

# Linux Foundation

## Exam Questions KCNA

Kubernetes and Cloud Native Associate (KCNA)



**NEW QUESTION 1**

What does CNCF stand for?

- A. Cloud Native Computing Foundation
- B. Cloud Native Cloud Foundation
- C. Cloud Native Container Foundation

**Answer:** A

**Explanation:**

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

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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.

**NEW QUESTION 2**

There are three Nodes in a cluster, and want to run exactly one replica of a Pod on each Node. Prefer to automatically create a replica on any new Nodes when they are added. Which Kubernetes re-source should you use?

- A. DaemonSet
- B. ReplicaSet
- C. NodeSet
- D. StatefulSet
- E. Deployment

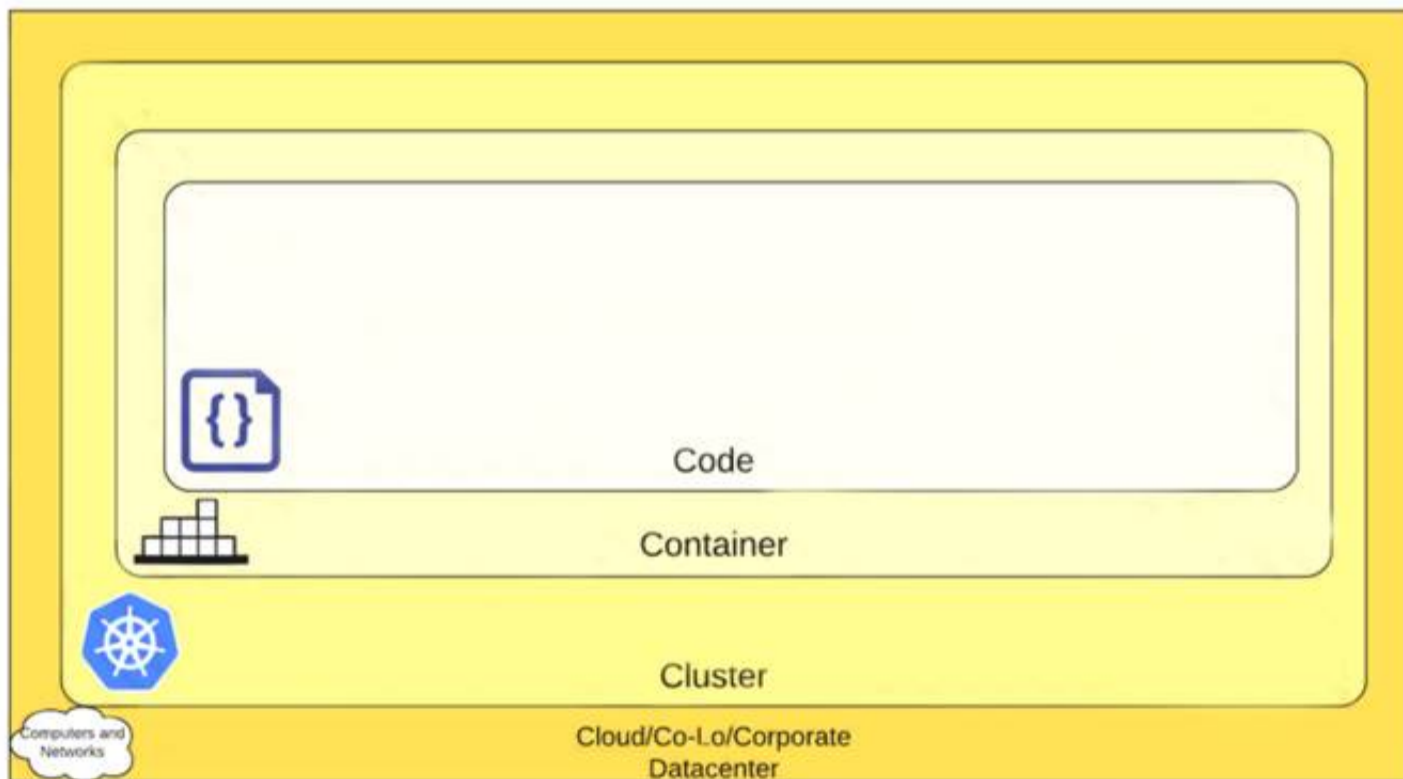
**Answer:** A

**Explanation:**

<https://kubernetes.io/docs/concepts/workloads/controllers/daemonset/>

A DaemonSet runs replicas on all (or just some) Nodes in the cluster.

Table Description automatically generated with medium confidence



**NEW QUESTION 3**

Which project in this list is a leading project in the observability space?

- A. Jaeger
- B. Vitess
- C. Argo
- D. Kubernetes

**Answer:** A

**Explanation:**

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



## CLOUD NATIVE TRAIL MAP

The Cloud Native Landscape (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](https://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/kspp](https://cncf.io/kspp)

#### C. Join CNCF's End User Community

For companies that don't offer cloud native services externally [cncf.io/enduser](https://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.

[cncf.io](https://cncf.io)

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### NEW QUESTION 4

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

- A. True
- B. False

**Answer: B**

### Explanation:

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

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**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

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

**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

**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

**6. NETWORKING, POLICY, & SECURITY**  
 To enable more flexible networking, use a CNF-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.

**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. TKV is a high performance, distributed transactional key-value store written in Rust.

**8. STREAMING & MESSAGING**  
 When you need higher performance than JSON-RPC, 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.

**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 CRIO.

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

### NEW QUESTION 5

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

- A. Imperative
- B. None of the above
- C. Declarative

**Answer: C**

#### Explanation:

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

### NEW QUESTION 6

What is Open Container Initiative 'OCI'?

- A. A protocol for communicating with the kubernetes api
- B. The governing body of the Cloud Native Computing Foundation 'CNCF'
- C. An open standard for managing service mesh in kubernetes
- D. An organization that creates open standards for containers

**Answer: D**

#### Explanation:

<https://opencontainers.org/>

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# Open Container Initiative

The **Open Container Initiative** is an open governance structure for the express purpose of creating open industry standards around container formats and runtimes.

Established in June 2015 by Docker and other leaders in the container industry, the OCI currently contains three specifications: the Runtime Specification (runtime-spec), the Image Specification (image-spec) and the Distribution Specification (distribution-spec). The Runtime Specification outlines how to run a "filesystem bundle" that is unpacked on disk. At a high-level an OCI implementation would download an OCI Image then unpack that image into an OCI Runtime filesystem bundle. At this point the OCI Runtime Bundle would be run by an OCI Runtime.

## NEW QUESTION 7

Which of the following command is used to get detailed information about the pod?

- A. kubectl info
- B. kubectl get
- C. kubectl describe
- D. kubectl explain

**Answer: C**

### Explanation:

<https://kubernetes.io/docs/reference/generated/kubectl/kubectl-commands#describe> Graphical user interface, application Description automatically generated

**Describe a pod**

`kubectl describe pods/nginx`

**Describe a pod identified by type and name in "pod.json"**

`kubectl describe -f pod.json`

**Describe all pods**

`kubectl describe pods`

## NEW QUESTION 8

What command can you use to get documentation about a resource type from the command line?

- A. kubectl api-resources
- B. kubectl explain
- C. kubectl get
- D. kubectl get-resource

**Answer: B**

### Explanation:

<https://kubernetes.io/docs/reference/generated/kubectl/kubectl-commands#explain> Graphical user interface, text, application, email Description automatically generated

## explain

List the fields for supported resources.

This command describes the fields associated with each supported API resource. Fields are identified via a simple JSONPath identifier:

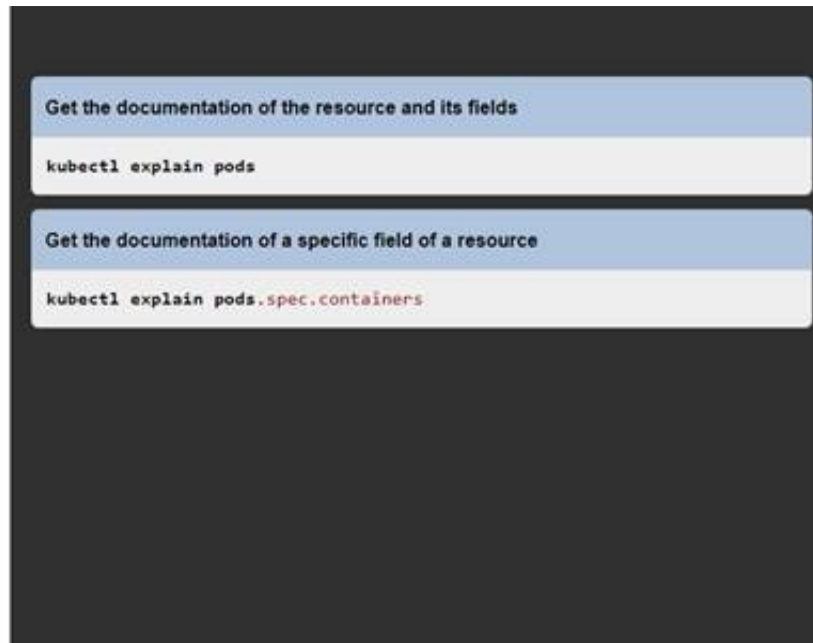
```
<type>.<fieldName>[.<fieldName>]
```

Add the `--recursive` flag to display all of the fields at once without descriptions. Information about each field is retrieved from the server in OpenAPI format.

Use `"kubectl api-resources"` for a complete list of supported resources.

### Usage

```
$ kubectl explain RESOURCE
```



### NEW QUESTION 9

What Linux feature is used to provide isolation for containers?

- A. Processes
- B. Services
- C. NetworkPolicy
- D. Control groups

**Answer:** D

**Explanation:**

Control groups provide isolation for container processes, keeping them separate from other process-es on the host.

### NEW QUESTION 10

How should folks new to the cloud native ecosystem, go about learning the different aspects of the ecosystem?

- A. by signing up the CNCF slack
- B. by reading the Kubernetes documentation
- C. by looking at the cloud native landscape
- D. by looking at the cloud native trail-map

**Answer:** D

**Explanation:**

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

### NEW QUESTION 11

Which of the following factors does scheduling take into account when selecting a Node?

- A. How many replicas there are in a Deployment
- B. Services
- C. Resource requirements
- D. The number of existing Pods on a Node

**Answer:** C

**Explanation:**

Scheduling takes resource requirements into account in the form of resource requests.

### NEW QUESTION 12

You might need to run a stateless application in kubernetes, and you want to be able to scale easily and perform rolling updates. What kubernetes resource type can you use to do this

- A. Dameon set
- B. Replica set
- C. Deployment
- D. pod
- E. service
- F. Stateful set

**Answer:** C

**Explanation:**

<https://kubernetes.io/docs/concepts/workloads/controllers/deployment/> Graphical user interface, text, application Description automatically generated

# Deployments

A *Deployment* provides declarative updates for Pods and ReplicaSets.

You describe a *desired state* in a Deployment, and the Deployment Controller changes the actual state to the desired state at a controlled rate. You can define Deployments to create new ReplicaSets, or to remove existing Deployments and adopt all their resources with new Deployments.

**Note:** Do not manage ReplicaSets owned by a Deployment. Consider opening an issue in the main Kubernetes repository if your use case is not covered below.

## NEW QUESTION 13

What is not semantic versioning?

- A. 1.0.0
- B. 2022-05-04
- C. 1.0.0-alpha
- D. 1.0.0-beta.2

**Answer:** B

**Explanation:**

<https://semver.org/>  
 RegEx SemVer at <https://regex101.com/r/vkijKf/1/>

## NEW QUESTION 14

The Kubernetes API provides an interface for storing objects. Which of the following describes the type of objects stored by the Kubernetes API?

- A. Containers
- B. REST
- C. YAML
- D. ETCD

**Answer:** B

**Explanation:**

Kubernetes objects are RESTful objects.

## NEW QUESTION 15

What is a commonly used package manager for kubernetes applications?

- A. npm
- B. apt
- C. helm
- D. kubernetes manifest

**Answer:** C

**Explanation:**

<https://helm.sh/>

## NEW QUESTION 16

The three typical opentelemetry data is?

- A. Metrics
- B. Traces
- C. Logs
- D. All of the options

**Answer:** D

**Explanation:**

<https://opentelemetry.io/docs/concepts/data-sources/> Text Description automatically generated

# What is OpenTelemetry?

OpenTelemetry is a set of APIs, SDKs, tooling and integrations that are designed for the creation and management of *telemetry data* such as traces, metrics, and logs. The project provides a vendor-agnostic implementation that can be configured to send telemetry data to the backend(s) of your choice. It supports a variety of popular open-source projects including Jaeger and Prometheus.

## NEW QUESTION 17

What are container runtimes with Kubernetes?

- A. CRI-O
- B. lxd
- C. containerd
- D. Dockershim

**Answer:** AC

### Explanation:

<https://kubernetes.io/docs/setup/production-environment/container-runtimes/> Graphical user interface, text, application, email Description automatically generated

## Container Runtimes

**Note:** Dockershim has been removed from the Kubernetes project as of release 1.24. Read the [Dockershim Removal FAQ](#) for further details.

You need to install a container runtime into each node in the cluster so that Pods can run there. This page outlines what is involved and describes related tasks for setting up nodes.

Kubernetes 1.25 requires that you use a runtime that conforms with the Container Runtime Interface (CRI).

See [CRI version support](#) for more information.

This page provides an outline of how to use several common container runtimes with Kubernetes.

- [containerd](#)
- [CRI-O](#)
- [Docker Engine](#)
- [Mirantis Container Runtime](#)

### Note:

Kubernetes releases before v1.24 included a direct integration with Docker Engine, using a component named *dockershim*. That special direct integration is no longer part of Kubernetes (this removal was [announced](#) as part of the v1.20 release). You can read [Check whether Dockershim removal affects you](#) to understand how this removal might affect you. To learn about migrating from using dockershim, see [Migrating from dockershim](#).

If you are running a version of Kubernetes other than v1.25, check the documentation for that version.

## NEW QUESTION 18

Which of the following best describes the way kubernetes Role-based access control (RBAC) works?

- A. Kubernetes does not do RBAC
- B. Kubernetes RBAC states which users can perform which actions against which re-source
- C. Kubernetes RBAC lists which operations on which resources are denied to users
- D. Kubernetes RBAC is responsible for authenticating subjects such as users and groups

**Answer:** B

### Explanation:

<https://kubernetes.io/docs/reference/access-authn-authz/rbac/>

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# Using RBAC Authorization

Role-based access control (RBAC) is a method of regulating access to computer or network resources based on the roles of individual users within your organization.

RBAC authorization uses the `rbac.authorization.k8s.io` [API group](#) to drive authorization decisions, allowing you to dynamically configure policies through the Kubernetes API.

To enable RBAC, start the [API server](#) with the `--authorization-mode` flag set to a comma-separated list that includes `RBAC`; for example:

```
kube-apiserver --authorization-mode=Example,RBAC --other-options --more-options
```

## NEW QUESTION 19

How to get the logs of the previously terminated nginx container from the web pod?

- A. `kubectl logs -p -c nginx web`
- B. `kubectl logs nginx`
- C. `kubectl logs -p -c web nginx`
- D. `kubectl logs -f -c nginx web`

**Answer:** A

### Explanation:

<https://kubernetes.io/docs/reference/generated/kubectl/kubectl-commands#logs> Text Description automatically generated with medium confidence

**Return snapshot of previous terminated ruby container logs from pod web-1**

```
kubectl logs -p -c ruby web-1
```

## NEW QUESTION 20

In Kubernetes, what is considered the primary cluster data source?

- A. etcd (pronounce: esty-d)
- B. api server
- C. kubelet
- D. scheduler

**Answer:** A

### Explanation:

<https://kubernetes.io/docs/concepts/overview/components/#etcd>  
 Graphical user interface, text, application, email Description automatically generated

## etcd

Consistent and highly-available key value store used as Kubernetes' backing store for all cluster data.

If your Kubernetes cluster uses etcd as its backing store, make sure you have a [back up](#) plan for those data.

You can find in-depth information about etcd in the official [documentation](#).

## NEW QUESTION 21

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