Kubernetes 学习规划

1.容器及编排 （Containers & Orchestration）

目的: 通过kubeadm 在个人的虚拟机环境安装 Kubernetes 集群

参考:

- 安装 Kubeadm
  https://kubernetes.io/docs/setup/production-environment/tools/kubeadm/install-kubeadm/
- 使用 Kubeadm启动一个kubernetes 集群
  https://kubernetes.io/docs/setup/production-environment/tools/kubeadm/create-cluster-kubeadm/
- 安装网络插件
  https://kubernetes.io/docs/setup/production-environment/tools/kubeadm/create-cluster-kubeadm/#podnetwork

2.Kubernetes 架构

目的: 使用kubectl管理 Kubernetes

参考:

- Kubectl 参考
  https://kubernetes.io/docs/reference/kubectl/overview/
- Kubectl 使用惯例
  https://kubernetes.io/docs/reference/kubectl/conventions/
  Kubectl 备忘录
  https://kubernetes.io/docs/reference/kubectl/cheatsheet/
- 查看和查找resources
  https://kubernetes.io/docs/reference/kubectl/cheatsheet/#viewing-findingresources
- 升级 resources
  https://kubernetes.io/docs/reference/kubectl/cheatsheet/#updating-resources
- 管理运行中的Pods
  https://kubernetes.io/docs/reference/kubectl/cheatsheet/#interacting-withrunning-pods

3.Pods and Configs

目的: Pods 及其配置文件

参考:

- Kubectl 参考
  https://kubernetes.io/docs/reference/kubectl/overview/
- Kubectl 使用惯例
  https://kubernetes.io/docs/reference/kubectl/conventions/
- Pod概述和模板示例
  https://kubernetes.io/docs/concepts/workloads/pods/podoverview/

4.Controllers 控制器

目的: 练习Deployments 和 ReplicaSets

参考:

- Deployment 说明及示例
  https://kubernetes.io/docs/concepts/workloads/controllers/deployment/
- Controller 更新
  https://kubernetes.io/docs/concepts/workloads/controllers/deployment/#updating-adeployment
  https://kubernetes.io/docs/concepts/workloads/controllers/deployment/#scaling-adeployment
- Kubectl 回滚追溯
  https://kubernetes.io/docs/concepts/workloads/controllers/deployment/#rolling-backa-deployment
  https://kubernetes.io/docs/concepts/workloads/controllers/deployment/#checkingrollout-history-of-a-deployment
  https://kubernetes.io/docs/concepts/workloads/controllers/deployment/#pausingand-resuming-a-deployment
- 健康检查功能
  https://kubernetes.io/docs/tasks/configure-pod-container/configure-livenessreadiness-startup-probes
  https://kubernetes.io/docs/tasks/configure-pod-container/configure-livenessreadiness-startup-probes/#define-a-tcp-liveness-probe
- Job 说明及示例
  https://kubernetes.io/docs/concepts/workloads/controllers/jobs-run-to-completion/

5.定义服务和Kube-Proxy (Services & Kube-Proxy)

目的: 练习创建服务

参考:

- 服务
  https://kubernetes.io/docs/concepts/services-networking/service/
- 便签选择和服务
  https://kubernetes.io/docs/concepts/servicesnetworking/service/#defining-a-service

6.管理状态（Managing State）

目的: 练习创建存储卷

参考:

- 卷管理
  https://kubernetes.io/docs/concepts/storage/volumes/
  https://kubernetes.io/docs/tasks/configure-pod-container/configurevolume-storage/
- 注释管理
  https://kubernetes.io/docs/concepts/overview/working-withobjects/annotations/
- 下载 API
  https://kubernetes.io/docs/tasks/inject-data-application/downward-apivolume-expose-pod-

information/
https://kubernetes.io/docs/tasks/inject-data-application/environmentvariable-expose-pod-information/

- 密钥管理
  https://kubernetes.io/docs/concepts/configuration/secret/
  https://kubernetes.io/docs/tasks/inject-data-application/distributecredentials-secure/
- ConfigMaps
  https://kubernetes.io/docs/tasks/configure-pod-container/configure-podconfigmap

7.API 和Pod 的安全

目的: 联系创建命名空间、配额、限制范围和准入控制

参考:

- 命名空间
  https://kubernetes.io/docs/concepts/overview/working-withobjects/namespaces/
  https://kubernetes.io/docs/tasks/administer-cluster/namespaceswalkthrough/
- 资源配额
  https://kubernetes.io/docs/concepts/policy/resource-quotas/
  https://kubernetes.io/docs/tasks/administer-cluster/quota-api-object/
- 准入控制
  https://kubernetes.io/docs/reference/access-authn-authz/admissioncontrollers/
  https://kubernetes.io/blog/2019/03/21/a-guide-to-kubernetesadmission-controllers/
- Pod的安全策略
  https://kubernetes.io/docs/reference/access-authn-authz/authorization/
  https://kubernetes.io/docs/concepts/policy/pod-security-policy/

8.可观测性 （Observability）

目的: 使用 metrics server 配置 HPAs

参考:

- Metrics Server
  https://kubernetes.io/docs/tasks/debug-application-cluster/resourcemetrics-pipeline/
- HPA
  https://kubernetes.io/docs/tasks/run-application/horizontal-podautoscale/
  https://kubernetes.io/docs/tasks/run-application/horizontal-podautoscale-walkthrough/

9.进口流量(Ingress)

目的: 练习使用 ingress controllers

参考:

- 创建 Namespaces
  https://kubernetes.io/docs/tasks/administer-cluster/namespaceswalkthrough/#create-new-namespaces
- 服务账号
  https://kubernetes.io/docs/reference/access-authn-authz/service-accounts-admin/

- 角色
  https://kubernetes.io/docs/reference/access-authn-authz/rbac/
  https://kubernetes.io/docs/reference/access-authn-authz/rbac/#api-overview
- 分布式密钥
  https://kubernetes.io/docs/tasks/inject-data-application/distribute-credentials-secure/
- Ingress 控制器
  https://kubernetes.io/docs/concepts/services-networking/ingress-controllers/
  https://kubernetes.io/docs/concepts/services-networking/ingress/
- 部署Ingress (feat. MiniKube, but still applies to regular clusters)
  https://kubernetes.io/docs/tasks/access-application-cluster/ingressminikube/#enable-the-ingress-controller
- 创建service
  https://kubernetes.io/docs/concepts/workloads/controllers/deployment/
- 创建一个Deployment
  https://kubernetes.io/docs/concepts/services-networking/service/

10.网络策略(Kubernetes Networking)

目的: 练习网络策略

参考:

- 网络策略
  https://kubernetes.io/docs/concepts/services-networking/networkpolicies/
  https://kubernetes.io/blog/2017/10/enforcing-network-policies-inkubernetes/
- 网络策略示例
  https://kubernetes.io/docs/concepts/services-networking/networkpolicies/#the-networkpolicy-resource

11.Etcd 数据库

目的: Etcd 集群的操作练习

参考:

- Kubernetes中使用Etcd
  https://kubernetes.io/docs/tasks/administer-cluster/configureupgrade-etcd/
- 使用etcdctl
  https://kubernetes.io/docs/tasks/administer-cluster/configureupgrade-etcd/#replacing-a-failed-etcd-member
- 备份etcd
  https://kubernetes.io/docs/tasks/administer-cluster/configureupgrade-etcd/#backing-up