

## Container: Lecture 4

### 1. Install container packages-

```
[root@rhel9-test ~]#  
[root@rhel9-test ~]# dnf install -y @container-tools
```

### 2. Pull one container image, start it in background & stop it to verify-

```
[root@rhel9-test ~]# podman run -d docker.io/lendingworks/rsyslog  
Trying to pull docker.io/lendingworks/rsyslog:latest...  
Getting image source signatures  
Copying blob 00d92704ec58 done  
Copying blob cdbbe7a5bc2a done  
Copying blob 692ba7e301ec done  
Copying blob 2890df2f5ec8 done  
Copying config cf97c1e428 done  
Writing manifest to image destination  
Storing signatures  
0dc82af10f0e5f88184d6c0bca48e1b7d5b0e6ae1b5bbb236a0121fadf5f942c  
[root@rhel9-test ~]#  
[root@rhel9-test ~]# podman images  
REPOSITORY          TAG             IMAGE ID        CREATED        SIZE  
docker.io/lendingworks/rsyslog  latest         cf97c1e428d9   2 years ago   9.22 MB  
[root@rhel9-test ~]#  
[root@rhel9-test ~]# podman ps  
CONTAINER ID  IMAGE                                COMMAND        CREATED        STATUS        PORTS        NAMES  
0dc82af10f0e  docker.io/lendingworks/rsyslog:latest  13 seconds ago Up 12 seconds ago  gallant_mahavira  
[root@rhel9-test ~]#  
[root@rhel9-test ~]# podman stop 0dc82af10f0e  
0dc82af10f0e  
[root@rhel9-test ~]#  
[root@rhel9-test ~]# podman ps  
CONTAINER ID  IMAGE                                COMMAND        CREATED        STATUS        PORTS        NAMES  
[root@rhel9-test ~]#
```

### 3. To run a container after assigning **static IP** to it-

```
[root@rhel9-test ~]# podman run -d --ip=192.168.111.135 docker.io/lendingworks/rsyslog  
Error: requested static ip 192.168.111.135 not in any subnet on network podman  
[root@rhel9-test ~]#  
[root@rhel9-test ~]#  
[root@rhel9-test ~]# podman run -d --ip=10.88.0.44 docker.io/lendingworks/rsyslog  
cfd9d93e050450a620ab7a1902b0b2e85dfa8625f34659097eacb49054443493  
[root@rhel9-test ~]#
```

**Note:** We can't assign IP from range of host network. Give it from provided range.

### 4. We can inspect this container image to see the IP address-

```
[root@rhel9-test ~]# podman inspect cfd9d93e0504 | grep ip  
      "--ip=10.88.0.44",  
[root@rhel9-test ~]#
```

5. To execute any command in this container image without going inside it-

```
[root@rhel9-test ~]# podman exec -it cfd9d93e0504 cat /etc/os-release
NAME="Alpine Linux"
ID=alpine
VERSION_ID=3.11.6
PRETTY_NAME="Alpine Linux v3.11"
HOME_URL="https://alpinelinux.org/"
BUG_REPORT_URL="https://bugs.alpinelinux.org/"
[root@rhel9-test ~]#
```

6. Now, to go inside container using [interactive session](#) & run few commands-

```
[root@rhel9-test ~]# podman exec -it cfd9d93e0504 /bin/bash
bash-5.0#
bash-5.0# df -h
Filesystem                Size      Used Available Use% Mounted on
overlay                  38.3G    12.7G    25.5G    33% /
tmpfs                     64.0M         0    64.0M     0% /dev
shm                       62.5M         0    62.5M     0% /dev/shm
tmpfs                     348.7M     9.8M    339.0M     3% /etc/hosts
tmpfs                     348.7M     9.8M    339.0M     3% /etc/hostname
tmpfs                     348.7M     9.8M    339.0M     3% /run/.containerenv
tmpfs                     348.7M     9.8M    339.0M     3% /run/secrets
tmpfs                     348.7M     9.8M    339.0M     3% /etc/resolv.conf
/dev/mapper/rhel-root      38.3G    12.7G    25.5G    33% /run/rsyslog/dev
devtmpfs                  4.0M         0     4.0M     0% /proc/kcore
devtmpfs                  4.0M         0     4.0M     0% /proc/keys
devtmpfs                  4.0M         0     4.0M     0% /proc/timer_list
bash-5.0#
bash-5.0# uname -r
5.14.0-162.6.1.el9_1.x86_64
bash-5.0#
bash-5.0# uname -a
Linux cfd9d93e0504 5.14.0-162.6.1.el9_1.x86_64 #1 SMP PREEMPT_DYNAMIC Fri Sep 30 07:36:03 EDT 2022 x86_64 Linux
bash-5.0#
```

7. To share files between two containers, we will create one volume on host machine & verify it-

```
[root@rhel9-test ~]# podman volume create hostvolume
hostvolume
[root@rhel9-test ~]#
[root@rhel9-test ~]# podman volume inspect hostvolume
[
  {
    "Name": "hostvolume",
    "Driver": "local",
    "Mountpoint": "/var/lib/containers/storage/volumes/hostvolume/_data",
    "CreatedAt": "2023-01-01T20:31:20.63904316+05:30",
    "Labels": {},
    "Scope": "local",
    "Options": {},
    "MountCount": 0,
    "NeedsCopyUp": true,
    "NeedsChown": true
  }
]
```

**Note:** We can see the [Mountpoint](#) in this snapshot. [\\_data](#) will be used for this purpose.

8. To avoid writing this path again & again, we will define one variable for it & verify as well. We will create one txt file & write some data into it to share-

```
[root@rhel9-test ~]# mntPoint=$(podman volume inspect hostvolume --format {{.Mountpoint}})
[root@rhel9-test ~]#
[root@rhel9-test ~]# echo $mntPoint
/var/lib/containers/storage/volumes/hostvolume/_data
[root@rhel9-test ~]#
[root@rhel9-test ~]# echo "Hello from host" >> $mntPoint/host.txt
[root@rhel9-test ~]#
```

```
[root@rhel9-test ~]# cat $mntPoint/host.txt
Hello from host
[root@rhel9-test ~]#
[root@rhel9-test ~]# ls $mntPoint
host.txt
[root@rhel9-test ~]#
```

9. Now, we will pull one ubi container image & verify it-

```
[root@rhel9-test ~]# podman pull registry.access.redhat.com/ubi8/ubi
Trying to pull registry.access.redhat.com/ubi8/ubi:latest...
Getting image source signatures
Checking if image destination supports signatures
Copying blob 0e0c4af1097a done
Copying config b2276c479c done
Writing manifest to image destination
Storing signatures
b2276c479c6016fc5f3f87899e43a32578781feb6043fade2e132e97a75ba2c9
[root@rhel9-test ~]#
[root@rhel9-test ~]# podman images
REPOSITORY                                TAG          IMAGE ID      CREATED        SIZE
registry.access.redhat.com/ubi8/ubi      latest       b2276c479c60  2 weeks ago   214 MB
docker.io/lendingworks/rsyslog          latest       cf97c1e428d9  2 years ago   9.22 MB
[root@rhel9-test ~]#
```

10. We will run its [interactive session](#) ([myubi](#)) with mounting the volume created on host ([hostvolume](#)). Then verify volume & file content & will create one text file with some content in it-

```
[root@rhel9-test ~]# podman run -it --name myubi -v hostvolume:/containervolume1 registry.access.redhat.com/ubi8/ubi /bin/bash
[root@8d1fd658a300 /]#
[root@8d1fd658a300 /]# ls containervolume1/
host.txt
[root@8d1fd658a300 /]# cat containervolume1/host.txt
Hello from host
[root@8d1fd658a300 /]#
[root@8d1fd658a300 /]# echo "Hello from container 1" >> /containervolume1/container1.txt
[root@8d1fd658a300 /]#
[root@8d1fd658a300 /]# ls containervolume1/
container1.txt  host.txt
[root@8d1fd658a300 /]# cat containervolume1/container1.txt
Hello from container 1
[root@8d1fd658a300 /]#
[root@8d1fd658a300 /]# [root@rhel9-test ~]#
[root@rhel9-test ~]#
```

11. To keep this container running & move to host machine, use **CTRL+P CTRL+Q** one by one-

```
[root@rhel9-test ~]# podman ps
```

CONTAINER ID	IMAGE	COMMAND	CREATED	STATUS	PORTS	NAMES
cf9d9d3e0504	docker.io/lendingworks/rsyslog:latest		17 minutes ago	Up 17 minutes ago		lucid_lederberg
8d1fd658a300	registry.access.redhat.com/ubi8/ubi:latest	/bin/bash	2 minutes ago	Up 2 minutes ago		myubi ←

```
[root@rhel9-test ~]#
```

12. Now verify new content of host volume-

```
[root@rhel9-test ~]# ls $mntPoint
```

container1.txt host.txt

```
[root@rhel9-test ~]# cat $mntPoint/container1.txt
```

Hello from container 1

```
[root@rhel9-test ~]#
```

13. Next, we will run its interactive session (**abhayubi**) with mounting the volume created on host (**hostvolume**). Then verify volume & file content-

```
[root@rhel9-test ~]# podman run -it --name abhayubi -v hostvolume:/containervolume2 registry.access.redhat.com/ubi8/ubi /bin/bash
```

```
[root@bc5ee4d686b3 /]#
```

```
[root@bc5ee4d686b3 /]# ls containervolume2/
```

container1.txt host.txt

```
[root@bc5ee4d686b3 /]#
```

```
[root@bc5ee4d686b3 /]# cat containervolume2/host.txt
```

Hello from host

```
[root@bc5ee4d686b3 /]#
```

```
[root@bc5ee4d686b3 /]# cat containervolume2/container1.txt
```

Hello from container 1

```
[root@bc5ee4d686b3 /]#
```

14. We will list this container's content. Copy one file to its **tmp** & verify it. Will create one text file with some content in it. Now go to host machine without closing container. **CTRL+P CTRL+Q**-

```
[root@bc5ee4d686b3 /]# ls
```

bin boot containervolume2 dev etc home lib lib64 lost+found media mnt opt proc root run sbin srv sys tmp usr var

```
[root@bc5ee4d686b3 /]#
```

```
[root@bc5ee4d686b3 /]#
```

```
[root@bc5ee4d686b3 /]# cp containervolume2/container1.txt /tmp/
```

```
[root@bc5ee4d686b3 /]#
```

```
[root@bc5ee4d686b3 /]# ls tmp/
```

container1.txt ks-script-mhz835p6 ks-script-t27c09ms

```
[root@bc5ee4d686b3 /]#
```

```
[root@bc5ee4d686b3 /]# ls tmp/container1.txt
```

tmp/container1.txt

```
[root@bc5ee4d686b3 /]#
```

```
[root@bc5ee4d686b3 /]# echo "Hello from container 2" >> /containervolume2/container2.txt
```

```
[root@bc5ee4d686b3 /]#
```

```
[root@bc5ee4d686b3 /]#
```

```
[root@bc5ee4d686b3 /]# [root@rhel9-test ~]#
```

```
[root@rhel9-test ~]#
```

15. Now verify images & host volume new content-

```
[root@rhel9-test ~]# podman ps
```

CONTAINER ID	IMAGE	COMMAND	CREATED	STATUS	PORTS	NAMES
cf9d9d93e0504	docker.io/lendingworks/rsyslog:latest		24 minutes ago	Up 24 minutes ago		lucid_lederberg
8d1fd658a300	registry.access.redhat.com/ubi8/ubi:latest	/bin/bash	9 minutes ago	Up 9 minutes ago		myubi
bc5ee4d686b3	registry.access.redhat.com/ubi8/ubi:latest	/bin/bash	2 minutes ago	Up 2 minutes ago		abhayubi

```
[root@rhel9-test ~]#  
[root@rhel9-test ~]# ls $mntPoint  
container1.txt container2.txt host.txt  
[root@rhel9-test ~]#
```

```
[root@rhel9-test ~]# cat $mntPoint/container2.txt  
Hello from container 2  
[root@rhel9-test ~]#
```

16. To export a running container, we will run a new container in background & verify-

```
[root@rhel9-test ~]# podman run -dt --name=singhubi registry.access.redhat.com/ubi8/ubi  
37ce34f9158b04588f56bae8f9259f3f901550852326e04754e6916042b1447d  
[root@rhel9-test ~]#  
[root@rhel9-test ~]#  
[root@rhel9-test ~]# podman ps
```

CONTAINER ID	IMAGE	COMMAND	CREATED	STATUS	PORTS	NAMES
cf9d9d93e0504	docker.io/lendingworks/rsyslog:latest		27 minutes ago	Up 27 minutes ago		lucid_lederberg
8d1fd658a300	registry.access.redhat.com/ubi8/ubi:latest	/bin/bash	12 minutes ago	Up 12 minutes ago		myubi
bc5ee4d686b3	registry.access.redhat.com/ubi8/ubi:latest	/bin/bash	5 minutes ago	Up 5 minutes ago		abhayubi
37ce34f9158b	registry.access.redhat.com/ubi8/ubi:latest	/bin/bash	3 seconds ago	Up 3 seconds ago		singhubi

```
[root@rhel9-test ~]#
```

17. To go inside container, use below command-

```
[root@rhel9-test ~]# podman attach singhubi  
[root@37ce34f9158b /]#  
[root@37ce34f9158b /]# echo "Hello" > testfile  
[root@37ce34f9158b /]#  
[root@37ce34f9158b /]#  
[root@rhel9-test ~]#
```

**Note:** We have created one file with some content in it for verification later on.

18. Now move to host without exiting this session, use **CTRL+P**, **CTRL+Q**-

```
[root@rhel9-test ~]# podman ps
```

CONTAINER ID	IMAGE	COMMAND	CREATED	STATUS	PORTS	NAMES
cf9d9d93e0504	docker.io/lendingworks/rsyslog:latest		28 minutes ago	Up 28 minutes ago		lucid_lederberg
8d1fd658a300	registry.access.redhat.com/ubi8/ubi:latest	/bin/bash	13 minutes ago	Up 13 minutes ago		myubi
bc5ee4d686b3	registry.access.redhat.com/ubi8/ubi:latest	/bin/bash	7 minutes ago	Up 7 minutes ago		abhayubi
37ce34f9158b	registry.access.redhat.com/ubi8/ubi:latest	/bin/bash	About a minute ago	Up About a minute ago		singhubi

```
[root@rhel9-test ~]#
```

19. Export it in archive form-

```
[root@rhel9-test ~]# podman export -o singhubi.tar 37ce34f9158b
[root@rhel9-test ~]#
[root@rhel9-test ~]# ls -ll
total 267168
-rw-----. 1 root root      820 Dec 29 18:00 anaconda-ks.cfg
drwxr-xr-x. 2 root root        6 Dec 31 10:25 Desktop
drwxr-xr-x. 2 root root        6 Dec 31 10:25 Documents
drwxr-xr-x. 2 root root        6 Dec 31 10:25 Downloads
drwxr-xr-x. 2 root root        6 Dec 31 10:25 Music
-rw-r--r--. 1 root root 59443712 Jan  1 09:24 mywebserver.tar
drwxr-xr-x. 2 root root        6 Dec 31 10:25 Pictures
drwxr-xr-x. 2 root root        6 Dec 31 10:25 Public
-rw-r--r--. 1 root root 214130688 Jan  1 20:54 singhubi.tar
drwxr-xr-x. 2 root root        6 Dec 31 10:25 Templates
drwxr-xr-x. 2 root root        6 Dec 31 10:25 Videos
```

20. Next, create one directory on host machine & extract this archive in order to create new container from it & verify-

```
[root@rhel9-test ~]# mkdir singhubi-container
[root@rhel9-test ~]# ls
anaconda-ks.cfg Desktop Documents Downloads Music mywebserver.tar Pictures Public singhubi-container singhubi.tar Templates Videos
[root@rhel9-test ~]#
```

```
[root@rhel9-test ~]# tar -xf singhubi.tar -C singhubi-container
[root@rhel9-test ~]#
```

21. We can verify its content using [tree](#) command-

```
[root@rhel9-test ~]# tree -L 1 singhubi-container/
singhubi-container/
├── bin -> usr/bin
├── boot
├── dev
├── etc
├── home
├── lib -> usr/lib
├── lib64 -> usr/lib64
├── lost+found
├── media
├── mnt
├── opt
├── proc
├── root
├── run
├── sbin -> usr/sbin
├── srv
├── sys
├── testfile
├── tmp
├── usr
└── var

20 directories, 1 file
[root@rhel9-test ~]#
```

22. To run container using this extracted content, use **podman import**-

```
[root@rhel9-test ~]# podman import singhubi.tar singhubi-imported
Getting image source signatures
Copying blob 414a4585c023 done
Copying config 6c7fd10ce1 done
Writing manifest to image destination
Storing signatures
sha256:6c7fd10ce13a28f92548e08ed7c505ca235de0cf3e3678a357ca720c37eb28ff
[root@rhel9-test ~]#
```

23. We can verify the same-

```
[root@rhel9-test ~]# podman images
REPOSITORY                                TAG      IMAGE ID      CREATED        SIZE
localhost/singhubi-imported               latest   6c7fd10ce13a  5 minutes ago  214 MB
registry.access.redhat.com/ubi8/ubi       latest   b2276c479c60  2 weeks ago   214 MB
docker.io/lendingworks/rsyslog            latest   cf97c1e428d9  2 years ago   9.22 MB
[root@rhel9-test ~]#
```

24. We can verify the file content (Created in step 17) of this newly created container without going inside it-

```
[root@rhel9-test ~]# podman run -it --name=singhubi-imported localhost/singhubi-imported cat testfile
Hello
[root@rhel9-test ~]#
```

25. Now, we are done with Lab. So, stop all the running containers & verify-

```
[root@rhel9-test ~]# podman stop -a
0297c22f303f18c35a18431aace4093e35eb34f9a6445e36b69da5b8e6896f50
03f44738072fdc3859a0a25a1cf4d3e05957445c5ddd2810cc92cf54aa8056ec
0dc82af10f0e5f88184d6c0bca48e1b7d5b0e6ae1b5bbb236a0121fadf5f942c
37ce34f9158b04588f56bae8f9259f3f901550852326e04754e6916042b1447d
49ce1733c502b785789f59e4496befb3a9b05391d5591336ff7562ab88d07fda
8d1fd658a3008362a64888bc2bacdc42c756ad3d0355afb454ac9f978fba03e0
bc5ee4d686b3a5eccfed17197dc50530aa7ffc4693007becfff40ed4f026ac12
cfd9d93e050450a620ab7a1902b0b2e85dfa8625f34659097eacb49054443493
[root@rhel9-test ~]#
[root@rhel9-test ~]# podman ps
CONTAINER ID  IMAGE  COMMAND  CREATED  STATUS  PORTS  NAMES
[root@rhel9-test ~]#
```

26. Similarly remove all the images from host machine (Use -f to forcefully remove)-

```
[root@rhel9-test ~]# podman rmi -a -f
Untagged: docker.io/lendingworks/rsyslog:latest
Untagged: registry.access.redhat.com/ubi8/ubi:latest
Deleted: cf97c1e428d919750e5a182e08eac637fde078dcd0e3520ae2e85fb7edcae100
Deleted: b2276c479c6016fc5f3f87899e43a32578781feb6043fade2e132e97a75ba2c9
[root@rhel9-test ~]#
[root@rhel9-test ~]#
[root@rhel9-test ~]# podman images
REPOSITORY TAG IMAGE ID CREATED SIZE
[root@rhel9-test ~]#
[root@rhel9-test ~]#
[root@rhel9-test ~]# podman ps -a
CONTAINER ID IMAGE COMMAND CREATED STATUS PORTS NAMES
[root@rhel9-test ~]#
```

This is it about Lecture 4!!!