SKILUP DAYS by: DevOps INSTITUTE

Robust and Resilient Services – Kubernetes Probes

Learn about Kubernetes probes and how to configure them

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Agenda

- Objectives
- Understanding the problem & solution
- Kubernetes probes – What are they & How it works?
- Configuration
- Conclusion

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BMK is a passionate Solutions Architect with over 20 years of ICT experience with the Bank of New Zealand.

DevOps, Cloud-Native, DataOps, CI/CD Enthusiast

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Objectives

In this SKILUP session, we will learn about #Kubernetes topics:

- Liveness & Readiness probes
- How to configure Liveness & Readiness probes

kubernetes

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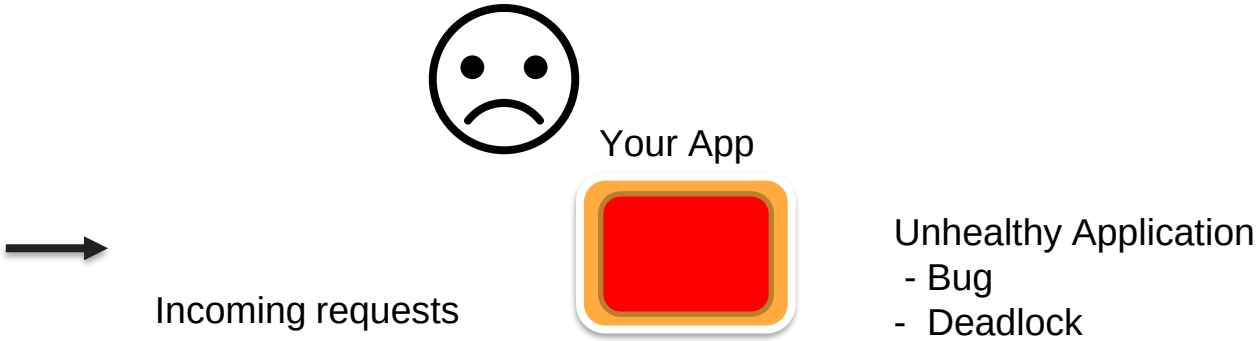
Health Checks – Understanding the problem

Health Checks – Understanding the problem



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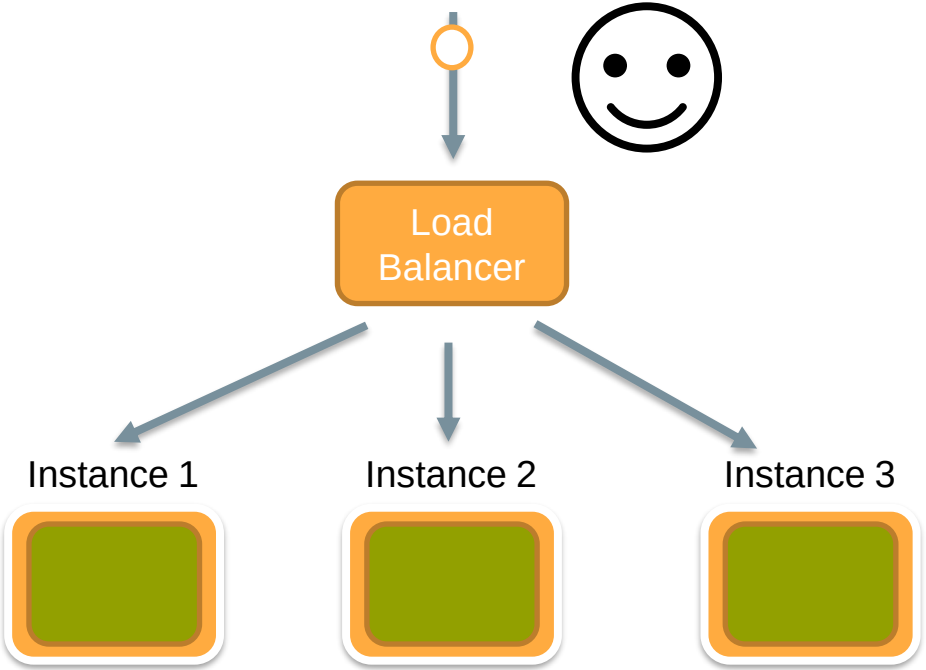
Health Checks – Understanding the problem

Application star-up is slow
- load dependencies
- load dataset/populate dataset

Health Checks – Understanding the problem



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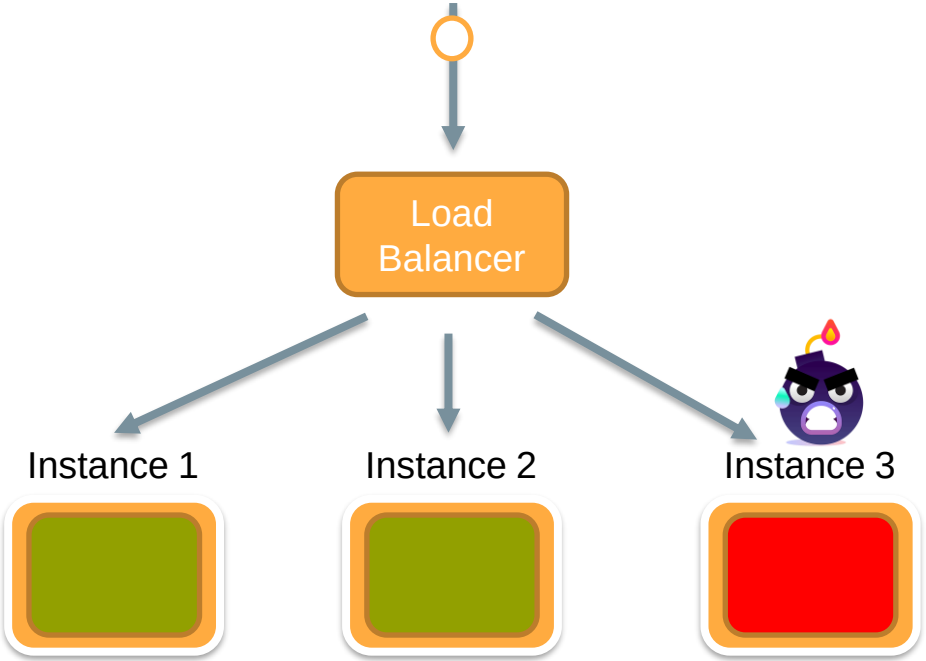
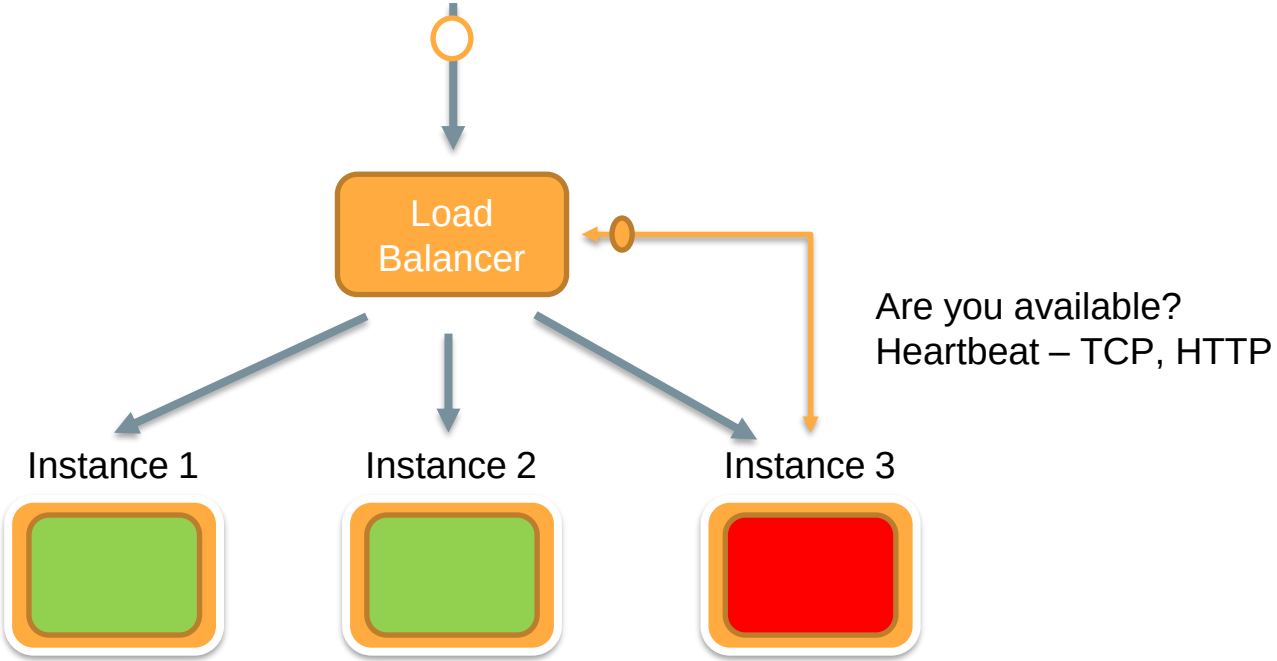
Health Checks – Understanding the problem



Health Checks – Understanding the problem



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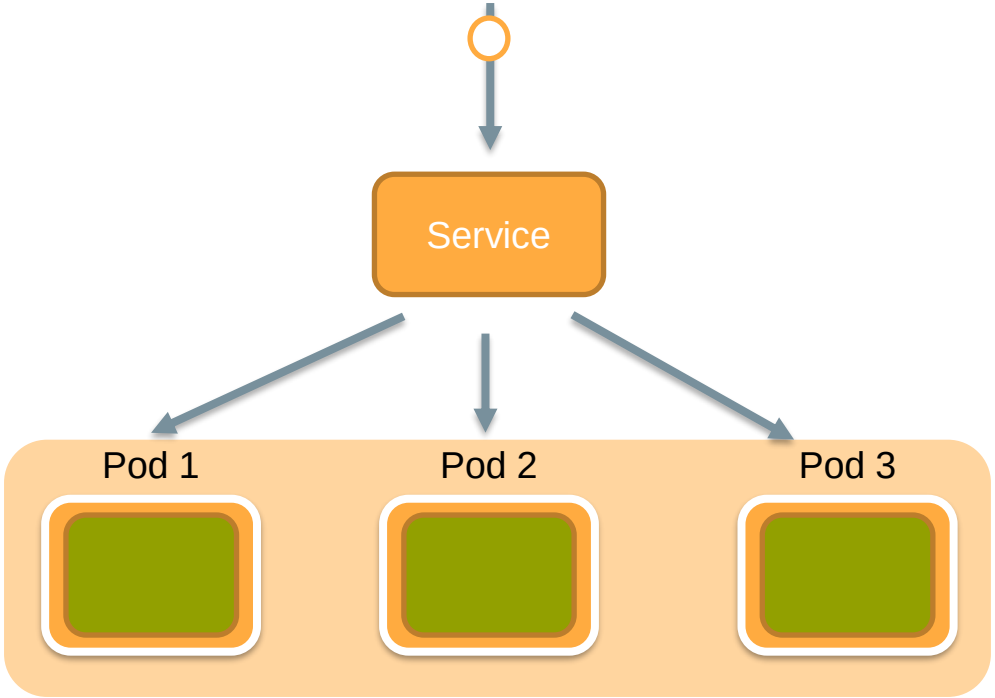
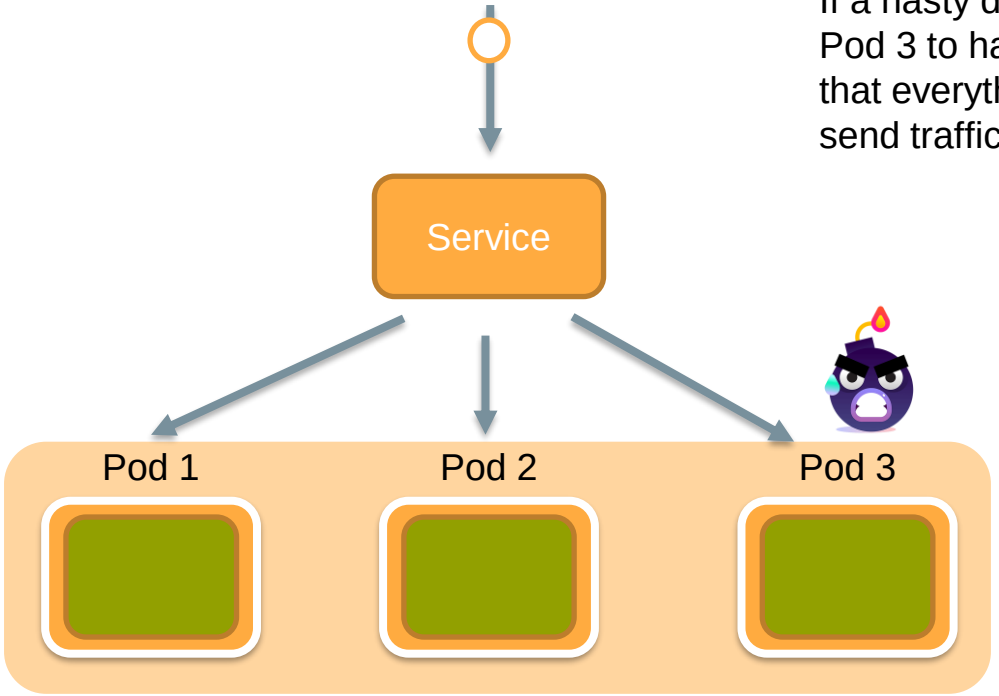
Health Checks



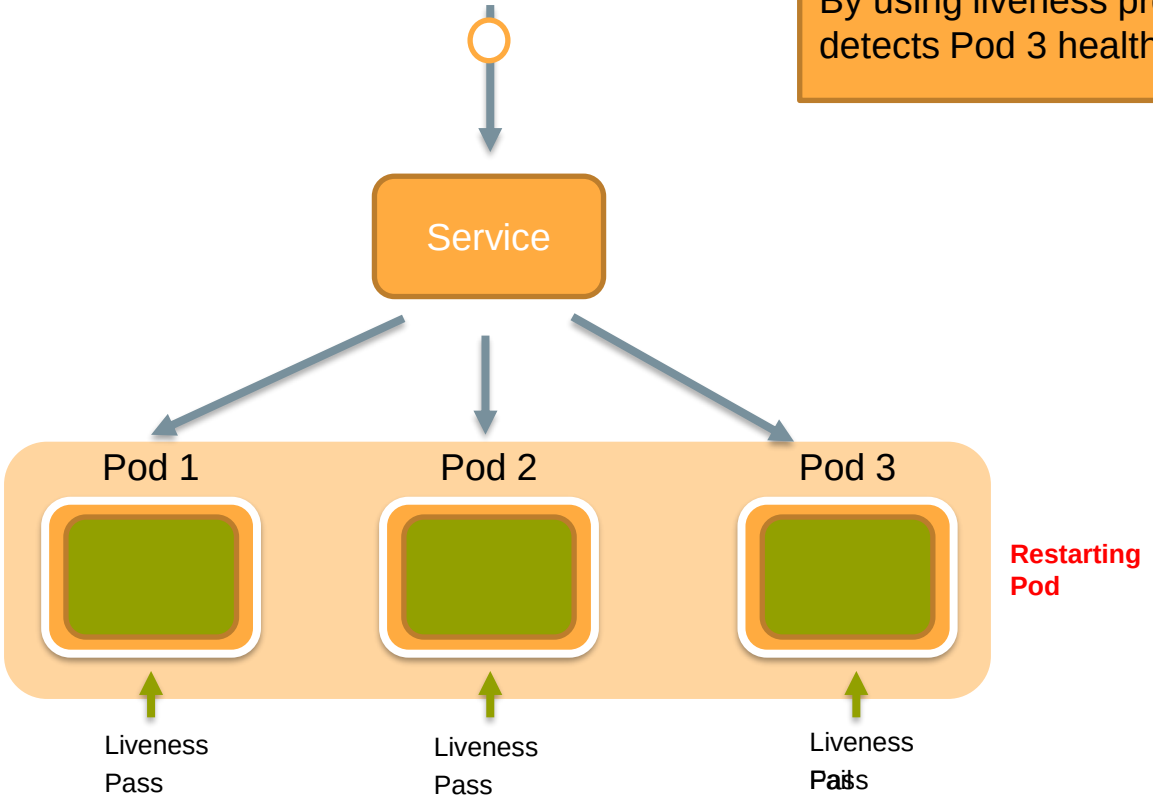
Health Checks

If a nasty defect / issue causing the Pod 3 to hang indefinitely, k8s thinks that everything is fine and continues to send traffic to Pod3.



Liveness Probe

By using liveness probe, Kubernetes detects Pod 3 health and restarts it.



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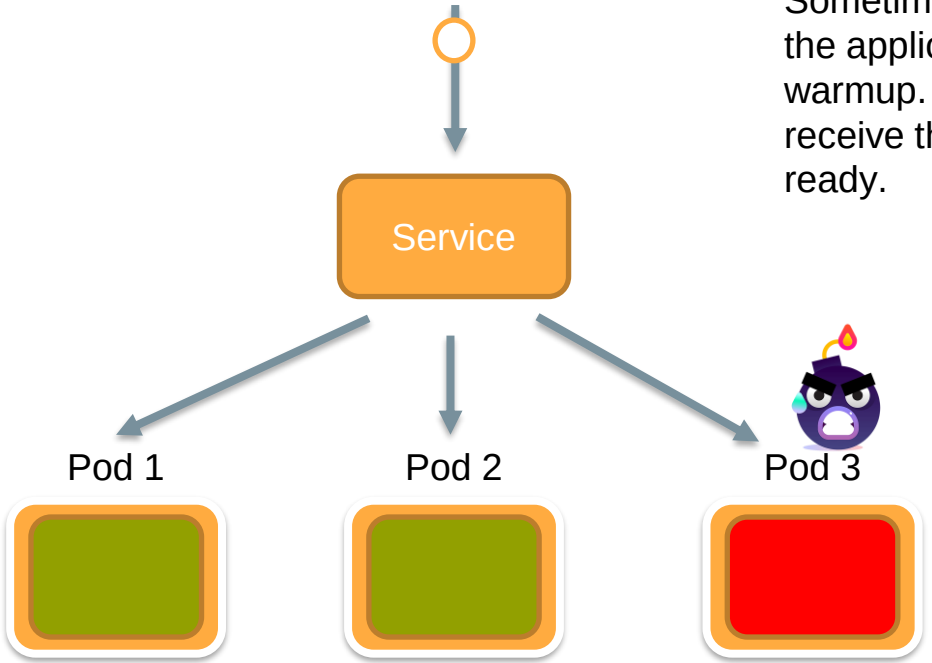
Health Checks



Sometimes, when new pod created, the application takes few seconds to warmup. In this case, it should not receive the request traffic until it is fully ready.

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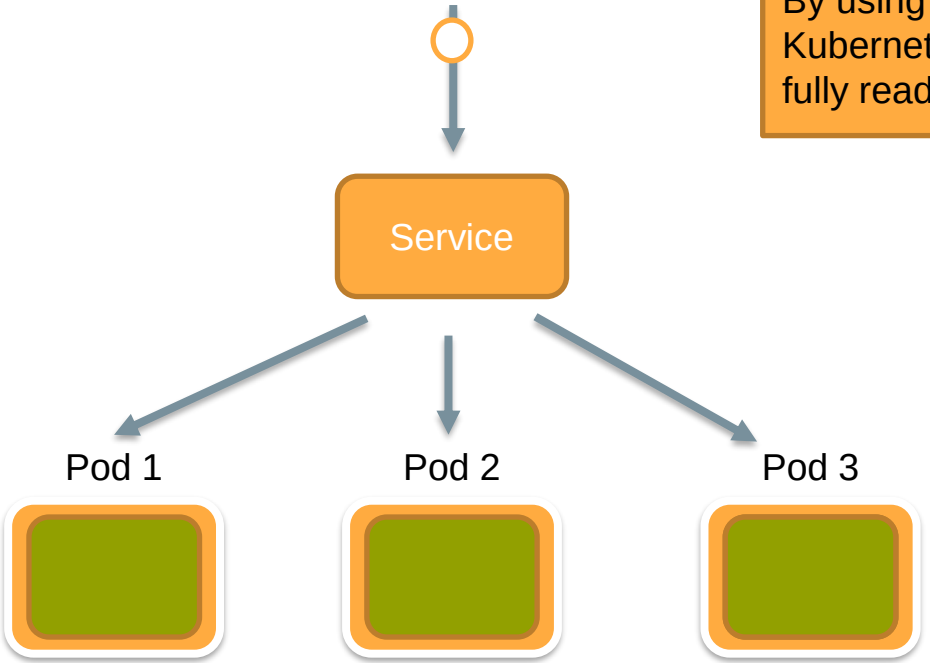
Readiness Probe

By using readiness probe, Kubernetes waits for the Pod to be fully ready to serve the requests.



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Kubernetes Probes

Liveness Probe	**liveness** probes to know when to restart a container
Readiness Probe	**readiness** probes to decide when the container is available for accepting traffic.

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Types of Probe

- HTTP
- COMMAND
- TCP

HTTP

```yaml
apiVersion: v1
kind: Pod
metadata:
  labels:
    test: liveness
  name: liveness-http
spec:
  containers:
  - name: liveness
    image: k8s.gcr.io/liveness
    args:
    - /server
    livenessProbe:
      httpGet:
        path: /healthz
        port: 8080
        httpHeaders:
        - name: Custom-Header
          value: Awesome
      initialDelaySeconds: 3
      periodSeconds: 3
```

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Source: https://kubernetes.io/

Command

```yaml
apiVersion: v1
kind: Pod
metadata:
  labels:
    test: liveness
  name: liveness-exec
spec:
  containers:
  - name: liveness
    image: k8s.gcr.io/busybox
    args:
    - /bin/sh
    - -c
    - touch /tmp/healthy; sleep 30; rm -rf /tmp/healthy; sleep 600
    livenessProbe:
      exec:
        command:
        - cat
        - /tmp/healthy
      initialDelaySeconds: 5
      periodSeconds: 5
```

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Source: https://kubernetes.io/

TCP

```yaml
apiVersion: v1
kind: Pod
metadata:
  name: goproxy
  labels:
    app: goproxy
spec:
  containers:
  - name: goproxy
    image: k8s.gcr.io/goproxy:0.1
    ports:
    - containerPort: 8080
    readinessProbe:
      tcpSocket:
        port: 8080
      initialDelaySeconds: 5
      periodSeconds: 10
    livenessProbe:
      tcpSocket:
        port: 8080
      initialDelaySeconds: 15
      periodSeconds: 20
```

Source: https://kubernetes.io/

Pod Status – Liveness Probe

```
Events:
  Type     Reason     Age                  From                                        Message
  ----     ------     ----                 ----                                        -------
  Normal   Scheduled  <unknown>            default-scheduler                           Successfully assigned default/liveness-http to aks-agentpool-74323035-vmss000000
  Normal   Pulled     20s (x2 over 41s)    kubelet, aks-agentpool-74323035-vmss000000  Successfully pulled image "k8s.gcr.io/liveness"
  Normal   Created    20s (x2 over 41s)    kubelet, aks-agentpool-74323035-vmss000000  Created container liveness
  Normal   Started    20s (x2 over 41s)    kubelet, aks-agentpool-74323035-vmss000000  Started container liveness
  Warning  Unhealthy  2s (x6 over 29s)     kubelet, aks-agentpool-74323035-vmss000000  Liveness probe failed: HTTP probe failed with statuscode: 500
  Normal   Killing    2s (x2 over 23s)     kubelet, aks-agentpool-74323035-vmss000000  Container liveness failed liveness probe, will be restarted
  Normal   Pulling    1s (x3 over 45s)     kubelet, aks-agentpool-74323035-vmss000000  Pulling image "k8s.gcr.io/liveness"
```

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Pod Status – Readiness Probe

```
Events:
  Type     Reason     Age                From                                                  Message
  ----     ------     ----               ----                                                  -------
  Normal   Scheduled  49s                default-scheduler                                     Successfully assigned k8s-probes-demo/readiness-ex
ec-6c99cf8479-dzcfz to gke-dsk-cluster-default-pool-c24ef3ff-r5ts
  Normal   Pulling    48s                kubelet, gke-dsk-cluster-default-pool-c24ef3ff-r5ts  Pulling image "k8s.gcr.io/busybox"
  Normal   Pulled     47s                kubelet, gke-dsk-cluster-default-pool-c24ef3ff-r5ts  Successfully pulled image "k8s.gcr.io/busybox"
  Normal   Created    47s                kubelet, gke-dsk-cluster-default-pool-c24ef3ff-r5ts  Created container readiness
  Normal   Started    47s                kubelet, gke-dsk-cluster-default-pool-c24ef3ff-r5ts  Started container readiness
  Warning  Unhealthy  1s (x4 over 16s)   kubelet, gke-dsk-cluster-default-pool-c24ef3ff-r5ts  Readiness probe failed: cat: can't open '/tmp/heal
```

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Summary

In this SKILUP session, we have learnt about #Kubernetes topics:

- Liveness & Readiness probes
- How to configure Liveness & Readiness probes

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THANK YOU!

Meet me in the Network Chat Lounge for questions

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