

docker container in LAN - replication controller - exposing - creating replicas

prove:

- If any containers are launched in docker, these are put in on box of private Network LAN.
- **SETUP REPLICATION CONTROLLER**
- **EXPOSE CONTAINERS TO PUBLIC WORLD**
- **CREATE RPLICAS**

👉 What is RC ?

- ✓ . RC is a replication controller program which manages the monitoring of container in case of failover.

👉 What is replica?

- ✓ Replica is container which is the exact copy made from another container.

👉 difference between create and apply?

- ✓ . If a particular yml file has already run once in K8 , and requirement re run the same program with some minor changes, then create keyword is not applicable, one has to apply keyword.

kubectl create -f rc.yml

kubectl apply -f rc.yml

👉 command to see replication controller?

- ✓ kubectl get rc

👉 What is labels ?

- ✓ Management of container with the help of its IP is very dynamic as it changes on every restart, so instead we use a tag name or the label which remain static until the container is deleted. The labels are written is key value pair.
-

→ If any containers are launched in docker, these are put in on box of private Network LAN.

Proof:

1. Launching the container

```
[root@localhost ~]# docker images | grep vimal
vimal13/apache-webserver-php latest 05774ad1cd23 3 years a
go 350MB
[root@localhost ~]# docker ps
CONTAINER ID        IMAGE               COMMAND             CREATED
STATUS            PORTS              NAMES
[root@localhost ~]# docker run -it --name os4 vimal13/apache-webserver-php
AH00558: httpd: Could not reliably determine the server's fully qualified domain
name, using 172.17.0.2. Set the 'ServerName' directive globally to suppress thi
s message
S
```

2. The ip is 172.17.0.2 as mentioned above.

3. Now , if the above statement is true, the hosted server on this ip should run in my vm but not from any other os .

4. Verifying:

Checking on my VM:

Curl http://172.17.0.2

```
[root@localhost ~]# curl http://172.17.0.2
<body bgcolor='aqua'>
<pre>

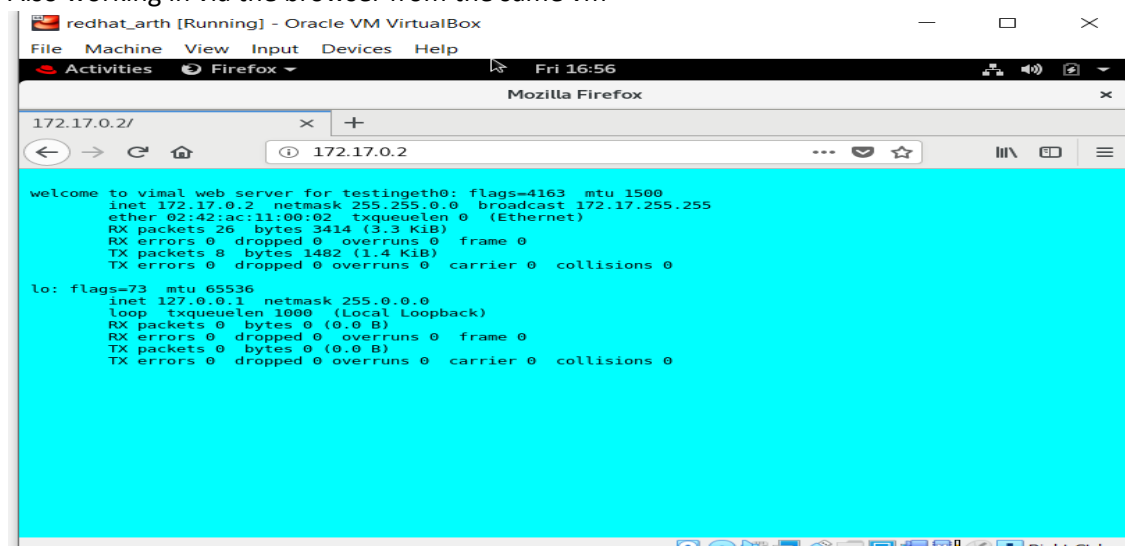
welcome to vimal web server for testingeth0: flags=4163<UP,BROADCAST,RUNNING,MUL
TICAST>  mtu 1500
    inet 172.17.0.2 netmask 255.255.0.0 broadcast 172.17.255.255
    ether 02:42:ac:11:00:02 txqueuelen 0 (Ethernet)
    RX packets 19 bytes 2658 (2.5 KiB)
    RX errors 0 dropped 0 overruns 0 frame 0
    TX packets 3 bytes 182 (182.0 B)
    TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0

lo: flags=73<UP,LOOPBACK,RUNNING> mtu 65536
    inet 127.0.0.1 netmask 255.0.0.0
    loop txqueuelen 1000 (Local Loopback)
    RX packets 0 bytes 0 (0.0 B)
    RX errors 0 dropped 0 overruns 0 frame 0
    TX packets 0 bytes 0 (0.0 B)
    TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0

</pre>
```

Yup working,

Also working in via the browser from the same vm



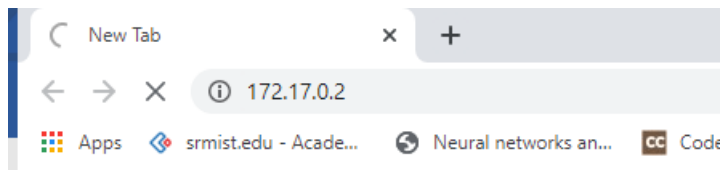
Now checking from my different OS say Windows either via CLI or via browser

→ CLI

```
C:\Users\Romio_juliete>curl http://172.17.0.2
```

Not working....

→ Browser



not working...

Proved.....

How to make it work ...??

Ans . PATing -> Port Address Translation

→ Route is not accessible in LAN, as it doesn't have the RT.

→ So, I will ask my client to connect to my baseOS IP(MY NODE) and use some port say 1234.

1st.

```
[root@localhost ~]# docker run -it --name os5 -p 1234:80 vimal13/apache-webserver-php
AH00558: httpd: Could not reliably determine the server's fully qualified domain name, using 172.17.0.2. Set the 'ServerName' directive globally to suppress this message
```

Ifconfig enp0s3 => ip of my node is 192.168.0.107

```
[root@localhost ~]# ifconfig enp0s3
enp0s3: flags=4163<UP,BROADCAST,RUNNING,MULTICAST> mtu 1500
    inet 192.168.0.107 netmask 255.255.255.0 broadcast 192.168.0.255
    inet6 fe80::f655:67cc:541d:acb2 prefixlen 64 scopeid 0x20<link>
    ether 08:00:27:f5:a2:4e txqueuelen 1000 (Ethernet)
    RX packets 112031 bytes 167747635 (159.9 MiB)
    RX errors 0 dropped 0 overruns 0 frame 0
    TX packets 28872 bytes 2111259 (2.0 MiB)
    TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0
```

2nd.

Checking on windows

Type curl http:// 192.168.0.107:1234 in CLI

```
C:\Users\Romio_juliete>curl http:// 192.168.0.107:1234
curl: (3) Bad URL
<body bgcolor='aqua'>
<pre>

welcome to vimal web server for testingeth0: 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 56 bytes 7836 (7.6 KiB)
    RX errors 0 dropped 0 overruns 0 frame 0
    TX packets 34 bytes 4404 (4.3 KiB)
    TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0

lo: flags=73<UP,LOOPBACK,RUNNING> mtu 65536
    inet 127.0.0.1 netmask 255.0.0.0
    loop txqueuelen 1000 (Local Loopback)
    RX packets 0 bytes 0 (0.0 B)
    RX errors 0 dropped 0 overruns 0 frame 0
    TX packets 0 bytes 0 (0.0 B)
    TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0

</pre>
```

Yes working...

Today: REPLICATION CONTROLLER>

1st. writing the labels in pod.yml file

```
File Edit Format View Help
apiVersion: v1
kind: Pod
metadata:
  name: "mypod1"
  labels:
    app: web
spec:
  containers:
  - name: "myc1"
    image: "vimal13/apache-webserver-php"
```

2nd: creating and checking labels

```
kubectl create -f pod.yml
```

```
kubectl describe pods mypod1
```

```
C:\Users\Romio_juliete\Desktop\CKA_ws_akshayanil>kubectl create -f pod.yml
pod/mypod1 created

C:\Users\Romio_juliete\Desktop\CKA_ws_akshayanil>kubectl describe pods mypod1
Name:          mypod1
Namespace:     default
Priority:       0
Node:          minikube/192.168.99.101
Start Time:    Fri, 15 Jan 2021 17:28:25 +0530
Labels:        app=web
Annotations:   <none>
Status:        Running
IP:            172.17.0.5
IPs:           172.17.0.5
```

```
kubectl get pods -L app
```

```
C:\Users\Romio_juliete\Desktop\CKA_ws_akshayanil>kubectl get pods -L app
NAME      READY   STATUS    RESTARTS   AGE   APP
mypod1    1/1     Running   0           72s   web
```

3rd:

Creating rc ;

→ I have a pod , select it via label and launch it => one kind of template

Code:

```
apiVersion: v1
kind: ReplicationController
metadata:
  name: myrc2
spec:
  selector:
    app: web

  template:
    metadata:
      name: "mypod1"
      labels:
        app: web
    spec:
      containers:
        - name: "myc1"
          image: "vimal13/apache-webserver-php"
```

kubect1 create -f rc.yml - create an rc..

```
C:\Users\Romio_juliete\Desktop\CKA_ws_akshayanil>kubect1 create -f rc.yml
replicationcontroller/myrc1 created
```

kubect1 get rc - check the number of rc's

```
C:\Users\Romio_juliete\Desktop\CKA_ws_akshayanil>kubect1 get rc
NAME      DESIRED   CURRENT   READY   AGE
myrc1     1         1         1       79s
```

kubect1 describe rc myrc1 - Can also view the template file in rc..

```
C:\Users\Romio_juliete\Desktop\CKA_ws_akshayanil>kubect1 describe rc myrc1
Name:      myrc1
Namespace: default
Selector:  app=web
Labels:    app=web
Annotations: <none>
Replicas:  1 current / 1 desired
Pods Status: 1 Running / 0 Waiting / 0 Succeeded / 0 Failed
Pod Template:
  Labels:  app=web
  Containers:
    myc1:
      Image:      vimal13/apache-webserver-php
      Port:       <none>
      Host Port:  <none>
      Environment: <none>
```

4th:

Lets check the available pods with the given labels app:web

`kubectl get pods -L app`

```
C:\Users\Romio_juliete\Desktop\CKA_ws_akshayanil>kubectl get pods -L app
NAME      READY   STATUS    RESTARTS   AGE   APP
mypod1    1/1     Running   0           16m   web
```

Let's delete this pod, rc will relaunch it again...

In ur case: it will show mypod1 just delete it....

`kubectl delete pod myrc2-lrbzz`

`kubectl get pods`

`kubectl get pods -L app`

```
C:\Users\Romio_juliete\Desktop\CKA_ws_akshayanil>kubectl get pods
NAME          READY   STATUS    RESTARTS   AGE
myrc2-lrbzz    1/1     Running   0           14s
```

```
C:\Users\Romio_juliete\Desktop\CKA_ws_akshayanil>kubectl delete pods myrc2-lrbzz
pod "myrc2-lrbzz" deleted
```

```
C:\Users\Romio_juliete\Desktop\CKA_ws_akshayanil>
```

```
C:\Users\Romio_juliete\Desktop\CKA_ws_akshayanil>
```

```
C:\Users\Romio_juliete\Desktop\CKA_ws_akshayanil>kubectl get pods
```

```
NAME          READY   STATUS    RESTARTS   AGE
myrc2-mhcnh    1/1     Running   0           16s
```

5th:

Expose the rc to public world....

`kubectl expose rc myrc2 --port=80 --type=NodePort`

```
C:\Users\Romio_juliete\Desktop\CKA_ws_akshayanil>kubectl expose rc myrc2 --port=80 --type=NodePort
service/myrc2 exposed
```

`kubectl get services` -- see the services(Loadbalancing) done by K8

```
C:\Users\Romio_juliete\Desktop\CKA_ws_akshayanil>kubectl get services
NAME         TYPE        CLUSTER-IP   EXTERNAL-IP   PORT(S)          AGE
kubernetes   ClusterIP   10.96.0.1    <none>         443/TCP          44h
myrc1        ClusterIP   10.101.46.85 <none>         80/TCP           19m
myrc2        NodePort    10.103.166.104 <none>        80:31504/TCP     13s
```

6th:

Find the ip : open minikube -> `ifconfig | less` and the exposed port number is mention above : `31504`(its completely random given by system)

```
eth1      Link encap:Ethernet  HWaddr 08:00:27:A4:3F:83
          inet addr:192.168.99.101  Bcast:192.168.99.255  Mask:255.255.255.0
          UP BROADCAST RUNNING MULTICAST  MTU:1500  Metric:1
          RX packets:2599 errors:0 dropped:0 overruns:0 frame:0
          TX packets:1595 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1000
          RX bytes:271889 (265.5 KiB)  TX bytes:3257217 (3.1 MiB)
```

standard input

Verify:

```
C:\Users\Romio_juliete\Desktop\CKA_ws_akshayanil>curl http://192.168.99.101:31504
<body bgcolor='aqua'>
<pre>

welcome to vimal web server for testingeth0: flags=4163<UP,BROADCAST,RUNNING,MULTICAST>  mtu 1500
  inet 172.17.0.5  netmask 255.255.0.0  broadcast 172.17.255.255
  ether 02:42:ac:11:00:05  txqueuelen 0  (Ethernet)
  RX packets 287  bytes 40365 (39.4 KiB)
  RX errors 0  dropped 0  overruns 0  frame 0
  TX packets 241  bytes 33176 (32.3 KiB)
  TX errors 0  dropped 0 overruns 0  carrier 0  collisions 0

lo: flags=73<UP,LOOPBACK,RUNNING>  mtu 65536
  inet 127.0.0.1  netmask 255.0.0.0
  loop txqueuelen 1000  (Local Loopback)
  RX packets 0  bytes 0 (0.0 B)
  RX errors 0  dropped 0  overruns 0  frame 0
  TX packets 0  bytes 0 (0.0 B)
  TX errors 0  dropped 0 overruns 0  carrier 0  collisions 0

</pre>
```

7th:

```
apiVersion: v1
kind: ReplicationController
metadata:
  name: myrc2
spec:
  replicas: 5
  selector:
    app: web
  template:
    metadata:
      name: "mypod1"
    labels:
      app: web
    spec:
      containers:
        - name: "myc1"
          image: "vimal13/apache-webserver-php"
```

Edit `replicas : 5` and save it.

`Kubectl apply -f rc.yml`

Kubectl get rc

Kubectl get pods -L app

```
C:\Users\Romio_juliete\Desktop\CKA_ws_akshayanil>kubectl apply -f rc.yml
replicationcontroller/myrc2 configured
```

```
C:\Users\Romio_juliete\Desktop\CKA_ws_akshayanil>kubectl get rc
```

NAME	DESIRED	CURRENT	READY	AGE
myrc2	5	5	1	21m

```
C:\Users\Romio_juliete\Desktop\CKA_ws_akshayanil>kubectl get pods -L app
```

NAME	READY	STATUS	RESTARTS	AGE	APP
myrc2-mhcnh	1/1	Running	0	20m	web
myrc2-mlv4q	1/1	Running	0	100s	web
myrc2-qg5dz	1/1	Running	0	100s	web
myrc2-t9nzg	1/1	Running	0	100s	web
myrc2-wn5r2	1/1	Running	0	100s	web

8th: verifying....

```
C:\Users\Romio_juliete\Desktop\CKA_ws_akshayanil>curl http://192.168.99.101:31504
```

```
<body bgcolor='aqua'>
<pre>
```

```
welcome to vimal web server for testingeth0: flags=4163<UP,BROADCAST,RUNNING,MULTICAST> mtu 1500
inet 172.17.0.8 netmask 255.255.0.0 broadcast 172.17.255.255
ether 02:42:ac:11:00:08 txqueuelen 0 (Ethernet)
RX packets 6 bytes 408 (408.0 B)
RX errors 0 dropped 0 overruns 0 frame 0
TX packets 3 bytes 162 (162.0 B)
TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0
```

```
lo: flags=73<UP,LOOPBACK,RUNNING> mtu 65536
inet 127.0.0.1 netmask 255.0.0.0
loop txqueuelen 1000 (Local Loopback)
RX packets 0 bytes 0 (0.0 B)
RX errors 0 dropped 0 overruns 0 frame 0
TX packets 0 bytes 0 (0.0 B)
TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0
```

```
</pre>
```

```
C:\Users\Romio_juliete\Desktop\CKA_ws_akshayanil>curl http://192.168.99.101:31504
```

```
<body bgcolor='aqua'>
<pre>
```

```
welcome to vimal web server for testingeth0: flags=4163<UP,BROADCAST,RUNNING,MULTICAST> mtu 1500
inet 172.17.0.7 netmask 255.255.0.0 broadcast 172.17.255.255
ether 02:42:ac:11:00:07 txqueuelen 0 (Ethernet)
RX packets 7 bytes 450 (450.0 B)
RX errors 0 dropped 0 overruns 0 frame 0
TX packets 3 bytes 162 (162.0 B)
TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0
```

```
lo: flags=73<UP,LOOPBACK,RUNNING> mtu 65536
inet 127.0.0.1 netmask 255.0.0.0
loop txqueuelen 1000 (Local Loopback)
RX packets 0 bytes 0 (0.0 B)
RX errors 0 dropped 0 overruns 0 frame 0
TX packets 0 bytes 0 (0.0 B)
TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0
```

```
</pre>
```

```
C:\Users\Romio_juliete\Desktop\CKA_ws_akshayanil>
```

Via browser

← → ↻ ⚠ Not secure | http://192.168.99.101:31504

```
welcome to vimal web server for testingeth0: flags=4163 mtu 1500
  inet 172.17.0.8 netmask 255.255.0.0 broadcast 172.17.255.255
  ether 02:42:ac:11:00:08 txqueuelen 0 (Ethernet)
  RX packets 56 bytes 7263 (7.0 KiB)
  RX errors 0 dropped 0 overruns 0 frame 0
  TX packets 44 bytes 6358 (6.2 KiB)
  TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0

lo: flags=73 mtu 65536
  inet 127.0.0.1 netmask 255.0.0.0
  loop txqueuelen 1000 (Local Loopback)
  RX packets 0 bytes 0 (0.0 B)
  RX errors 0 dropped 0 overruns 0 frame 0
  TX packets 0 bytes 0 (0.0 B)
  TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0
```

Refresh

← → ↻ ⚠ Not secure | 192.168.99.101:31504

```
welcome to vimal web server for testingeth0: flags=4163 mtu 1500
  inet 172.17.0.9 netmask 255.255.0.0 broadcast 172.17.255.255
  ether 02:42:ac:11:00:09 txqueuelen 0 (Ethernet)
  RX packets 93 bytes 12075 (11.7 KiB)
  RX errors 0 dropped 0 overruns 0 frame 0
  TX packets 71 bytes 10976 (10.7 KiB)
  TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0

lo: flags=73 mtu 65536
  inet 127.0.0.1 netmask 255.0.0.0
  loop txqueuelen 1000 (Local Loopback)
  RX packets 0 bytes 0 (0.0 B)
  RX errors 0 dropped 0 overruns 0 frame 0
  TX packets 0 bytes 0 (0.0 B)
  TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0
```

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