian.org/debian buster/main amd64 shellinabox amd64 2.21 [126 kB]
Fetched 126 kB in 0s (8911 kB/s)
debconf: unable to initialize frontend: Dialog
debconf: (No usable dialog-like program is installed, so the dialog based frontend cannot be used. at /usr/share/perl5/Debconf/FrontEnd/Dialog.pm line 76, <= line 1.)
debconf: falling back to frontend: Readline
debconf: unable to initialize frontend: Readline
debconf: (Can't locate Term/Readline.pm in @INC (you may need to install the Term::Readline module) (@INC contains: /etc/perl /usr/local/lib/x86_64-linux-gnu/perl/5.28.1 /usr/local/share/perl/5.28.1 /usr/lib/x86_64-linux-gnu/perl5/5.28 /usr/share/perl5 /usr/lib/x86_64-linux-gnu/perl/5.28 /usr/share/perl/5.28 /usr/local/lib/site_perl /usr/lib/x86_64-linux-gnu/perl-base) at /usr/share/perl5/Debconf/FrontEnd/Readline.pm line 7, <= line 1.)
debconf: falling back to frontend: Teletype
Selecting previously unselected package shellinabox.
(Reading database ... 7489 files and directories currently installed.)
Preparing to unpack .../shellinabox_2.21_amd64.deb ...
Unpacking shellinabox (2.21) ...
Setting up shellinabox (2.21) ...
invoke-rc.d: could not determine current runlevel
invoke-rc.d: policy-rc.d denied execution of start.
Removing intermediate container da8c02e59aea

```

```

Removing intermediate container da8c02e59aea
----> bf1187edc742
Step 4/4 : CMD service shellinabox start && tail -f /dev/null
----> Running in ed5176fa23e0
Removing intermediate container ed5176fa23e0
----> dafae8cb2aca
Successfully built dafae8cb2aca
Successfully tagged shellinabox:latest
ubuntu@ip-172-31-86-208:/opt/siab$ docker images

```

REPOSITORY	TAG	IMAGE ID	CREATED	SIZE
shellinabox	latest	dafae8cb2aca	5 seconds ago	154MB
siab	latest	6dbecf7dc05f	16 minutes ago	152MB
smartfin	latest	e93654481a72	39 minutes ago	166MB
helloworld	latest	05e00912c211	55 minutes ago	473MB
busybox	latest	edabd795951a	2 days ago	1.22MB
httpd	latest	a6ea92c35c43	4 weeks ago	166MB
debian	latest	ee11c54e6bb7	4 weeks ago	114MB
tomcat	jre8	3639174793ba	15 months ago	463MB

```

ubuntu@ip-172-31-86-208:/opt/siab$ |

```

```

ubuntu@ip-172-31-86-208:~$ docker images

```

REPOSITORY	TAG	IMAGE ID	CREATED	SIZE
shellinabox	latest	dafae8cb2aca	About a minute ago	154MB
siab	latest	6dbecf7dc05f	17 minutes ago	152MB
smartfin	latest	e93654481a72	40 minutes ago	166MB
helloworld	latest	05e00912c211	56 minutes ago	473MB
busybox	latest	edabd795951a	2 days ago	1.22MB
httpd	latest	a6ea92c35c43	4 weeks ago	166MB
debian	latest	ee11c54e6bb7	4 weeks ago	114MB
tomcat	jre8	3639174793ba	15 months ago	463MB

```

ubuntu@ip-172-31-86-208:~$ docker run -d -p 443:4200 --name siabcont shellinabox
c91acd1af0ccb1937b6791f8386e0fa12c71fc17246055a53d70a31439afaec7
ubuntu@ip-172-31-86-208:~$ docker ps

```

CONTAINER ID	IMAGE	COMMAND	CREATED	STATUS	PORTS	NAMES
c91acd1af0cc	shellinabox	"/bin/sh -c 'service..."	13 seconds ago	Up 11 seconds	0.0.0.0:443->4200/tcp	siabcont

```

ubuntu@ip-172-31-86-208:~$

```



```
← → ↻ ⚠ Not secure | 35.173.213.225 🔍 ☆ 📄 ⚙ ⌵ 👤 ⋮
c91acd1af0cc login: guest
Password:
Linux c91acd1af0cc 5.3.0-1032-aws #34~18.04.2-Ubuntu SMP Fri Jul 24 10:06:28 UTC 2020 x86_64

The programs included with the Debian GNU/Linux system are free software;
the exact distribution terms for each program are described in the
individual files in /usr/share/doc/*/copyright.

Debian GNU/Linux comes with ABSOLUTELY NO WARRANTY, to the extent
permitted by applicable law.
guest@c91acd1af0cc:~$ whoami
guest
guest@c91acd1af0cc:~$
```