HEALTH CHECK

Probe

>readiness probe: length of time to wait for a pod to initialize after pod startup, before applying health checking

>liveliness probe: length of time to wait for a pod to initialize after pod startup, before applying health checking

```
PS C:\Users\msuban01\Desktop\kube\Exercise\04_03_application_health_checks> cat helloworld-with-probes.yaml
apiVersion: apps/v1
kind: Deployment
metadata:
  name: helloworld-deployment-with-probe
spec:
  selector:
    matchLabels:
      app: helloworld
  replicas: 1 # tells deployment to run 1 pods matching the template
  template: # create pods using pod definition in this template
    metadata:
      labels:
        app: helloworld
    spec:
      containers:
      - name: helloworld
        image: karthequian/helloworld:latest
        ports:
        - containerPort: 80
        readinessProbe:
          # length of time to wait for a pod to initialize
          # after pod startup, before applying health checking
          initialDelaySeconds: 5
          # Amount of time to wait before timing out
          timeoutSeconds: 1
          # Probe for http
          httpGet:
            # Path to probe
            path: /
            # Port to probe
            port: 80
        livenessProbe:
          # length of time to wait for a pod to initialize
          # after pod startup, before applying health checking
          initialDelaySeconds: 5
          # Amount of time to wait before timing out
          timeoutSeconds: 1
          # Probe for http
          httpGet:
            # Path to probe
            path: /
            # Port to probe
            port: 80
PS C:\Users\msuban01\Desktop\kube\Exercise\04_03_application_health_checks> ^C
PS C:\Users\msuban01\Desktop\kube\Exercise\04_03_application_health_checks> kubectl create -f helloworld-with-probes.yaml
deployment.apps/helloworld-deployment-with-probe created
PS C:\Users\msuban01\Desktop\kube\Exercise\04_03_application_health_checks> kubectl get deployment
NAME                               READY   UP-TO-DATE   AVAILABLE   AGE
helloworld-deployment-with-probe   1/1     1            1           23s
PS C:\Users\msuban01\Desktop\kube\Exercise\04_03_application_health_checks> kubectl get replicaset
NAME                                        DESIRED   CURRENT   READY   AGE
helloworld-deployment-with-probe-6df7d86456   1         1         1       5m49s
PS C:\Users\msuban01\Desktop\kube\Exercise\04_03_application_health_checks> kubectl get pods
NAME                                              READY   STATUS    RESTARTS   AGE
helloworld-deployment-with-probe-6df7d86456-chgww   1/1     Running   0          6m11s
PS C:\Users\msuban01\Desktop\kube\Exercise\04_03_application_health_checks>
```

Readiness Probe

With a bad readiness probe we observe that after creation the deployment and pod runs but is not ready.

>using command: kubectl describe pod/[NAME]

We can observe the error associated with the pod in the events section (In this case we have assigned it to a different port)

```
PS C:\Users\msuban01\Desktop\kube\Exercise\04_03_application_health_checks> kubectl create -f helloworld-with-bad-readiness-probe.yaml
deployment.apps/helloworld-deployment-with-bad-readiness-probe created
PS C:\Users\msuban01\Desktop\kube\Exercise\04_03_application_health_checks> kubectl get deployments
NAME                                             READY   UP-TO-DATE   AVAILABLE   AGE
helloworld-deployment-with-bad-readiness-probe   0/1     1            0           24s
helloworld-deployment-with-probe                 1/1     1            1           10m
PS C:\Users\msuban01\Desktop\kube\Exercise\04_03_application_health_checks> kubectl get pods
NAME                                                            READY   STATUS    RESTARTS   AGE
helloworld-deployment-with-bad-readiness-probe-6cb6cd4bf4-42fj8  0/1     Running   0          44s
helloworld-deployment-with-probe-6df7d86456-chgww               1/1     Running   0          10m
PS C:\Users\msuban01\Desktop\kube\Exercise\04_03_application_health_checks> kubectl describe pod/helloworld-deployment-with-bad-readiness-probe-6cb6cd4bf4-42fj8
Name:         helloworld-deployment-with-bad-readiness-probe-6cb6cd4bf4-42fj8
Namespace:    default
Priority:     0
Node:         minikube/172.23.110.105
Start Time:   Tue, 22 Feb 2022 10:50:48 +1300
Labels:       app=helloworld
              pod-template-hash=6cb6cd4bf4
Annotations:  <none>
Status:       Running
IP:           172.17.0.4
IPs:
  IP:           172.17.0.4
Controlled By:  ReplicaSet/helloworld-deployment-with-bad-readiness-probe-6cb6cd4bf4
Containers:
  helloworld:
    Container ID:   docker://3ba2526d24ff1c1988fe20f3fb583e034ef88b43df5dc2abb4d130fdb8014b0f
    Image:          karthequian/helloworld:latest
    Image ID:       docker-pullable://karthequian/helloworld@sha256:48413fdddeae11e4732896e49b6d82979847955666ed95e4d6e57b433920c9e1
    Port:           80/TCP
    Host Port:      0/TCP
    State:          Running
      Started:      Tue, 22 Feb 2022 10:50:52 +1300
    Ready:          False
    Restart Count:  0
    Readiness:      http-get http://:90/ delay=5s timeout=1s period=10s #success=1 #failure=3
    Environment:    <none>
    Mounts:
      /var/run/secrets/kubernetes.io/serviceaccount from kube-api-access-n7kww (ro)
Conditions:
  Type              Status
  Initialized       True
  Ready             False
  ContainersReady   False
  PodScheduled      True
Volumes:
  kube-api-access-n7kww:
    Type:                    Projected (a volume that contains injected data from multiple sources)
    TokenExpirationSeconds:  3607
    ConfigMapName:           kube-root-ca.crt
    ConfigMapOptional:       <nil>
    DownwardAPI:             true
QoS Class:                   BestEffort
Node-Selectors:              <none>
Tolerations:                 node.kubernetes.io/not-ready:NoExecute op=Exists for 300s
                             node.kubernetes.io/unreachable:NoExecute op=Exists for 300s
Events:
  Type     Reason     Age                 From               Message
  ----     ------     ----                ----               -------
  Normal   Scheduled  102s                default-scheduler  Successfully assigned default/helloworld-deployment-with-bad-readiness-probe-6cb6cd4bf4-42fj8 to minikube
  Normal   Pulling    101s                kubelet            Pulling image "karthequian/helloworld:latest"
  Normal   Pulled     98s                 kubelet            Successfully pulled image "karthequian/helloworld:latest" in 3.294583485s
  Normal   Created    98s                 kubelet            Created container helloworld
  Normal   Started    98s                 kubelet            Started container helloworld
  Warning  Unhealthy  2s (x11 over 92s)   kubelet            Readiness probe failed: Get "http://172.17.0.4:90/": dial tcp 172.17.0.4:90: connect: connection refused
PS C:\Users\msuban01\Desktop\kube\Exercise\04_03_application_health_checks>
```

Liveliness probe

With a bad liveliness probe we observe after creation that the probe is successful in deployment however when looking at the pods the probe is running however the restart count increases continuously – this occurs until the status is modified to 'CrashLoopBackOff' and the deployment status is changed to not ready.

>Using command: kubectl describe pod/[NAME]

We can observe the error associated with the pod in the events section (In this case we have assigned it to a different port)

```
Administrator: Windows PowerShell

PS C:\Users\msuban01\Desktop\kube\Exercise\04_03_application_health_checks> kubectl create -f helloworld-with-bad-liveness-probe.yaml
deployment.apps/helloworld-deployment-with-bad-liveness-probe created
PS C:\Users\msuban01\Desktop\kube\Exercise\04_03_application_health_checks> kubectl get deployments
NAME                                             READY   UP-TO-DATE   AVAILABLE   AGE
helloworld-deployment-with-bad-liveness-probe    1/1     1            1           8s
helloworld-deployment-with-bad-readiness-probe   0/1     1            0           11m
helloworld-deployment-with-probe                 1/1     1            1           21m
PS C:\Users\msuban01\Desktop\kube\Exercise\04_03_application_health_checks> kubectl get pods
NAME                                                             READY   STATUS    RESTARTS       AGE
helloworld-deployment-with-bad-liveness-probe-7f8c6548cc-ts6ms   1/1     Running   1 (14s ago)    29s
helloworld-deployment-with-bad-readiness-probe-6cb6cd4bf4-42fj8  0/1     Running   0              12m
helloworld-deployment-with-probe-6df7d86456-chgww               1/1     Running   0              21m
PS C:\Users\msuban01\Desktop\kube\Exercise\04_03_application_health_checks> kubectl get pods
NAME                                                             READY   STATUS    RESTARTS       AGE
helloworld-deployment-with-bad-liveness-probe-7f8c6548cc-ts6ms   1/1     Running   2 (16s ago)    46s
helloworld-deployment-with-bad-readiness-probe-6cb6cd4bf4-42fj8  0/1     Running   0              12m
helloworld-deployment-with-probe-6df7d86456-chgww               1/1     Running   0              22m
PS C:\Users\msuban01\Desktop\kube\Exercise\04_03_application_health_checks> kubectl get pods
NAME                                                             READY   STATUS             RESTARTS       AGE
helloworld-deployment-with-bad-liveness-probe-7f8c6548cc-ts6ms   0/1     CrashLoopBackOff   3 (24s ago)    84s
helloworld-deployment-with-bad-readiness-probe-6cb6cd4bf4-42fj8  0/1     Running            0              13m
helloworld-deployment-with-probe-6df7d86456-chgww               1/1     Running            0              22m
PS C:\Users\msuban01\Desktop\kube\Exercise\04_03_application_health_checks> kubectl describe pod/helloworld-deployment-with-bad-liveness-probe-7f8c6548cc-ts6ms
Name:          helloworld-deployment-with-bad-liveness-probe-7f8c6548cc-ts6ms
Namespace:     default
Priority:      0
Node:          minikube/172.23.110.105
Start Time:    Tue, 22 Feb 2022 11:02:27 +1300
Labels:        app=helloworld
               pod-template-hash=7f8c6548cc
Annotations:   <none>
Status:        Running
IP:            172.17.0.5
IPs:
  IP:          172.17.0.5
Controlled By: ReplicaSet/helloworld-deployment-with-bad-liveness-probe-7f8c6548cc
Containers:
  helloworld:
    Container ID:   docker://deb7ff9444c30d9adb6209b6638044557f7ad6732cb6da232ad7df88420642b2
    Image:          karthequian/helloworld:latest
    Image ID:       docker-pullable://karthequian/helloworld@sha256:48413fdddeae11e4732896e49b6d82979847955666ed95e4d6e57b433920c9e1
    Port:           80/TCP
    Host Port:      0/TCP
    State:          Running
      Started:      Tue, 22 Feb 2022 11:04:16 +1300
    Last State:     Terminated
      Reason:       Completed
      Exit Code:    0
      Started:      Tue, 22 Feb 2022 11:03:59 +1300
      Finished:     Tue, 22 Feb 2022 11:04:12 +1300
    Ready:          True
    Restart Count:  5
    Liveness:       http-get http://:90/ delay=5s timeout=1s period=5s #success=1 #failure=2
    Environment:    <none>
    Mounts:
      /var/run/secrets/kubernetes.io/serviceaccount from kube-api-access-x7ckv (ro)
Conditions:
  Type              Status
  Initialized       True
  Ready             True
  ContainersReady   True
  PodScheduled      True
Volumes:
  kube-api-access-x7ckv:
    Type:                    Projected (a volume that contains injected data from multiple sources)
    TokenExpirationSeconds:  3607
    ConfigMapName:           kube-root-ca.crt
    ConfigMapOptional:       <nil>
    DownwardAPI:             true
QoS Class:                   BestEffort
Node-Selectors:              <none>
Tolerations:                 node.kubernetes.io/not-ready:NoExecute op=Exists for 300s
                             node.kubernetes.io/unreachable:NoExecute op=Exists for 300s
Events:
  Type     Reason     Age                   From               Message
  ----     ------     ----                  ----               -------
  Normal   Scheduled  111s                  default-scheduler  Successfully assigned default/helloworld-deployment-with-bad-liveness-probe-7f8c6548cc-ts6ms to minikube
  Normal   Pulled     107s                  kubelet            Successfully pulled image "karthequian/helloworld:latest" in 3.090975061s
  Normal   Pulled     92s                   kubelet            Successfully pulled image "karthequian/helloworld:latest" in 3.142882378s
  Normal   Pulled     78s                   kubelet            Successfully pulled image "karthequian/helloworld:latest" in 3.028275602s
  Warning  Unhealthy  66s (x6 over 101s)    kubelet            Liveness probe failed: Get "http://172.17.0.5:90/": dial tcp 172.17.0.5:90: connect: connection refused
  Normal   Killing    66s (x3 over 96s)     kubelet            Container helloworld failed liveness probe, will be restarted
  Normal   Pulling    66s (x4 over 110s)    kubelet            Pulling image "karthequian/helloworld:latest"
  Normal   Pulled     63s                   kubelet            Successfully pulled image "karthequian/helloworld:latest" in 3.086589553s
  Normal   Started    62s (x4 over 107s)    kubelet            Started container helloworld
  Normal   Created    62s (x4 over 107s)    kubelet            Created container helloworld
PS C:\Users\msuban01\Desktop\kube\Exercise\04_03_application_health_checks> kubectl get deployments
NAME                                             READY   UP-TO-DATE   AVAILABLE   AGE
helloworld-deployment-with-bad-liveness-probe    0/1     1            0           2m45s
helloworld-deployment-with-bad-readiness-probe   0/1     1            0           14m
helloworld-deployment-with-probe                 1/1     1            1           24m
PS C:\Users\msuban01\Desktop\kube\Exercise\04_03_application_health_checks>
```