1. Self Healing

```
devops@master:~$ kubectl get pods
NAME                      READY   STATUS    RESTARTS   AGE
pyapp-c486fff5c-64cs5     1/1     Running   0          40m
pyapp-c486fff5c-6m7sl     1/1     Running   0          23s
pyapp-c486fff5c-9qsh5     1/1     Running   0          40m
pyapp-c486fff5c-ljndn     1/1     Running   0          3h3m
pyapp-c486fff5c-w2jfc     1/1     Running   0          3h3m

devops@master:~$ kubectl get deployments
NAME    READY   UP-TO-DATE   AVAILABLE   AGE
pyapp   5/5     5            5           3h3m
```

2. Watch the container on master node and kill the same to watch it come again.

```
devops@master:~$ sudo docker container ls
[sudo] password for devops:
CONTAINER ID        IMAGE                     COMMAND
CREATED             STATUS               PORTS                   NAMES
ea2c0d349305        prakaram/sayhello       "python app.py"         7
minutes ago         Up 7 minutes
k8s_pyapp_pyapp-c486fff5c-6m7sl_default_13566120-6f53-11e9-b479-
080027aad68a_0

devops@master:~$ sudo docker container kill ea2c0d349305
ea2c0d349305

devops@master:~$ sudo docker container ls -a
CONTAINER ID        IMAGE              COMMAND                 CREATED
STATUS                   PORTS               NAMES
ca7261f92243        prakaram/sayhello       "python app.py"         2 minutes
ago     Up 2 minutes                                    k8s_pyapp_pyapp-
c486fff5c-6m7sl_default_13566120-6f53-11e9-b479-080027aad68a_1
ea2c0d349305        prakaram/sayhello       "python app.py"         17
minutes ago     Exited (137) 2 minutes ago
k8s_pyapp_pyapp-c486fff5c-6m7sl_default_13566120-6f53-11e9-b479-
080027aad68a_0

devops@master:~$ kubectl get pods
NAME                      READY   STATUS    RESTARTS   AGE
pyapp-c486fff5c-64cs5     1/1     Running   0          60m
pyapp-c486fff5c-6m7sl     1/1     Running   1          20m
pyapp-c486fff5c-9qsh5     1/1     Running   0          60m
pyapp-c486fff5c-ljndn     1/1     Running   0          3h23m
pyapp-c486fff5c-w2jfc     1/1     Running   0          3h23m
```

3. Let us delete a pod running on master node:

```
devops@master:~$ kubectl get pods
NAME                    READY    STATUS    RESTARTS    AGE
pyapp-c486fff5c-64cs5   1/1      Running   0           60m
pyapp-c486fff5c-6m7sl   1/1      Running   1           20m
pyapp-c486fff5c-9qsh5   1/1      Running   0           60m
pyapp-c486fff5c-ljndn   1/1      Running   0           3h23m
pyapp-c486fff5c-w2jfc   1/1      Running   0           3h23m

devops@master:~$ kubectl get deployments
NAME    READY   UP-TO-DATE   AVAILABLE   AGE
pyapp   5/5     5            5           3h28m

devops@master:~$ kubectl delete pod pyapp-c486fff5c-6m7sl
pod "pyapp-c486fff5c-6m7sl" deleted

devops@master:~$ kubectl get deployments
NAME    READY   UP-TO-DATE   AVAILABLE   AGE
pyapp   5/5     5            5           3h29m

devops@master:~$ kubectl get pods
NAME                    READY    STATUS    RESTARTS    AGE
pyapp-c486fff5c-64cs5   1/1      Running   0           66m
pyapp-c486fff5c-6lvp4   1/1      Running   0           44s
pyapp-c486fff5c-9qsh5   1/1      Running   0           66m
pyapp-c486fff5c-ljndn   1/1      Running   0           3h29m
pyapp-c486fff5c-w2jfc   1/1      Running   0           3h29m

devops@master:~$ kubectl describe pod pyapp-c486fff5c-6lvp4
Name:              pyapp-c486fff5c-6lvp4
Namespace:         default
Priority:          0
PriorityClassName: <none>
Node:              master/192.168.56.120
Start Time:        Sun, 05 May 2019 22:26:09 +0530
Labels:            pod-template-hash=c486fff5c
                   run=pyapp
Annotations:       cni.projectcalico.org/podIP: 10.244.0.7/32
Status:            Running
IP:                10.244.0.7
Controlled By:     ReplicaSet/pyapp-c486fff5c
Containers:
  pyapp:
    Container ID:
docker://336d275bdd94bc8b26b3e60ab4daf76fbd2d382b23ea2b686da5b3c5bc1b2ecb
    Image:         prakaram/sayhello:latest
    Image ID:      docker-
pullable://prakaram/sayhello@sha256:33dfdfa51c1a8822b91163741e83bfb775534eb96
055e7cb29e92a3b76852553
    Port:          80/TCP
```

```
    Host Port:        0/TCP
    State:            Running
      Started:        Sun, 05 May 2019 22:26:13 +0530
    Ready:            True
    Restart Count:    0
    Environment:      <none>
    Mounts:
      /var/run/secrets/kubernetes.io/serviceaccount from default-token-ss6kc
(ro)
Conditions:
  Type              Status
  Initialized       True
  Ready             True
  ContainersReady   True
  PodScheduled      True
Volumes:
  default-token-ss6kc:
    Type:           Secret (a volume populated by a Secret)
    SecretName:     default-token-ss6kc
    Optional:       false
QoS Class:          BestEffort
Node-Selectors:     <none>
Tolerations:        node.kubernetes.io/not-ready:NoExecute for 300s
                    node.kubernetes.io/unreachable:NoExecute for 300s
Events:
  Type    Reason     Age     From              Message
  ----    ------     ----    ----              -------
  Normal  Scheduled  3m1s    default-scheduler  Successfully assigned
default/pyapp-c486fff5c-6lvp4 to master
  Normal  Pulling    3m      kubelet, master    Pulling image
"prakaram/sayhello:latest"
  Normal  Pulled     2m57s   kubelet, master    Successfully pulled image
"prakaram/sayhello:latest"
  Normal  Created    2m57s   kubelet, master    Created container pyapp
  Normal  Started    2m57s   kubelet, master    Started container pyapp
```

---

4. Let us now bring down or make a node drain (Unschedulable)

```
devops@master:~$ kubectl get pods
NAME                     READY    STATUS     RESTARTS    AGE
pyapp-c486fff5c-64cs5    1/1      Running    0           77m
pyapp-c486fff5c-6lvp4    1/1      Running    0           11m
pyapp-c486fff5c-9qsh5    1/1      Running    0           77m
pyapp-c486fff5c-ljndn    1/1      Running    0           3h41m
pyapp-c486fff5c-w2jfc    1/1      Running    0           3h41m


devops@master:~$ kubectl get nodes
NAME        STATUS    ROLES     AGE      VERSION
master      Ready     master    7h16m    v1.14.1
```

```
worker01    Ready      <none>   83m      v1.14.1
worker02    Ready      worker   7h11m    v1.14.1


devops@master:~$ kubectl drain worker02 --delete-local-data --force --ignore-
daemonsets
node/worker02 cordoned
WARNING: ignoring DaemonSet-managed Pods: kube-system/calico-node-2krt9,
kube-system/kube-proxy-rcbzv
evicting pod "pyapp-c486fff5c-w2jfc"
evicting pod "pyapp-c486fff5c-ljndn"
pod/pyapp-c486fff5c-ljndn evicted
pod/pyapp-c486fff5c-w2jfc evicted
node/worker02 evicted

devops@master:~$ kubectl get nodes
NAME          STATUS                  ROLES     AGE      VERSION
master        Ready                   master    7h17m    v1.14.1
worker01      Ready                   <none>    84m      v1.14.1
worker02      Ready,SchedulingDisabled worker   7h12m    v1.14.1

devops@master:~$ kubectl get pods
NAME                    READY    STATUS    RESTARTS    AGE
pyapp-c486fff5c-4xwhd   1/1      Running   0           49s
pyapp-c486fff5c-64cs5   1/1      Running   0           79m
pyapp-c486fff5c-6lvp4   1/1      Running   0           13m
pyapp-c486fff5c-7446h   1/1      Running   0           49s
pyapp-c486fff5c-9qsh5   1/1      Running   0           79m

devops@master:~$ kubectl describe pod pyapp-c486fff5c-4xwhd
Name:             pyapp-c486fff5c-4xwhd
Namespace:        default
Priority:         0
PriorityClassName: <none>
Node:             worker01/192.168.56.121
Start Time:       Sun, 05 May 2019 22:38:46 +0530
Labels:           pod-template-hash=c486fff5c
                  run=pyapp
Annotations:      cni.projectcalico.org/podIP: 10.244.2.5/32
Status:           Running
IP:               10.244.2.5
Controlled By:    ReplicaSet/pyapp-c486fff5c
Containers:
  pyapp:
    Container ID:
docker://3b02ca48ef3fe2c454aaa7c98429945408b80416f56e766c268cdcebf3342f5d
    Image:        prakaram/sayhello:latest
    Image ID:     docker-
pullable://prakaram/sayhello@sha256:33dfdfa51c1a8822b91163741e83bfb775534eb96
055e7cb29e92a3b76852553
    Port:         80/TCP
    Host Port:    0/TCP
    State:        Running
```

```
      Started:         Sun, 05 May 2019 22:38:53 +0530
    Ready:           True
    Restart Count:   0
    Environment:     <none>
    Mounts:
      /var/run/secrets/kubernetes.io/serviceaccount from default-token-ss6kc
(ro)
Conditions:
  Type              Status
  Initialized       True
  Ready             True
  ContainersReady   True
  PodScheduled      True
Volumes:
  default-token-ss6kc:
    Type:         Secret (a volume populated by a Secret)
    SecretName:   default-token-ss6kc
    Optional:     false
QoS Class:        BestEffort
Node-Selectors:   <none>
Tolerations:      node.kubernetes.io/not-ready:NoExecute for 300s
                  node.kubernetes.io/unreachable:NoExecute for 300s
Events:
  Type    Reason     Age    From              Message
  ----    ------     ----   ----              -------
  Normal  Pulling    3m27s  kubelet, worker01 Pulling image
"prakaram/sayhello:latest"
  Normal  Scheduled 3m26s  default-scheduler  Successfully assigned
default/pyapp-c486fff5c-4xwhd to worker01
  Normal  Pulled     3m21s  kubelet, worker01  Successfully pulled image
"prakaram/sayhello:latest"
  Normal  Created    3m21s  kubelet, worker01  Created container pyapp
  Normal  Started    3m21s  kubelet, worker01  Started container pyapp


devops@master:~$ kubectl describe pod pyapp-c486fff5c-7446h
Name:             pyapp-c486fff5c-7446h
Namespace:        default
Priority:         0
PriorityClassName: <none>
Node:             worker01/192.168.56.121
Start Time:       Sun, 05 May 2019 22:38:45 +0530
Labels:           pod-template-hash=c486fff5c
                  run=pyapp
Annotations:      cni.projectcalico.org/podIP: 10.244.2.4/32
Status:           Running
IP:               10.244.2.4
Controlled By:    ReplicaSet/pyapp-c486fff5c
Containers:
  pyapp:
    Container ID:
docker://1e26c5cb9cc64c6fde805c59aa4be4ab5ad643ecc3578930bcb56db95e172d83
    Image:        prakaram/sayhello:latest
```

```
    Image ID:       docker-
pullable://prakaram/sayhello@sha256:33dfdfa51c1a8822b91163741e83bfb775534eb96
055e7cb29e92a3b76852553
    Port:           80/TCP
    Host Port:      0/TCP
    State:          Running
      Started:      Sun, 05 May 2019 22:38:50 +0530
    Ready:          True
    Restart Count:  0
    Environment:    <none>
    Mounts:
      /var/run/secrets/kubernetes.io/serviceaccount from default-token-ss6kc
(ro)
Conditions:
  Type              Status
  Initialized       True
  Ready             True
  ContainersReady   True
  PodScheduled      True
Volumes:
  default-token-ss6kc:
    Type:       Secret (a volume populated by a Secret)
    SecretName: default-token-ss6kc
    Optional:   false
QoS Class:      BestEffort
Node-Selectors: <none>
Tolerations:    node.kubernetes.io/not-ready:NoExecute for 300s
                node.kubernetes.io/unreachable:NoExecute for 300s
Events:
  Type    Reason     Age    From             Message
  ----    ------     ----   ----             -------
  Normal  Pulling    3m59s  kubelet, worker01  Pulling image
"prakaram/sayhello:latest"
  Normal  Scheduled  3m57s  default-scheduler  Successfully assigned
default/pyapp-c486fff5c-7446h to worker01
  Normal  Pulled     3m55s  kubelet, worker01  Successfully pulled image
"prakaram/sayhello:latest"
  Normal  Created    3m55s  kubelet, worker01  Created container pyapp
  Normal  Started    3m55s  kubelet, worker01  Started container pyapp
```