**KCNA**<sup>Q&As</sup>

Kubernetes and Cloud Native Associate (KCNA)

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**QUESTION 1**

What does CNCF stand for?

A. Cloud Native Computing Foundation

B. Cloud Native Cloud Foundation

C. Cloud Native Container Foundation

Correct Answer: A

Explanation: https://www.cncf.io/about/who-we-are/

The Cloud Native Computing Foundation (CNCF) hosts critical components of the global technology infrastructure. CNCF brings together the world's top developers, end users, and vendors and runs the largest open source developer conferences. CNCF is part of the nonprofit Linux Foundation.

**QUESTION 2**

What is a commonly used package manager for kubernetes applications?

A. npm

B. apt

C. helm

D. kubernetes manifest

Correct Answer: C

Explanation: https://helm.sh/

**QUESTION 3**

Fluentd is the only way to export logs from Kubernetes cluster or applications running in cluster

A. True

B. False

Correct Answer: B

Explanation: https://github.com/cncf/landscape#trail-map

**CLOUD NATIVE COMPUTING FOUNDATION**

## CLOUD NATIVE TRAIL MAP

The Cloud Native Landscape l.cncf.io has a large number of options. This Cloud Native Trail Map is a recommended process for leveraging open source, cloud native technologies. At each step, you can choose a vendor-supported offering or do it yourself, and everything after step #3 is optional based on your circumstances.

### HELP ALONG THE WAY

#### A. Training and Certification
Consider training offerings from CNCF and then take the exam to become a Certified Kubernetes Administrator or a Certified Kubernetes Application Developer
cncf.io/training

#### B. Consulting Help
If you want assistance with Kubernetes and the surrounding ecosystem, consider leveraging a Kubernetes Certified Service Provider
cncf.io/kcsp

#### C. Join CNCF's End User Community
For companies that don't offer cloud native services externally
cncf.io/enduser

### WHAT IS CLOUD NATIVE?

Cloud native technologies empower organizations to build and run scalable applications in modern, dynamic environments such as public, private, and hybrid clouds. Containers, service meshes, microservices, immutable infrastructure, and declarative APIs exemplify this approach.

These techniques enable loosely coupled systems that are resilient, manageable, and observable. Combined with robust automation, they allow engineers to make high-impact changes frequently and predictably with minimal toil.

The Cloud Native Computing Foundation seeks to drive adoption of this paradigm by fostering and sustaining an ecosystem of open source, vendor-neutral projects. We democratize state-of-the-art patterns to make these innovations accessible for everyone.

l.cncf.io
v20200501

### 1. CONTAINERIZATION
- Commonly done with Docker containers
- Any size application and dependencies (even PDP-11 code running on an emulator) can be containerized
- Over time, you should aspire towards splitting suitable applications and writing future functionality as microservices

### 2. CI/CD
- Setup Continuous Integration/Continuous Delivery (CI/CD) so that changes to your source code automatically result in a new container being built, tested, and deployed to staging and eventually, perhaps, to production
- Setup automated rollouts, roll backs and testing
- Argo is a set of Kubernetes-native tools for deploying and running jobs, applications, workflows, and events using GitOps paradigms such as continuous and progressive delivery and MLops

argo
CNCF Incubating

### 3. ORCHESTRATION & APPLICATION DEFINITION
- Kubernetes is the market-leading orchestration solution
- You should select a Certified Kubernetes Distribution, Hosted Platform, or Installer: cncf.io/ck
- Helm Charts help you define, install, and upgrade even the most complex Kubernetes application

kubernetes
CNCF Graduated

HELM
CNCF Graduated

### 4. OBSERVABILITY & ANALYSIS
- Pick solutions for monitoring, logging and tracing
- Consider CNCF projects Prometheus for monitoring, Fluentd for logging and Jaeger for Tracing
- For tracing, look for an OpenTracing-compatible implementation like Jaeger

Prometheus — CNCF Graduated
fluentd — CNCF Graduated
JAEGER — CNCF Graduated
OPENTRACING — CNCF Incubating

### 5. SERVICE PROXY, DISCOVERY, & MESH
- CoreDNS is a fast and flexible tool that is useful for service discovery
- Envoy and Linkerd each enable service mesh architectures
- They offer health checking, routing, and load balancing

envoy — CNCF Graduated
CoreDNS — CNCF Graduated
LINKERD — CNCF Incubating

### 6. NETWORKING, POLICY, & SECURITY
To enable more flexible networking, use a CNI-compliant network project like Calico, Flannel, or Weave Net. Open Policy Agent (OPA) is a general purpose policy engine with uses ranging from authorization and admission control to data filtering. Falco is an anomaly detection engine for cloud native.

CNI — CNCF Incubating
Open Policy Agent — CNCF Incubating
falco — CNCF Incubating

### 7. DISTRIBUTED DATABASE & STORAGE
When you need more resiliency and scalability than you can get from a single database, Vitess is a good option for running MySQL at scale through sharding. Rook is a storage orchestrator that integrates a diverse set of storage solutions into Kubernetes. Serving as the "brain" of Kubernetes, etcd provides a reliable way to store data across a cluster of machines. TiKV is a high performant distributed transactional key-value store written in Rust.

Vitess — CNCF Graduated
ROOK — CNCF Incubating
etcd — CNCF Incubating
KV — CNCF Incubating

### 8. STREAMING & MESSAGING
When you need higher performance than JSON-REST, consider using gRPC or NATS. gRPC is a universal RPC framework. NATS is a multi-modal messaging system that includes request/reply, pub/sub and load balanced queues. CloudEvents is a specification for describing event data in common ways.

gRPC — CNCF Incubating
NATS — CNCF Incubating
cloudevents — CNCF Incubating

### 9. CONTAINER REGISTRY & RUNTIME
Harbor is a registry that stores, signs, and scans content. You can use alternative container runtimes. The most common, both of which are OCI-compliant, are containerd and CRI-O.

containerd — CNCF Graduated
HARBOR — CNCF Incubating
cri-o — CNCF Incubating

### 10. SOFTWARE DISTRIBUTION
If you need to do secure software distribution, evaluate Notary, an implementation of The Update Framework.

TUF — CNCF Graduated
Notary — CNCF Incubating

**QUESTION 4**

What are default kubernetes namespaces?

A. default, kube-public, kube-system, kube-node-lease

B. kube-default, kube-public, kube-system, kube-node-lease

C. default, kube-public, kube-systems, kube-node-lease

D. default, kube-public, kube-system, kube-node-leases

Correct Answer: A

Explanation: https://kubernetes.io/docs/concepts/overview/working-with- objects/namespaces/

You can list the current namespaces in a cluster using:

```
kubectl get namespace
```

```
NAME              STATUS   AGE
default           Active   1d
kube-node-lease   Active   1d
kube-public       Active   1d
kube-system       Active   1d
```

Kubernetes starts with four initial namespaces:

- `default` The default namespace for objects with no other namespace

- `kube-system` The namespace for objects created by the Kubernetes system

- `kube-public` This namespace is created automatically and is readable by all users (including those not authenticated). This namespace is mostly reserved for cluster usage, in case that some resources should be visible and readable publicly throughout the whole cluster. The public aspect of this namespace is only a convention, not a requirement.

- `kube-node-lease` This namespace holds Lease objects associated with each node. Node leases allow the kubelet to send heartbeats so that the control plane can detect node failure.

**QUESTION 5**

Which style of operations are preferred for kubernetes and cloud-native applications?

A. Imperative

B. None of the above

C. Declarative

Correct Answer: C

Explanation: https://kubernetes.io/docs/tasks/manage-kubernetes-objects/declarative- config/#trade-offs

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