Summary

Session No - 7

- Docker-compose helps us in automation in the docker containers
- The only use case of using the operating system is to run the program
- The primary use of the container is to run programs and shut down
- If the requirement is to launch the container then run the command & shutdown then we can achieve this in the following way

```
[root@ip-172-31-40-68 ~]# docker run -it ubuntu:14.04    date
Wed Oct 19 15:33:26 UTC 2022
[root@ip-172-31-40-68 ~]#
[root@ip-172-31-40-68 ~]#
[root@ip-172-31-40-68 ~]#
```

- The life of the container is the life of the command
- **Sleep** command in Linux is used to suspend the calling process of the next command for a specific amount of time

```
[root@ip-172-31-40-68 ~]#
[root@ip-172-31-40-68 ~]# docker run -it ubuntu:14.04    sleep 10
```

- If the requirement is to launch the container run the command & once the command is run then remove the container then we have to use the **--rm** keyword in the run command

```
[root@ip-172-31-40-68 ~]# docker run -it --name os1  --rm   ubuntu:14.04    date
Wed Oct 19 15:39:39 UTC 2022
[root@ip-172-31-40-68 ~]#
[root@ip-172-31-40-68 ~]# docker ps -a
CONTAINER ID   IMAGE          COMMAND       CREATED          STATUS                          PORTS     NAMES
12319c1fb71f   ubuntu:14.04   "sleep 10"    3 minutes ago    Exited (0) 3 minutes ago                  lucid_payne
cea8a61a62d9   ubuntu:14.04   "sleep 10"    4 minutes ago    Exited (0) 3 minutes ago                  stupefied_burnel
a1b21ffa53a9   ubuntu:14.04   "date"        6 minutes ago    Exited (0) 6 minutes ago                  eloquent_sutherl
nd
d80635310949   ubuntu:14.04   "/bin/bash"   8 minutes ago    Exited (0) 8 minutes ago                  clever_mendel
7a954251d9b9   ubuntu:14.04   "/bin/bash"   14 minutes ago   Exited (127) 12 minutes ago               zealous_shtern
[root@ip-172-31-40-68 ~]#
```

- Docker-compose is a tool that helps in the automation of containers

- Installing Docker-compose
  - Command to download docker-compose:-
    curl -SL https://github.com/docker/compose/releases/download/v2.12.0/docker-compose-linux-x86_64 -o /usr/local/bin/docker-compose
  - Making binary file executable
    Command:- **chmod +x /usr/local/bin/docker-compose**

```
[root@ip-172-31-40-68 ~]# curl -SL https://github.com/docker/compose/releases/download/v2.11.2/docker-compose-linux-x8
l/bin/docker-compose
  % Total    % Received % Xferd  Average Speed   Time    Time     Time  Current
                                 Dload  Upload   Total   Spent    Left  Speed
  0     0    0     0    0     0      0      0 --:--:-- --:--:-- --:--:--     0
100 42.4M  100 42.4M    0     0  30.6M      0  0:00:01  0:00:01 --:--:--  252M
[root@ip-172-31-40-68 ~]#
[root@ip-172-31-40-68 ~]#
[root@ip-172-31-40-68 ~]# chmod  +x  /usr/local/bin/docker-compose
[root@ip-172-31-40-68 ~]#
[root@ip-172-31-40-68 ~]#
[root@ip-172-31-40-68 ~]# docker-compose  version
Docker Compose version v2.11.2
[root@ip-172-31-40-68 ~]#
```

- Docker compose work on the top of docker-engine
- A good practice is to write code in a directory
- Docker-Compose uses YAML as a language for code
- YAML language uses semicolon (**:**) to differentiate between key & values pair
- Good practice in YAML is to write strings in double cotes (**“ ”)**
- In YAML hyphen (**–**) is used to create the array

```
File Edit Format View Help
name: "vimal"
id: 123
phone: 1111


name:
- "vimal"
- "pop"
- "tom"
```

- In the YAML language indentation is used for writing blocks of code

```
db:
    name1: "pop"
    name2: "tom"
    name3: "jack"
```

- The extension of the YAML file should be **.yml**

```
[root@ip-172-31-40-68 ~]# mkdir /mydockercode
[root@ip-172-31-40-68 ~]# cd /mydockercode
[root@ip-172-31-40-68 mydockercode]# ls
[root@ip-172-31-40-68 mydockercode]# vim mycode.yml
```

- Creating a manifest or code file for launching the container
  - **Services** is a keyword to tell docker-compose that we are looking for containers
  - For every container, we have to give a docker-compose name for e.g. c1

```
services:
  c1:
    container_name:  "myos1"
    image:  "ubuntu:14.04"
    command: "date"

  c2:
    container_name:  "myos2"
    image:  "centos:7"
    command: "cal"
```

  - Creating a container from code or manifest file
    - Up means run the code
    - -f to give the file name
    - Command :- **docker-compose -f (file name) up**

```
[root@ip-172-31-40-68 mydockercode]# docker-compose  -f  mycode.yml    up
[+] Running 3/0
 ⠿ Network mydockercode_default  Created                                  0.0s
 ⠿ Container myos1               Created                                  0.0s
 ⠿ Container myos2               Created                                  0.0s
Attaching to myos1, myos2
myos1  | Wed Oct 19 16:48:02 UTC 2022
myos2  |     October 2022
myos2  | Su Mo Tu We Th Fr Sa
myos2  |                     1
myos2  |  2  3  4  5  6  7  8
myos2  |  9 10 11 12 13 14 15
myos2  | 16 17 18 19 20 21 22
myos2  | 23 24 25 26 27 28 29
myos2  | 30 31
```

- Command to see the containers in docker-compose

  Command :- **docker-compose -f (file name) ps**

```
[root@ip-172-31-40-68 mydockercode]# docker-compose   -f mycode.yml   ps
NAME                COMMAND             SERVICE             STATUS              PORTS
myos1               "date"              c1                  exited (0)
myos2               "cal"               c2                  exited (0)
[root@ip-172-31-40-68 mydockercode]#
[root@ip-172-31-40-68 mydockercode]#
```

- **docker-compose.yml** is a special file that docker-compose reads by default
  - **exited(0)** means the container ran successfully
  - Any number other than zero means the container did not run successfully

```
[root@ip-172-31-40-68 mydockercode]# mv  mycode.yml  docker-compose.yml
[root@ip-172-31-40-68 mydockercode]# ls
docker-compose.yml
[root@ip-172-31-40-68 mydockercode]# docker-compose   -f docker-compose.yml   ps
NAME                COMMAND             SERVICE             STATUS              PORTS
myos1               "date"              c1                  exited (0)
myos2               "cal"               c2                  exited (0)
[root@ip-172-31-40-68 mydockercode]# docker-compose     ps
NAME                COMMAND             SERVICE             STATUS              PORTS
myos1               "date"              c1                  exited (0)
myos2               "cal"               c2                  exited (0)
[root@ip-172-31-40-68 mydockercode]# pwd
/mydockercode
[root@ip-172-31-40-68 mydockercode]# ls
docker-compose.yml
[root@ip-172-31-40-68 mydockercode]#
```

- **-d** keyword in docker-compose is used to run the container in detached/demonized mode

```
[root@ip-172-31-40-68 mydockercode]# docker-compose  up   -d
[+] Running 2/2
 ⠿ Container myos1  Started
 ⠿ Container myos2  Started
[root@ip-172-31-40-68 mydockercode]#
[root@ip-172-31-40-68 mydockercode]#
[root@ip-172-31-40-68 mydockercode]#
[root@ip-172-31-40-68 mydockercode]#
[root@ip-172-31-40-68 mydockercode]#
[root@ip-172-31-40-68 mydockercode]# docker-compose  ps
NAME                COMMAND             SERVICE             STATUS              PORTS
myos1               "sleep 30"          c1                  running
myos2               "sleep 60"          c2                  running
[root@ip-172-31-40-68 mydockercode]#
```

- **docker-compose logs (service/docker-compose name)** is used to see the logs of the specific container

```
myos1  | 64 bytes from 8.8.8.8: icmp_seq=37 ttl=50 time=1.20 ms
myos1  | 64 bytes from 8.8.8.8: icmp_seq=38 ttl=50 time=1.21 ms
myos1  | 64 bytes from 8.8.8.8: icmp_seq=39 ttl=50 time=1.23 ms
myos1  | 64 bytes from 8.8.8.8: icmp_seq=40 ttl=50 time=1.21 ms
myos1  | 64 bytes from 8.8.8.8: icmp_seq=41 ttl=50 time=1.25 ms
myos1  | 64 bytes from 8.8.8.8: icmp_seq=42 ttl=50 time=1.21 ms
myos1  | 64 bytes from 8.8.8.8: icmp_seq=43 ttl=50 time=1.20 ms
myos1  | 64 bytes from 8.8.8.8: icmp_seq=44 ttl=50 time=1.22 ms
myos1  | 64 bytes from 8.8.8.8: icmp_seq=45 ttl=50 time=1.32 ms
myos1  | 64 bytes from 8.8.8.8: icmp_seq=46 ttl=50 time=1.23 ms
myos1  | 64 bytes from 8.8.8.8: icmp_seq=47 ttl=50 time=1.24 ms
myos1  | 64 bytes from 8.8.8.8: icmp_seq=48 ttl=50 time=1.30 ms
myos1  | 64 bytes from 8.8.8.8: icmp_seq=49 ttl=50 time=1.28 ms
myos1  | 64 bytes from 8.8.8.8: icmp_seq=50 ttl=50 time=1.31 ms
myos1  | 64 bytes from 8.8.8.8: icmp_seq=51 ttl=50 time=1.38 ms
myos1  | 64 bytes from 8.8.8.8: icmp_seq=52 ttl=50 time=1.22 ms
[root@ip-172-31-40-68 mydockercode]#
[root@ip-172-31-40-68 mydockercode]#
```

- **exec** in docker-compose is used to run the command inside the container

```
[root@ip-172-31-40-68 mydockercode]# docker-compose  exec  c1  date
Wed Oct 19 17:03:47 UTC 2022
[root@ip-172-31-40-68 mydockercode]# docker-compose  exec  c1   ifconfig
eth0      Link encap:Ethernet  HWaddr 02:42:ac:14:00:02
          inet addr:172.20.0.2  Bcast:172.20.255.255  Mask:255.255.0.0
          UP BROADCAST RUNNING MULTICAST  MTU:1500  Metric:1
          RX packets:163 errors:0 dropped:0 overruns:0 frame:0
          TX packets:151 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:0
          RX bytes:15462 (15.4 KB)  TX bytes:14462 (14.4 KB)

lo        Link encap:Local Loopback
          inet addr:127.0.0.1  Mask:255.0.0.0
          UP LOOPBACK RUNNING  MTU:65536  Metric:1
          RX packets:0 errors:0 dropped:0 overruns:0 frame:0
          TX packets:0 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1000
          RX bytes:0 (0.0 B)  TX bytes:0 (0.0 B)
```

- Not every version of the docker engine is compatible with docker-compose so we have to write the version keyword in the manifest /code file

```
version: "3.8"

services:
  c1:
    container_name:  "myos1"
    image:  "ubuntu:14.04"
    command: "ping  8.8.8.8"

  c2:
    container_name:  "myos2"
    image:  "centos:7"
    command: "sleep 60"
```

- Stopping the container in docker-compose

```
[root@ip-172-31-40-68 mydockercode]# docker-compose  stop
[+] Running 2/2
 ⠿ Container myos2  Stopped
 ⠿ Container myos1  Stopped
```

- Removing the container in docker-compose

```
[root@ip-172-31-40-68 mydockercode]# docker-compose  rm
? Going to remove myos1, myos2 Yes
[+] Running 2/0
 ⠿ Container myos2  Removed
 ⠿ Container myos1  Removed
[root@ip-172-31-40-68 mydockercode]# docker-compose  ps
NAME                COMMAND             SERVICE             STATUS              PORTS
[root@ip-172-31-40-68 mydockercode]#
```

Important Links:-

- Docker-compose Installation

  https://docs.docker.com/compose/install/other/

- Compose and Docker compatibility matrix
  https://docs.docker.com/compose/compose-file/compose-file-v3/