What you have to know about

Certified Kubernetes Administrator

GDG Cloud Bangkok

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CEO/Founder Opsta

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GDG Cloud Bangkok 2nd Meetup @ Tencent

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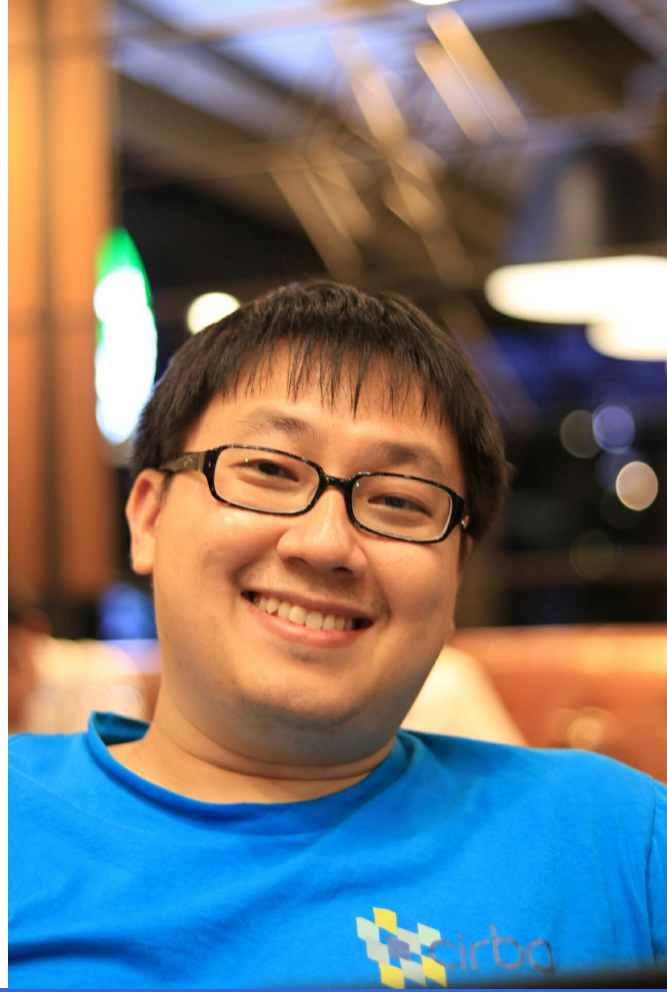
#whoami

- Jirayut Nimsaeng (Dear)
- Interested in Cloud and Open Source
- Agile Practitioner with DevOps Driven
- CEO and Founder Opsta
- First Certified Kubernetes Administrator in Thailand



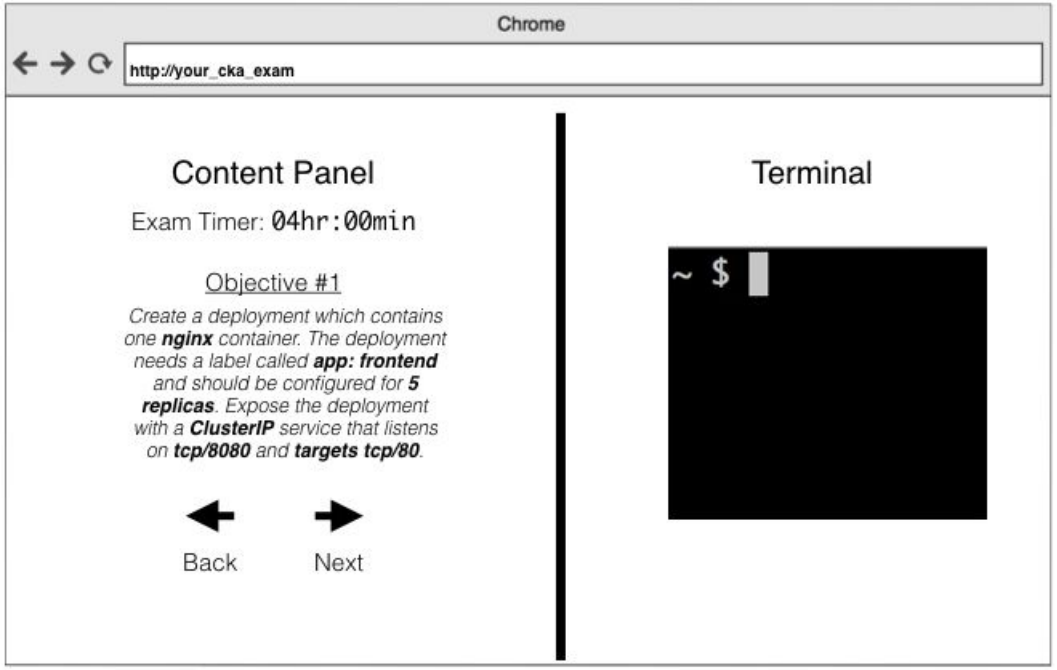
Facts

- Created by Cloud Native Computing Foundation (CNCF)
- Cost $300 with one free retake
- Online performance-based exam with proctor
- Use Kubernetes version 1.6.2 on Ubuntu 16.04
- Exam expected to take 3-4 hours to complete
- Passing score is 74%
- Certification valid for 2 years
- Register here https://www.cncf.io/certification/expert/

Preparation

- PC or Laptop
- Clean surface
- Windows, MacOS or Linux
- Chrome or Chromium Browser
- Reliable Internet
- Webcam
- Microphone
- Private space
- Passport or ID card
- Need 1-3 days for exam reservation

Exam Panel


Chrome
http://your_cka_exam
Content Panel
Exam Timer: 04hr:00min
Objective #1
Create a deployment which contains one nginx container. The deployment needs a label called app: frontend and should be configured for 5 replicas. Expose the deployment with a ClusterIP service that listens on tcp/8080 and targets tcp/80.
Back
Next
Terminal
~ $

While Exam

- You can browse for anything
- No K8s dashboard. You can use only command-line
- You can not note down anything except included Notepad
- Proctor has an ultimate timer
- You can reboot exam server
- Use Ctrl+Alt+W instead of Ctrl+W
- Copy & Paste key
  - Linux: select text to copy and paste with middle mouse
  - Mac: ⌘+C to copy and ⌘+V to paste
  - Windows: Ctrl+Insert to copy and Shift+Insert to paste
- You can use Screen or tmux

CKA Exam Environment

Cluster	Members	CNI	Description
k8s	1 CA, 1 etcd, 1 master, 2 worker	flannel	non-HA k8s cluster
Hk8s	1 CA, 3 etcd, 3 master, 1 loadbalancer, 2 worker	calico	HA k8s cluster
bk8s	1 CA, 1 etcd, 1 master, 1 worker	flannel	non-HA k8s cluster
wk8s	1 CA, 1 etcd, 1 master, 2 worker	flannel	non-HA k8s cluster
ek8s	1 CA, 1 etcd, 1 master, 2 worker	flannel	non-HA k8s cluster
fk8s	1 CA, 1 etcd, 1 base node none k8s cluster	none	missing master node
ik8s	1 CA, 1 etcd, 1 master, 1 base node	flannel	k8s cluster - missing worker node
tk8s	1 CA, 1 etcd, 1 master, 1 worker	flannel	non-HA k8s cluster

Curriculum

- 5% Scheduling
- 5% Logging/Monitoring
- 8% Application Lifecycle Management
- 11% Cluster Maintenance
- 12% Security
- 7% Storage
- 10% Troubleshooting
- 19% Core Concepts
- 11% Networking
- 12% Installation, Configuration & Validation

Core Concepts

- **Master Components**
  - kube-api-server
  - kube-controller-manager
  - kube-scheduler
- **Non-master components**
  - kubelet
  - kube-proxy

- **Kubernetes Objects**
  - Pod
  - Service
  - Ingress
  - Volume
  - Namespace
  - ReplicaSet
  - Deployment
  - Job
  - [CronJob]
  - [StatefulSet]
  - [DaemonSet]

Core Concepts

- Namespace is use a lot
- Label and Selector
- Create multiple containers in Pod with Init Container
  https://kubernetes.io/docs/concepts/workloads/pods/init-containers/
- Control output
  https://kubernetes.io/docs/user-guide/kubectl-overview/
- Job
  https://kubernetes.io/docs/concepts/workloads/controllers/jobs-run-to-completion/
- Update and Scaling Deployment
- History and Rollback Deployment

Installation, Configuration and Validation

- Create K8s cluster from binaries
- Must use token and certificates
- Configure to start K8s components with systemd
- Use systemctl to enable/disable services
- Troubleshooting with K8s log files
- Backup and restore etcd
- https://github.com/kelseyhightower/kubernetes-the-hard-way

Networking

- Understand the service concept with NodePort type
- Find service IP address
  https://kubernetes.io/docs/concepts/services-networking/service/
- Ingress
  https://kubernetes.io/docs/concepts/services-networking/ingress/

Volume

- Volume
  https://kubernetes.io/docs/concepts/storage/volumes/
- Persistent Volume and Persistent Volume Claim
  https://kubernetes.io/docs/concepts/storage/persistent-volumes/
- Storage Class
  https://kubernetes.io/docs/concepts/storage/storage-classes/

Security

- Network Policy
  https://ahmet.im/blog/kubernetes-network-policy/
- Secret both file and env
  https://kubernetes.io/docs/concepts/configuration/secret/

Troubleshooting, Monitoring/Logging

- Debug with kubectl describe
  https://kubernetes.io/docs/tasks/debug-application-cluster/debug-application-introspection/
- Logging with kubectl logs

Tips

- Practice, practice and practice
- Question 60% is for developer and 40% is for administrator
- Kubernetes version is 1.6.2 so watch out for compatibility and apiVersion
- kubectl explain is your friend
- Questions is an independent task so you can go back and forward
- Create manifest file for each question
- Challege yourself with https://github.com/kelseyhightower/kubernetes-the-hard-way


CERTIFIED
kubernetes
ADMINISTRATOR
The Cloud Native Computing Foundation hereby certifies that
Jirayut Nimsaeng
has successfully completed the program
requirements to be recognized as a
Kubernetes Certified Administrator
October 17, 2017
DATE OF COMPLETION
CKA-1700-0146-0100
CERTIFICATE ID NUMBER
DAN KOHN, EXECUTIVE DIRECTOR
CLOUD NATIVE COMPUTING FOUNDATION