Lesson 05 Demo 06
Troubleshooting Container and Engine Logs

Objective: To troubleshoot container and engine logs to resolve connectivity issues between containers

Tools required: Ubuntu OS

Prerequisites: None

Steps to be followed:

1. Set up Docker containers
2. Troubleshoot container and engine logs

Step 1: Set up Docker containers

1.1 Run the following command to switch to the root user:
sudo su

```
ravitulsianisim@ip-172-31-31-214:~$ sudo su
```

1.2 Execute the following command to create and run a Docker container:
docker run -dt --name containerA ubuntu /bin/bash

```
root@ip-172-31-31-214:/home/ravitulsianisim# docker run -dt --name containerA ubuntu /bin/bash
9ba06a19161a90d68e7a3ee4efa95c0860658a030ac97667f5fe5cfdc1d732b7
root@ip-172-31-31-214:/home/ravitulsianisim#
```

1.3 Execute the following command to create and run another Docker container:
docker run -dt --name containerB ubuntu /bin/bash

```
root@ip-172-31-31-214:/home/ravitulsianisim# docker run -dt --name containerB ubuntu /bin/bash
be21a32e47717182c715de30048b6d6c17cd36dd953e7040d669d5ffae0fcd0d
root@ip-172-31-31-214:/home/ravitulsianisim#
```

1.4 Run the following command to list all the containers in the system:
docker ps -a

```
root@ip-172-31-31-214:/home/ravitulsianisim# docker ps -a
CONTAINER ID   IMAGE     COMMAND       CREATED              STATUS              PORTS     NAMES
be21a32e4771   ubuntu    "/bin/bash"   About a minute ago   Up About a minute             containerB
9ba06a19161a   ubuntu    "/bin/bash"   3 minutes ago        Up 3 minutes                  containerA
root@ip-172-31-31-214:/home/ravitulsianisim#
```

Step 2: Troubleshoot container and engine logs

2.1 Inspect the network configuration of containerA:
docker inspect containerA

```
root@ip-172-31-31-214:/home/ravitulsianisim# docker inspect containerA
[
    {
        "Id": "9ba06a19161a90d68e7a3ee4efa95c0860658a030ac97667f5fe5cfdc1d732b7",
        "Created": "2024-04-25T09:37:56.114996161Z",
        "Path": "/bin/bash",
        "Args": [],
        "State": {
            "Status": "running",
            "Running": true,
            "Paused": false,
            "Restarting": false,
            "OOMKilled": false,
            "Dead": false,
            "Pid": 2560,
            "ExitCode": 0,
            "Error": "",
            "StartedAt": "2024-04-25T09:37:56.582769814Z",
            "FinishedAt": "0001-01-01T00:00:00Z"
        },
        "Image": "sha256:7af9ba4f0a47d9bc8b1ffa492c6b0276476f1889cf4e699fba2236924e5932ed",
        "ResolvConfPath": "/var/lib/docker/containers/9ba06a19161a90d68e7a3ee4efa95c0860658a030ac97667f5fe5cfdc1d732b7/resolv.conf",
        "HostnamePath": "/var/lib/docker/containers/9ba06a19161a90d68e7a3ee4efa95c0860658a030ac97667f5fe5cfdc1d732b7/hostname",
        "HostsPath": "/var/lib/docker/containers/9ba06a19161a90d68e7a3ee4efa95c0860658a030ac97667f5fe5cfdc1d732b7/hosts",
```

2.2 Inspect the network configuration of containerB:
docker inspect containerB

```
root@ip-172-31-31-214:/home/ravitulsianisim# docker inspect containerB
[
    {
        "Id": "be21a32e47717182c715de30048b6d6c17cd36dd953e7040d669d5ffae0fcd0d",
        "Created": "2024-04-25T09:39:47.63046323Z",
        "Path": "/bin/bash",
        "Args": [],
        "State": {
            "Status": "running",
            "Running": true,
            "Paused": false,
            "Restarting": false,
            "OOMKilled": false,
            "Dead": false,
            "Pid": 2795,
            "ExitCode": 0,
            "Error": "",
            "StartedAt": "2024-04-25T09:39:47.94790756Z",
            "FinishedAt": "0001-01-01T00:00:00Z"
        },
        "Image": "sha256:7af9ba4f0a47d9bc8b1ffa492c6b0276476f1889cf4e699fba2236924e5932ed",
        "ResolvConfPath": "/var/lib/docker/containers/be21a32e47717182c715de30048b6d6c17cd36dd953e7040d669d5ffae0fcd0d/resolv.conf",
        "HostnamePath": "/var/lib/docker/containers/be21a32e47717182c715de30048b6d6c17cd36dd953e7040d669d5ffae0fcd0d/hostname",
        "HostsPath": "/var/lib/docker/containers/be21a32e47717182c715de30048b6d6c17cd36dd953e7040d669d5ffae0fcd0d/hosts",
```

2.3 Run the following command to check the Docker daemon logs:
journalctl -u docker.service

```
root@ip-172-31-31-214:/home/ravitulsianisim# journalctl -u docker.service
Jan 24 04:41:22 ip-172-31-83-147 systemd[1]: Starting Docker Application Container Engine...
Jan 24 04:41:22 ip-172-31-83-147 dockerd[10751]: time="2022-01-24T04:41:22.991959382Z" level=info msg="Starting up"
Jan 24 04:41:22 ip-172-31-83-147 dockerd[10751]: time="2022-01-24T04:41:22.992724707Z" level=info msg="detected 127.0.0.53 nameserver, assuming syst>
Jan 24 04:41:23 ip-172-31-83-147 dockerd[10751]: time="2022-01-24T04:41:23.019666948Z" level=info msg="parsed scheme: \"unix\"" module=grpc
Jan 24 04:41:23 ip-172-31-83-147 dockerd[10751]: time="2022-01-24T04:41:23.019686936Z" level=info msg="scheme \"unix\" not registered, fallback to d>
Jan 24 04:41:23 ip-172-31-83-147 dockerd[10751]: time="2022-01-24T04:41:23.019711485Z" level=info msg="ccResolverWrapper: sending update to cc: {[{u>
Jan 24 04:41:23 ip-172-31-83-147 dockerd[10751]: time="2022-01-24T04:41:23.019728458Z" level=info msg="ClientConn switching balancer to \"pick_first>
Jan 24 04:41:23 ip-172-31-83-147 dockerd[10751]: time="2022-01-24T04:41:23.022340318Z" level=info msg="parsed scheme: \"unix\"" module=grpc
Jan 24 04:41:23 ip-172-31-83-147 dockerd[10751]: time="2022-01-24T04:41:23.026984616Z" level=info msg="scheme \"unix\" not registered, fallback to d>
Jan 24 04:41:23 ip-172-31-83-147 dockerd[10751]: time="2022-01-24T04:41:23.027144001Z" level=info msg="ccResolverWrapper: sending update to cc: {[{u>
Jan 24 04:41:23 ip-172-31-83-147 dockerd[10751]: time="2022-01-24T04:41:23.027160232Z" level=info msg="ClientConn switching balancer to \"pick_first>
Jan 24 04:41:23 ip-172-31-83-147 dockerd[10751]: time="2022-01-24T04:41:23.212738119Z" level=warning msg="Your kernel does not support CPU realtime >
Jan 24 04:41:23 ip-172-31-83-147 dockerd[10751]: time="2022-01-24T04:41:23.212767312Z" level=warning msg="Your kernel does not support cgroup blkio >
Jan 24 04:41:23 ip-172-31-83-147 dockerd[10751]: time="2022-01-24T04:41:23.212775484Z" level=warning msg="Your kernel does not support cgroup blkio >
```

2.4 Retrieve the IP address assigned to the Docker containerB:
docker inspect containerB | grep IPAddress

```
root@ip-172-31-31-214:/home/ravitulsianisim# docker inspect containerB | grep IPAddress
            "SecondaryIPAddresses": null,
            "IPAddress": "172.17.0.3",
                    "IPAddress": "172.17.0.3",
root@ip-172-31-31-214:/home/ravitulsianisim#
```

2.5 Run the following command to start an interactive bash shell session within the Docker containerA:
docker exec -it containerA /bin/bash

```
root@ip-172-31-31-214:/home/ravitulsianisim# docker exec -it containerA /bin/bash
root@9ba06a19161a:/#
```

2.6 Run the following command to update the package lists for repositories configured in the system:
apt-get update

```
root@9ba06a19161a:/# apt-get update
Get:1 http://archive.ubuntu.com/ubuntu jammy InRelease [270 kB]
Get:2 http://archive.ubuntu.com/ubuntu jammy-updates InRelease [119 kB]
Get:3 http://security.ubuntu.com/ubuntu jammy-security InRelease [110 kB]
Get:4 http://archive.ubuntu.com/ubuntu jammy-backports InRelease [109 kB]
Get:5 http://archive.ubuntu.com/ubuntu jammy/main amd64 Packages [1792 kB]
Get:6 http://archive.ubuntu.com/ubuntu jammy/restricted amd64 Packages [164 kB]
Get:7 http://archive.ubuntu.com/ubuntu jammy/universe amd64 Packages [17.5 MB]
Get:8 http://archive.ubuntu.com/ubuntu jammy/multiverse amd64 Packages [266 kB]
Get:9 http://archive.ubuntu.com/ubuntu jammy-updates/restricted amd64 Packages [2339 kB]
Get:10 http://archive.ubuntu.com/ubuntu jammy-updates/multiverse amd64 Packages [51.1 kB]
Get:11 http://archive.ubuntu.com/ubuntu jammy-updates/main amd64 Packages [2035 kB]
Get:12 http://security.ubuntu.com/ubuntu jammy-security/universe amd64 Packages [1077 kB]
Get:13 http://archive.ubuntu.com/ubuntu jammy-updates/universe amd64 Packages [1369 kB]
Get:14 http://archive.ubuntu.com/ubuntu jammy-backports/universe amd64 Packages [35.0 kB]
Get:15 http://archive.ubuntu.com/ubuntu jammy-backports/main amd64 Packages [110 kB]
Get:16 http://security.ubuntu.com/ubuntu jammy-security/main amd64 Packages [1755 kB]
Get:17 http://security.ubuntu.com/ubuntu jammy-security/restricted amd64 Packages [2265 kB]
```

2.7 Run the following command to install the **iputils** package and test for network connectivity:
apt-get install iputils-ping -y

```
root@9ba06a19161a:/# apt-get install iputils-ping -y
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
The following additional packages will be installed:
  libcap2-bin libpam-cap
The following NEW packages will be installed:
  iputils-ping libcap2-bin libpam-cap
0 upgraded, 3 newly installed, 0 to remove and 3 not upgraded.
Need to get 76.8 kB of archives.
After this operation, 280 kB of additional disk space will be used.
Get:1 http://archive.ubuntu.com/ubuntu jammy-updates/main amd64 libcap2-bin amd64 1:2.44-1ubuntu0.22.04.1 [26.0 kB]
Get:2 http://archive.ubuntu.com/ubuntu jammy/main amd64 iputils-ping amd64 3:20211215-1 [42.9 kB]
Get:3 http://archive.ubuntu.com/ubuntu jammy-updates/main amd64 libpam-cap amd64 1:2.44-1ubuntu0.22.04.1 [7928 B]
Fetched 76.8 kB in 0s (1085 kB/s)
```

2.8 Check if the specified IP address is reachable over the network by sending echo requests and waiting for responses:
ping 172.17.0.3

```
root@9ba06a19161a:/# ping 172.17.0.3
PING 172.17.0.3 (172.17.0.3) 56(84) bytes of data.
64 bytes from 172.17.0.3: icmp_seq=1 ttl=64 time=0.085 ms
64 bytes from 172.17.0.3: icmp_seq=2 ttl=64 time=0.056 ms
64 bytes from 172.17.0.3: icmp_seq=3 ttl=64 time=0.061 ms
64 bytes from 172.17.0.3: icmp_seq=4 ttl=64 time=0.057 ms
64 bytes from 172.17.0.3: icmp_seq=5 ttl=64 time=0.050 ms
64 bytes from 172.17.0.3: icmp_seq=6 ttl=64 time=0.036 ms
64 bytes from 172.17.0.3: icmp_seq=7 ttl=64 time=0.056 ms
64 bytes from 172.17.0.3: icmp_seq=8 ttl=64 time=0.045 ms
64 bytes from 172.17.0.3: icmp_seq=9 ttl=64 time=0.047 ms
64 bytes from 172.17.0.3: icmp_seq=10 ttl=64 time=0.055 ms
64 bytes from 172.17.0.3: icmp_seq=11 ttl=64 time=0.056 ms
64 bytes from 172.17.0.3: icmp_seq=12 ttl=64 time=0.053 ms
64 bytes from 172.17.0.3: icmp_seq=13 ttl=64 time=0.055 ms
64 bytes from 172.17.0.3: icmp_seq=14 ttl=64 time=0.056 ms
```

By following these steps, you have effectively troubleshooted the container and engine logs in Docker.