Kubernetes Pod Life Cycle Cheat Sheet

2018 Ernesto Garbarino at http://www.garba.org

Pod

- **Pending**
  - Init
    - Init Container
      - Container

- **Running**
  - Container
    - PostStart Hook
    - Liveness Probe
    - Readiness Probe
    - PreStop Hook
    - SIGTERM
    - SIGKILL
    - Start Grace Period
    - Grace Period
    - Delete Pod Event

- **Terminating**
  - A scaling or deletion event starts the grace period (see pod.spec.terminationGracePeriodSeconds) counter and the command declared at pod.spec.containers.lifecycle.preStop is run.

- **Succeeded**
- **Failed**
- **Unknown**

Service Controller

- Publish Endpoint
- Remove Endpoint

Timeline

- **T0:** Pod is created directly or by a controller such as ReplicaSet or StatefulSet.
- **T1:** The container(s) declared at pod.spec.initContainers are run.
- **T2:** The regular container(s) declared at pod.spec.containers are run in parallel with the command declared at pod.spec.containers.lifecycle.postStart.
- **T3:** The commands defined for the liveness and readiness probes at pod.spec.containers.livenessProbe and pod.spec.containers.readinessProbe, respectively, are run at regular intervals (see .periodSeconds).
- **T4:** The Service Controller publishes the pod’s endpoint as witnessed by kubectl get endpoints/service-name.
- **T5:** A scaling or deletion event starts the grace period (see pod.spec.terminationGracePeriodSeconds) counter and the command declared at pod.spec.containers.lifecycle.preStop is run.
- **T6:** The container’s first process receives the SIGTERM Linux signal which may be caught using the signal library (signal.h) in C or its equivalent in another language. Note that /bin/sh does not propagate it down.
- **T7:** The container is terminated abruptly with no further means to catch the termination event or run mitigating code elsewhere.

Event

- A formal event declared by the pod.status.phase attribute.

Event

- An indicative event observed using kubectl get pod/name -w.

Guarantees when running a Container

- Volumes will be mounted first
- The env variable $HOSTNAME contains the Pod’s hostname.

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- T4
- T5
- T6
- T7

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