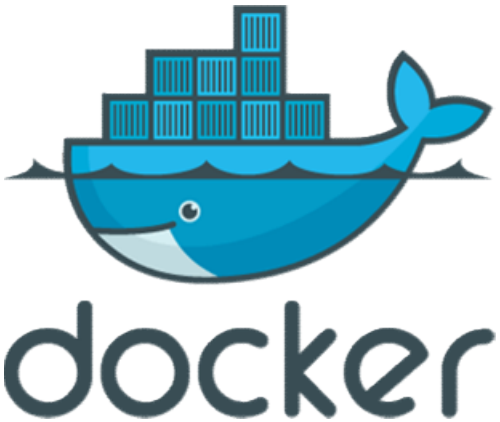
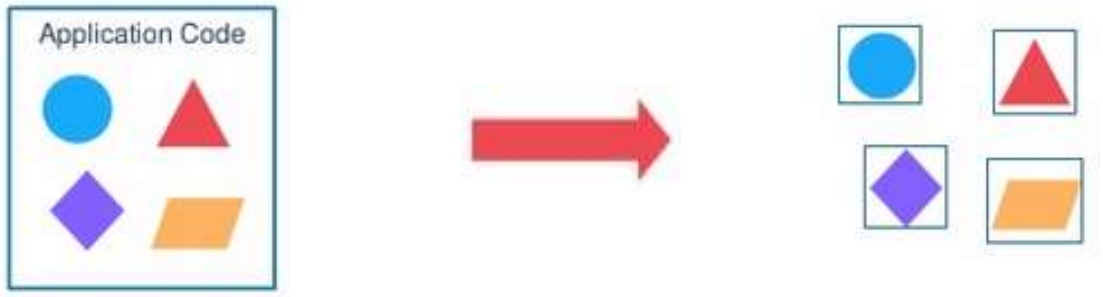


Docker, Containers, and the Future of Application Delivery

Table of Contents

- Application Modernization
- Devops …
- Continuous Integration and Delivery
- War Between Developers and IT Operations
- History of Docker
- Docker is …
- The Docker Family Tree
- Docker Overview
- Historical limitations of application deployment
- What is a Container
- Virtual Machines vs Docker
- Key Benefits of Docker Containers
- Foundation : Docker Engine
- Install Docker On Centos 7
- Steps of a Docker workflow
- Docker Commands
- Docker Image
- Volume in Docker
- Network in Docker
- Build Custom Image By DockerFile
- Docker Local Registry
- Docker Compose
- Docker Cluster Swarm
- Implement Docker Cluster Swarm dockercloud/haproxy and dockercloud/hello-world

Application Modernization

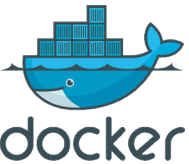


Developer Issues :

- Minor code changes require full re-compile and re-test
- Application becomes single point of failure
- Application is difficult scale

Microservices :

- Break application into separate operations
- highly available by design
- Make the app independently scalable



DevOps …

DevOps is Process
Approach to reach DevOps with CALMS

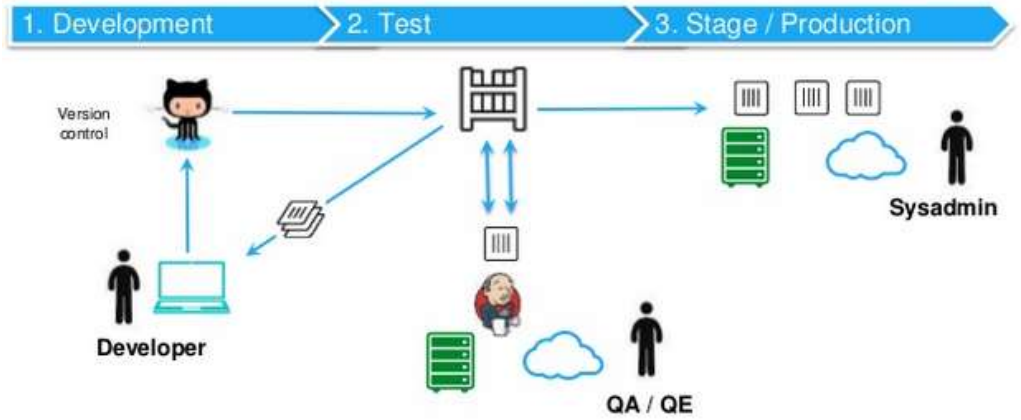
Culture : Delete Wall between Developers Team and Operations Team
Automation : Continuous Delivery – Continuous Integration – Continuous Deployment (NO Manual)
Use tools (Configuration Management and Virtualization , …)
Lean : Delete Redundant work and Useless
Measurement : Unless we know where we are, we will not know where we want to go
Infrastructure Monitoring
Log Management
Application and Performance Management
→ TPS and Response Time , …
Sharing : Share Information and Result with Coworker

DevOps Use cases :
High changes in product
Add More Features
Competitive products

Continuous Integration and Delivery

Continuous Integration and Delivery Developer Version control :

1. Development
2. Test
3. Stage / Production QA / QE Sysadmin



Deploy : (Build ➔ Execute)

War Between Developers and IT Operations

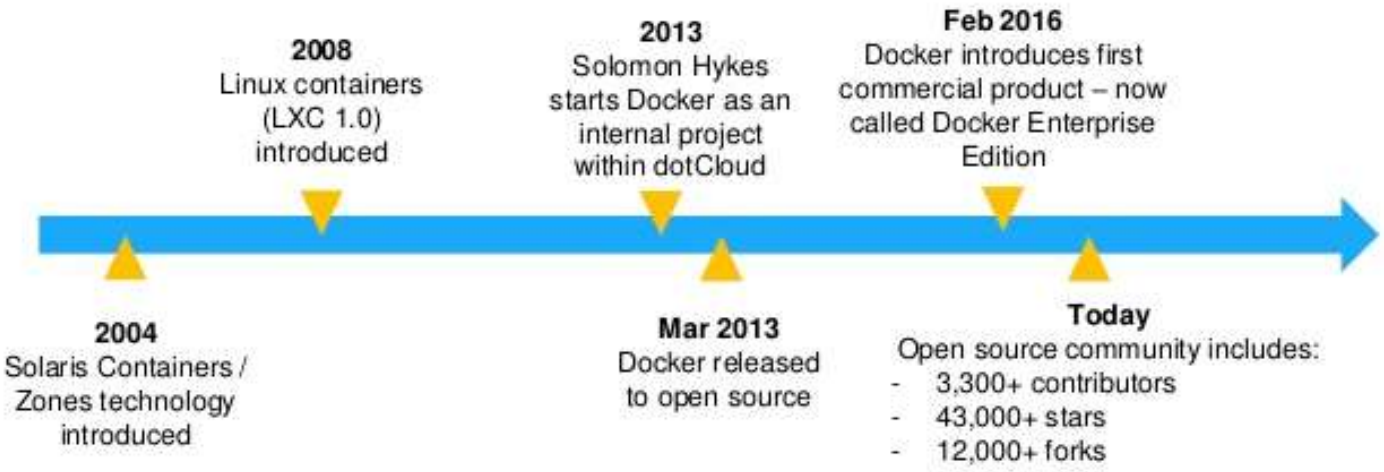
Developer :

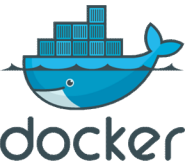
- Freedom to create and deploy apps fast
- Define and package application needs

Operations :

- Quickly and flexibly respond to changing needs
- Standardize, secure, and manage

History of Docker





History of Docker

Original Author : Solomon Hykes

Initial Release : 13 March 2013; years ago

Stable Release : 18.03.0-ce, build 0520e24

Repository : github.com/docker/docker-ce

Operating System : Linux / Windows

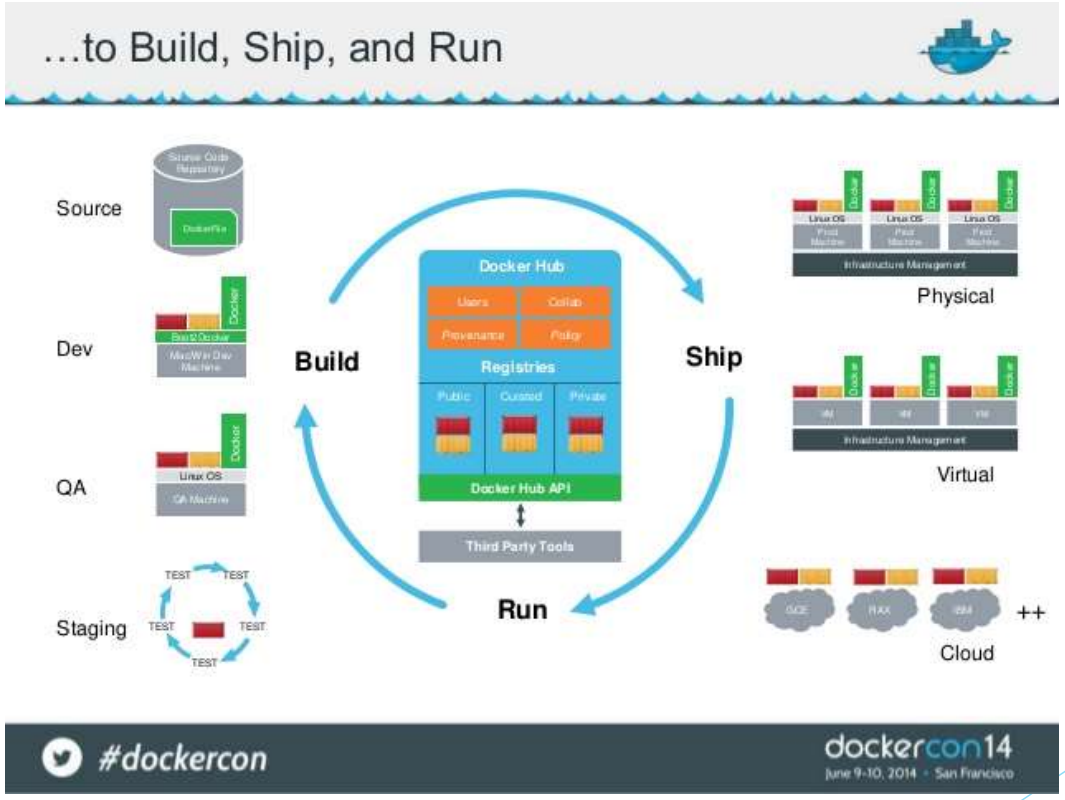
License : Apache License 2.0

Written in : Go

Docker is …

Docker is an open platform for :

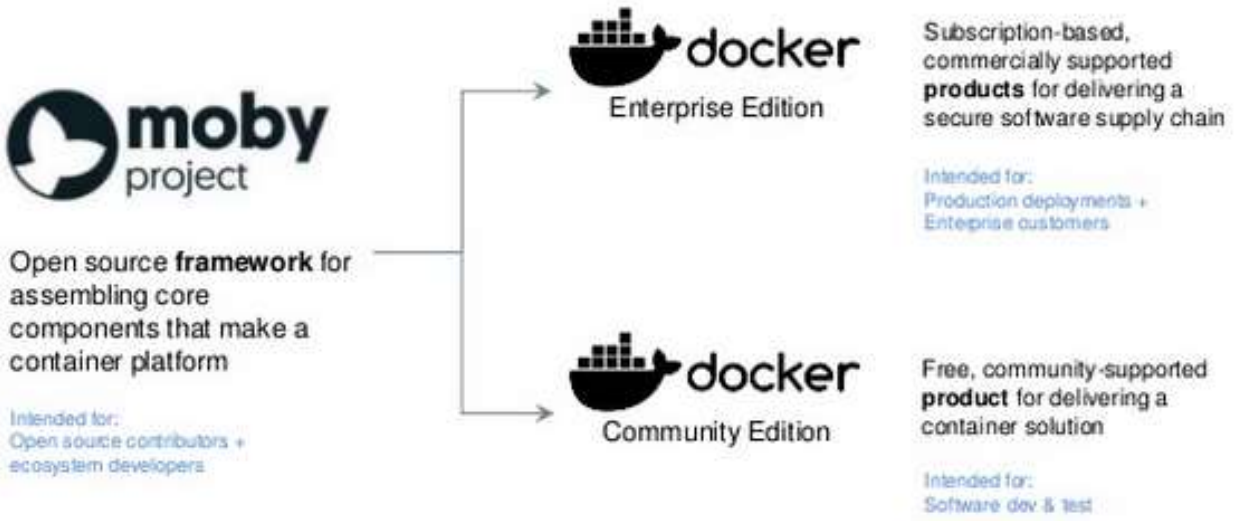
- Developing
- Shipping
- Running



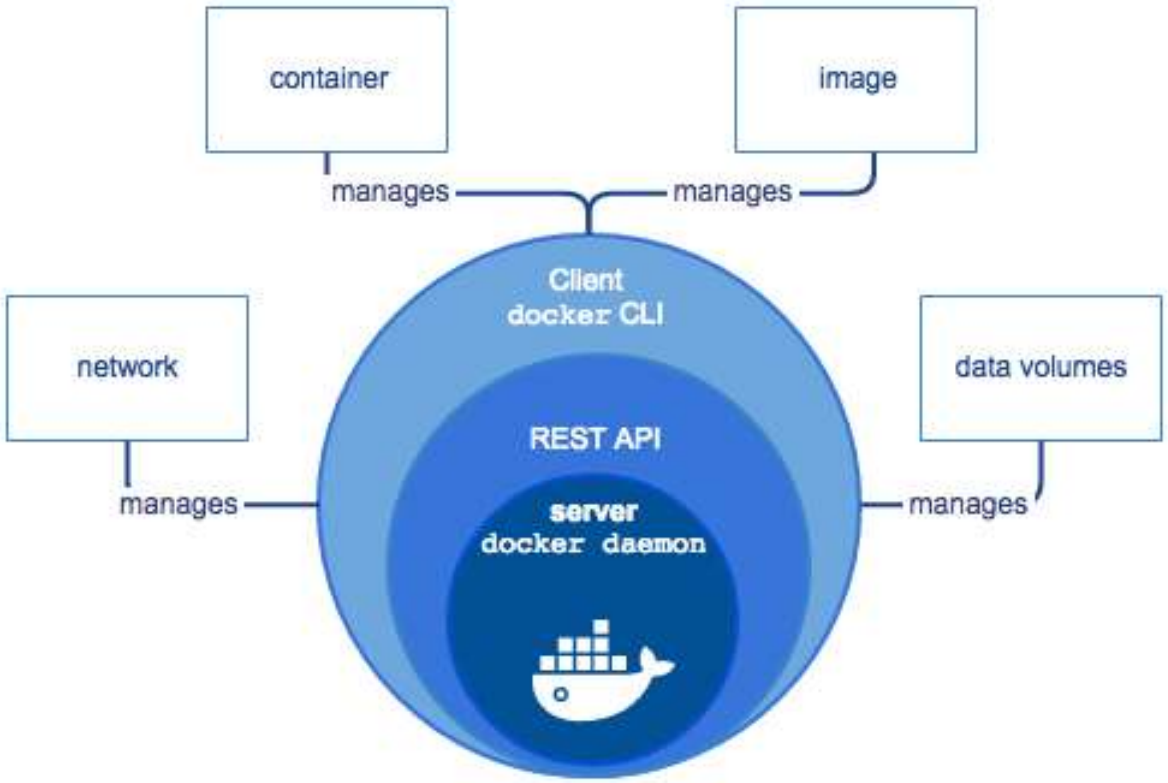
Banner Docker :

Build Any App
Ship Any Where
Run Any Where

The Docker Family Tree

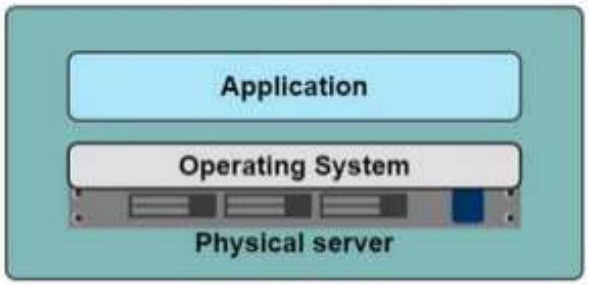


Docker Overview



Historical limitations of application deployment

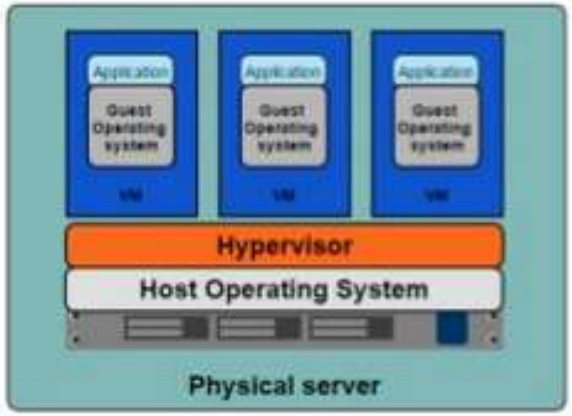
- Slow deployment times
- Huge costs
- Wasted resources
- Difficult to scale
- Difficult to migrate



Historical limitations of application deployment

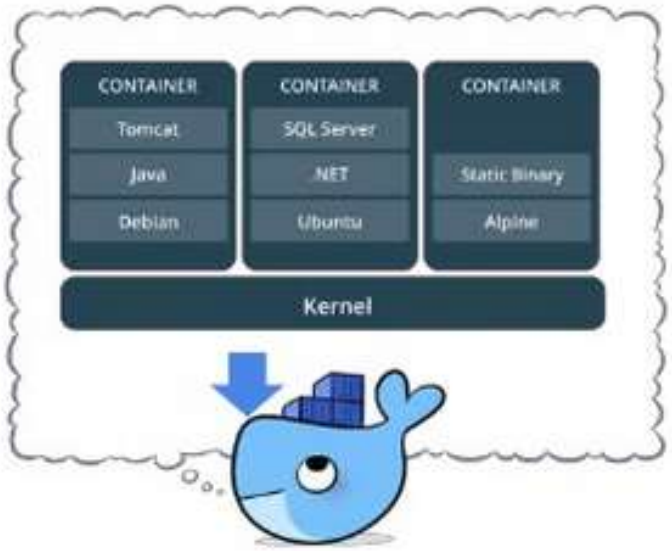
Hypervisor-based Virtualization

- One physical server can contain multiple applications
- Each application runs in a virtual machine (VM)



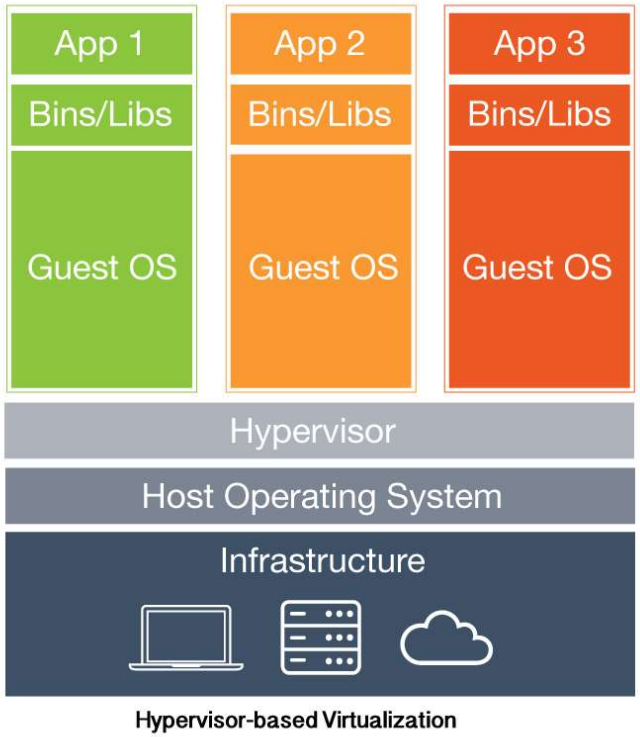
What is a Container

- Standardized packaging for software and dependencies
- Isolate apps from each other
- Share the same OS kernel
- Works with all major Linux and Windows Server

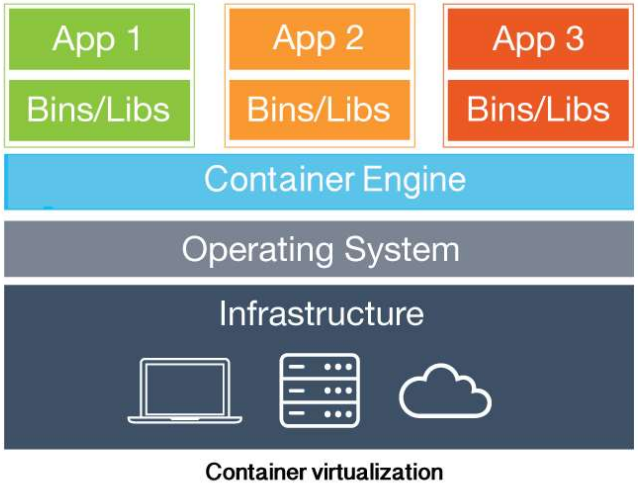


Container Include :
BOX (APPs Or Packages)

Virtual Machines vs Docker



Hypervisor-based Virtualization

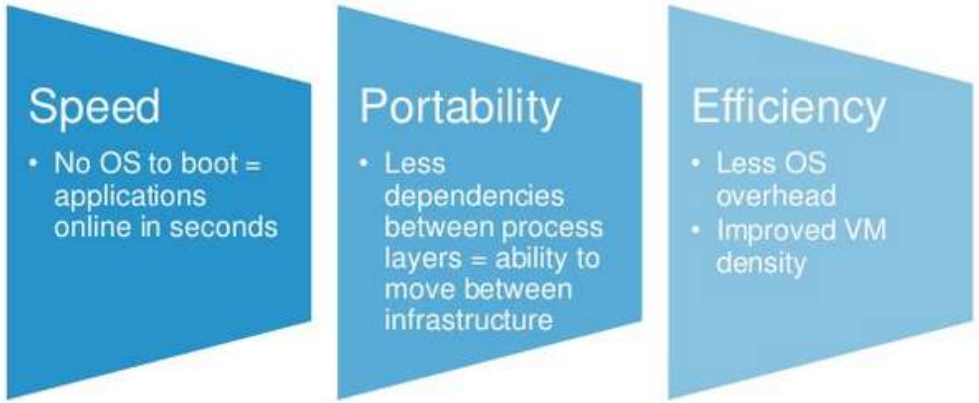


Container virtualization

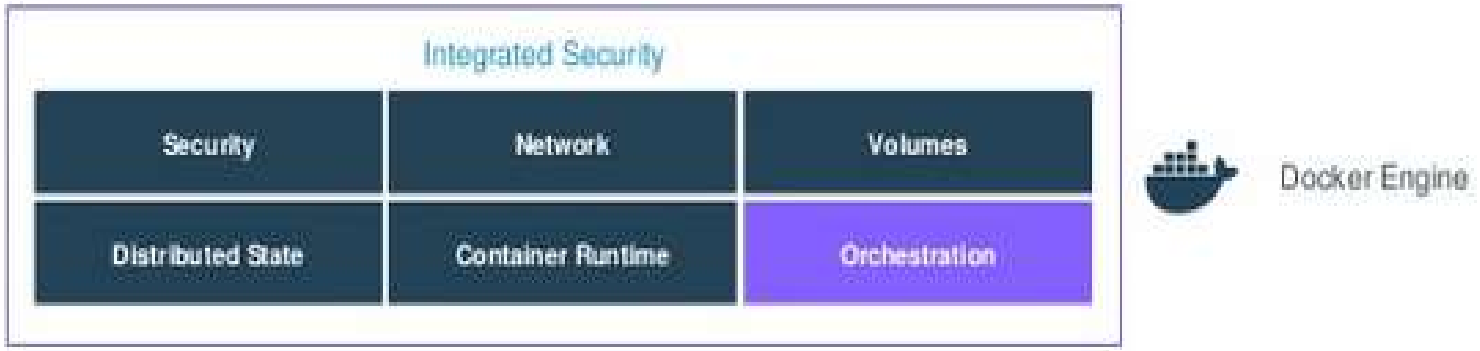
Containers No problem and tested

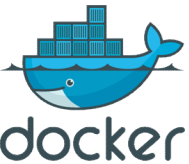
Key Benefits of Docker Containers

- Speed
- Portability
- Efficiency
- Secure
- Open Source
- Simplify DevOps



Foundation : Docker Engine





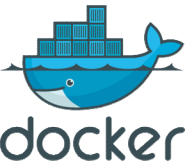
Install Docker On Centos 7

Install Docker_CE :

**1- yum remove docker **
**docker-common **
**docker-selinux **
docker-engine

2- yum install -y yum-utils
**3- yum-config-manager **
**--add-repo **
https://download.docker.com/linux/centos/docker-ce.repo

4- yum-config-manager --disable docker-ce-edge
5- yum makecache fast
6- yum install docker-ce
7- systemctl start docker
8- ps -ef | grep docker



Steps of a Docker workflow

1- Pulls the ubuntu:15.04 Image from the Registry

2- Creates a new Container

3- Allocates a filesystem and mounts a read-write Layer

4- Allocates a Network Bridge Interface

5- Sets up an IP Address

6- Executes a process that you specify (/bin/bash)

7- Captures and provides application output

Docker Commands

Note : Path /var/lib/docker/ all docker information and content.

Note : Command Structure

docker [option] [command] [arguments]

Note :

1- Dockerhub is Docker Registery of Docker Image containers

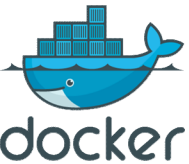
2- Connect to VPN Before Connect to dockerhub for get images.

Command 1 : Docker informarion.

docker info

Output :

```
Containers: 0
 Running: 0
 Paused: 0
 Stopped: 0
Images: 0
Server Version: 17.12.1-ce
Storage Driver: devicemapper
 Pool Name: docker-253:0-231686-pool
 Pool Blocksize: 65.54kB
 Base Device Size: 10.74GB
 Backing Filesystem: xfs
 Udev Sync Supported: true
 Data file: /dev/loop0
 Metadata file: /dev/loop1
 Data loop file: /var/lib/docker/devicemapper/devicemapper/data
Swarm: inactive
Kernel Version: 3.10.0-229.el7.x86_64
Operating System: CentOS Linux 7 (Core)
OSType: linux
Architecture: x86_64
CPUs: 1
Total Memory: 979.7MiB
Name: docker
ID: F5U6:QWY5:U6ID:UME6:XQLL:OY7B:LPKO:RDE3:F5MX:5LDG:HMGD:STSI
Docker Root Dir: /var/lib/docker
Registry: https://index.docker.io/v1/
Labels:
Experimental: false
Insecure Registries:
 127.0.0.0/8
```



Docker Commands

Command 2 : Docker Get Image from Dockerhub.

docker run hello-world

Output :

```
Unable to find image 'hello-world:latest' locally
latest: Pulling from library/hello-world
ca4f61b1923c: Pull complete
Digest: sha256:083de497cff944f969d8499ab94f07134c50bcf5e6b9559b27182d3fa80ce3f7
Status: Downloaded newer image for hello-world:latest

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

Docker Commands

Command 3 : View Docker image (hello-world) from Dockerhub.

docker image ls OR docker images

Output :

REPOSITORY	TAG	IMAGE ID(uniq)	CREATED	SIZE
hello-world	latest	f2a91732366c	3 months ago	1.85kB

docker images -a ➔ show all images

docker images -q ➔ show ONLY Image ID

Output :

f2a91732366c

docker info

Output :

Containers: 1

Running: 0

Paused: 0

Stopped: 1

Images: 1

Docker Commands

Command 4 : Docker Container Execute and Input to Container

docker run -it IMAGE:TAG
docker run -it centos:latest

Output :

docker info === With Other Shell

Containers: 4
Running: 1
Paused: 0
Stopped: 3
Images: 2

[root@e76eb81b3607 /]# HOSTNAME MY CONTAINER ➔ e76eb81b3607

[root@e76eb81b3607 /]# exit or ctrl+d ➔ for quit and shutdown Container .

Docker Commands

Command 5 : Docker Container Process Info

docker ps

Output :

CONTAINER ID	IMAGE	COMMAND	CREATED	STATUS	PORTS	NAMES
e76eb81b3607	centos:latest	"/bin/bash"	2 minutes ago	Up 2 minutes		zen_rosalind

Docker Commands

Command 6 : Docker Container Execute Without Input to Container

docker run -it -d centos:latest /bin/bash

docker run **[OPTIONS]**

OPTIONS :

-d, --detach Run container in background and print container ID

-i, --interactive=false] Run and Not Exit

-t, --tty=false] Run by tty in session

Output :

4751d298fe47fe4e77e1b6cc7bf60efe3a09d0ce36f1bf23b5eadb6177636a0a

CONTAINER ID ➔ 4751d298fe47

docker info === With Other Shell

Containers: 4

Running: 1

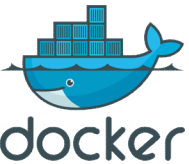
Paused: 0

Stopped: 3

Images: 2

docker ps

CONTAINER ID	IMAGE	COMMAND	CREATED	STATUS	PORTS	NAMES
4751d298fe47	centos:latest	"/bin/bash"	About a minute ago	Up About a minute		condescending_franklin



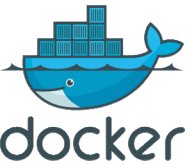
Docker Commands

Note :

Containers Info Path:

/var/lib/docker/containers

```
ls –l
drwx------ 4 root root 4096 Mar  2 12:05 2a1b714f7a05013502dc19d23ea8def14783e15e928a4a8ebdd76f4bdc29a9f4
drwx------ 4 root root 4096 Mar  2 12:34 4751d298fe47fe4e77e1b6cc7bf60efe3a09d0ce36f1bf23b5eadb6177636a0a
drwx------ 4 root root 4096 Mar  2 12:06 d7879faaf2a71ea78a05cc2ed8bff1b6132ea3fd2bae50509d455a6431236f4e
drwx------ 4 root root 4096 Mar  2 12:15 e76eb81b36078b407c88508ca409c39dfcbaca45b68c561851369538bb304880
drwx------ 4 root root 4096 Mar  2 11:49 fb9f94f3651300f7b3f62eceaeb27d10abd840358a802ecc6b220858a7d4b492

cd 4751d298fe47fe4e77e1b6cc7bf60efe3a09d0ce36f1bf23b5eadb6177636a0a
ls -l
-rw-r----- 1 root root    0 Mar  2 12:16 4751d298fe47fe4e77e1b6cc7bf60efe3a09d0ce36f1bf23b5eadb6177636a0a-json.log
drwx------ 2 root root    6 Mar  2 12:16 checkpoints
-rw------- 1 root root 2713 Mar  2 12:16 config.v2.json
-rw-r--r-- 1 root root 1153 Mar  2 12:16 hostconfig.json
-rw-r--r-- 1 root root   13 Mar  2 12:16 hostname          ➔ vim hostname
-rw-r--r-- 1 root root  174 Mar  2 12:16 hosts             ➔ vim hosts
-rw-r--r-- 1 root root   74 Mar  2 12:16 resolv.conf       ➔ vim resolv.conf
-rw-r--r-- 1 root root   71 Mar  2 12:16 resolv.conf.hash
drwxrwxrwt 2 root root   40 Mar  2 12:16 shm
```



Docker Commands

Command 7 : Docker Container Process All Informations (UP and Down)

docker ps -a

Output :

CONTAINER ID	IMAGE	COMMAND	CREATED	STATUS	PORTS	NAMES
ca2112abd8e1	centos:latest	"/bin/bash"	About a minute ago	Exited (0) About a minute ago		tender_jones
1bc50a242764	centos:latest	"/bin/bash"	3 minutes ago	Exited (0) 2 minutes ago		eloquent_booth
864e4254110d	centos:latest	"/bin/bash"	3 minutes ago	Exited (0) 3 minutes ago		objective_archimedes
4751d298fe47	centos:latest	"/bin/bash"	30 minutes ago	Exited (137) 3 minutes ago		condescending_franklin
e76eb81b3607	centos:latest	"/bin/bash"	36 minutes ago	Exited (0) 31 minutes ago		zen_rosalind
d7879faaf2a7	centos:latest	"/bin/bash"	40 minutes ago	Exited (137) 40 minutes ago		boring_cray
2a1b714f7a05	centos:latest	"/bin/bash"	43 minutes ago	Exited (0) 41 minutes ago		mystifying_golick
fb9f94f36513	hello-world	"/hello"	About an hour ago	Exited (0) About an hour ago		cranky_kilby

Docker Commands

Command 8 : Docker Container Process OLNY UP

docker run -it -d centos:latest

21439f50a158fc0d6abc1a290da6ae10c2e289a3b374c360bf636e8cd187ed0f

docker ps -q

Output :

21439f50a158

Command 9 : Docker Container Process OLNY UP and Image Size

docker run -it -d centos:latest

21439f50a158fc0d6abc1a290da6ae10c2e289a3b374c360bf636e8cd187ed0f

docker ps -s

Output :

CONTAINER ID	IMAGE	COMMAND	CREATED	STATUS	PORTS	NAMES	SIZE
21439f50a158	centos:latest	"/bin/bash"	About a minute ago	Up About a minute		nervous_heyrovsky	0B (virtual 207MB)

Docker Commands

Command 10 : Docker Container Process Number of LAST Create Container (UP or Down)

docker ps –n=3

Output :

CONTAINER ID	IMAGE	COMMAND	CREATED	STATUS	PORTS	NAMES
21439f50a158	centos:latest	"/bin/bash"	5 minutes ago	Up 5 minutes		nervous_heyrovsky
d8d4b3f80789	centos:latest	"/bin/bash"	6 minutes ago	Exited (0) 5 minutes ago		elastic_lovelace
ca2112abd8e1	centos:latest	"/bin/bash"	2 days ago	Exited (0) 2 days ago		tender_jones

Docker Commands

Command 11 : Docker Container Remove if Down Container

docker ps -n=3

CONTAINER ID	IMAGE	COMMAND	CREATED	STATUS	PORTS	NAMES
21439f50a158	centos:latest	"/bin/bash"	5 minutes ago	Up 5 minutes		nervous_heyrovsky
d8d4b3f80789	centos:latest	"/bin/bash"	6 minutes ago	Exited (0) 5 minutes ago		elastic_lovelace
ca2112abd8e1	centos:latest	"/bin/bash"	2 days ago	Exited (0) 2 days ago		tender_jones

docker rm d8d4b3f80789

Output : d8d4b3f80789 ➔ is Remove

docker ps -n=3

CONTAINER ID	IMAGE	COMMAND	CREATED	STATUS	PORTS	NAMES
21439f50a158	centos:latest	"/bin/bash"	11 minutes ago	Up 11 minutes		nervous_heyrovsky
ca2112abd8e1	centos:latest	"/bin/bash"	2 days ago	Exited (0) 2 days ago		tender_jones
1bc50a242764	centos:latest	"/bin/bash"	2 days ago	Exited (0) 2 days ago		eloquent_booth

Docker Commands

Command 12 : Docker Container Remove if UP Container

docker ps -n=3

CONTAINER ID	IMAGE	COMMAND	CREATED	STATUS	PORTS	NAMES
21439f50a158	centos:latest	"/bin/bash"	11 minutes ago	Up 11 minutes		nervous_heyrovsky
ca2112abd8e1	centos:latest	"/bin/bash"	2 days ago	Exited (0) 2 days ago		tender_jones
1bc50a242764	centos:latest	"/bin/bash"	2 days ago	Exited (0) 2 days ago		eloquent_booth

docker rm 21439f50a158

Output :

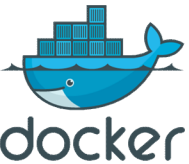
Error response from daemon: You cannot remove a running container 21439f50a158fc0d6abc1a290da6ae10c2e289a3b374c360bf636e8cd187ed0f. Stop the container before attempting removal or force remove

docker rm -f 21439f50a158

Output : 21439f50a158 ➔ is Remove

docker ps -n=3

CONTAINER ID	IMAGE	COMMAND	CREATED	STATUS	PORTS	NAMES
ca2112abd8e1	centos:latest	"/bin/bash"	2 days ago	Exited (0) 2 days ago		tender_jones
1bc50a242764	centos:latest	"/bin/bash"	2 days ago	Exited (0) 2 days ago		eloquent_booth
864e4254110d	centos:latest	"/bin/bash"	2 days ago	Exited (0) 2 days ago		objective_archimedes

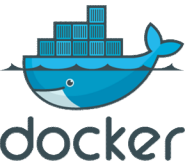


Docker Commands

NOTE1 : Remove UP Container and Logout from Container 21439f50a158

docker run -it centos:latest
[root@ 21439f50a158 /]#

docker rm –f 21439f50a158
[root@ 21439f50a158 /]# LOGOUT and EXIT Shell



Docker Commands

NOTE2 : For Remove Container Use Container ID or Container Name

docker ps -n=3

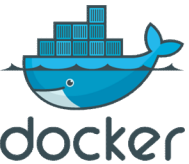
CONTAINER ID	IMAGE	COMMAND	CREATED	STATUS	PORTS	NAMES
1bd6c9d0d003	centos:latest	"/bin/bash"	7 minutes ago	Up 7 minutes		modest_kilby
ca2112abd8e1	centos:latest	"/bin/bash"	2 days ago	Exited (0) 2 days ago		tender_jones
1bc50a242764	centos:latest	"/bin/bash"	2 days ago	Exited (0) 2 days ago		eloquent_booth

docker rm -f modest_kilby

modest_kilby

docker ps -n=3

CONTAINER ID	IMAGE	COMMAND	CREATED	STATUS	PORTS	NAMES
ca2112abd8e1	centos:latest	"/bin/bash"	2 days ago	Exited (0) 2 days ago		tender_jones
1bc50a242764	centos:latest	"/bin/bash"	2 days ago	Exited (0) 2 days ago		eloquent_booth
864e4254110d	centos:latest	"/bin/bash"	2 days ago	Exited (0) 2 days ago		objective_archimedes



Docker Commands

NOTE3 : For Remove ALL Container UP or Down

docker ps -a

CONTAINER ID	IMAGE	COMMAND	CREATED	STATUS	PORTS	NAMES
1a2e3f6258e6	centos:latest	"/bin/bash"	9 seconds ago	Up 8 seconds		happy_shirley
ca2112abd8e1	centos:latest	"/bin/bash"	2 days ago	Exited (0) 2 days ago		tender_jones
1bc50a242764	centos:latest	"/bin/bash"	2 days ago	Exited (0) 2 days ago		eloquent_booth
864e4254110d	centos:latest	"/bin/bash"	2 days ago	Exited (0) 2 days ago		objective_archimedes
4751d298fe47	centos:latest	"/bin/bash"	2 days ago	Exited (137) 2 days ago		condescending_franklin
e76eb81b3607	centos:latest	"/bin/bash"	2 days ago	Exited (0) 2 days ago		zen_rosalind
d7879faaf2a7	centos:latest	"/bin/bash"	2 days ago	Exited (137) 2 days ago		boring_cray
2a1b714f7a05	centos:latest	"/bin/bash"	2 days ago	Exited (0) 2 days ago		mystifying_golick
fb9f94f36513	hello-world	"/hello"	2 days ago	Exited (0) 2 days ago		cranky_kilby

docker rm -f $(docker ps -aq)

```
1a2e3f6258e6
ca2112abd8e1
1bc50a242764
864e4254110d
4751d298fe47
e76eb81b3607
d7879faaf2a7
2a1b714f7a05
fb9f94f36513
```

docker ps -a

CONTAINER ID	IMAGE	COMMAND	CREATED	STATUS	PORTS	NAMES

Docker Commands

Command 13 : Copy File Docker to Container :

[root@docker ~]# docker run -it centos:latest /bin/bash
[root@6e7bb89e0f03 /]#

[root@docker ~]# docker ps

CONTAINER ID	IMAGE	COMMAND	CREATED	STATUS	PORTS	NAMES
6e7bb89e0f03	centos:latest	"/bin/bash"	31 seconds ago	Up 28 seconds		tender_ramanujan

[root@docker ~]# touch ali
[root@docker ~]# docker cp ali 6e7bb89e0f03:/root

[root@6e7bb89e0f03 ~]# ls
ali anaconda-ks.cfg

Docker Commands

Command 14 : Copy Folder and SubFolder Docker to Container :

```
[root@docker ~]# docker run -it centos:latest /bin/bash
[root@6e7bb89e0f03 /]#

[root@docker ~]# docker ps
CONTAINER ID   IMAGE           COMMAND       CREATED          STATUS          PORTS   NAMES
6e7bb89e0f03   centos:latest   "/bin/bash"   31 seconds ago   Up 28 seconds           tender_ramanujan

[root@docker ~]# mkdir folder1
[root@docker ~]# touch folder1/file1
[root@docker ~]# touch folder1/file2
[root@docker ~]# mkdir folder1/folder2
[root@docker ~]# touch folder1/folder2/file3
[root@docker ~]# touch folder1/folder2/file4

[root@docker ~]# docker   cp   folder1/   6e7bb89e0f03:/root/

[root@6e7bb89e0f03 ~]# ls
ali  anaconda-ks.cfg  folder1
```

Docker Commands

Command 15 : Copy Files Docker to Container With Archive mode (copy all uid/gid information) :

[root@docker ~]# adduser ali

[root@docker ~]# chown ali. file1

[root@docker ~]# ll

-rw-r--r-- 1 ali ali 15 Apr 10 09:09 file1

[root@docker ~]# cat /etc/passwd | grep ali

ali:x:1000:1000::/home/ali:/bin/bash

[root@docker ~]# docker cp -a file1 6e7bb89e0f03:/root/

[root@6e7bb89e0f03 ~]# ll

-rw-r--r-- 1 1000 1000 15 Apr 10 13:09 file1

Docker Commands

Command 16 : Docker Stop , Start and Attach Container :

[root@docker ~]# docker run -it centos:latest /bin/bash

[root@docker ~]# docker ps

CONTAINER ID	IMAGE	COMMAND	CREATED	STATUS	PORTS	NAMES
f75ef67694e2	centos:latest	"/bin/bash"	11 seconds ago	Up 10 seconds		flamboyant_curie

[root@docker ~]# docker stop f75ef67694e2 Stop Container Without Delete Container ID

f75ef67694e2

[root@docker ~]# docker ps

CONTAINER ID	IMAGE	COMMAND	CREATED	STATUS	PORTS	NAMES

[root@docker ~]# docker start f75ef67694e2 Start OLD Stop Container ID

f75ef67694e2

[root@docker ~]# docker ps

CONTAINER ID	IMAGE	COMMAND	CREATED	STATUS	PORTS	NAMES
f75ef67694e2	centos:latest	"/bin/bash"	5 minutes ago	Up 1 second		flamboyant_curie

[root@docker ~]# docker attach f75ef67694e2 attach = execute OLD Container ID Started

[root@f75ef67694e2 /]#

Docker Commands

NOTE : Befor Test Docker Machine with 4 Core CPU (0,1,2,3)

IF ERROR :

```
vim    /etc/default/grub
GRUB_CMDLINE_LINUX_DEFAULT="quiet splash systemd.legacy_systemd_cgroup_controller=yes"
reboot
```

Command 17 : Assign CPUs to Docker Container and RUN.

docker run -it --cpuset-cpus=1 centos:latest === CPU Number 1 For Used.

```
[root@7b6299470037 /]# yes > /dev/null &
[root@7b6299470037 /]# top  + 1
Tasks:   3 total,   2 running,   1 sleeping,   0 stopped,   0 zombie
%Cpu0  :  0.0 us,  0.3 sy,  0.0 ni, 99.7 id,  0.0 wa,  0.0 hi,  0.0 si,  0.0 st
%Cpu1  : 98.7 us,  1.3 sy,  0.0 ni,  0.0 id,  0.0 wa,  0.0 hi,  0.0 si,  0.0 st
%Cpu2  :  0.0 us,  0.0 sy,  0.0 ni,100.0 id,  0.0 wa,  0.0 hi,  0.0 si,  0.0 st
%Cpu3  :  0.3 us,  0.0 sy,  0.0 ni, 99.7 id,  0.0 wa,  0.0 hi,  0.0 si,  0.0 st
KiB Mem :  1003164 total,   153348 free,   188216 used,   661600 buff/cache
KiB Swap:  1048572 total,  1048284 free,      288 used.   608836 avail Mem

  PID USER      PR  NI    VIRT    RES    SHR S  %CPU %MEM     TIME+ COMMAND
   14 root      20   0    4324    352    276 R  100.0  0.0   0:35.34 yes
```

docker ps

```
CONTAINER ID        IMAGE               COMMAND             CREATED             STATUS              PORTS               NAMES
7b6299470037        centos:latest       "/bin/bash"         3 seconds ago       Up 2 seconds                            trusting_hodgkin
```

Docker Commands

Command 18 : Assign CPUs to Docker Container and RUN.

docker run -it --cpuset-cpus="1,2" centos:latest === CPU Number 1,2 For Used.

Note : For test . Run 2 Times yes > /dev/null &

```
[root@86890c50c36f /]# yes > /dev/null &
[root@86890c50c36f /]# top CPU2
[1] 19
```

%Cpu2 : 99.0 us, 1.0 sy, 0.0 ni, 0.0 id, 0.0 wa, 0.0 hi, 0.0 si, 0.0 st

```
docker exec -it 953ff27ae015 /bin/bash
[root@86890c50c36f /]# yes > /dev/null &
[root@86890c50c36f /]# top CPU1
[1] 22
```

%Cpu1 : 98.8 us, 1.2 sy, 0.0 ni, 0.0 id, 0.0 wa, 0.0 hi, 0.0 si, 0.0 st

docker run -it --cpuset-cpus="0-2" centos:latest === CPU Number 0,1,2 For Used.

Note : For test . Run 3 Times yes > /dev/null &

Docker Commands

Note :

Remove shutdown container :

[root@docker ~]# docker ps -a

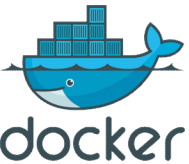
```
CONTAINER ID   IMAGE              COMMAND                  CREATED          STATUS                      PORTS      NAMES
0ceb72d4f89b   centos:latest      "/bin/bash"              14 minutes ago   Up 14 minutes                          AnisaCo
1f198d30add8   mariadb:latest     "docker-entrypoint.s…"   23 minutes ago   Up 23 minutes               3306/tcp   youthful_mayer
1f527b451e05   mariadb            "docker-entrypoint.s…"   24 minutes ago   Exited (1) 24 minutes ago              fervent_booth
545ae5778c99   centos:latest      "ping 4.2.2.4"           34 minutes ago   Exited (0) 34 minutes ago              kayvan2
51acaa1af243   centos:latest      "ls -l"                  35 minutes ago   Exited (0) 35 minutes ago              kayvan1
b6f89cdee9b8   centos:latest      "bash"                   41 minutes ago   Exited (0) 35 minutes ago              kayvan
```

[root@docker ~]# docker rm $(docker ps -a -q -f status=exited)

```
1f527b451e05
545ae5778c99
51acaa1af243
b6f89cdee9b8
87be674ed745
```

[root@docker ~]# docker ps -a

```
CONTAINER ID   IMAGE              COMMAND                  CREATED          STATUS          PORTS      NAMES
0ceb72d4f89b   centos:latest      "/bin/bash"              14 minutes ago   Up 14 minutes              AnisaCo
1f198d30add8   mariadb:latest     "docker-entrypoint.s…"   24 minutes ago   Up 24 minutes   3306/tcp   youthful_mayer
```



Docker Commands

Command 19 : -e or –env=Variable ➔ Run with Set Environment Variable

```
[root@docker ~]# export VAR1=val1

[root@docker ~]#  docker run -it --env VAR1  centos:latest

[root@873e7ae7d170 /]# echo $VAR1
val1
```

docker ps

CONTAINER ID	IMAGE	COMMAND	CREATED	STATUS	PORTS	NAMES
873e7ae7d170	centos:latest	"/bin/bash"	19 seconds ago	Up 18 seconds		keen_meitner

Docker Commands

Command 20 : Set Name To Container

docker run -it --name MyContainer centos:latest

docker ps

CONTAINER ID	IMAGE	COMMAND	CREATED	STATUS	PORTS	NAMES
b6ff0a90da10	centos:latest	"/bin/bash"	10 seconds ago	Up 8 seconds		MyContainer

NOTE 1 : Do Not Change Container HostName in Path :

cat /var/lib/docker/containers/b6ff0a90da1033a0039615a6d57d522622d02625988d98163f6a9c4f1f82dd47/hostname

b6ff0a90da10

NOTE 2 : Names is uniq

docker ps -a

CONTAINER ID	IMAGE	COMMAND	CREATED	STATUS	PORTS	NAMES
a5b1754684b9	centos	"/bin/bash"	About a minute ago	Exited (0) 55 seconds ago		vigorous_raman
b6ff0a90da10	centos:latest	"/bin/bash"	6 minutes ago	Exited (0) About a minute ago		MyContainer
873e7ae7d170	centos:latest	"/bin/bash"	18 minutes ago	Exited (0) 14 minutes ago		keen_meitner
48ebccc76d3f	centos:latest	"/bin/bash"	8 hours ago	Exited (127) 20 minutes ago		affectionate_mirzakhani
e54dd67db540	centos:latest	"/bin/bash"	8 hours ago	Created		nifty_ptolemy

Docker Commands

Command 21 : Connent to Container UP and Run in Background with option exec

```
docker run -it --name test  centos:latest
```

```
docker ps
```

CONTAINER ID	IMAGE	COMMAND	CREATED	STATUS	PORTS	NAMES
335a5485795b	centos:latest	"/bin/bash"	4 seconds ago	Up 3 seconds		test

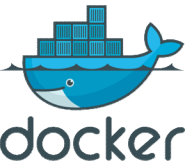
```
docker exec -it test /bin/bash     OR     docker exec -it 335a5485795b  /bin/bash
```

```
[root@335a5485795b /]# exit
```

NOTE : after exit , Container is UP

```
docker ps
```

CONTAINER ID	IMAGE	COMMAND	CREATED	STATUS	PORTS	NAMES
335a5485795b	centos:latest	"/bin/bash"	2 minutes ago	Up 2 minutes		test



Docker Commands

Project : Start Docker Container with name and Running top command startup ?

[root@docker ~]# docker run -d --name topdemo centos:latest /usr/bin/top –b ➔ -b = Batch-mode = Start Container

[root@docker ~]# docker ps

```
CONTAINER ID   IMAGE          COMMAND          CREATED          STATUS          PORTS   NAMES
f963ccdeb441   centos:latest  "/usr/bin/top -b"  2 minutes ago  Up 2 minutes            topdemo
```

[root@docker ~]# docker attach topdemo

```
top - 14:01:23 up 1 day, 23:39,  0 users,  load average: 0.47, 0.12, 0.08
Tasks:   1 total,   1 running,   0 sleeping,   0 stopped,   0 zombie
%Cpu(s):  0.1 us,  0.2 sy,  0.0 ni, 99.8 id,  0.0 wa,  0.0 hi,  0.0 si,  0.0 st
KiB Mem :  1870520 total,  1276040 free,   180460 used,   414020 buff/cache
KiB Swap:  1048572 total,  1048572 free,        0 used.  1498588 avail Mem

  PID USER      PR  NI    VIRT    RES    SHR S  %CPU %MEM     TIME+ COMMAND
    1 root      20   0   51776   1848   1404 R   0.0  0.1   0:00.12 top
```

Docker Commands

Command 22 : Docker Create and Run :

[root@docker ~]# docker create -t -i centos:latest bash

694f29658210f280bb1f042f3b73e434b970e781139c1b71e700373fc91fbd50

[root@docker ~]# docker ps -a

CONTAINER ID	IMAGE	COMMAND	CREATED	STATUS	PORTS	NAMES
694f29658210	centos:latest	"bash"	8 seconds ago	Created		fervent_kirch

[root@docker ~]# docker start -ai 694f29658210

[root@694f29658210 /]#

Docker Commands

Command 23 : Docker Create and Run With / Storage 120GB :

[root@docker ~]# docker create -t -i --storage-opt size=120G centos:latest bash

e69268cee881481d4dc37a80b1aad76c527eca6a075f6f08dd862350c9685ca5

[root@docker ~]# docker ps -a

```
CONTAINER ID   IMAGE           COMMAND   CREATED              STATUS              PORTS   NAMES
e69268cee881   centos:latest   "bash"    About a minute ago   Up About a minute           awesome_kilby
```

[root@docker ~]# docker start -ai e69268cee881

[root@e69268cee881 /]# df -h

```
Filesystem                                                                                Size  Used  Avail Use% Mounted on
/dev/mapper/docker-253:0-526980-9cf28d9ee7bab23651a3c342414f64911470ab366d85027fdc6a210d0a322549  120G  245M  120G   1%   /
```

Docker Commands

Command 24 : Docker Create and Run With /dev/shm Storage 128M :

[root@docker ~]# docker create -t -i --shm-size 128M centos:latest bash

26cd892f24c71ed61c4d557bf632019a964841d9959d30c143632be089a9e3c2

[root@docker ~]# docker ps -a

CONTAINER ID	IMAGE	COMMAND	CREATED	STATUS	PORTS	NAMES
26cd892f24c7	centos:latest	"bash"	4 seconds ago	Created		laughing_wright

[root@docker ~]# docker start -ai 26cd892f24c7

[root@26cd892f24c7 /]# df -h

Filesystem	Size	Used	Avail	Use%	Mounted on
/dev/mapper/docker-253:0-526980-d9adeca525db8609b77a0af74d3ddaa16757d5100a0f47b0ee05d420f13a87ce	10G	239M	9.8G	3%	/
tmpfs	64M	0	64M	0%	/dev
tmpfs	914M	0	914M	0%	/sys/fs/cgroup
/dev/mapper/centos-root	8.5G	6.3G	2.2G	75%	/etc/hosts
shm	128M	0	128M	0%	/dev/shm

Docker Commands

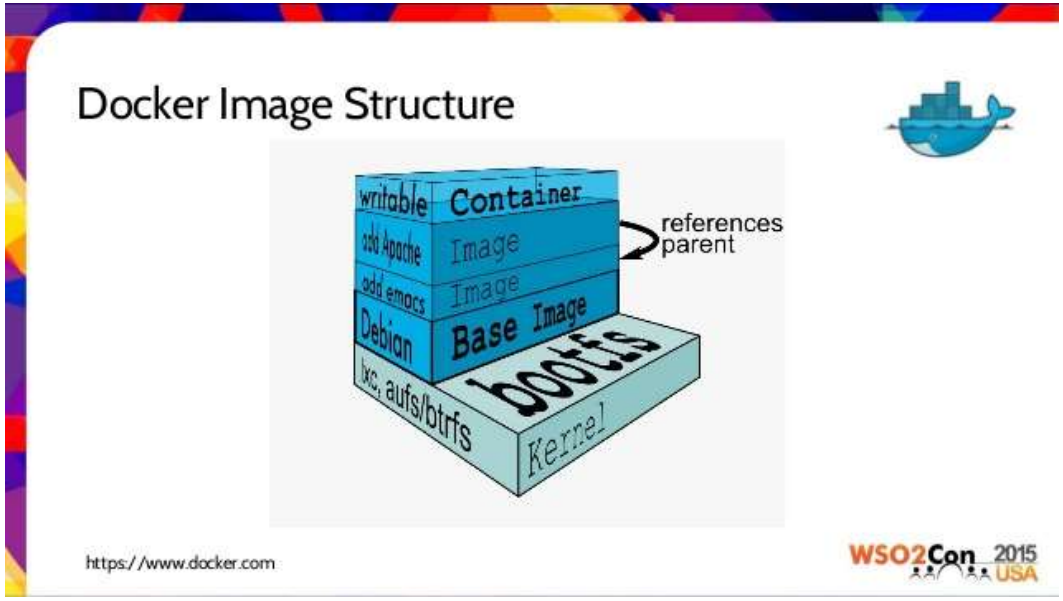
Project : Start and Running Docker Container ?

Container Name : ?
Container Set Variable AUTHOR : Your Name
Detach run
Container Image : centos:latest
Running With ping 4.2.2.4

```
docker run --name AnisaCo  -e AUTHOR="Anisa" -dit  centos:latest ping 4.2.2.4
        545ae5778c9969dc91bbaf12de9ce534dba453b8b84e24575b6e0b2a7e0d026f
docker start -ia 545ae5778c99
Ctrl+c
```

Docker Image

Docker Image Structure



StateLess Docker Image : Install and Settings Apps Delete With Shutdown Image .

Docker Image

DockerHub : https://hub.docker.com Open With VPN.

Docker Image

Command 18 : Search Container Images from DockerHub

docker search centos

Output : Error connect to internet without VPN.

Error response from daemon: Unexpected status code 403

docker search centos

NAME	DESCRIPTION	STARS	OFFICIAL	AUTOMATED
centos	**The official build of CentOS**.	**4088**	[**OK**] (**CENTOS Company**)	
ansible/centos7-ansible	**Ansible on Centos7**	**105**		[**OK**] (**Other Company**)
jdeathe/centos-ssh	CentOS-6 6.9 x86_64 / CentOS-7 7.4.1708 x86_…	92		[OK]
consol/centos-xfce-vnc	Centos container with "headless" VNC session…	47		[OK]
imagine10255/centos6-lnmp-php56	centos6-lnmp-php56	39		[OK]
tutum/centos	Simple CentOS docker image with SSH access	36		
gluster/gluster-centos	Official GlusterFS Image [CentOS-7 + Glust…	23		[OK]
centos/mysql-57-centos7	MySQL 5.7 SQL database server	18		
openshift/base-centos7	A Centos7 derived base image for Source-To-I…	17		
kinogmt/centos-ssh	CentOS with SSH	17		[OK]
openshift/jenkins-2-centos7	A Centos7 based Jenkins v2.x image for use w…	10		
centos/postgresql-96-centos7	PostgreSQL is an advanced Object-Relational …	10		
openshift/mysql-55-centos7	DEPRECATED: A Centos7 based MySQL v5.5 image…	6		
darksheer/centos	Base Centos Image -- Updated hourly	3		[OK]
openshift/wildfly-101-centos7	A Centos7 based WildFly v10.1 image for use …	3		
pivotaldata/centos-gpdb-dev	CentOS image for GPDB development. Tag names…	3		
openshift/jenkins-1-centos7	DEPRECATED: A Centos7 based Jenkins v1.x ima…	3		
blacklabelops/centos	CentOS Base Image! Built and Updates Daily!	1		[OK]
openshift/php-55-centos7	DEPRECATED: A Centos7 based PHP v5.5 image f…	1		
openshift/wildfly-100-centos7	A Centos7 based WildFly v10.0 image for use …	1		
pivotaldata/centos	Base centos, freshened up a little with a Do…	1		
pivotaldata/centos-mingw	Using the mingw toolchain to cross-compile t…	1		
smartentry/centos	centos with smartentry	0		[OK]
pivotaldata/centos-gcc-toolchain	CentOS with a toolchain, but unaffiliated wi…	0		
jameseckersall/sonarr-centos	Sonarr on CentOS 7	0		[OK]

Docker Image

1- Download From Local Registry
2- Download From Docker Hub
3- Start Download

Command 19 : ONLY Download Container Images from DockerHub

docker pull ubuntu ➔ OFFICIAL Download

Output :

```
Using default tag: latest
latest: Pulling from library/ubuntu
22dc81ace0ea: Downloading [==========================================>        ]  34.54MB/42.96MB
1a8b3c87dba3: Download complete
91390a1c435a: Download complete
07844b14977e: Download complete
b78396653dae: Download complete
22dc81ace0ea: Extracting [============================>                      ]  23.4MB/42.96MB
Digest: sha256:e348fbbea0e0a0e73ab0370de151e7800684445c509d46195aef73e090a49bd6
Status: Downloaded newer image for ubuntu:latest
```

Note : docker pull dorowu/ubuntu-desktop-lxde-vnc ➔ AUTOMATED Download

docker run -it -d dorowu/ubuntu-desktop-lxde-vnc:latest

docker images -a

REPOSITORY	TAG	IMAGE ID	CREATED	SIZE
dorowu/ubuntu-desktop-lxde-vnc	latest	037345e9e695	Less than a second ago	1.31GB
ubuntu	latest	f975c5035748	20 hours ago	112MB
centos	latest	ff426288ea90	8 weeks ago	207MB

Docker Image

Command 20 : Remove Container Images

docker images

REPOSITORY	TAG	IMAGE ID	CREATED	SIZE
dorowu/ubuntu-desktop-lxde-vnc	latest	037345e9e695	22 hours ago	1.31GB
ubuntu	latest	f975c5035748	2 days ago	112MB
centos	latest	ff426288ea90	8 weeks ago	207MB

docker rmi f975c5035748 or docker rmi ubuntu

```
Untagged: ubuntu:latest
Untagged: ubuntu@sha256:e348fbbea0e0a0e73ab0370de151e7800684445c509d46195aef73e090a49bd6
Deleted: sha256:f975c50357489439eb9145dbfa16bb7cd06c02c31aa4df45c77de4d2baa4e232
```

docker images

REPOSITORY	TAG	IMAGE ID	CREATED	SIZE
dorowu/ubuntu-desktop-lxde-vnc	latest	037345e9e695	22 hours ago	1.31GB
centos	latest	ff426288ea90	8 weeks ago	207MB

Note : If Container Image not in used.

Docker Image

Command 21 : Remove Container Images in Used :

docker run -it -d centos:latest /bin/bash

5740ecfdd66f88a74aa71bb4d7653f6a039e448694848487f1bf45590cdb2f3f

docker ps -a

CONTAINER ID	IMAGE	COMMAND	CREATED	STATUS	PORTS	NAMES
5740ecfdd66f	centos:latest	"/bin/bash"	About a minute ago	Up About a minute		boring_noyce

docker images

REPOSITORY	TAG	IMAGE ID	CREATED	SIZE	
dorowu/ubuntu-desktop-lxde-vnc	latest	037345e9e695	22 hours ago	1.31GB	
centos	latest	ff426288ea90	8 weeks ago	207MB	➔ **Image in Used.**

docker rmi centos

Error response from daemon: conflict: unable to remove repository reference "centos" (must force) - container 5740ecfdd66f is using its referenced image ff426288ea90

docker rm -f 5740ecfdd66f ➔ Stop centos Container

docker rmi centos ➔ Remove centos Image

Untagged: centos:latest

Untagged: centos@sha256:6247c7082d4c86c61b00f7f2e3edbf7f072a24aa8edc28b5b68b3de3101bc1ce

Deleted: sha256:ff426288ea903fcf8d91aca97460c613348f7a27195606b45f19ae91776ca23d

Deleted: sha256:e15afa4858b655f8a5da4c4a41e05b908229f6fab8543434db79207478511ff7

docker images

REPOSITORY	TAG	IMAGE ID	CREATED	SIZE
dorowu/ubuntu-desktop-lxde-vnc	latest	037345e9e695	22 hours ago	1.31GB

Docker Image

Command 22 : Change Container Images and Commit Status :

```
docker run -it centos:latest
[root@bb04f0602188 /]# touch  MyFile ; ls
[root@bb04f0602188 /]# exit
docker run -it centos:latest
[root@77152172fcc1 /]# ls
        ls: cannot access MyFile: No such file or directory
docker run -it centos:latest
[root@bb04f0602188 /]# touch  MyFile ; ls
Other Shell :
    docker ps -a
```

CONTAINER ID	IMAGE	COMMAND	CREATED	STATUS	PORTS	NAMES
Bb04f0602188	centos:latest	"/bin/bash"	About a minute ago	Up About a minute		boring_noyce

```
    docker commit  bb04f0602188  centos:myversion
    docker images
```

REPOSITORY	TAG	IMAGE ID	CREATED	SIZE
centos	myversion	84684fbb5ff5	11 seconds ago	195MB
dorowu/ubuntu-desktop-lxde-vnc	latest	037345e9e695	2 days ago	1.31GB
centos	latest	2d194b392dd1	4 days ago	195MB

```
    docker run -it centos:myversion
    [root@07d5399bdea8 /]# ls MyFile
        MyFile
```

Docker Image

Command 23 : Change Container Images and Save Status For Other Docker Machine:

docker run -it centos:latest

[root@bb04f0602188 /]# touch MyFile ; ls

Other Shell :

docker ps -a

CONTAINER ID	IMAGE	COMMAND	CREATED	STATUS	PORTS	NAMES
Bb04f0602188	centos:latest	"/bin/bash"	About a minute ago	Up About a minute		boring_noyce

docker commit bb04f0602188 centos:myversion

docker images

REPOSITORY	TAG	IMAGE ID	CREATED	SIZE
centos	myversion	84684fbb5ff5	11 seconds ago	195MB
centos	latest	2d194b392dd1	4 days ago	195MB

docker run -it centos:myversion

[root@07d5399bdea8 /]# ls MyFile

MyFile

docker save -o centos_file.tar.gz 84684fbb5ff5 OR docker save -o centos_file.tar.gz centos:myversion

[root@docker ~]# ls

centos_file.tar.gz

scp centos_file.tar.gz 192.168.190.228:/root/ ➔ Docker 2 :

Docker Image

Command 24 : Change Container Images and Save Status For Other Docker Machine:

Docker 2 :

docker load -i centos_file.tar.gz OR docker load < centos_file.tar.gz

Loaded image ID: sha256:d078ca76a79a972c527e40eb08732bb8202f92eed431d807d2a715487059128e

docker image ls

REPOSITORY	TAG	IMAGE ID	CREATED = save time	SIZE
<none>	<none>	d078ca76a79a	8 minutes ago	195MB
dorowu/ubuntu-desktop-lxde-vnc	latest	037345e9e695	7 days ago	1.31GB
centos	latest	2d194b392dd1	9 days ago	195MB
nginx	latest	e548f1a579cf	3 weeks ago	109MB

docker tag d078ca76a79a cent:myversion

docker image ls

REPOSITORY	TAG	IMAGE ID	CREATED	SIZE
cent	**myversion**	**d078ca76a79a**	**10 minutes ago**	**195MB**
dorowu/ubuntu-desktop-lxde-vnc	latest	037345e9e695	7 days ago	1.31GB
centos	latest	2d194b392dd1	9 days ago	195MB
nginx	latest	e548f1a579cf	3 weeks ago	109MB

NOTE : Create File Server for Docker Local Registry

Docker Image

Command 25 : Running Mariadb Container

docker run -it mariadb

```
Unable to find image 'mariadb:latest' locally
latest: Pulling from library/mariadb
f2b6b4884fc8: Pull complete
26d8bdca4f3e: Pull complete
74f09e820cce: Pull complete
5390f1fe4554: Pull complete
3d3f1706a741: Pull complete
2942f66426ea: Pull complete
97ee11d39c75: Pull complete
5f3d3e597bc0: Pull complete
717718e492b1: Pull complete
dba2794b394b: Pull complete
b66b4021503c: Pull complete
Digest: sha256:f5e93cd79cb34d7a34da1af1e11ef9bfdbcdac629f4a50c59c69b913b061fea7
Status: Downloaded newer image for mariadb:latest
error: database is uninitialized and password option is not specified
    You need to specify one of MYSQL_ROOT_PASSWORD, MYSQL_ALLOW_EMPTY_PASSWORD and MYSQL_RANDOM_ROOT_PASSWORD
```

docker images

REPOSITORY	TAG	IMAGE ID	CREATED	SIZE
centos	myver	d078ca76a79a	2 days ago	195MB
mariadb	latest	ea5e726062ce	3 days ago	396MB

Docker Image

Command 26 : Running Mariadb Container with set variable MYSQL_ROOT_PASSWORD for Connect to DB:

docker run -d -e MYSQL_ROOT_PASSWORD=123 -it mariadb:latest

ac72e6ce574484fa2223588687d240377f6813402a0fe0b0300f033ea02c28cf

docker ps -a

CONTAINER ID	IMAGE	COMMAND	CREATED	STATUS	PORTS	NAMES
ac72e6ce5744	mariadb:latest	"docker-entrypoint.s…"	17 seconds ago	Up 16 seconds	3306/tcp	tender_kilby

docker exec -it ac72e6ce5744 /bin/bash

root@ac72e6ce5744:/# mysql -u root -p

Enter password: 123

```
MariaDB [(none)]> show databases;
+--------------------+
| Database           |
+--------------------+
| information_schema |
| mysql              |
| performance_schema |
+--------------------+
3 rows in set (0.00 sec)
```

Docker Image

Command 27 : Pause and Unpause Container :

docker run -it centos /bin/bash

docker ps

CONTAINER ID	IMAGE	COMMAND	CREATED	STATUS	PORTS	NAMES
7cd503fdfd16	centos	"/bin/bash"	8 seconds ago	Up 6 seconds		pensive_chandrasekhar

docker pause 7cd503fdfd16

[root@7cd503fdfd16 /]# ➔ PAUSE

[root@docker ~]# docker ps -a

CONTAINER ID	IMAGE	COMMAND	CREATED	STATUS	PORTS	NAMES
1f198d30add8	mariadb:latest	"docker-entrypoint.s…"	2 minutes ago	Up 2 minutes (**Paused**)	3306/tcp	youthful_mayer

[root@docker ~]# docker exec -it 1f198d30add8 /bin/bash

Error response from daemon: Container 1f198d30add8 is paused, unpause the container before exec

docker unpause 7cd503fdfd16

[root@7cd503fdfd16 /]# ➔ UNPAUSE

Docker Image

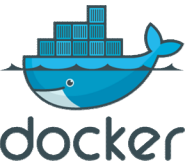
Command 28 : Kill Container :

docker run -it centos /bin/bash

docker ps

CONTAINER ID	IMAGE	COMMAND	CREATED	STATUS	PORTS	NAMES
7cd503fdfd16	centos	"/bin/bash"	8 seconds ago	Up 6 seconds		pensive_chandrasekhar

docker kill 7cd503fdfd16



Docker Image

Project : Create and running Container :

1- base centos 7
2- install httpd
3- commit with name : centhttpd:v1
4- run centhttpd:v1 container
5- start httpd
6- pause and unpause new container
7- test it…

Docker Image

Project : Create and running Container :

1- base centos 7

```
[root@docker volumes]# docker run -it centos:latest /bin/bash
```

2- install httpd

```
[root@0ceb72d4f89b /]# yum install httpd
```

3- commit with name : centhttpd:v1

```
[root@docker ~]# docker commit 0ceb72d4f89b centhttpd:v1
[root@docker ~]# docker images
REPOSITORY          TAG       IMAGE ID       CREATED          SIZE
centhttpd           v1        ba49b1b2ed23   44 seconds ago   332MB
```

4- run centhttpd:v1 container

```
[root@docker ~]# docker run -it ba49b1b2ed23 /bin/bash
[root@840d734f62c2 /]# ps -ef | grep http
root        15     1  0 12:44 pts/0    00:00:00 grep --color=auto http
```

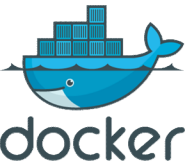
5- start httpd

```
[root@840d734f62c2 /]# /usr/sbin/httpd
AH00558: httpd: Could not reliably determine the server's fully qualified domain name, using 172.17.0.5. Set the 'ServerName' directive globally to suppress this message
httpd (pid 18) already running
[root@840d734f62c2 /]# ps -ef | grep http
root        18     1  0 12:47 ?        00:00:00 /usr/sbin/httpd
apache      19    18  0 12:47 ?        00:00:00 /usr/sbin/httpd
apache      20    18  0 12:47 ?        00:00:00 /usr/sbin/httpd
apache      21    18  0 12:47 ?        00:00:00 /usr/sbin/httpd
apache      22    18  0 12:47 ?        00:00:00 /usr/sbin/httpd
apache      23    18  0 12:47 ?        00:00:00 /usr/sbin/httpd
```

6- pause and unpause new container

```
[root@docker volumes]# docker pause 840d734f62c2
[root@docker volumes]# docker unpause 840d734f62c2
```

7- test it…



Docker Image

Project : Create and running Container :

1- docker run
2- change command and commit
3- run centos:v1 container
4- test it…

Docker Image

Project : Create and running Container :

1- docker run

```
docker run -it centos:latest
[root@docker volumes]# docker ps -a
CONTAINER ID   IMAGE          COMMAND       CREATED          STATUS          PORTS   NAMES
d776d4f6d4e6   centos:latest  "/bin/bash"   31 seconds ago   Up 29 seconds           festive_swanson
```

2- change command and commit

```
name : centos:v1
command : /bin/sh
docker commit --change='CMD ["/bin/sh"]'  d776d4f6d4e6  centos:v1
```

3- run centos:v1 container

```
[root@docker volumes]# docker run -itd centos:v1
98d1d6cf99de926617bef90417b4693a01ddada2c1d2b75681800f463c31422e
[root@docker volumes]# docker ps
CONTAINER ID   IMAGE          COMMAND       CREATED          STATUS          PORTS   NAMES
98d1d6cf99de   centos:v1      "/bin/sh"     39 seconds ago   Up 38 seconds           cocky_shockley
d776d4f6d4e6   centos:latest  "/bin/bash"   2 minutes ago    Up 2 minutes            festive_swanson
```

4- test it…

```
[root@docker volumes]# docker attach 98d1d6cf99de
sh-4.2#
```

Docker Image

Note : The Other Diffrenet Docker exec with Docker attach :

```
[root@docker ~]# docker run -itd centos:latest
        [root@docker ~]# docker ps
            CONTAINER ID   IMAGE           COMMAND       CREATED          STATUS          PORTS   NAMES
            b3f853062898   centos:latest   "/bin/bash"   3 seconds ago    Up 2 seconds            focused_carson
```

Terminal 1 :

```
[root@docker ~]# docker exec -it b3f853062898 /bin/bash
```

Terminal 2 :

```
[root@docker ~]# docker exec -it b3f853062898 /bin/bash
```

Terminal 1 :

```
[root@docker ~]# docker attach b3f853062898
```

Terminal 2 :

```
[root@docker ~]# docker attach b3f853062898
```

Docker Image

Note : Docker Container Rename :

```
[root@docker ~]# docker run -itd centos:latest
        [root@docker ~]# docker ps
            CONTAINER ID   IMAGE           COMMAND       CREATED          STATUS          PORTS   NAMES
            b3f853062898   centos:latest   "/bin/bash"   3 seconds ago    Up 2 seconds            focused_carson
```

[root@docker ~]# docker rename focused_carson MYCONTAINER

```
[root@docker ~]# docker ps
    CONTAINER ID   IMAGE           COMMAND       CREATED              STATUS              PORTS   NAMES
    b3f853062898   centos:latest   "/bin/bash"   About a minute ago   Up About a minute           MYCONTAINER
```

Docker Image

Note : Docker Export and Import

[root@docker ~]# docker run -itd centos:latest

[root@docker ~]# docker ps

CONTAINER ID	IMAGE	COMMAND	CREATED	STATUS	PORTS	NAMES
fffad5a175cc	centos:latest	"/bin/bash"	3 seconds ago	Up 2 seconds		focused_carson

Export :

[root@docker ~]# docker export fffad5a175cc > mycent.tar

Or

[root@docker ~]# docker export --output="mycent1.tar" fffad5a175cc

Copy to Docker2

scp mycent* 192.168.190.228:/root

Import :

[root@docker ~]# docker import mycent.tar

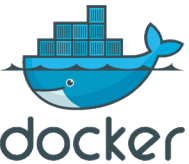
Or

[root@docker ~]# docker import mycent1.tar

[root@docker ~]# docker images

REPOSITORY	TAG	IMAGE ID	CREATED	SIZE
<none>	<none>	fa01519f5ca1	5 seconds ago	195MB

[root@docker ~]# docker tag centos:l2 fa01519f5ca1 ➔ and Run (docker run -itd centos:l2 /bin/bash)



Docker Command

Docker Container –h :

attach Attach local standard input, output, and error streams to a running container
commit Create a new image from a container's changes
cp Copy files/folders between a container and the local filesystem
create Create a new container
diff Inspect changes to files or directories on a container's filesystem
exec Run a command in a running container
export Export a container's filesystem as a tar archive
inspect Display detailed information on one or more containers
kill Kill one or more running containers
logs Fetch the logs of a container
ls List containers
pause Pause all processes within one or more containers
port List port mappings or a specific mapping for the container
prune Remove all stopped containers
rename Rename a container
restart Restart one or more containers
rm Remove one or more containers
run Run a command in a new container
start Start one or more stopped containers
stats Display a live stream of container(s) resource usage statistics
stop Stop one or more running containers
top Display the running processes of a container
unpause Unpause all processes within one or more containers
update Update configuration of one or more containers
wait Block until one or more containers stop, then print their exit codes

Docker Command

Docker Container commands :

[root@docker ~]# docker container run -itd centos:latest

[root@docker ~]# docker container ls

[root@docker ~]# docker container top 14de62c3be72

UID	PID	PPID	C	STIME	TTY	TIME	CMD
root	114166	114152	0	05:52	?	00:00:00	/bin/bash

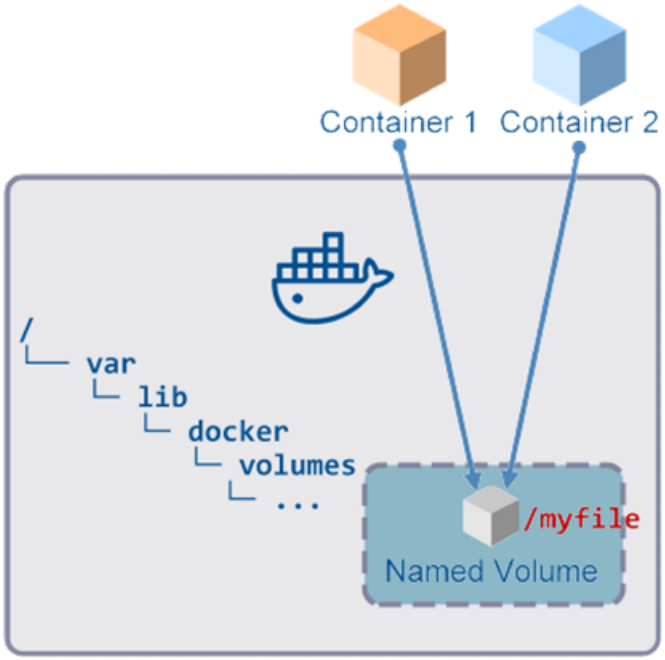
[root@docker ~]# docker container stats 14de62c3be72

CONTAINER ID	NAME	CPU %	MEM USAGE / LIMIT	MEM %	NET I/O	BLOCK I/O	PIDS
14de62c3be72	laughing_noether	0.00%	380KiB / 1.784GiB	0.02%	648B / 0B	4.66MB / 0B	0

[root@docker ~]# docker container restart 14de62c3be72

[root@docker ~]# docker container pause 2fd6ddc4410f

Volume in Docker



Volume in Docker

Create Volume Directory vol1 ReadOnly in Docker Machine Path /var/lib/docker/volumes/ :

docker volume create --name vol1

ll /var/lib/docker/volumes/

```
total 24
drwxr-xr-x 3 root root    18 Mar 17 15:45 31e1257ff6685bf6482ac83bbc6e49b1265ebca31c974d8be9930b20cbff1176
-rw------- 1 root root 32768 Mar 17 17:57 metadata.db
drwxr-xr-x 3 root root    18 Mar 17 17:57 vol1
```

docker run -it -v vol1:/root:ro centos:latest

Note :
Path_in_Docker:Path_in_Container:Permision
- ro : Read Only
- rw: Read Write

```
[root@a8626b482869 /]# touch /root/myfile
    touch: cannot touch '/root/myfile': Read-only file system
[root@a8626b482869 /]# exit
```

Volume in Docker

Create Volume Directory vol2 ReadWrite in Docker Machine Path /var/lib/docker/volumes/ :

docker volume create --name vol2

ll /var/lib/docker/volumes/

```
total 24
drwxr-xr-x 3 root root    18 Mar 17 15:45 31e1257ff6685bf6482ac83bbc6e49b1265ebca31c974d8be9930b20cbff1176
-rw------- 1 root root 32768 Mar 17 17:57 metadata.db
drwxr-xr-x 3 root root    18 Mar 17 17:57 vol2
```

docker run -it -v vol2:/root:rw centos:latest

[root@23d5b7a0dfb6 /]# touch /root/myfile

[root@23d5b7a0dfb6 /]# ll /root/myfile

```
-rw-r--r-- 1 root root 0 Mar 17 22:04 /root/myfile
```

[root@docker ~]# ll /var/lib/docker/volumes/vol2/_data/

```
total 4
-rw------- 1 root root 3270 Mar  1 20:07 anaconda-ks.cfg
-rw-r--r-- 1 root root    0 Mar 17 18:04 myfile
```

[root@23d5b7a0dfb6 /]# echo Hi > /root/myfile

[root@23d5b7a0dfb6 /]# cat /root/myfile

Hi

[root@docker ~]# cat /var/lib/docker/volumes/vol2/_data/myfile

Hi

Volume in Docker

View Mount Volume Docker and Container :

```
[root@docker ~]#  docker ps -a
```

CONTAINER ID	IMAGE	COMMAND	CREATED	STATUS	PORTS	NAMES
23d5b7a0dfb6	centos:latest	"/bin/bash"	38 minutes ago	Up 38 minutes		determined_beaver

```
[root@docker ~]# docker inspect 23d5b7a0dfb6 | grep -i mounts -A 11
    "Mounts": [
        {
            "Type": "volume",
            "Name": "vol2",
            "Source": "/var/lib/docker/volumes/vol2/_data",
            "Destination": "/root",
            "Driver": "local",
            "Mode": "rw",
            "RW": true,
            "Propagation": ""
        }
    ],
```

Note :

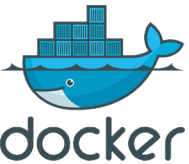
Change Source to Destination and Destination to Source

Volume in Docker

View Mount Volume Docker and Container :

[root@docker ~]# docker volume ls ➔ /var/lib/docker/volumes

```
DRIVER          VOLUME NAME
local           05958fce0f09a9d60d4a5f6fc0edac91b4e4ff4353ec14647442b97da1453166
local           15d7a0c71fbb23a423055820c0d8486e38c301504f89ab336519aac082fee265
local           1bb18e39869ce611c3cbf9396af3671a8a916d1be608c41d77dab8382fab3839
local           1c5d71acce48fc28645318c102958d01aef82a2a07e72176e10badf074c19e4d
local           f434d157f1422b9ec484cc530bf3ffa115a540bfc686aaf07b0379b36355f43e
local           f64e298deaa29a98f74d03f43066e19b92992f008747f020d246ac758d9ab402
local           fa89a9eb3a605ed4b77adf9636e100e4e9cc59e85b3e342aef8582a7d33b7aa0
local           fc31c59e90be694adfbb3edaefe0d12d233ec5a060e6dd38f91e746f2b1e4469
local           fce55252b23c7cad920d385ed1212ae691419239be6a59035d028f66a6ba1870
local           fd4a9f1b805fb70302c5c6a6d0b4eda61a81c986acc6f11b685c48a8988ae063
local           fe36d8e1c014e41e1a3d1b98c9851a64de109ff6ec49cba0511b7d0c9f79a635
local           fe6fb9b793696c5f823fc7bb1a317829721ad72a3f6f1786cad2ac220febd3ef
local           vol1
```



Volume in Docker

Project : mount CDROM for Container :

[root@docker /]# mount /dev/sr0 /mnt

mount: /dev/sr0 is write-protected, mounting read-only

[root@docker /]# ll /mnt/

```
-rw-r--r-- 1 root root      16 Mar 31  2015 CentOS_BuildTag
drwxr-xr-x 3 root root    2048 Mar 27  2015 EFI
-rw-r--r-- 1 root root     215 Mar 27  2015 EULA
```

[root@docker ~]# docker create -t -i -v /mnt:/mnt centos:latest bash

ea9547e00a5dfd3361fd7548dc62203f66e11aa5e8773c6085e817626a3c4138

[root@docker /]# docker ps -a

CONTAINER ID	IMAGE	COMMAND	CREATED	STATUS	PORTS	NAMES
ea9547e00a5d	centos:latest	"bash"	20 seconds ago	Created		ecstatic_turing

[root@docker ~]# docker start -ai ea9547e00a5d

[root@ea9547e00a5d /]# ll /mnt/

```
-rw-r--r-- 1 root root      16 Apr  1       2015 CentOS_BuildTag
drwxr-xr-x 3 root root    2048 Mar 27  2015 EFI
-rw-r--r-- 1 root root     215 Mar 27    2015 EULA
```

Volume in Docker

Project : mount CDROM for Container with mount :

[root@docker /]# mount /dev/sr0 /mnt

mount: /dev/sr0 is write-protected, mounting read-only

[root@docker /]# ll /mnt/

```
-rw-r--r-- 1 root root      16 Mar 31  2015 CentOS_BuildTag
drwxr-xr-x 3 root root    2048 Mar 27  2015 EFI
-rw-r--r-- 1 root root     215 Mar 27  2015 EULA
```

[root@docker ~]# docker create -t -i --mount type=bind,source=/mnt,target=/mnt centos:latest bash

15f0eb9613c54c77ce83eb5bef7c008ac9c2e5df01029f499ca9645337cc29ff

[root@docker /]# docker ps -a

CONTAINER ID	IMAGE	COMMAND	CREATED	STATUS	PORTS	NAMES
15f0eb9613c5	centos:latest	"bash"	4 seconds ago	Created		eager_darwin

[root@docker ~]# docker start -ai 15f0eb9613c5

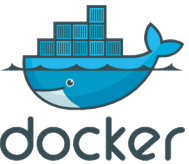
[root@ea9547e00a5d /]# ll /mnt/

```
-rw-r--r-- 1 root root      16 Apr  1       2015 CentOS_BuildTag
drwxr-xr-x 3 root root    2048 Mar 27  2015 EFI
-rw-r--r-- 1 root root     215 Mar 27    2015 EULA
```

[root@15f0eb9613c5 /]# df -h

```
Size  Used Avail Use% Mounted on
/dev/mapper/docker-253:0-526980-9a55160759150252c4235cb1c4e74ec6a8cf99d09c99c86de96dc74bfd0be034
10G  239M  9.8G   3% /
tmpfs                                          64M     0   64M   0% /dev
tmpfs                                         914M     0  914M   0% /sys/fs/cgroup
/dev/sr0                                      7.1G  7.1G     0 100% /mnt
```

Note : Volume is better than mount



Volume in Docker

Project : Run Container

1- base centos 7
2- name mycontainer
3- create volume /root host to /data container
4- create file and import ping 4.2.2.4 to file
4- run mycontainer container with the above
5- view online file in container and docker host
6- pause and unpause new container
7- test it…

Volume in Docker

Project : Run Container

1- base centos 7
2- name mycontainer
3- create volume /root host to /data container
4- create file and import ping 4.2.2.4 to file in container
4- run mycontainer container with the above

```
docker run -itd --name mycontainer -v /root:/data centos:latest /bin/bash -c 'ping 4.2.2.4 > /data/ping.txt'
```

5- view online file in container and docker host

```
[root@docker ~]# docker exec -it 1bb78c35c096 /bin/bash
[root@1bb78c35c096 /]# tail -f /data/ping.txt

[root@docker ~]# watch -d -n 1  "tail  ping.txt"
```

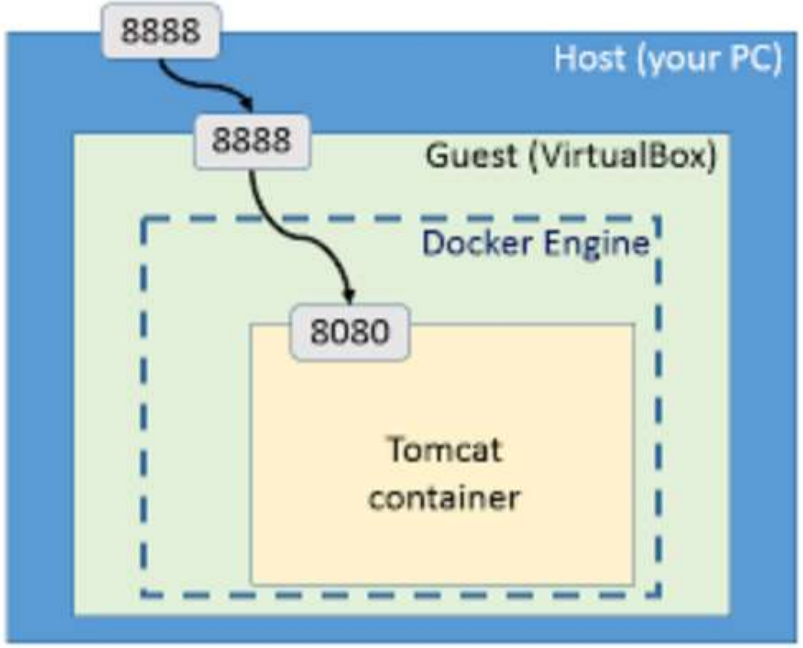
6- pause and unpause new container

```
docker pause 1bb78c35c096 /bin/bash
docker unpause 1bb78c35c096 /bin/bash
```

7- test it…

```
[root@docker ~]# docker inspect 1bb78c35c096 | grep "Mounts" -A 8
        "Mounts": [
            {
                "Type": "bind",
                "Source": "/root",
                "Destination": "/data",
                "Mode": "",
                "RW": true,
                "Propagation": "rprivate"
            }
```

Network in Docker



Network in Docker

View Default Network in Docker

[root@docker ~]# docker network ls

NETWORK ID	NAME	DRIVER	SCOPE
22db620303a3	bridge	bridge	local
b08fbf066d47	host	host	local
b3766469c82d	none	null	local

Default :

Access Container to Host Docker

Access Any Host to Container with Port Publish

Information any Default Network in Docker

[root@docker ~]# docker inspect bridge


```
[
    {
        "Name": "bridge",
        "Id": "22db620303a3d8e47100e1e880d7aa62d41b2f2ea0481f16c3a76f408840e4bb",
        "Created": "2018-03-15T11:11:51.37854753-04:00",
        "Scope": "local",
        "Driver": "bridge",
        "EnableIPv6": false,
        "IPAM": {
            "Driver": "default",
            "Options": null,
            "Config": [
                {
                    "Subnet": "172.17.0.0/16",
                    "Gateway": "172.17.0.1"
                }
            ]
        },
        "Internal": false,
        "Attachable": false,
        "Ingress": false,
        "ConfigFrom": {
            "Network": ""
        },
        "ConfigOnly": false,
        "Containers": {},
        "Options": {
            "com.docker.network.bridge.default_bridge": "true",
            "com.docker.network.bridge.enable_icc": "true",
            "com.docker.network.bridge.enable_ip_masquerade": "true",
            "com.docker.network.bridge.host_binding_ipv4": "0.0.0.0",
            "com.docker.network.bridge.name": "docker0",
            "com.docker.network.driver.mtu": "1500"
        },
        "Labels": {}
    }
]
```


➔ **Range Containers IP**

[root@docker ~]# docker inspect host


```
[
    {
        "Name": "host",
        "Id": "b08fbf066d4709239ddfd7f6d2faa4d6dd354838685318476c2dd7e31c958462",
        "Created": "2018-03-01T10:22:19.272774007-05:00",
        "Scope": "local",
        "Driver": "host",
        "EnableIPv6": false,
        "IPAM": {
            "Driver": "default",
            "Options": null,
            "Config": []
        },
        "Internal": false,
        "Attachable": false,
        "Ingress": false,
        "ConfigFrom": {
            "Network": ""
        },
        "ConfigOnly": false,
        "Containers": {},
        "Options": {},
        "Labels": {}
    }
]
```


Note :

docker network inspect bridge

OR

docker inspect bridge

Network in Docker

Running a Container and get IP Address from Docker Network

docker run -it centos:latest

docker ps -a

CONTAINER ID	IMAGE	COMMAND	CREATED	STATUS	PORTS	NAMES
53d7dd3c6668	centos:latest	"/bin/bash"	About an hour ago	Up About an hour		amazing_turing

docker inspect 53d7dd3c6668


```
"NetworkSettings": {
        "Bridge": "",
        "SandboxID": "59c8e935cbde2be94e94919cccddf931c43c0950bbb9cf6b461494ac32624f0e",
        "HairpinMode": false,
        "LinkLocalIPv6Address": "",
        "LinkLocalIPv6PrefixLen": 0,
        "Ports": {},
        "SandboxKey": "/var/run/docker/netns/59c8e935cbde",
        "SecondaryIPAddresses": null,
        "SecondaryIPv6Addresses": null,
        "EndpointID": "25ed7255040a626463ca456c0759c9d77e1487179f085c9118ace3928739ee38",
        "Gateway": "172.17.0.1",
        "GlobalIPv6Address": "",
        "GlobalIPv6PrefixLen": 0,
        "IPAddress": "172.17.0.2",
        "IPPrefixLen": 16,
        "IPv6Gateway": "",
        "MacAddress": "02:42:ac:11:00:02",
        "Networks": {
          "bridge": {
            "IPAMConfig": null,
            "Links": null,
            "Aliases": null,
            "NetworkID": "22db620303a3d8e47100e1e880d7aa62d41b2f2ea0481f16c3a76f408840e4bb",
            "EndpointID": "25ed7255040a626463ca456c0759c9d77e1487179f085c9118ace3928739ee38",
            "Gateway": "172.17.0.1",      ➔ IP Docker
            "IPAddress": "172.17.0.2",    ➔ IP Container
            "IPPrefixLen": 16,            ➔ 255.255.0.0
            "IPv6Gateway": "",
            "GlobalIPv6Address": "",
            "GlobalIPv6PrefixLen": 0,
            "MacAddress": "02:42:ac:11:00:02",
            "DriverOpts": null
          }
```


[root@docker ~]# ip a

docker0: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc noqueue state UP
link/ether 02:42:fd:2b:f8:a5 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

Network in Docker

View IP Address from Container :

docker ps -a

CONTAINER ID	IMAGE	COMMAND	CREATED	STATUS	PORTS	NAMES
53d7dd3c6668	centos:latest	"/bin/bash"	About an hour ago	Up About an hour		amazing_turing

docker exec -it 53d7dd3c6668 /bin/bash
[root@53d7dd3c6668 /]# yum install net-tools

[root@53d7dd3c6668 /]# ifconfig

```
eth0: flags=4163<UP,BROADCAST,RUNNING,MULTICAST>  mtu 1500
        inet 172.17.0.2  netmask 255.255.0.0  broadcast 172.17.255.255
        ether 02:42:ac:11:00:02  txqueuelen 0  (Ethernet)
        RX packets 10043  bytes 14543212 (13.8 MiB)
        RX errors 0  dropped 0  overruns 0  frame 0
        TX packets 5860  bytes 319755 (312.2 KiB)
        TX errors 0  dropped 0 overruns 0  carrier 0  collisions 0
```

Network in Docker

Running a Mariadb Container With Port Publish from Docker Network

docker run -d -e MYSQL_ROOT_PASSWORD=123 -it mariadb:latest

docker ps -a

CONTAINER ID	IMAGE	COMMAND	CREATED	STATUS	PORTS	NAMES
ef811cbe69c6	mariadb:latest	"docker-entrypoint.s…"	8 seconds ago	Up 7 seconds	3306/tcp	determined_wozniak

docker inspect ef811cbe69c6 | grep -i "\<ports\>" -A 10

```
    "Ports": {
      "3306/tcp": null
},
"SandboxKey": "/var/run/docker/netns/4c333982284a",
"SecondaryIPAddresses": null,
"SecondaryIPv6Addresses": null,
"EndpointID": "b46dc557cc41e12b01abcb13f1f17bdd535ebc544b66078ac5f62e3ffd7ace4f",
"Gateway": "172.17.0.1",
"GlobalIPv6Address": "",
"GlobalIPv6PrefixLen": 0,
"IPAddress": "172.17.0.2",
```

➔ Container_Port/Protocol:Docker_Port ➔ Null : Not Port Publish For Docker

Network in Docker

Test a Mariadb Container Port and Process and From Docker Network

docker exec -it ef811cbe69c6 /bin/bash

root@ef811cbe69c6:/# ps -ef | grep mysql

mysql 1 0 0 22:01 pts/0 00:00:00 mysqld ➔ pid mairadb =1

root@ef811cbe69c6:/# ss -a | grep 3306

tcp LISTEN 0 70 :::3306 :::*

[root@docker ~]# telnet 172.17.0.2 3306

Trying 172.17.0.2...
Connected to 172.17.0.2.
Escape character is '^]'

Note :

main difference between Docker Run and Docker Exec???

Network in Docker

Test a Mariadb Container Port and Process and From Docker Network

```
docker run -d -e MYSQL_ROOT_PASSWORD=123  -p 3000:3306  -it mariadb:latest
docker ps -a
CONTAINER ID   IMAGE            COMMAND                  CREATED         STATUS         PORTS                    NAMES
e75fb2d63d90   mariadb:latest   "docker-entrypoint.s…"   2 hours ago     Up 2 hours     0.0.0.0:3000->3306/tcp   quizzical_hugle
```

Connect to mariadb with Container :

```
docker exec -it e75fb2d63d90 /bin/bash
root@e75fb2d63d90:/# mysql -u root -p
Enter password:123
MariaDB [(none)]> create database zabbix character set utf8; collate utf8_bin;
MariaDB [(none)]> show databases;
+--------------------+
| Database           |
+--------------------+
| information_schema |
| mysql              |
| performance_schema |
| zabbix             |
+--------------------+
```

Connect to mariadb Any Host : 192.168.190.228

```
mysql -u root -p -h 192.168.190.223 -P 3000
Enter password:123
MariaDB [(none)]> show databases;
+--------------------+
| Database           |
+--------------------+
| information_schema |
| mysql              |
| performance_schema |
| zabbix             |
+--------------------+
4 rows in set (0.00 sec)
```

Network in Docker

Publish Port for Nginx Connect From AnyHosts to Container :

docker run -p 8080:80 -it nginx:latest /bin/bash ⟸ **-p DockerHost_Port:Container_Port/Protocol**

root@382d798f7979:/#

docker ps -a

CONTAINER ID	IMAGE	COMMAND	CREATED	STATUS	PORTS	NAMES
382d798f7979	nginx:latest	"/bin/bash"	12 minutes ago	Up 12 minutes	0.0.0.0:8080->80/tcp	musing_saha

root@382d798f7979:/# /etc/init.d/nginx start

root@382d798f7979:/# 192.168.190.1 - - [19/Mar/2018:15:01:06 +0000] "GET / HTTP/1.1" 200 612 "-" "Mozilla/5.0 (Windows NT 10.0; Win64; x64; rv:58.0) Gecko/20100101 Firefox/58.0" "-"
2018/03/19 15:01:07 [error] 17#17: *1 open() "/usr/share/nginx/html/favicon.ico" failed (2: No such file or directory), client: 192.168.190.1, server: localhost, request: "GET /favicon.ico HTTP/1.1", host: "192.168.190.223:8080"

Network in Docker

Publish Port for Connect From AnyHosts to Container :

Container Log :

root@382d798f7979:/# 192.168.190.1 - - [19/Mar/2018:15:01:06 +0000] "GET / HTTP/1.1" 200 612 "-" "Mozilla/5.0 (Windows NT 10.0; Win64; x64; rv:58.0) Gecko/20100101 Firefox/58.0" "-"

2018/03/19 15:01:07 [error] 17#17: *1 open() "/usr/share/nginx/html/favicon.ico" failed (2: No such file or directory), client: 192.168.190.1, server: localhost, request: "GET /favicon.ico HTTP/1.1", host: "**192.168.190.223:8080**"

192.168.190.1 - - [19/Mar/2018:15:01:07 +0000] "GET /favicon.ico HTTP/1.1" 404 169 "-" "Mozilla/5.0 (Windows NT 10.0; Win64; x64; rv:58.0) Gecko/20100101 Firefox/58.0" "-"

192.168.190.1 - - [19/Mar/2018:15:14:56 +0000] "GET / HTTP/1.1" 200 612 "-" "Mozilla/5.0 (Windows NT 10.0; Win64; x64; rv:58.0) Gecko/20100101 Firefox/58.0" "-" ⟸ Control+F5

192.168.190.1 - - [19/Mar/2018:15:15:03 +0000] "GET / HTTP/1.1" 200 612 "-" "Mozilla/5.0 (Windows NT 10.0; Win64; x64; rv:58.0) Gecko/20100101 Firefox/58.0" "-"

Network in Docker

Publish Port for Connect From AnyHosts to Container :

Container Log :

root@382d798f7979:/# 192.168.190.1 - - [19/Mar/2018:15:01:06 +0000] "GET / HTTP/1.1" 200 612 "-" "Mozilla/5.0 (Windows NT 10.0; Win64; x64; rv:58.0) Gecko/20100101 Firefox/58.0" "-"

2018/03/19 15:01:07 [error] 17#17: *1 open() "**usr/shar/e/nginx/html/**favicon.ico" failed (2: No such file or directory), client: 192.168.190.1, server: localhost, request: "GET /favicon.ico HTTP/1.1", host: "**192.168.190.223:8080**"
192.168.190.1 - - [19/Mar/2018:15:01:07 +0000] "GET /favicon.ico HTTP/1.1" 404 169 "-" "Mozilla/5.0 (Windows NT 10.0; Win64; x64; rv:58.0) Gecko/20100101 Firefox/58.0" "-"
192.168.190.1 - - [19/Mar/2018:15:14:56 +0000] "GET / HTTP/1.1" 200 612 "-" "Mozilla/5.0 (Windows NT 10.0; Win64; x64; rv:58.0) Gecko/20100101 Firefox/58.0" "-" ⟸ Control+F5
192.168.190.1 - - [19/Mar/2018:15:15:03 +0000] "GET / HTTP/1.1" 200 612 "-" "Mozilla/5.0 (Windows NT 10.0; Win64; x64; rv:58.0) Gecko/20100101 Firefox/58.0" "-"

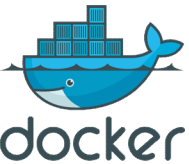
root@382d798f7979:/# cp /usr/share/nginx/html/index.html /usr/share/nginx/html/index1.html

root@382d798f7979:/# echo HI > /usr/share/nginx/html/index.html

[root@docker ~]# docker inspect 382d798f7979 | grep -i "\<ports\>" -A 7

```
"Ports": {
    "80/tcp": [        Container_Port/Protocol
        {
            "HostIp": "0.0.0.0",
            "HostPort": "8080"      DockerHost_Port
        }
    ]
},
```

Test ➔ Telnet from Any Host :
telnet 192.168.190.223 8080



Docker Commands

Project : Start and Running Docker Container ?

Container Name : ?
Container Set Variable AUTHOR : Your Name
Detach run
Container Image : centos:latest
Running With bash
Create Random Port : ?

```
docker run --name AnisaCo  -e AUTHOR="Anisa" -dit -P centos:latest ping 4.2.2.4
        545ae5778c9969dc91bbaf12de9ce534dba453b8b84e24575b6e0b2a7e0d026f
docker start -ia 545ae5778c99
Ctrl+c
```

Network in Docker

Project : Implement the Following Scenario 1

A: Create Docker Volume

B: View Path Volume

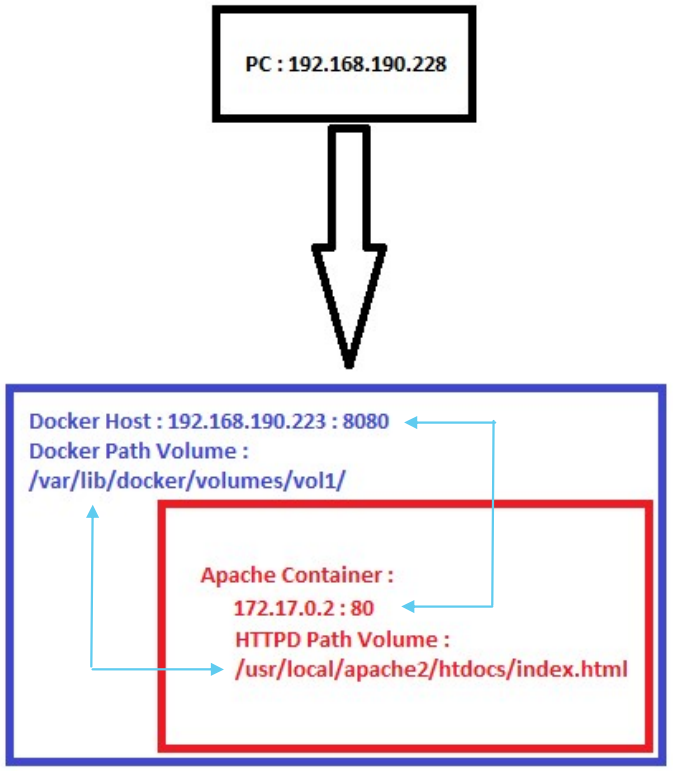
C: Docker Run With Container Apache(httpd) and Volume , Port

D: Start httpd and test listen port

E: Test URL On PC with Browser

G: Telnet Docker Host and From PC on port 8080

H: Change Index.html from Docker Host
Deploy System For Change Version



Network in Docker

Project : Implement the Following Scenario 1

docker volume create --name vol1

ll /var/lib/docker/volumes/

```
total 24
drwxr-xr-x 3 root root    18 Mar 17 15:45 31e1257ff6685bf6482ac83bbc6e49b1265ebca31c974d8be9930b20cbff1176
-rw------- 1 root root 32768 Mar 17 17:57 metadata.db
drwxr-xr-x 3 root root    18 Mar 17 17:57 vol1
```

docker run -p 8080:80 -v vol1:/usr/local/apache2/htdocs:rw -it httpd:latest /bin/bash

[root@docker _data]# docker ps -a

CONTAINER ID	IMAGE	COMMAND	CREATED	STATUS	PORTS	NAMES
6f36b7fc9aa6	httpd:latest	"/bin/bash"	5 minutes ago	Up 5 minutes	0.0.0.0:8080->80/tcp	distracted_ritchie

root@6f36b7fc9aa6:/usr/local/apache2/bin# ss –a ➔ Not Start

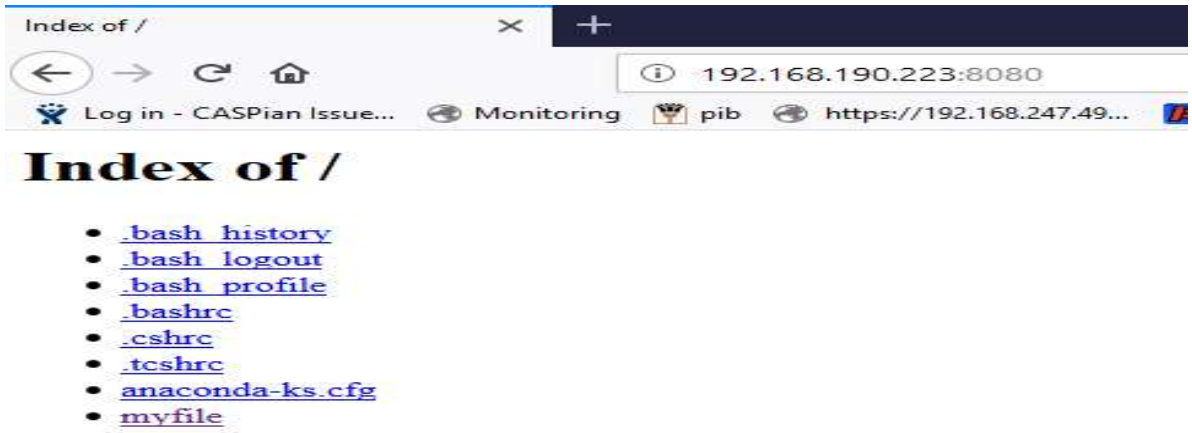
root@6f36b7fc9aa6:/usr/local/apache2# cd bin/
root@6f36b7fc9aa6:/usr/local/apache2/bin# ./httpd
root@6f36b7fc9aa6:/usr/local/apache2/bin# ss -a | grep http
tcp LISTEN 0 128 *:http *:*

Start apache

Network in Docker

Project : Implement the Following Scenario 1

Test URL On PC with Browser



Telnet Docker Host and From PC on port 8080

Test From IP : 192.168.190.228

```
[root@docker ~]# telnet 192.168.190.223 8080
Trying 192.168.190.223...
Connected to 192.168.190.223.
Escape character is '^]'.
```

View From Container :

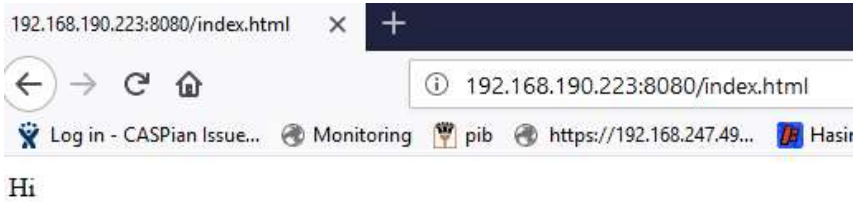
```
root@16de1a0da3d1:/usr/local/apache2/bin# watch -d -n 1 "ss -a | grep h"
tcp   LISTEN   0   128          *:http          *:*
tcp   ESTAB    0   0        172.17.0.2:http   192.168.190.228:43435
```

Network in Docker

Project : Implement the Following Scenario 1

Change or Create Index.html from Docker Host :

[root@docker _data]# echo Hi > /var/lib/docker/volumes/vol1/_data/index.html



Network in Docker

Project : Network Create Implement the Following Scenario 2

Docker Host : 192.168.190.223 ➔ ping 192.168.20.100 , 192.168.20.200
Container 1 : 192.168.30.100 ➔ ping 192.168.20.200
Container 2 : 192.168.30.200 ➔ ping 192.168.20.100

Start Container 1 : docker run -it centos:latest /bin/bash
[root@911b4c064ded /]#

Start Container 2 : docker run -it centos:latest /bin/bash
[root@4952822065fa /]#

[root@docker ~]# docker ps -a

CONTAINER ID	IMAGE	COMMAND	CREATED	STATUS	PORTS	NAMES
911b4c064ded	centos:latest	"/bin/bash"	19 minutes ago	Up 19 minutes		clever_wescoff
4952822065fa	centos:latest	"/bin/bash"	22 minutes ago	Up 22 minutes		admiring_gates

Create Network :

docker network create --subnet 192.168.20.0/24 testnet

Assigen Network and IP to Container 1 :

docker network connect --ip 192.168.20.100 testnet 911b4c064ded

Assigen Network and IP to Container 2 :

docker network connect --ip 192.168.20.200 testnet 4952822065fa

Network Disconnect :

docker network disconnect testnet 911b4c064ded

Network in Docker

Docker My Network Info :

docker network inspect testnet


```
"Containers": {
    "4952822065faa0cd1e55043dee3005140eb2857c59fb663ff1a92c7ab2940cb5": {
      "Name": "admiring_gates",
      "EndpointID": "0a968ea341f114fec3f545a1877fd398e9de5260c044ea4b765cf287b14ec742",
      "MacAddress": "02:42:c0:a8:14:c8",
      "IPv4Address": "192.168.20.200/24",
      "IPv6Address": ""
    },
    "911b4c064dedcc41f3dfb3cd8722e6d9390bf992b7000cf013cf2398b2864242": {
      "Name": "clever_wescoff",
      "EndpointID": "31ad7e3045c9a721e877fee1b2b6bdb74ef7e8f0bc68851efb6b89195f036163",
      "MacAddress": "02:42:c0:a8:14:64",
      "IPv4Address": "192.168.20.100/24",
      "IPv6Address": ""
    }
  },
  "Options": {},
  "Labels": {}
}
```


[root@docker ~]# docker ps -a

CONTAINER ID	IMAGE	COMMAND	CREATED	STATUS	PORTS	NAMES
911b4c064ded	centos:latest	"/bin/bash"	19 minutes ago	Up 19 minutes		clever_wescoff
4952822065fa	centos:latest	"/bin/bash"	22 minutes ago	Up 22 minutes		admiring_gates

Docker Network Remove :

docker network rm testnet / Network ID ➔ NOTE : UnUsed any Containers (STOP or KILL Containers)

Network in Docker

Docker Port :

[root@docker ~]# docker run -itd -p 3306:3310 mariadb:latest /bin//bash

b9474a2679009871cd85f30a048ddee0076fb9346923adbc937e58822574257d

[root@docker ~]# docker ps

CONTAINER ID	IMAGE	COMMAND	CREATED	STATUS	PORTS	NAMES
b9474a267900	mariadb:latest	"docker-entrypoint.s…"	6 seconds ago	Up 5 seconds	3306/tcp, 0.0.0.0:3306->3310/tcp	competent_raman

[root@docker ~]# docker port b9474a267900

3310/tcp -> 0.0.0.0:3306

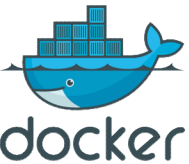
[root@docker ~]# docker port b9474a267900 3310/tcp

0.0.0.0:3306

Build Custom Image By DockerFile

There is a DockerFile for a Image in DockerHub

Download This File and View



Build Custom Image By DockerFile

Below are some dockerfile commands you must know:

FROM
The base image for building a new image. This command must be on top of the dockerfile.

MAINTAINER
Optional, it contains the name of the maintainer of the image.

RUN
Used to execute a command during the build process of the docker image.

ADD
Copy a file from the host machine to the new docker image. There is an option to use an URL for the file, docker will then download that file to the destination directory.

ENV
Define an environment variable.

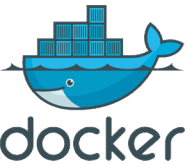
CMD
Used for executing commands when we build a new container from the docker image.

ENTRYPOINT
Define the default command that will be executed when the container is running.

WORKDIR
This is directive for CMD command to be executed.

USER
Set the user or UID for the container created with the image.

VOLUME
Enable access/linked directory between the container and the host machine.



Build Custom Image By DockerFile

Note For Write DockerFile :

Merge multiple RUN commands into one

Remove unneeded files after each step

Use proper base image (alpine versions should be enough)

Set WORKDIR and CMD

Prefer COPY over ADD

NOTE : disk space 30GB /docker

Build Custom Image By DockerFile

Create Path For Parent Container IMAGES :

mkdir /docker/ContainerIMG

Create Path For Container IMAGEName and Include :

mkdir /docker/ContainerIMG/ImageName
touch /docker/ContainerIMG/ImageName/Dockerfile
vim Dockerfile

…

Note : If Need to Image Source Copy To Directory /docker/ContainerIMG/ImageName

CentOS Base : centos-7-docker.tar.xz

Then :

Build Container Image :

docker build -t IMAGEName 

Run Container :

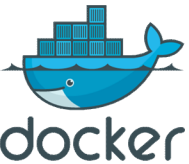
docker run -it IMAGEName /bin/bash

Test :

docker images

REPOSITORY	TAG	IMAGE ID	CREATED	SIZE
IMAGEName	latest	714016bc9779	21 minutes ago	385MB

docker ps -a



Build Custom Image By DockerFile

DockerFile Structure :

```
FROM    ImageName:TAG
ADD     centos-7-docker.tar.xz /
RUN     ["<executable", "<param 1>", "<param 2>"]
LABEL   name="CentOS Base Image" \
    vendor="CentOS" \
    license="GPLv2" \
    build-date="20180302"

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

Build Custom Image By DockerFile

Sample1 : Build Centos Clean

mkdir **docker/ContainerIMG**

mkdir **/docker/ContainerIMG/centclean**

```
cd centclean
ls
  centos-7-docker.tar.xz  Dockerfile

vim Dockerfile
   FROM scratch
   ADD centos-7-docker.tar.xz /
   LABEL name="CentOS Base Image" \
         vendor="CentOS" \
         license="GPLv2" \
         build-date="20180302"
   CMD ["/bin/bash"]
```

docker build -t centclean . ➔ docker images

docker run -it centclean /bin/bash ➔ docker ps -a

Build Custom Image By DockerFile

Sample2 : Build Centos Base With install Vim and Net-tools Packages

mkdir **docker/ContainerIMG**

mkdir **/docker/ContainerIMG/centbase**

```
cd centbase
ls
  centos-7-docker.tar.xz  Dockerfile

vim Dockerfile
    FROM scratch
    ADD centos-7-docker.tar.xz /
    LABEL name="CentOS Base Image" \
       vendor="CentOS" \
       license="GPLv2" \
       build-date="20180302"
    RUN yum install -y vim && yum install -y net-tools
    CMD ["/bin/bash"]
```

docker build -t centbase . ➔ docker images

docker run -it centbase /bin/bash ➔ docker ps -a

Build Custom Image By DockerFile

Sample3 : Build Centos With Copy Files From host to Container

mkdir **docker/ContainerIMG**

mkdir **/docker/ContainerIMG/centbase**

cd centbase

touch myfile ; echo Hi > myfile

ls

centos-7-docker.tar.xz Dockerfile myfile

vim Dockerfile

```
FROM scratch
ADD centos-7-docker.tar.xz /
LABEL name="CentOS Base Image" \
    vendor="CentOS" \
    license="GPLv2" \
    build-date="20180302"
COPY myfile /root  ➔ Copy Myfile From Docker To /root in Container
CMD ["/bin/bash"]
```

docker build -t copyimg . ➔ docker images ➔

REPOSITORY	TAG	IMAGE ID	CREATED	SIZE
copyimg	latest	6ca9dc879cff	11 seconds ago	195MB

docker run -it copyimg /bin/bash ➔ docker ps –a ➔

```
[root@d6ac0fceecbe /]# cat /root/myfile
Hi
```

Build Custom Image By DockerFile

Sample4 : Build Centos With Copy Files From host to Container With Set Container Variable

mkdir **docker/ContainerIMG**

mkdir **/docker/ContainerIMG/centbase**

```
cd centbase
touch myfile ; echo Hi > myfile
ls
  centos-7-docker.tar.xz  Dockerfile   myfile
vim Dockerfile
      FROM scratch
      ADD centos-7-docker.tar.xz /
      LABEL name="CentOS Base Image" \
         vendor="CentOS" \
         license="GPLv2" \
         build-date="20180302"
      ENV  file_path   /root          OR       ENV file_path=/root
      COPY  myfile    ${file_path}
      CMD ["/bin/bash"]
```

docker build -t copyimg_with_var . ➔ docker images ➔

REPOSITORY	TAG	IMAGE ID	CREATED	SIZE
copyimg_with_var	latest	6ca9dc879cff	11 seconds ago	195MB

docker run -it copyimg_with_var /bin/bash ➔ docker ps –a ➔

```
[root@d6ac0fceecbe /]# cat /root/myfile
Hi
```

Build Custom Image By DockerFile

Sample5 : Build Centos Container With Multiple Commands (Create User and Create Directory and Set Permision Owner) :

mkdir **docker/ContainerIMG**

mkdir **/docker/ContainerIMG/centbase**

cd centbase ; ls

centos-7-docker.tar.xz Dockerfile

vim Dockerfile

```
FROM scratch
ADD centos-7-docker.tar.xz /
LABEL name="CentOS Base Image" \
   vendor="CentOS" \
   license="GPLv2" \
   build-date="20180302"
RUN  /usr/sbin/useradd doc1  && \
        mkdir -p /opt/docker  && \
        chown -R  doc1:doc1  /opt/docker
CMD ["/bin/bash"]
```

docker build –t useradd_changeowner . ➔ docker images ➔

REPOSITORY	TAG	IMAGE ID	CREATED	SIZE
useradd_changeowner	latest	6ca9dc879cff	11 seconds ago	195MB

docker run -it useradd_changeowner /bin/bash ➔ docker ps –a ➔

ll /opt/

drwxr-xr-x 2 **doc1 doc1** 6 Mar 28 18:58 **docker**

Build Custom Image By DockerFile

Sample6 : Build Centos Container With Set Volume and Access to host

mkdir **docker/ContainerIMG**

mkdir **/docker/ContainerIMG/centbase**

cd centbase ; ls

centos-7-docker.tar.xz Dockerfile

vim Dockerfile

```
FROM scratch
ADD centos-7-docker.tar.xz /
LABEL name="CentOS Base Image" \
   vendor="CentOS" \
   license="GPLv2" \
   build-date="20180302"
VOLUME /opt/docker  OR ["/opt/docker1" , "/opt/docker2" , "/etc"]
CMD ["/bin/bash"]
```

docker build –t volumeimage . ➔ docker images ➔

REPOSITORY	TAG	IMAGE ID	CREATED	SIZE
volumeimage	latest	6ca9dc879cff	11 seconds ago	195MB

docker run -it **-v /app1:/opt/docker1 -v /app2:/opt/docker2 -v /app3:/etc** volumeimage /bin/bash ➔ docker ps –a ➔

Test : Create In Container :

touch /opt/docker1/doc1 ; touch /opt/docker2/doc2 ; /etc/doc3

View in Host :

ls /app1 ; ls /app2 ; ls /app3 OR cat /app1/doc1 ; ls /app2/doc2 ; ls /app3/doc3

Build Custom Image By DockerFile

Sample7 : Build Centos Container With Running a Script

mkdir **docker/ContainerIMG**

mkdir **/docker/ContainerIMG/centbase**

cd centbase ; ls

centos-7-docker.tar.xz Dockerfile script.sh ➔

#!/bin/sh
ping -c 1 4.2.2.4 > /var/log/ping.log

vim Dockerfile

```
FROM scratch
ADD centos-7-docker.tar.xz /
LABEL name="CentOS Base Image" \
    vendor="CentOS" \
    license="GPLv2" \
    build-date="20180302"
COPY script.sh /script.sh
RUN chmod 777 /script.sh
RUN ./script.sh
CMD ["/bin/bash"]
```

docker build –t RunCommandImage . ➔ docker images ➔

REPOSITORY	TAG	IMAGE ID	CREATED	SIZE
RunCommandImage	latest	6ca9dc879cff	11 seconds ago	195MB

docker run -it RunCommandImage /bin/bash ➔ docker ps –a ➔

Container : cat /var/log/ping.log

```
PING 4.2.2.4 (4.2.2.4) 56(84) bytes of data.
64 bytes from 4.2.2.4: icmp_seq=1 ttl=127 time=238 ms
```

Build Custom Image By DockerFile

Sample8 : Build Centos Container With Change Path

mkdir **docker/ContainerIMG**

mkdir **/docker/ContainerIMG/centbase**

cd centbase ; ls

centos-7-docker.tar.xz Dockerfile

vim Dockerfile

```
FROM scratch
ADD centos-7-docker.tar.xz /
LABEL name="CentOS Base Image" \
    vendor="CentOS" \
    license="GPLv2" \
    build-date="20180302"
RUN  mkdir -p /opt/docker
WORKDIR /opt/docker/
CMD ["/bin/bash"]
```

docker build –t changepath . ➔ docker images ➔

REPOSITORY	TAG	IMAGE ID	CREATED	SIZE
changepath	latest	6ca9dc879cff	11 seconds ago	195MB

docker run -it changepath /bin/bash ➔ docker ps –a ➔

Container :

[root@5140e0495b19 docker]# pwd

/opt/docker

Build Custom Image By DockerFile

Sample9 : Build Centos Container With ENTRYPOINT ➔ **RUN Container Until The Execution Command and Parameters**

mkdir **docker/ContainerIMG**

mkdir **/docker/ContainerIMG/centbase**

cd centbase ; ls

centos-7-docker.tar.xz Dockerfile

vim Dockerfile

```
FROM scratch
ADD centos-7-docker.tar.xz /
LABEL name="CentOS Base Image" \
   vendor="CentOS" \
   license="GPLv2" \
   build-date="20180302"
ENTRYPOINT  ping  4.2.2.4  -c1
CMD ["/bin/bash"]
```

ENTRYPOINT ping 4.2.2.4 -c1 ➔ Until the execution of this action Then STOP Container.

Note :

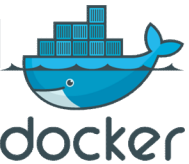
ENTRYPOINT ["executable", "param1", "param2"]
OR
ENTRYPOINT command param1 param2

docker build –t entrypoint . ➔ docker images ➔

REPOSITORY	TAG	IMAGE ID	CREATED	SIZE
entrypoint	latest	6ca9dc879cff	11 seconds ago	195MB

docker run -it entrypoint /bin/bash ➔ docker ps –a ➔

```
PING 4.2.2.4 (4.2.2.4) 56(84) bytes of data.
64 bytes from 4.2.2.4: icmp_seq=1 ttl=127 time=195 ms
--- 4.2.2.4 ping statistics ---
1 packets transmitted, 1 received, 0% packet loss, time 0ms
rtt min/avg/max/mdev = 195.445/195.445/195.445/0.000 ms
[root@docker docker]# STOP Container
```



Build Custom Image By DockerFile

Note 1 : Using ARG in Dockerfile.

```
ARG CODE_VERSION=latest
FROM base:${CODE_VERSION}
```

Note 2 :

The imagename must be **lowercase**

```
docker  build  -t  imagename  .
```

Note 3 :

EXPOSE 8080:80 Active With -p in Docker RUN

Create Container centos:6.6 with Set ARG ???

Build Custom Image By DockerFile

Create httpd Container and Solve Error Failed to get D-Bus connection: Operation not permitted

Vim Dockerfile :

```
FROM centos
MAINTAINER “Yourname" <youremail@address.com>
ENV container docker
RUN yum -y update; yum clean all
RUN yum -y install systemd; yum clean all; \
(cd /lib/systemd/system/sysinit.target.wants/; for i in *; do [ $i == systemd-tmpfiles-setup.service ] || rm -f $i; done); \
rm -f /lib/systemd/system/multi-user.target.wants/*;\
rm -f /etc/systemd/system/*.wants/*;\
rm -f /lib/systemd/system/local-fs.target.wants/*; \
rm -f /lib/systemd/system/sockets.target.wants/*udev*; \
rm -f /lib/systemd/system/sockets.target.wants/*initctl*; \
rm -f /lib/systemd/system/basic.target.wants/*;\
rm -f /lib/systemd/system/anaconda.target.wants/*;
RUN yum -y install httpd
VOLUME [ “/sys/fs/cgroup” ]
EXPOSE 8080:80
CMD [“/usr/sbin/init”]
```

➔ **Solved with Remove Systemd Files**

docker build -t centhttpd .

docker run --privileged -it -v /sys/fs/cgroup:/sys/fs/cgroup -p 8080:80 centhttpd /usr/sbin/init

Build Custom Image By DockerFile

Create httpd Container and Solve Error Failed to get D-Bus connection: Operation not permitted

docker build -t centhttpd .

docker run --privileged -it -v /sys/fs/cgroup:/sys/fs/cgroup centhttpd /usr/sbin/init

docker ps -a

CONTAINER ID	IMAGE	COMMAND	CREATED	STATUS	PORTS	NAMES
826bf13aca94	centhttpd	"/usr/sbin/init"	37 seconds ago	Up 35 seconds	0.0.0.0:8080->80/tcp	pensive_murdock

docker exec -it 826bf13aca94 /bin/bash

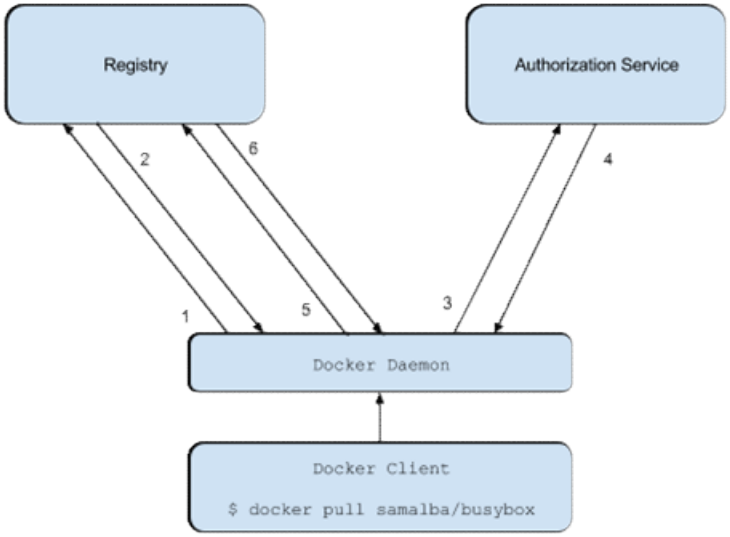
[root@826bf13aca94 /]# **systemctl start httpd**

[root@826bf13aca94 /]# **ps -ef | grep httpd**

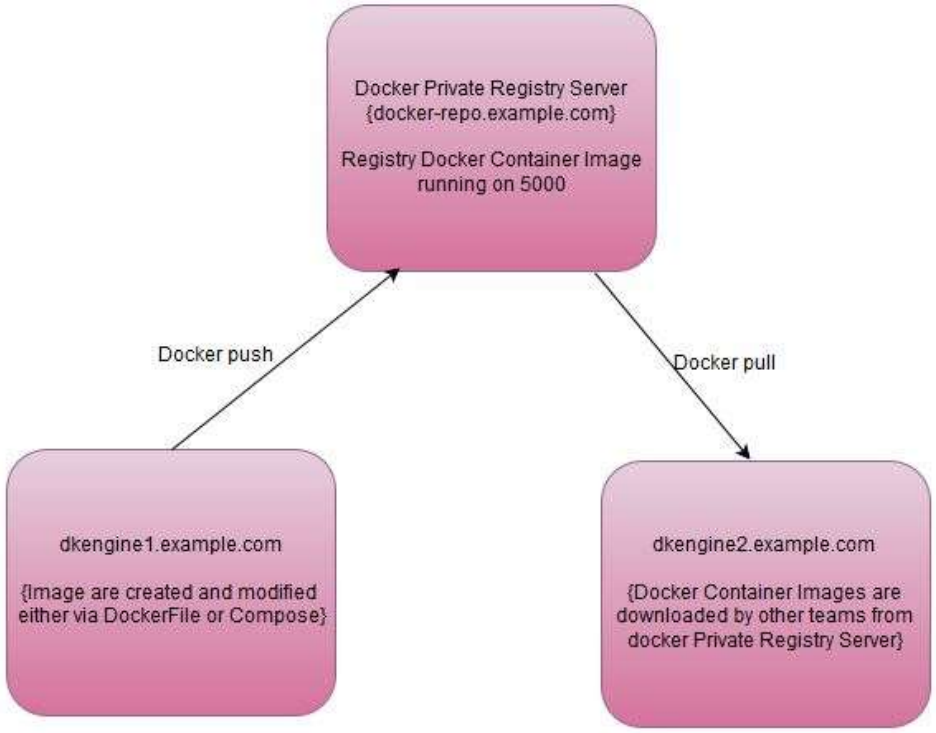
```
root        37     1  6 18:24 ?        00:00:00 /usr/sbin/httpd -DFOREGROUND
apache      38    37  0 18:24 ?        00:00:00 /usr/sbin/httpd -DFOREGROUND
apache      39    37  0 18:24 ?        00:00:00 /usr/sbin/httpd -DFOREGROUND
apache      40    37  0 18:24 ?        00:00:00 /usr/sbin/httpd -DFOREGROUND
apache      41    37  0 18:24 ?        00:00:00 /usr/sbin/httpd -DFOREGROUND
apache      42    37  0 18:24 ?        00:00:00 /usr/sbin/httpd -DFOREGROUND
```

Test : Check With Browser and Telnet

Docker Local Registry



Docker Local Registry



Docker Master
docker_reg.master.reg
192.168.190.232
Install Docker and Start
Firewalld Stop

Docker Client
docker_reg.client.reg
192.168.190.233
Install Docker and Start
Firewalld Stop

Docker Local Registry

Step:1 Download and start registry Container on your private registry server

[root@docker-repo ~]# **docker pull registry**

[root@docker-repo ~]# **docker history registry**

```
[root@docker-repo ~]# docker history registry
IMAGE               CREATED             CREATED BY                                      SIZE                COMMENT
047218491f8c        2 weeks ago         /bin/sh -c #(nop)  CMD ["/etc/docker/regis...   0 B
<missing>           2 weeks ago         /bin/sh -c #(nop)  ENTRYPOINT ["/entrypoin...   0 B
<missing>           2 weeks ago         /bin/sh -c #(nop) COPY file:7b57f7ab1a8cf8...   155 B
<missing>           2 weeks ago         /bin/sh -c #(nop)  EXPOSE 5000/tcp              0 B
<missing>           2 weeks ago         /bin/sh -c #(nop)  VOLUME [/var/lib/registry]   0 B
<missing>           2 weeks ago         /bin/sh -c #(nop) COPY file:6c4758d509045d...   295 B
<missing>           2 weeks ago         /bin/sh -c #(nop) COPY file:6ccb0558ad0a49...   22.8 MB
<missing>           2 weeks ago         /bin/sh -c set -ex     && apk add --no-cac...   5.59 MB
<missing>           2 weeks ago         /bin/sh -c #(nop) ADD file:3df55c321c1c8d7...   4.8 MB
[root@docker-repo ~]#
```

[root@docker-repo ~]# **docker run -dit -p 5000:5000 --name registry registry**

bf8e703b0149211bb923beeb042f8e656bf407b21646f101eb58e0acd4409c24

[root@docker-repo ~]# **docker ps**

CONTAINERID	IMAGE	COMMAND	CREATED	STATUS	PORTS	NAMES
bf8e703b0149	registry	"/entrypoint.sh /e..."	5 minutes ago	Up 5 minutes	0.0.0.0:5000->5000/tcp	registry

[root@docker-repo ~]# **systemctl stop firewalld**

Docker Local Registry

Step:2 Create Docker Container Image and upload it to Private Registry Server

ON docker_reg.master.reg :

docker kill all container ➔ **docker rm -f $(docker ps -aq)**

docker pull centos:latest

docker images

REPOSITORY	TAG	IMAGE ID	CREATED	SIZE
centos	latest	e934aafc2206	38 hours ago	199MB
registry	latest	d1fd7d86a825	2 months ago	33.3MB

Edit the file "**/usr/lib/systemd/system/docker.service**" and change the parameter

ExecStart=/usr/bin/dockerd

to

ExecStart=/usr/bin/dockerd –insecure-registry 192.168.190.232:5000 ➔ Container Registry IP

[root@dkengine2 ~]# **systemctl daemon-reload ; systemctl restart docker**

docker run -dit -p 5000:5000 --name registry registry

docker tag centos 192.168.190.232:5000/centoslocal

[root@dkengine1 ~]# **docker push 192.168.190.232:5000/centoslocal**

The push refers to a repository [192.168.190.232:5000/centoslocal]

56827159aa8b: Pushed

440e02c3dcde: Pushed

29660d0e5bb2: Pushed

85782553e37a: Pushed

digest: sha256:6b079ae764a6affcb632231349d4a5e1b084bece8c46883c099863ee2aeb5cf8 size: 1357

Docker Local Registry

Step:3 Download Docker Container image from Private Registry Server

ON docker_reg.client.reg :

Edit the file "**/usr/lib/systemd/system/docker.service**" and change the parameter
ExecStart=/usr/bin/dockerd
to
ExecStart=/usr/bin/dockerd --insecure-registry 192.168.190.232:5000 ➔ Container Registry IP

[root@dkengine2 ~]# **systemctl daemon-reload ; systemctl restart docker**
Note : VPN Disconnect
[root@dkengine2 ~]# **docker pull 192.168.190.232:5000/centoslocal**
Using default tag: latest
latest: Pulling from centoslocal
469cfcc7a4b3: Pull complete
Digest: sha256:191c883e479a7da2362b2d54c0840b2e8981e5ab62e11ab925abf8808d3d5d44
Status: Downloaded newer image for 192.168.190.232:5000/centoslocal:latest

[root@dkengine2 ~]# **docker images**

REPOSITORY	TAG	IMAGE ID	CREATED	SIZE docker-
repo.example.com:5000/ubuntu	16.04	0ef2e08ed3fa	3 weeks ago	130 MB

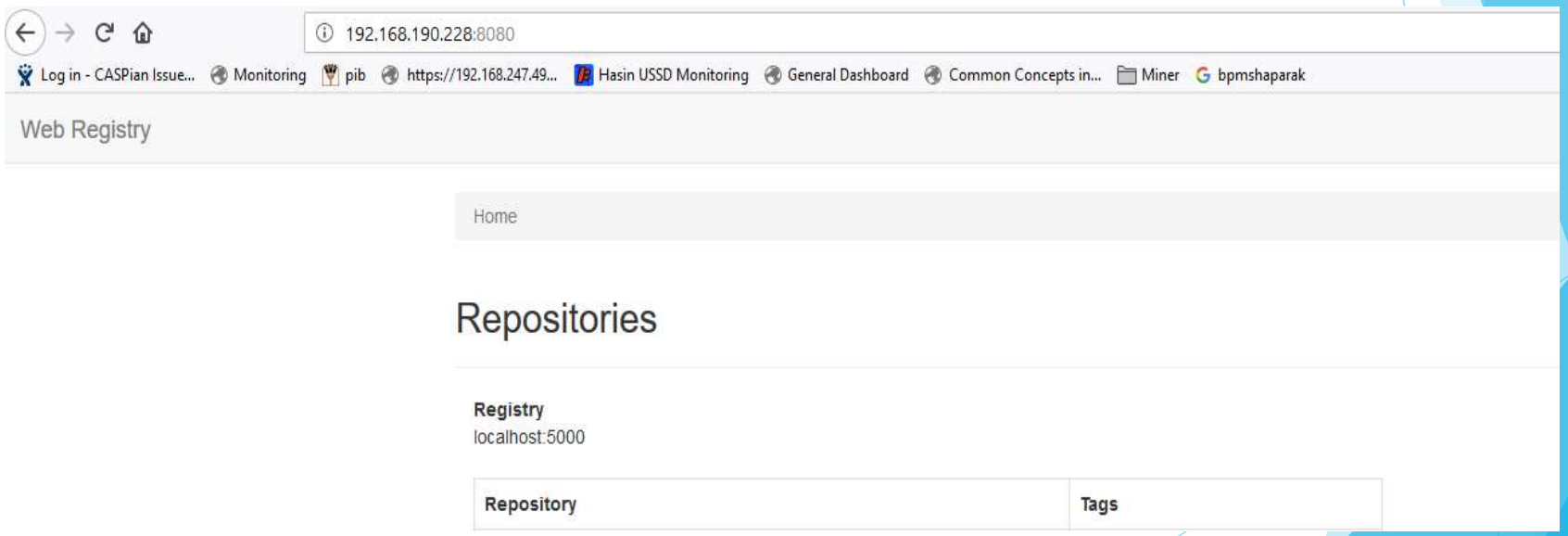
[root@docker_reg ~]# **docker run -it 192.168.190.233:5000/centoslocal /bin/bash**
[root@9bd4031d04d0 /]#

Docker Local Registry

docker-registry-web :

Quick start (config with environment variables, no authentication)

1- docker rm -f $(docker ps -qa)
2- docker run -d -p 5000:5000 --name registry-srv registry:2
3- docker run -it -p 8080:8080 --name registry-web --link registry-srv -e REGISTRY_URL=http://registry-srv:5000/v2 -e REGISTRY_NAME=localhost:5000 hyper/docker-registry-web
4- Web UI will be available on http://localhost:8080 **OR http://IP/8080**



Docker Local Registry

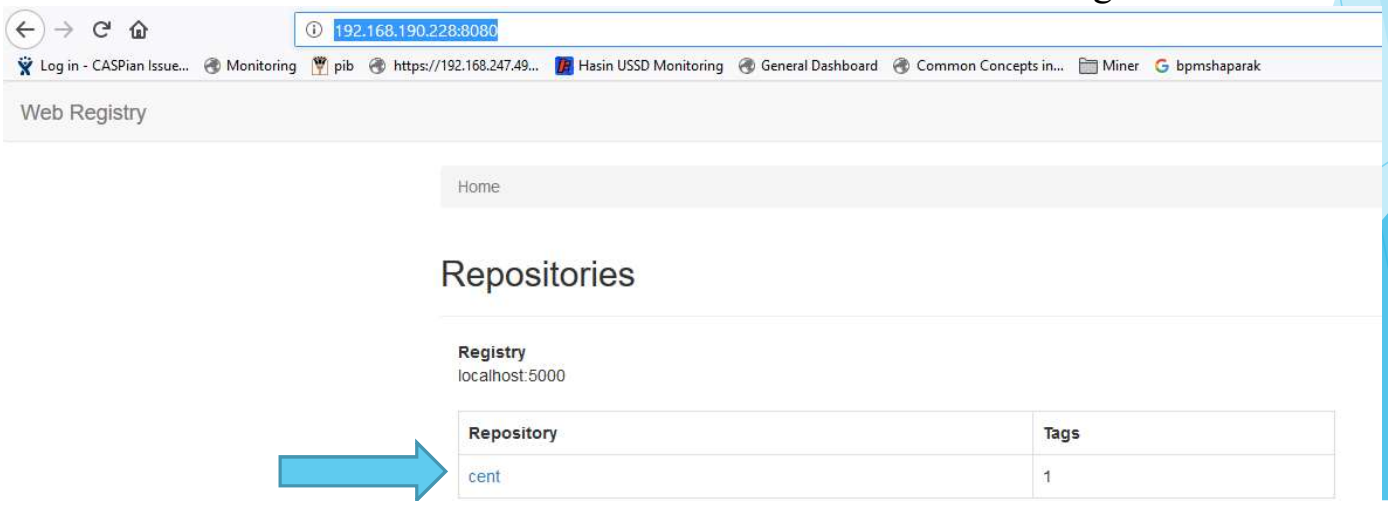
docker-registry-web :

Test

[root@docker ~]# **docker tag centos 127.0.0.1:5000/cent**
[root@docker ~]# **docker push 127.0.0.1:5000/cent**
The push refers to repository [127.0.0.1:5000/cent]
b03095563b79: Pushed
latest: digest: sha256:8c7ac054adab3692f7026d49fd1c4df69aa6a138b2f076b432d2ac0164c022d3 size: 529

[root@docker ~]# **docker images**

127.0.0.1:5000/cent	latest	2d194b392dd1	8 weeks ago	195MB



Docker Compose

Note :

Deployment on Several Container
Used in 1 YAML file (name.yml)
Default Path docker-compose file:
/usr/local/bin/docker-compose

Install Docker-compose :

sudo yum install epel-release
sudo yum install -y python-pip
sudo pip install docker-compose
sudo yum upgrade python*

OR

curl -L https://github.com/docker/compose/releases/download/1.11.2/docker-compose-$(uname -s)-$(uname -m)" -o /usr/local/bin/docker-compose
chmod +x /usr/local/bin/docker-compose
docker-compose --version

Run and Test :

docker-compose --version

docker-compose version 1.20.1, build 5d8c71b

vim /usr/local/bin/docker-compose.yml

```
my-test:
    image: nginx:latest
```

docker-compose up -d

Recreating bin_my-test_1 ... Done

docker ps -a

CONTAINER ID	IMAGE	COMMAND	CREATED	STATUS	PORTS	NAMES
9372c4efbd7b	nginx:latest	"nginx -g 'daemon of…"	3 seconds ago	Up 1 second	80/tcp	bin_my-test_1

Docker Compose

[root@docker compose]# docker-compose ps
ERROR:
Can't find a suitable configuration file in this directory or any parent. Are you in the right directory?
Supported filenames: docker-compose.yml, docker-compose.yaml

Run and Test :

This Path : ➔ Else : ERROR ➔

/usr/local/bin/

[root@docker bin]# **docker-compose ps**

```
     Name            Command         State    Ports
-------------------------------------------------------
bin_my-test_1   nginx -g daemon off;   Up      80/tcp
```

Stop Docker-Compose

docker-compose stop

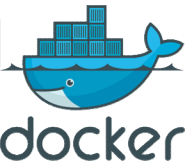
Stopping bin_my-test_1 ... done

[root@docker bin]# docker-compose ps

```
     Name            Command         State    Ports
-------------------------------------------------------
bin_my-test_1   nginx -g daemon off;   Exit 0
```

docker-compose kill ➔ **Note:** docker-compose kill is also available if you need to **shut things down** more **forcefully**.

Killing bin_my-test_1 ... done



Docker Compose

docker-compose rm

Going to remove bin_my-test_1
Are you sure? [yN] y
Removing bin_my-test_1 ... done

docker-compose up

Creating bin_my-test_1 ... done
Attaching to bin_my-test_1 ➔ wait

docker-compose ps

```
     Name            Command         State    Ports
-------------------------------------------------------
bin_my-test_1   nginx -g daemon off;   Up      80/tcp
```

docker-compose down

Stopping bin_my-test_1 ... done
Removing bin_my-test_1 ... done

Docker Compose

```
version: '3' ➔ docker file Format = Docker Engine Release.
services:
  app:
    build:
      context: ./docker/app
      dockerfile: Dockerfile
    image: shippingdocker.com/app
    volumes:
     - .:/var/www/html
    ports:
     - "80:80"
    networks:
     - sdnet
  node:
    build:
      context: ./docker/node
      dockerfile: Dockerfile
    image: shippingdocker.com/node
    volumes:
     - .:/var/www/html
    networks:
     - sdnet
```

⟹ build: ./docker/app

```
  mysql:
    image: mysql:5.7
    ports:
     - "3306:3306"
    environment:
      MYSQL_ROOT_PASSWORD: "secret"
      MYSQL_DATABASE: "homestead"
      MYSQL_USER: "homestead"
      MYSQL_PASSWORD: "secret"
    volumes:
     - mysqldata:/var/lib/mysql
    networks:
     - sdnet
  redis:
    image: redis:alpine
    volumes:
     - redisdata:/data
    networks:
     - sdnet
networks:
  sdnet:
    driver: "bridge"
volumes:
  mysqldata:
    driver: "local"
  redisdata:
    driver: "local"
```

Docker Compose

Create mariadb Container with Docker-compose :

vim docker-compose.yml

```
my-test:
  image: mariadb:latest
  environment:
        MYSQL_ROOT_PASSWORD: 123
```

docker-compose up -d

docker-compose ps

```
      Name                 Command            State    Ports
-------------------------------------------------------------
bin_my-test_1   docker-entrypoint.sh mysqld   Up      3306/tcp
```

Docker Compose

Create registry and registry-web Container with Docker-compose :

docker rm -f $(docker ps -qa)

vim docker-compose.yml

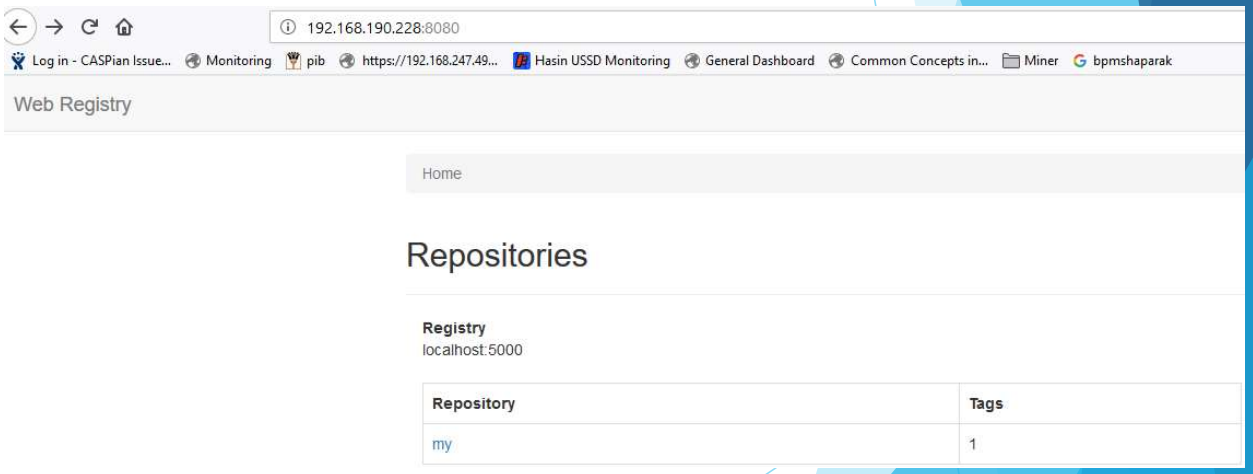
```
version: '3'
services:
 registry-srv:
    container_name: "registry-srv"
    image: registry:latest
    ports:
      - 5000:5000
 registry-web:
    container_name: "regitry-web"
    image: hyper/docker-registry-web
    environment:
      - REGISTRY_URL=http://registry-srv:5000/v2
      - REGISTRY_NAME=localhost:5000
    ports:
      - 8080:8080
    links:
      - registry-srv
```

docker-compose up -d

docker-compose ps

```
     Name                Command             State         Ports
-------------------------------------------------------------------------------
registry-srv   /entrypoint.sh /etc/docker ...   Up      0.0.0.0:5000->5000/tcp
regitry-web    start.sh                         Up      0.0.0.0:8080->8080/tcp
```

docker tag cent 127.0.0.1:5000/my
docker push 127.0.0.1:5000/my



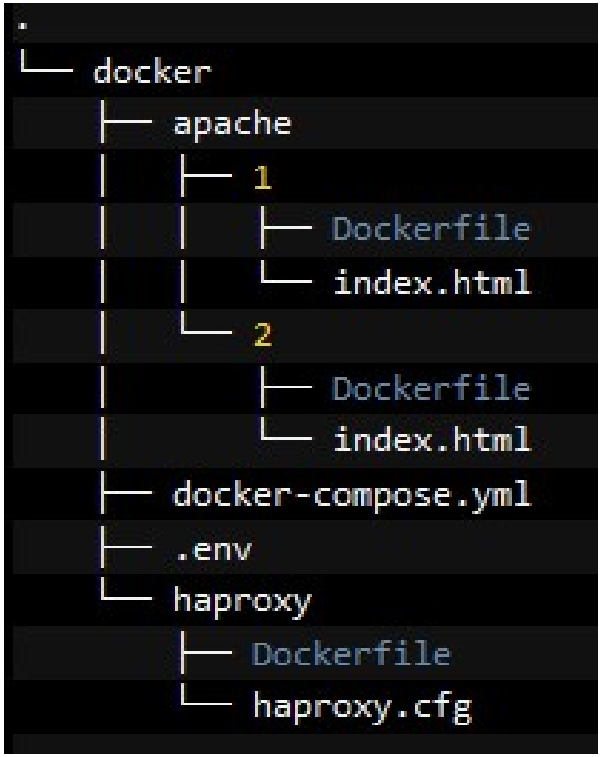
Docker Compose

Project Implement the Following Scenario 3 :

Creating a single HAProxy and two Apache containers with Docker compose

Create Directory ➔

Cd /use/local/bin/



IP : 192.168.0.11

Serving from Apache Server 1

IP : 192.168.0.22

Serving from Apache Server 2

IP : 192.168.0.33

Docker Compose

Project Implement the Following Scenario 3 :

Creating a single HAProxy and two Apache containers with Docker compose

Write and import Config Files to Path:

vim haproxy/haproxy.cfg

```
global
   log /dev/log local0
   log localhost local1 notice
   maxconn 2000
   daemon
defaults
   log global
   mode http
   option httplog
   option dontlognull
   retries 3
   timeout connect 5000
   timeout client 50000
   timeout server 50000
frontend http-in
   bind *:80
   default_backend webservers
backend webservers
   stats enable
   stats auth admin:admin
   stats uri /haproxy?stats
   balance roundrobin
   option httpchk
   option forwardfor
   option http-server-close
   server apache1 ${APACHE_1_IP}:${APACHE_EXPOSED_PORT} check
   server apache2 ${APACHE_2_IP}:${APACHE_EXPOSED_PORT} check
```

vim apache/1/index.html

Serving from Apache Server 1

vim apache/2/index.html

Serving from Apache Server 2

NOTE : Pwd : /usr/local/bin

Docker Compose

Project Implement the Following Scenario 3 :

Creating a single HAProxy and two Apache containers with Docker compose

Write Dockerfiles to Paths:

vim apache/1/Dockerfile

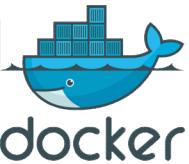
```
FROM httpd:2.4
COPY index.html /usr/local/apache2/htdocs/index.html
```

vim apache/2/Dockerfile

```
FROM httpd:2.4
COPY index.html /usr/local/apache2/htdocs/index.html
```

vim haproxy/Dockerfile

```
FROM haproxy:1.7
COPY haproxy.cfg /usr/local/etc/haproxy/haproxy.cfg
```



Docker Compose

Project Implement the Following Scenario 3 :

Creating a single HAProxy and two Apache containers with Docker compose

Write Environment Varibale to Paths:

vim /usr/local/bin/.env

```
COMPOSE_PROJECT_NAME=helloworld
APACHE_EXPOSED_PORT=80
APACHE_1_IP=192.168.0.11
APACHE_2_IP=192.168.0.22
HA_PROXY_IP=192.168.0.33
NETWORK_SUBNET=192.168.0.0/24
```

Docker Compose

Project Implement the Following Scenario 3 :

Creating a single HAProxy and two Apache containers with Docker compose

Write Docker-Compose to Paths:

vim /usr/local/bin/docker-compose.yml

```
version: '3'
services:
  apache_img_1:
    container_name: ${COMPOSE_PROJECT_NAME}_apache_con_1
    build: ./apache/1
    expose:
      - ${APACHE_EXPOSED_PORT}
    networks:
      public_net:
        ipv4_address: ${APACHE_1_IP}
  apache_img_2:
    container_name: ${COMPOSE_PROJECT_NAME}_apache_con_2
    build: ./apache/2
    expose:
      - ${APACHE_EXPOSED_PORT}
    networks:
      public_net:
        ipv4_address: ${APACHE_2_IP}
  haproxy_img:
    build: ./haproxy
    ports:
      - 80:80
    expose:
      - 80
    networks:
      public_net:
        ipv4_address: ${HA_PROXY_IP}
    environment:
      - APACHE_1_IP=${APACHE_1_IP}
      - APACHE_2_IP=${APACHE_2_IP}
      - APACHE_EXPOSED_PORT=${APACHE_EXPOSED_PORT}
networks:
  public_net:
    driver: bridge
    ipam:
      driver: default
      config:
        - subnet: ${NETWORK_SUBNET}
```

Docker Compose

Project Implement the Following Scenario 3 :
Creating a single HAProxy and two Apache containers with Docker compose

Validation : Test Docker-Compose File

Validate "docker-compose.yml" file and see the mapping.

docker-compose config

```
networks:
  public_net:
    driver: bridge
    ipam:
      config:
      - subnet: 192.168.0.0/24
      driver: default
services:
  apache_img_1:
    build:
      context: /usr/local/bin/apache/1
    container_name: helloworld_apache_con_1
    expose:
    - '80'
    networks:
      public_net:
        ipv4_address: 192.168.0.11
  apache_img_2:
    build:
      context: /usr/local/bin/apache/2
    container_name: helloworld_apache_con_2
    expose:
    - '80'
    networks:
      public_net:
        ipv4_address: 192.168.0.22
  haproxy_img:
    build:
      context: /usr/local/bin/haproxy
    environment:
      APACHE_1_IP: 192.168.0.11
      APACHE_2_IP: 192.168.0.22
      APACHE_EXPOSED_PORT: '80'
    expose:
    - 80
    networks:
      public_net:
        ipv4_address: 192.168.0.33
    ports:
    - 80:80/tcp
version: '3.0'
```

Docker Compose

Project Implement the Following Scenario 3 :
Creating a single HAProxy and two Apache containers with Docker compose

docker-compose up

```
Creating network "helloworld_public_net" with driver "bridge"
Building haproxy_img
Successfully tagged helloworld_haproxy_img:latest

Building apache_img_2
Successfully tagged helloworld_apache_img_2:latest

Building apache_img_1
Successfully tagged helloworld_apache_img_1:latest

Creating helloworld_apache_con_1 ... done
Creating helloworld_apache_con_1 ...
Creating helloworld_apache_con_2 ...

helloworld_apache_con_1 | 192.168.0.33 - - [03/Feb/2018:21:15:29 +0000] "OPTIONS / HTTP/1.0" 200 -
helloworld_apache_con_2 | 192.168.0.33 - - [03/Feb/2018:21:15:29 +0000] "OPTIONS / HTTP/1.0" 200 -
helloworld_apache_con_1 | 192.168.0.33 - - [03/Feb/2018:21:15:31 +0000] "OPTIONS / HTTP/1.0" 200 -
helloworld_apache_con_2 | 192.168.0.33 - - [03/Feb/2018:21:15:33 +0000] "OPTIONS / HTTP/1.0" 200 -
helloworld_apache_con_1 | 192.168.0.33 - - [03/Feb/2018:21:15:33 +0000] "OPTIONS / HTTP/1.0" 200 -
helloworld_apache_con_2 | 192.168.0.33 - - [03/Feb/2018:21:15:31 +0000] "OPTIONS / HTTP/1.0" 200 -
helloworld_apache_con_1 | 192.168.0.33 - - [03/Feb/2018:21:15:35 +0000] "OPTIONS / HTTP/1.0" 200 -
```

Docker Compose

Project Implement the Following Scenario 3 :

Creating a single HAProxy and two Apache containers with Docker compose

Confirmation :

docker images

REPOSITORY TAG IMAGE ID CREATED SIZE
helloworld_apache_img_2 latest 6f63653a9e68 9 minutes ago 177MB
helloworld_haproxy_img latest 363551ccafe6 9 minutes ago 136MB
helloworld_apache_img_1 latest 83bc617be089 9 minutes ago 177MB

docker network ls

NETWORK ID	NAME	DRIVER	SCOPE
c72c538d9025	helloworld_public_net	bridge	local

docker ps

CONTAINER ID	IMAGE	COMMAND	CREATED	STATUS	PORTS	NAMES
4e4291f3a95c	helloworld_apache_img_2	"httpd-foreground"	11 minutes ago Up	11 minutes	80/tcp	helloworld_apache_con_2
ebba54230552	helloworld_apache_img_1	"httpd-foreground"	11 minutes ago Up	11 minutes	80/tcp	helloworld_apache_con_1
a770b68939c5	helloworld_haproxy_img	"/docker-entrypoin..."	11 minutes ago Up	11 minutes	0.0.0.0:80->80/tcp	helloworld_haproxy_img_1

Docker Compose

Project Implement the Following Scenario 3 :
Creating a single HAProxy and two Apache containers with Docker compose

Test :

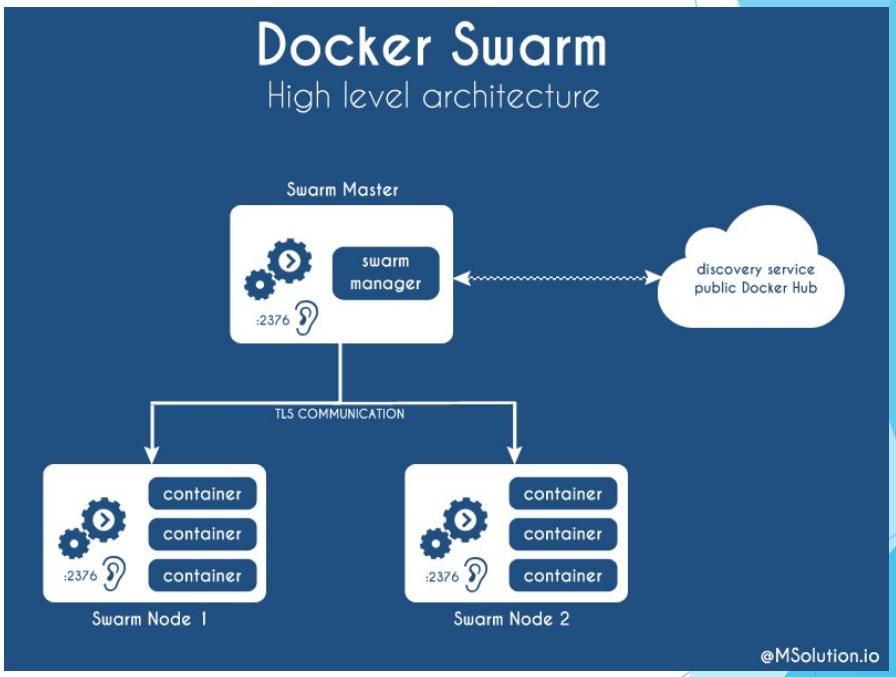
ab -n 10000 -c 30 http://192.168.0.33/

```
This is ApacheBench, Version 2.3 <$Revision: 1706008 $>
Copyright 1996 Adam Twiss, Zeus Technology Ltd, http://www.zeustech.net/
Licensed to The Apache Software Foundation, http://www.apache.org/

Benchmarking 192.168.0.33 (be patient)
Completed 1000 requests
Completed 2000 requests
Completed 3000 requests
Completed 4000 requests
Completed 5000 requests
Completed 6000 requests
Completed 7000 requests
Completed 8000 requests
Completed 9000 requests
Completed 10000 requests
Finished 10000 requests

Server Software: Apache/2.4.29
Server Hostname: 192.168.0.33
Server Port: 80

Document Path: /
Document Length: 29 bytes

Concurrency Level: 30
Time taken for tests: 2.943 seconds
Complete requests: 10000
Failed requests: 0
Total transferred: 2730000 bytes
HTML transferred: 290000 bytes
Requests per second: 3397.93 [#/sec] (mean)
Time per request: 8.829 [ms] (mean)
Time per request: 0.294 [ms] (mean, across all concurrent requests)
Transfer rate: 905.89 [Kbytes/sec] received

Connection Times (ms)
min mean[+/-sd] median max
Connect: 0 0 0.3 0 6
Processing: 0 9 5.4 8 153
Waiting: 0 8 5.4 8 153
Total: 0 9 5.4 8 154

Percentage of the requests served within a certain time (ms)
50% 8
66% 9
75% 9
80% 10
90% 11
95% 13
98% 16
99% 25
100% 154 (longest request)
```

Docker Cluster Swarm

Docker Swarm Structure:

IP1:192.168.102.165 : Docker_Node1_165
IP2:192.168.102.169 : Docker_Node2_169
IP3:192.168.102.117 : Docker_Node3_117



Docker Cluster Swarm

Install Docker Swarm On CentOS 7 :

Preinstall : On 3 Nodes

1- Set IP
2- Selinux Disable : vim /etc/sysconfig/selinux
3- Set Hostname : vim /etc/hostname ➔ Docker_Node1_165 , Docker_Node1_169 , Docker_Node1_117
4- ping 4.2.2.4 with VPN
5- vim /etc/hosts ➔

192.168.102.165	Docker_Node1_165
192.168.102.169	Docker_Node2_169
192.168.102.117	Docker_Node3_117

6- reboot

Note : Stop Firewall On 3 Nodes

```
systemctl stop iptables
systemctl stop firewalld
systemctl disable iptables
systemctl disable firewalld
systemctl enable docker
```

Install Docker_CE : On 3 Nodes

```
1- yum remove docker \
                docker-common \
                docker-selinux \
                docker-engine

2- yum install -y yum-utils vim
3- yum-config-manager \
   --add-repo \
   https://download.docker.com/linux/centos/docker-ce.repo
4- yum-config-manager --disable docker-ce-edge
5- yum makecache fast
6- yum install docker-ce
7- systemctl start docker
8- ps -ef | grep docker
```

Docker Cluster Swarm

Install Docker Swarm On CentOS 7 :

Initial SWARM :

On Node Docker_Node1_165 :

[root@Docker_Node1_165 ~]# **docker swarm init --advertise-addr 192.168.102.165**

OutPut :

Swarm initialized: current node (k069mrt4c3su7rncogu7ur7zm) is now a manager.

To add a worker to this swarm, run the following command:

docker swarm join --token SWMTKN-1-0szukol3jkbxcpcxlh5i327kozevgmt6ux2bhtzptvfnqa9zor-11k0ouknrab50fgegb2pq6pwz 192.168.102.165:2377

To add a manager to this swarm, run 'docker swarm join-token manager' and follow the instructions.

On Node Docker_Node2_169 :

docker swarm join --token SWMTKN-1-0szukol3jkbxcpcxlh5i327kozevgmt6ux2bhtzptvfnqa9zor-11k0ouknrab50fgegb2pq6pwz 192.168.102.165:2377

This node joined a swarm as a worker.

On Node Docker_Node3_117 :

docker swarm join --token SWMTKN-1-0szukol3jkbxcpcxlh5i327kozevgmt6ux2bhtzptvfnqa9zor-11k0ouknrab50fgegb2pq6pwz 192.168.102.165:2377

This node joined a swarm as a worker.

Docker Cluster Swarm

Install Docker Swarm On CentOS 7 :

Initial SWARM :

On Node Docker_Node1_165 :

[root@Docker_Node1_165 ~]# **docker node ls**

ID	HOSTNAME	STATUS	AVAILABILITY	MANAGER	STATUS	ENGINE VERSION
k069mrt4c3su7rncogu7ur7zm *	Docker_Node1_165	Ready	Active	Leader		18.03.0-ce
65s8bq479upkdm0wocse90zgw	Docker_Node2_169	Ready	Active			18.03.0-ce
247rtgx761a1two57evl1rnu3	Docker_Node3_117	Ready	Active			18.03.0-ce

On Node Docker_Node2_169 :

[root@Docker_Node2_169 ~]# **docker node ls**

Error response from daemon: **This node is not a swarm manager**. Worker nodes can't be used to view or modify cluster state. Please run this command on a manager node or promote the current node to a manager.

On Node Docker_Node3_117 :

[root@Docker_Node2_169 ~]# **docker node ls**

Error response from daemon: **This node is not a swarm manager**. Worker nodes can't be used to view or modify cluster state. Please run this command on a manager node or promote the current node to a manager.

Docker Cluster Swarm

Install Docker Swarm On CentOS 7 :

Initial SWARM :

On Node Docker_Node1_165 : ➔ All Node is Leader

[root@Docker_Node1_165 ~]# docker node promote Docker_Node2_169

Node Docker_Node2_169 promoted to a manager in the swarm.

[root@Docker_Node1_165 ~]# docker node promote Docker_Node3_117

Node Docker_Node3_117 promoted to a manager in the swarm.

[root@Docker_Node1_165 ~]# docker node ls

ID	HOSTNAME	STATUS	AVAILABILITY	MANAGER STATUS	ENGINE VERSION
k069mrt4c3su7rncogu7ur7zm *	Docker_Node1_165	Ready	Active	**Leader**	18.03.0-ce
65s8bq479upkdm0wocse90zgw	Docker_Node2_169	Ready	Active	**Reachable**	18.03.0-ce
247rtgx761a1two57evl1rnu3	Docker_Node3_117	Ready	Active	**Reachable**	18.03.0-ce

[root@Docker_Node2_169 ~]# docker node ls

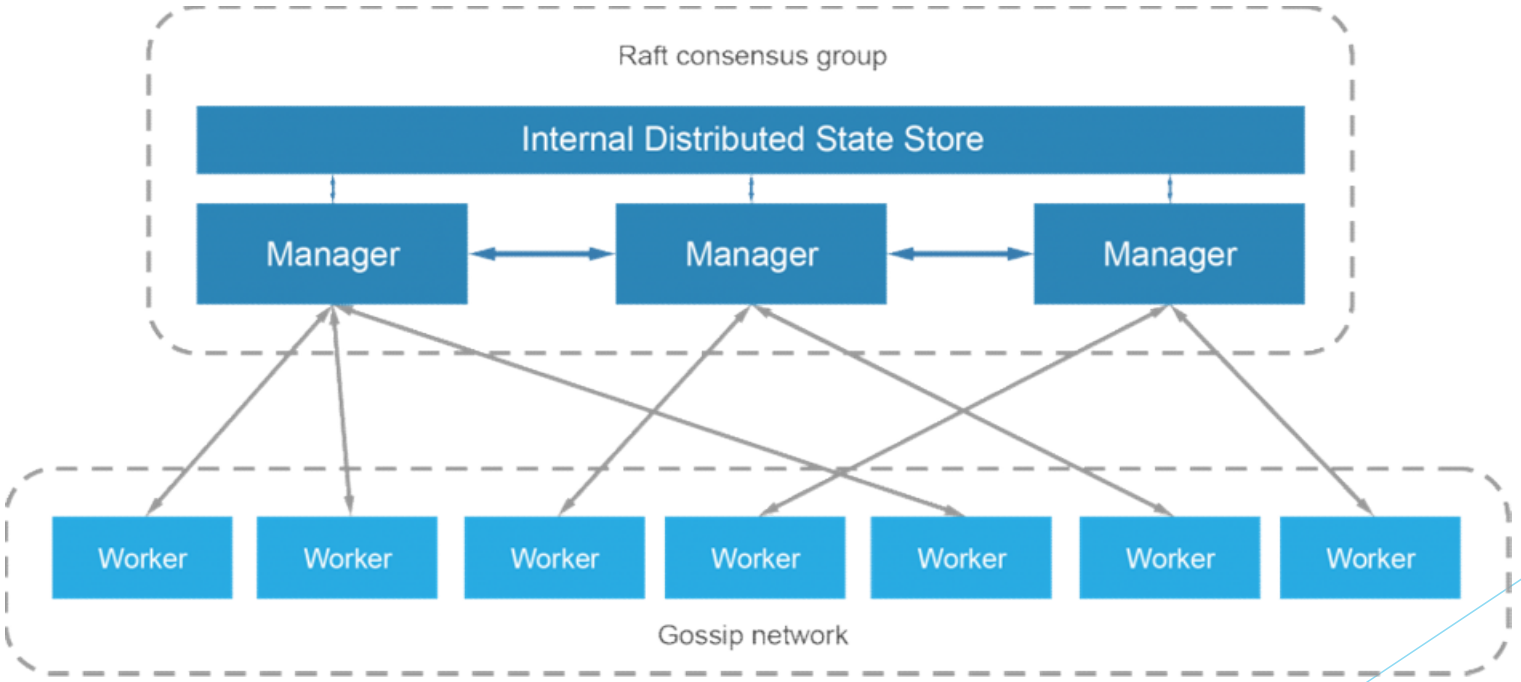
ID	HOSTNAME	STATUS	AVAILABILITY	MANAGER STATUS	ENGINE VERSION
k069mrt4c3su7rncogu7ur7zm	Docker_Node1_165	Ready	Active	Leader	18.03.0-ce
65s8bq479upkdm0wocse90zgw *	Docker_Node2_169	Ready	Active	Reachable	18.03.0-ce
247rtgx761a1two57evl1rnu3	Docker_Node3_117	Ready	Active	Reachable	18.03.0-ce

[root@Docker_Node3_117 ~]# docker node ls

ID	HOSTNAME	STATUS	AVAILABILITY	MANAGER STATUS	ENGINE VERSION
k069mrt4c3su7rncogu7ur7zm	Docker_Node1_165	Ready	Active	Leader	18.03.0-ce
65s8bq479upkdm0wocse90zgw	Docker_Node2_169	Ready	Active	Reachable	18.03.0-ce
247rtgx761a1two57evl1rnu3 *	Docker_Node3_117	Ready	Active	Reachable	18.03.0-ce

Docker Cluster Swarm

Initial Docker Swarm Promote :



Docker Cluster Swarm

Install Docker Swarm On CentOS 7 :

Initial SWARM :

On Node Docker_Node1_165 : ➔ All Node is Leader

[root@Docker_Node1_165 ~]# reboot

[root@Docker_Node2_169 ~]# docker node ls

ID	HOSTNAME	STATUS	AVAILABILITY	MANAGER STATUS	ENGINE VERSION
k069mrt4c3su7rncogu7ur7zm	Docker_Node1_165	Unknown	Active	Unreachable	18.03.0-ce
65s8bq479upkdm0wocse90zgw *	Docker_Node2_169	Ready	Active	Leader	18.03.0-ce
247rtgx761a1two57evl1rnu3	Docker_Node3_117	Ready	Active	Reachable	18.03.0-ce

[root@Docker_Node2_169 ~]# docker node ls

ID	HOSTNAME	STATUS	AVAILABILITY	MANAGER STATUS	ENGINE VERSION
k069mrt4c3su7rncogu7ur7zm	Docker_Node1_165	Down	Active	Unreachable	18.03.0-ce
65s8bq479upkdm0wocse90zgw *	Docker_Node2_169	Ready	Active	Leader	18.03.0-ce
247rtgx761a1two57evl1rnu3	Docker_Node3_117	Ready	Active	Reachable	18.03.0-ce

[root@Docker_Node2_169 ~]# docker node ls

ID	HOSTNAME	STATUS	AVAILABILITY	MANAGER STATUS	ENGINE VERSION
k069mrt4c3su7rncogu7ur7zm	Docker_Node1_165	Ready	Active	Reachable	18.03.0-ce
65s8bq479upkdm0wocse90zgw *	Docker_Node2_169	Ready	Active	Reachable	18.03.0-ce
247rtgx761a1two57evl1rnu3	Docker_Node3_117	Ready	Active	Leader	18.03.0-ce

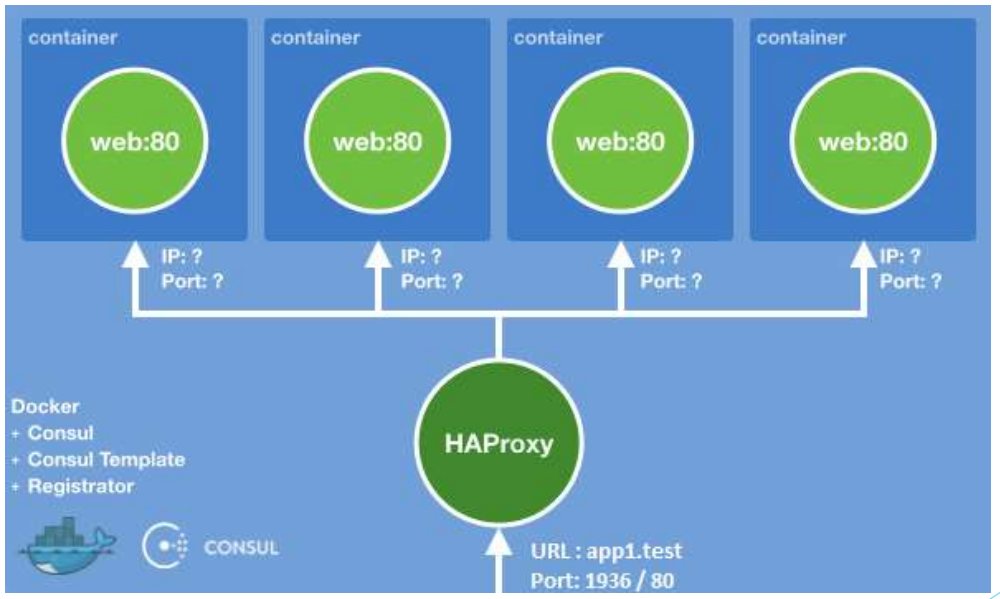
View all Status For Test:

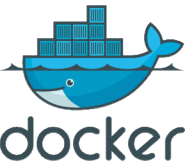
Note : watch -d -n 1 "docker node ls"

Implement Docker Cluster Swarm dockercloud/haproxy and dockercloud/hello-world

Docker Swarm Network Overlay and Service :

- Container1 : dockercloud/haproxy (Num 1)
- Container2 : dockercloud/hello-world (Num 4)
- Haproxy Publish Port : 1936/80
- Docker Cluster Virtual Host Name : app1.test





Implement Docker Cluster Swarm
dockercloud/haproxy and dockercloud/hello-world

Create Network :

[root@Docker_Node1_229 ~]# docker network create -d overlay proxy

edxbij8y5xx4bn0o8lumlv0kc

[root@Docker_Node1_229 ~]# docker network ls

NETWORK ID	NAME	DRIVER	SCOPE
0b2787e3d6a2	bridge	bridge	local
29b3970ac91f	docker_gwbridge	bridge	local
ab29dc771773	host	host	local
rw3wtziaya4j	ingress	overlay	swarm
1c2e7108c479	none	null	local
edxbij8y5xx4	**proxy**	**overlay**	**swarm**

Implement Docker Cluster Swarm
dockercloud/haproxy and dockercloud/hello-world

Create Service and join to network and start haproxy Container :

```
[root@Docker_Node1_229 ~]#
docker service create --name haproxy --network proxy --mount target=/var/run/docker.sock,source=/var/run/docker.sock,type=bind -p 80:80 -p 1936:1936 --constraint "node.role == manager" dockercloud/haproxy
```

OutPut :

```
ojz5kimsyv03itsmyirmwqz1t
overall progress: 0 out of 1 tasks
overall progress: 0 out of 1 tasks
overall progress: 1 out of 1 tasks
1/1: running   [==================================================>]
verify: Service converged
```

[root@Docker_Node1_229 ~]# docker service ls

ID	NAME	MODE	REPLICAS	IMAGE	PORTS
ojz5kimsyv03	haproxy	replicated	1/1	dockercloud/haproxy:latest	*:80->80/tcp, *:1936->1936/tcp

Implement Docker Cluster Swarm
dockercloud/haproxy and dockercloud/hello-world

Create Service and join to network and start hello-world Container :

```
[root@Docker_Node1_229 ~]#
docker  service create -e SERVICE_PORTS="80"  --name app2 --network proxy  --replicas 4   dockercloud/hello-world
```

OutPut :

```
y49ldyr1g0n25m189lhx6vjuy
overall progress: 1 out of 2 tasks
overall progress: 2 out of 2 tasks
1/2: running
[==================================================>]
2/2: running
[==================================================>]
verify: Service converged
```

[root@Docker_Node1_229 ~]# docker service ls

ID	NAME	MODE	REPLICAS	IMAGE	PORTS
y49ldyr1g0n2	app2	replicated	2/2	dockercloud/hello-world:latest	
ojz5kimsyv03	haproxy	replicated	1/1	dockercloud/haproxy:latest	*:80->80/tcp, *:1936->1936/tcp

Implement Docker Cluster Swarm
dockercloud/haproxy and dockercloud/hello-world

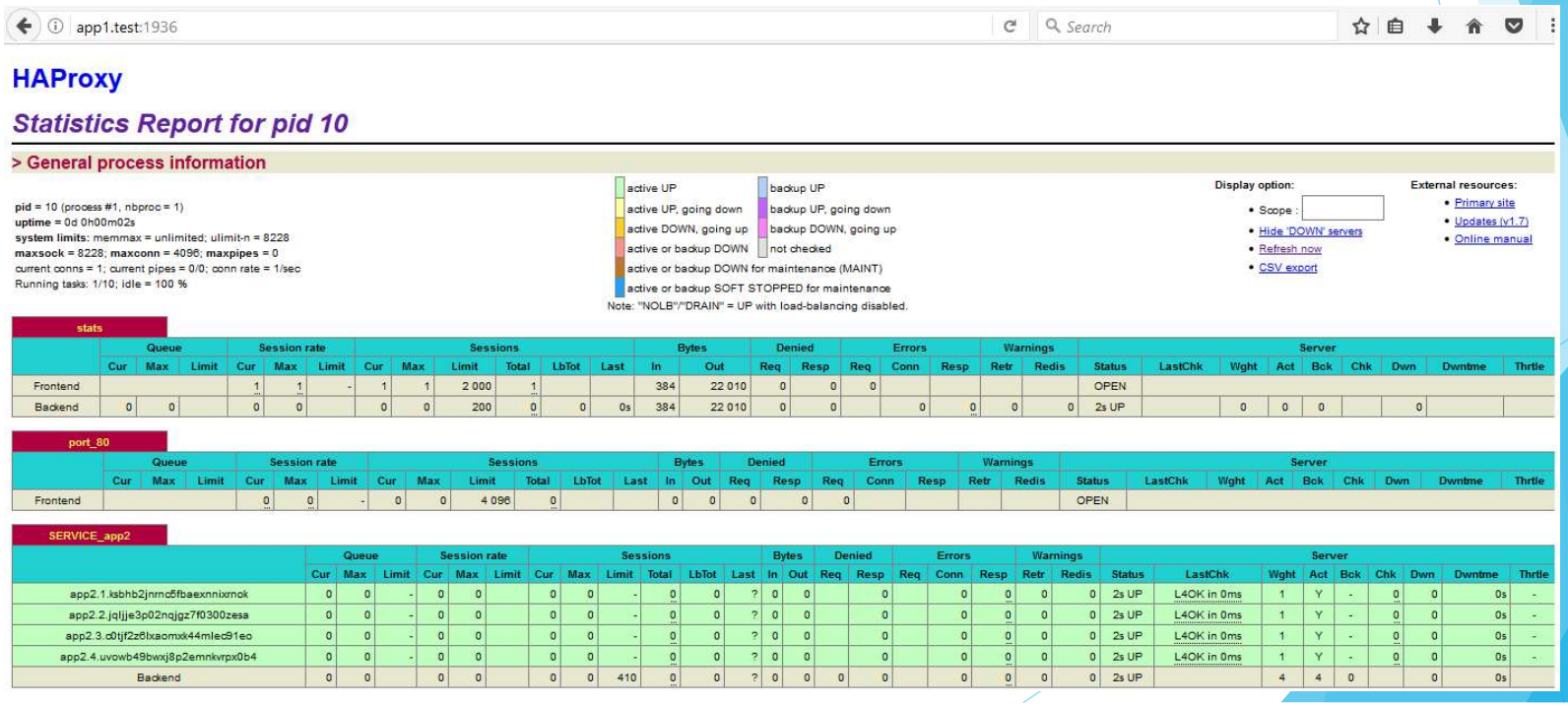
Test :

edit hosts on windows mashine OR /etc/hosts

192.168.102.117 app1.test
192.168.102.169 app1.test
192.168.102.165 app1.test

http://192.168.102.169:1936/
username : stats
password : stats

HaProxy , DashBoard



app1.test:1936

HAProxy

Statistics Report for pid 10

> General process information

pid = 10 (process #1, nbproc = 1)
uptime = 0d 0h00m02s
system limits: memmax = unlimited; ulimit-n = 8228
maxsock = 8228; maxconn = 4096; maxpipes = 0
current conns = 1; current pipes = 0/0; conn rate = 1/sec
Running tasks: 1/10; idle = 100 %

active UP | backup UP
active UP, going down | backup UP, going down
active DOWN, going up | backup DOWN, going up
active or backup DOWN | not checked
active or backup DOWN for maintenance (MAINT)
active or backup SOFT STOPPED for maintenance
Note: "NOLB"/"DRAIN" = UP with load-balancing disabled.

Display option:
- Scope :
- Hide 'DOWN' servers
- Refresh now
- CSV export

External resources:
- Primary site
- Updates (v1.7)
- Online manual

stats

	Queue			Session rate			Sessions						Bytes		Denied		Errors			Warnings		Server								
	Cur	Max	Limit	Cur	Max	Limit	Cur	Max	Limit	Total	LbTot	Last	In	Out	Req	Resp	Req	Conn	Resp	Retr	Redis	Status	LastChk	Wght	Act	Bck	Chk	Dwn	Dwntme	Thrtle
Frontend				1	1	-	1	1	2 000	1			384	22 010	0	0	0					OPEN								
Backend	0	0		0	0		0	0	200	0	0	0s	384	22 010	0	0		0	0	0	0	2s UP		0	0	0		0		

port_80

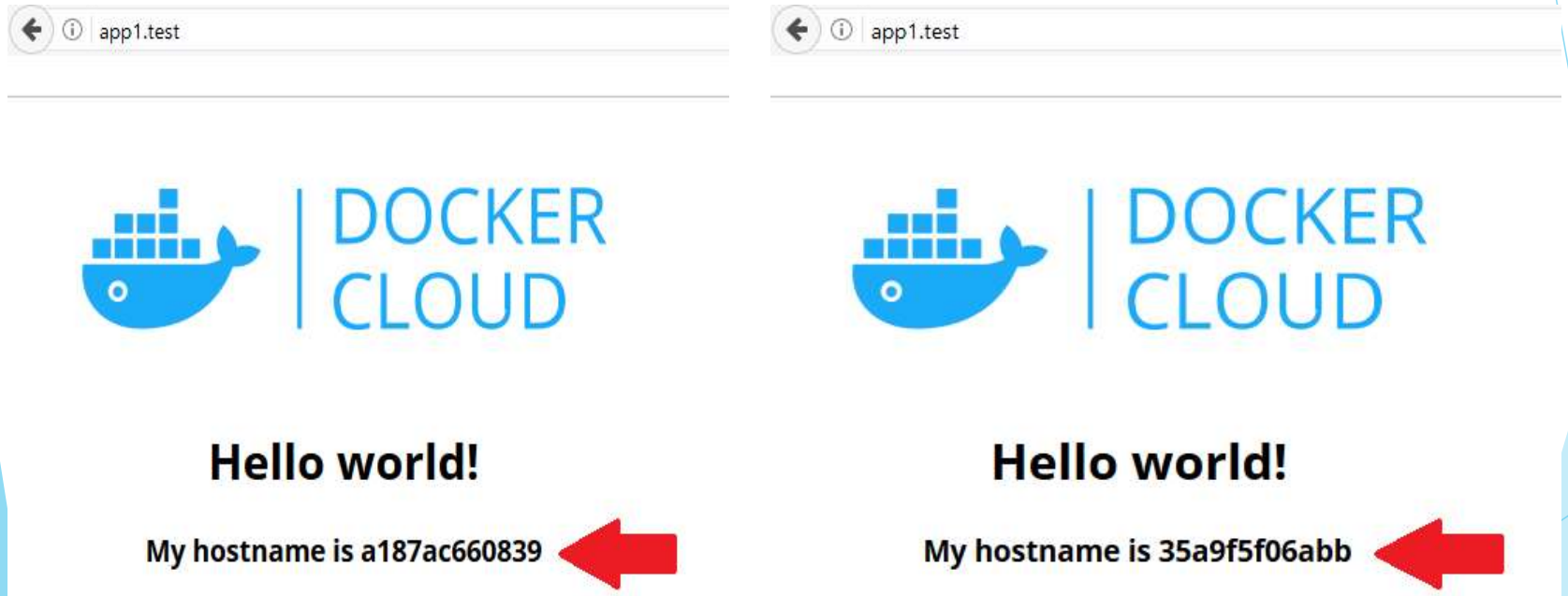
	Queue			Session rate			Sessions						Bytes		Denied		Errors			Warnings		Server								
	Cur	Max	Limit	Cur	Max	Limit	Cur	Max	Limit	Total	LbTot	Last	In	Out	Req	Resp	Req	Conn	Resp	Retr	Redis	Status	LastChk	Wght	Act	Bck	Chk	Dwn	Dwntme	Thrtle
Frontend				0	0	-	0	0	4 096	0			0	0	0	0	0					OPEN								

SERVICE_app2

	Queue			Session rate			Sessions						Bytes		Denied		Errors			Warnings		Server								
	Cur	Max	Limit	Cur	Max	Limit	Cur	Max	Limit	Total	LbTot	Last	In	Out	Req	Resp	Req	Conn	Resp	Retr	Redis	Status	LastChk	Wght	Act	Bck	Chk	Dwn	Dwntme	Thrtle
app2.1.ksbhb2jnrnc5fbaexnnixrnok	0	0	-	0	0		0	0	-	0	0	?	0	0		0		0	0	0	0	2s UP	L4OK in 0ms	1	Y	-	0	0	0s	-
app2.2.jqljje3p02nqjgz7f0300zesa	0	0	-	0	0		0	0	-	0	0	?	0	0		0		0	0	0	0	2s UP	L4OK in 0ms	1	Y	-	0	0	0s	-
app2.3.c0tjf2z6lxaomxk44mlec91eo	0	0	-	0	0		0	0	-	0	0	?	0	0		0		0	0	0	0	2s UP	L4OK in 0ms	1	Y	-	0	0	0s	-
app2.4.uvowb49bwxj8p2emnkvrpx0b4	0	0	-	0	0		0	0	-	0	0	?	0	0		0		0	0	0	0	2s UP	L4OK in 0ms	1	Y	-	0	0	0s	-
Backend	0	0		0	0		0	0	410	0	0	?	0	0	0	0		0	0	0	0	2s UP		4	4	0		0	0s	

Docker Cluster Swarm Demo with dockercloud/haproxy and dockercloud/hello-world

Implementing Hello-World (1-4), Change Request with User



Implement Docker Cluster Swarm
dockercloud/haproxy and dockercloud/hello-world

[root@Docker_Node1_229 ~]# docker service scale app2=10

```
app2 scaled to 10
overall progress: 10 out of 10 tasks
1/10: running   [==================================================>]
2/10: running   [==================================================>]
3/10: running   [==================================================>]
4/10: running   [==================================================>]
5/10: running   [==================================================>]
6/10: running   [==================================================>]
7/10: running   [==================================================>]
8/10: running   [==================================================>]
9/10: running   [==================================================>]
10/10: running   [==================================================>]
verify: Service converged
```

[root@Docker_Node2_230 ~]# docker service ls

ID	NAME	MODE	REPLICAS	IMAGE	PORTS
y49ldyr1g0n2	app2	replicated	10/10	dockercloud/hello-world:latest	
ojz5kimsyv03	haproxy	replicated	1/1	dockercloud/haproxy:latest	*:80->80/tcp, *:1936->1936/tcp

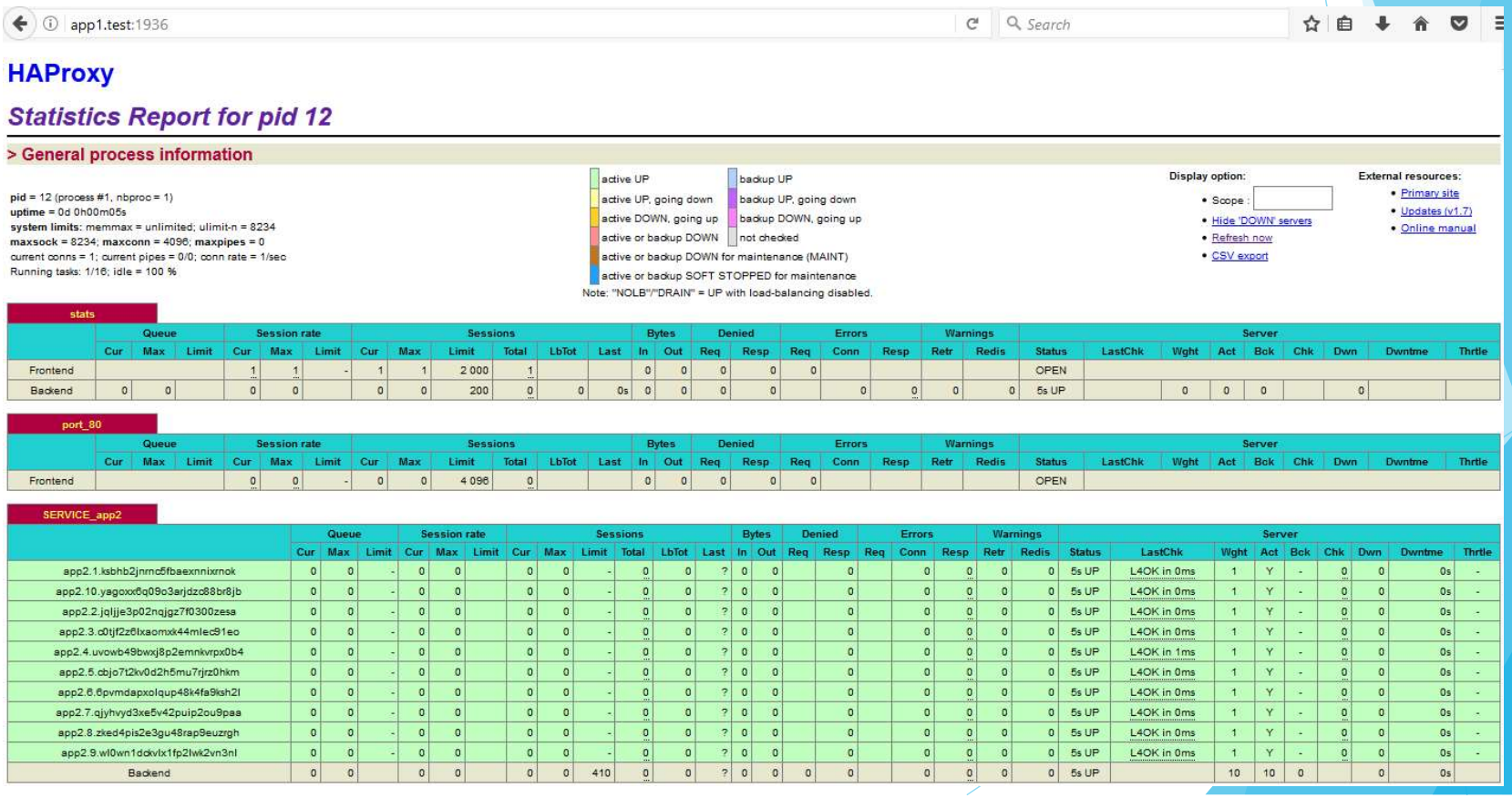
Note : Update Virtual Host

docker service update --env-add VIRTUAL_HOST=app1.test app2

Implement Docker Cluster Swarm
dockercloud/haproxy and dockercloud/hello-world

Extend Web Server Hello-World on Cluster With a Command :

docker service scale app2=10 , docker node ps



app1.test:1936

Search

HAProxy

Statistics Report for pid 12

> General process information

pid = 12 (process #1, nbproc = 1)
uptime = 0d 0h00m05s
system limits: memmax = unlimited; ulimit-n = 8234
maxsock = 8234; **maxconn** = 4096; **maxpipes** = 0
current conns = 1; current pipes = 0/0; conn rate = 1/sec
Running tasks: 1/16; idle = 100 %

active UP
active UP, going down
active DOWN, going up
active or backup DOWN
active or backup DOWN for maintenance (MAINT)
active or backup SOFT STOPPED for maintenance
backup UP
backup UP, going down
backup DOWN, going up
not checked
Note: "NOLB"/"DRAIN" = UP with load-balancing disabled.

Display option:
- Scope :
- Hide 'DOWN' servers
- Refresh now
- CSV export

External resources:
- Primary site
- Updates (v1.7)
- Online manual

stats

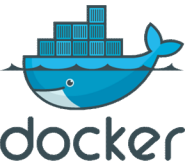
	Queue			Session rate			Sessions						Bytes		Denied		Errors			Warnings		Server								
	Cur	Max	Limit	Cur	Max	Limit	Cur	Max	Limit	Total	LbTot	Last	In	Out	Req	Resp	Req	Conn	Resp	Retr	Redis	Status	LastChk	Wght	Act	Bck	Chk	Dwn	Dwntme	Thrtle
Frontend				1	1	-	1	1	2 000	1			0	0	0	0	0					OPEN								
Backend	0	0		0	0		0	0	200	0	0	0s	0	0	0	0		0	0	0	0	5s UP		0	0	0		0		

port_80

	Queue			Session rate			Sessions						Bytes		Denied		Errors			Warnings		Server								
	Cur	Max	Limit	Cur	Max	Limit	Cur	Max	Limit	Total	LbTot	Last	In	Out	Req	Resp	Req	Conn	Resp	Retr	Redis	Status	LastChk	Wght	Act	Bck	Chk	Dwn	Dwntme	Thrtle
Frontend				0	0	-	0	0	4 096	0			0	0	0	0	0					OPEN								

SERVICE_app2

	Queue			Session rate			Sessions						Bytes		Denied		Errors			Warnings		Server								
	Cur	Max	Limit	Cur	Max	Limit	Cur	Max	Limit	Total	LbTot	Last	In	Out	Req	Resp	Req	Conn	Resp	Retr	Redis	Status	LastChk	Wght	Act	Bck	Chk	Dwn	Dwntme	Thrtle
app2.1.ksbhb2jnrnc5fbaexnnixrnok	0	0	-	0	0		0	0	-	0	0	?	0	0		0		0	0	0	0	5s UP	L4OK in 0ms	1	Y	-	0	0	0s	-
app2.10.yagoxx6q09o3arjdzc88br8jb	0	0	-	0	0		0	0	-	0	0	?	0	0		0		0	0	0	0	5s UP	L4OK in 0ms	1	Y	-	0	0	0s	-
app2.2.jqljje3p02nqjgz7f0300zesa	0	0	-	0	0		0	0	-	0	0	?	0	0		0		0	0	0	0	5s UP	L4OK in 0ms	1	Y	-	0	0	0s	-
app2.3.c0tjf2z6lxaomxk44mlec91eo	0	0	-	0	0		0	0	-	0	0	?	0	0		0		0	0	0	0	5s UP	L4OK in 0ms	1	Y	-	0	0	0s	-
app2.4.uvowb49bwxj8p2emnkvrpx0b4	0	0	-	0	0		0	0	-	0	0	?	0	0		0		0	0	0	0	5s UP	L4OK in 1ms	1	Y	-	0	0	0s	-
app2.5.cbjo7t2kv0d2h5mu7rjrz0hkm	0	0	-	0	0		0	0	-	0	0	?	0	0		0		0	0	0	0	5s UP	L4OK in 0ms	1	Y	-	0	0	0s	-
app2.6.6pvmdapxolqup48k4fa9ksh2l	0	0	-	0	0		0	0	-	0	0	?	0	0		0		0	0	0	0	5s UP	L4OK in 0ms	1	Y	-	0	0	0s	-
app2.7.qjyhvyd3xe5v42puip2ou9paa	0	0	-	0	0		0	0	-	0	0	?	0	0		0		0	0	0	0	5s UP	L4OK in 0ms	1	Y	-	0	0	0s	-
app2.8.zked4pis2e3gu48rap9euzrgh	0	0	-	0	0		0	0	-	0	0	?	0	0		0		0	0	0	0	5s UP	L4OK in 0ms	1	Y	-	0	0	0s	-
app2.9.wl0wn1dckvlx1fp2lwk2vn3nl	0	0	-	0	0		0	0	-	0	0	?	0	0		0		0	0	0	0	5s UP	L4OK in 0ms	1	Y	-	0	0	0s	-
Backend	0	0		0	0		0	0	410	0	0	?	0	0	0	0		0	0	0	0	5s UP		10	10	0		0	0s	



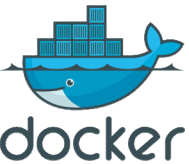
Implement Docker Cluster Swarm
dockercloud/haproxy and dockercloud/hello-world

[root@Docker_Node1_165 ~]# docker node ps

ID	NAME	IMAGE	NODE	DESIRED STATE	CURRENT STATE	ERROR	PORTS
rbdrwuhbnzpy	app2.1	dockercloud/hello-world:latest	Docker_Node1_229	Shutdown	Shutdown 31 minutes ago		
gcm3faybtrmv	app2.3	dockercloud/hello-world:latest	Docker_Node1_229	Running	Running 22 minutes ago		
8s68fs8ii1la	app2.4	dockercloud/hello-world:latest	Docker_Node1_229	Running	Running 42 minutes ago		
yebcx74o5uv2	_ app2.4	dockercloud/hello-world:latest	Docker_Node1_229	Shutdown	Shutdown 43 minutes ago		
t45ewa1fsbv5	app2.5	dockercloud/hello-world:latest	Docker_Node1_229	Running	Running 22 minutes ago		
500b17d127jx	app2.7	dockercloud/hello-world:latest	Docker_Node1_229	Running	Running 32 minutes ago		
xi900fwglb8a	app2.8	dockercloud/hello-world:latest	Docker_Node1_229	Running	Running 22 minutes ago		

[root@Docker_Node3_117 ~]# docker node ps

ID	NAME	IMAGE	NODE	DESIRED STATE	CURRENT STATE	ERROR	PORTS
qcyj6785hkhq	app2.1	dockercloud/hello-world:latest	Docker_Node3_231	Running	Running 33 minutes ago		
8t9s2rvjh412	haproxy.1	dockercloud/haproxy:latest	Docker_Node3_231	Running	Running 2 hours ago		
p4khvy8ddtc9	app2.2	dockercloud/hello-world:latest	Docker_Node3_231	Running	Running 33 minutes ago		
y41nrrg8tugs	_ app2.2	dockercloud/hello-world:latest	Docker_Node3_231	Shutdown	Shutdown 33 minutes ago		
ngmbwyy91aye	app2.6	dockercloud/hello-world:latest	Docker_Node3_231	Running	Running 23 minutes ago		
xjklmekj4nnt	app2.9	dockercloud/hello-world:latest	Docker_Node3_231	Running	Running 24 minutes ago		
rg4zfhilqpvg	app2.10	dockercloud/hello-world:latest	Docker_Node3_231	Running	Running 24 minutes ago		



Implement Docker Cluster Swarm dockercloud/haproxy and dockercloud/hello-world

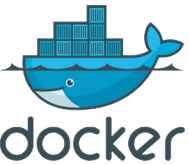
Delete Service :

[root@Docker_Node1_229 ~]# docker service rm app2

Service Info :

[root@Docker_Node1_229 ~]# docker service inspect app2


```
[
    {
        "ID": "y49ldyr1g0n25m189lhx6vjuy",
        "Version": {
            "Index": 329
        },
        "CreatedAt": "2018-04-05T14:16:43.549666013Z",
        "UpdatedAt": "2018-04-05T15:30:15.222802113Z",
        "Spec": {
            "Name": "app2",
            "Labels": {},
            "TaskTemplate": { ….
```



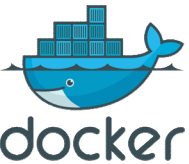
Implement Docker Cluster Swarm
dockercloud/haproxy and dockercloud/hello-world

[root@Docker_Node1_229 ~]# docker service logs app2

```
app2.2.y41nrrg8tugs@Docker_Node3_231  | 10.0.0.6 - - [05/Apr/2018:14:51:28 +0000] "GET /logo.png HTTP/1.1" 200 13133 "http://app1.test/" "Mozilla/5.0 (Windows NT 10.0; Win64; x64; rv:59.0) Gecko/20100101 Firefox/59.0"
app2.2.y41nrrg8tugs@Docker_Node3_231  | 10.0.0.6 - - [05/Apr/2018:14:59:13 +0000] "GET / HTTP/1.1" 200 485 "-" "Mozilla/5.0 (Windows NT 10.0; Win64; x64; rv:59.0) Gecko/20100101 Firefox/59.0"
app2.2.y41nrrg8tugs@Docker_Node3_231  | 10.0.0.6 - - [05/Apr/2018:15:05:44 +0000] "GET / HTTP/1.1" 200 485 "-" "Mozilla/5.0 (Windows NT 10.0; Win64; x64; rv:59.0) Gecko/20100101 Firefox/59.0"
app2.2.y41nrrg8tugs@Docker_Node3_231  | 10.0.0.6 - - [05/Apr/2018:15:05:47 +0000] "GET /logo.png HTTP/1.1" 200 13133 "http://app1.test/" "Mozilla/5.0 (Windows NT 10.0; Win64; x64; rv:59.0) Gecko/20100101 Firefox/59.0"
app2.2.y41nrrg8tugs@Docker_Node3_231  | 10.0.0.6 - - [05/Apr/2018:15:05:47 +0000] "GET /logo.png HTTP/1.1" 200 13133 "http://app1.test/" "Mozilla/5.0 (Windows NT 10.0; Win64; x64; rv:59.0) Gecko/20100101 Firefox/59.0"
app2.2.y41nrrg8tugs@Docker_Node3_231  | 10.0.0.6 - - [05/Apr/2018:15:05:50 +0000] "GET /logo.png HTTP/1.1" 200 13133 "http://app1.test/" "Mozilla/5.0 (Windows NT 10.0; Win64; x64; rv:59.0) Gecko/20100101 Firefox/59.0"
app2.2.y41nrrg8tugs@Docker_Node3_231  | 10.0.0.6 - - [05/Apr/2018:15:05:52 +0000] "GET /logo.png HTTP/1.1" 200 13133 "http://app1.test/" "Mozilla/5.0 (Windows NT 10.0; Win64; x64; rv:59.0) Gecko/20100101 Firefox/59.0"
app2.2.y41nrrg8tugs@Docker_Node3_231  | 10.0.0.6 - - [05/Apr/2018:15:05:54 +0000] "GET /logo.png HTTP/1.1" 200 13133 "http://app1.test/" "Mozilla/5.0 (Windows NT 10.0; Win64; x64; rv:59.0) Gecko/20100101 Firefox/59.0"
app2.2.y41nrrg8tugs@Docker_Node3_231  | 10.0.0.6 - - [05/Apr/2018:15:05:59 +0000] "GET / HTTP/1.1" 200 485 "-" "Mozilla/5.0 (Windows NT 10.0; Win64; x64; rv:59.0) Gecko/20100101 Firefox/59.0
[root@Docker_Node1_229 ~]#
```

[root@Docker_Node1_229 ~]# docker service logs -f app2

```
app2.2.y41nrrg8tugs@Docker_Node3_231  | 10.0.0.6 - - [05/Apr/2018:14:51:28 +0000] "GET /logo.png HTTP/1.1" 200 13133 "http://app1.test/" "Mozilla/5.0 (Windows NT 10.0; Win64; x64; rv:59.0) Gecko/20100101 Firefox/59.0"
app2.2.y41nrrg8tugs@Docker_Node3_231  | 10.0.0.6 - - [05/Apr/2018:14:59:13 +0000] "GET / HTTP/1.1" 200 485 "-" "Mozilla/5.0 (Windows NT 10.0; Win64; x64; rv:59.0) Gecko/20100101 Firefox/59.0"
app2.2.y41nrrg8tugs@Docker_Node3_231  | 10.0.0.6 - - [05/Apr/2018:15:05:44 +0000] "GET / HTTP/1.1" 200 485 "-" "Mozilla/5.0 (Windows NT 10.0; Win64; x64; rv:59.0) Gecko/20100101 Firefox/59.0"
app2.2.y41nrrg8tugs@Docker_Node3_231  | 10.0.0.6 - - [05/Apr/2018:15:05:47 +0000] "GET /logo.png HTTP/1.1" 200 13133 "http://app1.test/" "Mozilla/5.0 (Windows NT 10.0; Win64; x64; rv:59.0) Gecko/20100101 Firefox/59.0"
app2.2.y41nrrg8tugs@Docker_Node3_231  | 10.0.0.6 - - [05/Apr/2018:15:05:47 +0000] "GET /logo.png HTTP/1.1" 200 13133 "http://app1.test/" "Mozilla/5.0 (Windows NT 10.0; Win64; x64; rv:59.0) Gecko/20100101 Firefox/59.0"
app2.2.y41nrrg8tugs@Docker_Node3_231  | 10.0.0.6 - - [05/Apr/2018:15:05:50 +0000] "GET /logo.png HTTP/1.1" 200 13133 "http://app1.test/" "Mozilla/5.0 (Windows NT 10.0; Win64; x64; rv:59.0) Gecko/20100101 Firefox/59.0"
app2.2.y41nrrg8tugs@Docker_Node3_231  | 10.0.0.6 - - [05/Apr/2018:15:05:52 +0000] "GET /logo.png HTTP/1.1" 200 13133 "http://app1.test/" "Mozilla/5.0 (Windows NT 10.0; Win64; x64; rv:59.0) Gecko/20100101 Firefox/59.0"
app2.2.y41nrrg8tugs@Docker_Node3_231  | 10.0.0.6 - - [05/Apr/2018:15:05:54 +0000] "GET /logo.png HTTP/1.1" 200 13133 "http://app1.test/" "Mozilla/5.0 (Windows NT 10.0; Win64; x64; rv:59.0) Gecko/20100101 Firefox/59.0"
app2.2.y41nrrg8tugs@Docker_Node3_231  | 10.0.0.6 - - [05/Apr/2018:15:05:59 +0000] "GET / HTTP/1.1" 200 485 "-" "Mozilla/5.0 (Windows NT 10.0; Win64; x64; rv:59.0) Gecko/20100101 Firefox/59.0 …
```



Implement Docker Cluster Swarm
dockercloud/haproxy and dockercloud/hello-world

[root@Docker_Node1_229 ~]# docker service ps app2

ID	NAME	IMAGE	NODE	DESIRED STATE	CURRENT STATE	ERROR	PORTS
qcyj6785hkhq	app2.1	dockercloud/hello-world:latest	Docker_Node3_231	Running	Running about an hour ago		
c3wxdgjehw4p	_ app2.1	dockercloud/hello-world:latest	Docker_Node2_230	Shutdown	Failed about an hour ago	"starting container failed: er…"	
rbdrwuhbnzpy	_ app2.1	dockercloud/hello-world:latest	Docker_Node1_229	Shutdown	Shutdown about an hour ago		
p4khvy8ddtc9	app2.2	dockercloud/hello-world:latest	Docker_Node3_231	Running	Running about an hour ago		
y41nrrg8tugs	_ app2.2	dockercloud/hello-world:latest	Docker_Node3_231	Shutdown	Shutdown about an hour ago		
lc3vaj8epzsp	_ app2.2	dockercloud/hello-world:latest	Docker_Node2_230	Shutdown	Failed 2 hours ago	"starting container failed: er…"	
l9ffgcyvpuzb	_ app2.2	dockercloud/hello-world:latest	Docker_Node2_230	Shutdown	Failed 2 hours ago	"starting container failed: er…"	
s1zhcnrfjcew	_ app2.2	dockercloud/hello-world:latest	Docker_Node2_230	Shutdown	Failed 2 hours ago	"starting container failed: er…"	
gcm3faybtrmv	app2.3	dockercloud/hello-world:latest	Docker_Node1_229	Running	Running about an hour ago		
6oxnxx7cvcbo	_ app2.3	dockercloud/hello-world:latest	Docker_Node2_230	Shutdown	Failed about an hour ago	"starting container failed: er…"	
o83j3kax9ve4	_ app2.3	dockercloud/hello-world:latest	Docker_Node2_230	Shutdown	Failed about an hour ago	"starting container failed: er…"	
fz3e00n9y1wd	_ app2.3	dockercloud/hello-world:latest	Docker_Node2_230	Shutdown	Failed about an hour ago	"starting container failed: er…"	
yu7k888l4bv8	_ app2.3	dockercloud/hello-world:latest	Docker_Node2_230	Shutdown	Failed about an hour ago	"starting container failed: er…"	
8s68fs8ii1la	app2.4	dockercloud/hello-world:latest	Docker_Node1_229	Running	Running about an hour ago		
nsyr192p3ivq	_ app2.4	dockercloud/hello-world:latest	Docker_Node2_230	Shutdown	Failed about an hour ago	"starting container failed: er…"	
phiaiihv3vge	_ app2.4	dockercloud/hello-world:latest	Docker_Node2_230	Shutdown	Failed about an hour ago	"starting container failed: er…"	
une4u3bhhz58	_ app2.4	dockercloud/hello-world:latest	Docker_Node2_230	Shutdown	Failed about an hour ago	"starting container failed: er…"	
yebcx74o5uv2	_ app2.4	dockercloud/hello-world:latest	Docker_Node1_229	Shutdown	Shutdown about an hour ago		
t45ewa1fsbv5	app2.5	dockercloud/hello-world:latest	Docker_Node1_229	Running	Running about an hour ago		
eeksojqdr9gr	_ app2.5	dockercloud/hello-world:latest	Docker_Node2_230	Shutdown	Failed about an hour ago	"starting container failed: er…"	
of7w2v4rcdxc	_ app2.5	dockercloud/hello-world:latest	Docker_Node2_230	Shutdown	Failed about an hour ago	"starting container failed: er…"	
i3w1ufo4bg4n	app2.6	dockercloud/hello-world:latest	Docker_Node3_231	Running	Running about a minute ago		
sdor03uo84gg	_ app2.6	dockercloud/hello-world:latest	Docker_Node2_230	Shutdown	Failed about a minute ago	"starting container failed: er…"	
wiew86fgf0no	_ app2.6	dockercloud/hello-world:latest	Docker_Node2_230	Shutdown	Failed 2 minutes ago	"starting container failed: er…"	
g7as9fy1pago	_ app2.6	dockercloud/hello-world:latest	Docker_Node2_230	Shutdown	Failed about an hour ago	"starting container failed: er…"	
qv23vzevxtau	_ app2.6	dockercloud/hello-world:latest	Docker_Node2_230	Shutdown	Failed about an hour ago	"starting container failed: er…"	
hbqe8yl91s3r	app2.7	dockercloud/hello-world:latest	Docker_Node3_231	Running	Running about a minute ago		
tg86dvyw3cdw	_ app2.7	dockercloud/hello-world:latest	Docker_Node2_230	Shutdown	Failed about a minute ago	"starting container failed: er…"	