KCNA - Practice Exams

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What Kubernetes component should be used when a developer wants a guarantee of pods available on every node?	DaemonSet
In the event that the Kubernetes control plane becomes unavailable, what happens to the existing pods that are running on a cluster?	existing pods on the cluster will continue to run without interruption
How can namespaces be used in Kubernetes to divide a cluster into virtual clusters, providing isolation and organization?	by partitioning the cluster into isolated namespaces
What is the name of the collective group of individuals responsible for overseeing the overall direction of the Kubernetes project in the CNCF?	Kubernetes Steering Committee
In cloud-native architecture, what approach allows you to define the desired outcome of the architecture without writing a step-by-step procedure to achieve a goal?	declarative approach
Why might you use multiple custom schedulers alongside the default scheduler in Kubernetes?	to accommodate different workload requirements and policies
Which of the following is NOT a valid Kubernetes SIG?	certification
Rather than running a container directly, what does Kubernetes use to schedule and run the container?	a Pod
Which definition offers the most precise representation of logs within the context of system observability?	records of events that have occurred which contain information about a specific event
What Kubernetes feature will ensure the scheduler distributes an application across user-defined fault zones, such as physical nodes?	pod topology spread constraints
What is the difference between static pods and pods created using DaemonSets? (select two)	static pods are created by the local kubelet running on each node, DaemonSets are created by the kube-api server
What component in a Kubernetes cluster is responsible for running workloads and applications?	Node
In Kubernetes, what are the two primary update strategies for managing changes to a deployment?	Rolling Update and Recreate Update
What architecture is commonly associated with breaking up a larger, monolith application into smaller, loosely coupled services that represent a specific function or application?	microservices
You have an application running on a Kubernetes cluster but want to manually scale out the number of pods. What is the process to scale the number of pods without impacting existing workloads in the deployment?	Modify the definition file and update the number of replicas to the desired number. Apply the new configuration using kubectl apply -f bryan.yaml
Prometheus follows what type of model for collecting metrics from target systems?	Pull-Based Model
You have a Kubernetes cluster with nodes that have specialized hardware accelerators (e.g., GPUs) and nodes without accelerators. You want to ensure that a specific set of pods, labeled as app=ml-app, always run on nodes with GPUs to maximize performance. Which Kubernetes feature should you use for this purpose?	Node Affinity
What limitation is associated with using node selectors in Kubernetes for pod scheduling?	node selectors are not suitable for handling complex node selection criteria
Which of the following is a cloud-native architecture that allows developers to run custom server-side code in containers that are commonly managed by a cloud service provider?	serverless
What are the benefits of using Git to store and manage both infrastructure and application code?	Git allows you to track changes, revert to previous versions, and collaborate effectively for infrastructure resources and applications
When using a GitOps practice, what happens when a merge request is approved to a Git repository?	Changes are automatically applied to the target system or platform

What is a common name used for the kubectl configuration file?	kubeconfig
Which of the following are key concepts to building a resilient and self-healing application? (select four)	,the application is defined as code, otherwise known as a desired state, reconciliation to execute commands or tasks as needed, ability to automatically adjust the resources based on demand, also known as autoscaling, ongoing observability to understand the current state of the application
You have multiple workloads running on your Kubernetes cluster and must collect logs for security and monitoring purposes. To achieve this, you need a log collector running on every node in the cluster. What Kubernetes feature will ensure a log collector pod is always running on every node in the cluster, even as nodes are added and removed from the cluster?	DaemonSet
What group did the CNCF create to oversee and define GitOps in a vendor-neutral manner?	GitOps Working Group
You have created a namespace with default limits of 1 CPU and 256Gi of memory. What are the default resources assigned to a pod if the definition file doesn't specify any requirements?	1 CPU 256Gi memory
What feature does Kubernetes use to implement the pod network to create a large, flat open network that pods can use to communicate on?	third-party Container Network Interface (CNI) plugins
You need to examine the logs for a pod named prd-nginx-app. What command would you use to display these logs to the CLI?	kubectl logs prd-nginx-app
What declarative GitOps tool was developed by Intuit and is a graduated CNCF project?	Argo
How can you manually assign a pod to a specific node in a Kubernetes cluster?	provide the name of the target node in the nodeName field in the pod definition file
When creating a resource definition file, what section would you define labels that apply to the resource itself?	metadata
You've created a new Kubernetes manifest to run five instances of your production application in a deployment. Once applied, what Kubernetes component is responsible for changing the actual state to the desired state and ensuring the desired number of pods is always running?	deployment controller
Once an API is updated to version 1, (v1) what is the term used to refer to this stage of the API's development?	stable
How do you specify resource limits for CPU and memory in a Kubernetes resource definition file, such as a pod manifest?	using the resources field within the containers section
What is the well-known local directory that kubelet periodically checks to deploy and manage static pods?	/etc/kubernetes/manifests
What is NOT a benefit of using a pull-based system like Prometheus for the observability of a system or application?	Simplifies the configuration of an event-based system for monitoring events
You are a Kubernetes administrator managing a production cluster. You need to perform a rolling update of a deployment using kubectl. What is a critical requirement for successfully executing this command?	the Kubernetes API server must be available
What year did Google initially develop Kubernetes?	2014
Based on the code below, what labels can be used to filter the object that will be created on the Kubernetes cluster? (select three)	course: practice exam training: kcna application: web-app
In the context of container security, what is a recommended best practice regarding containers running as the root user?	run containers as non-root users whenever possible to enhance security
You are managing user access in a Kubernetes cluster. You've noticed that Kubernetes lacks objects to represent normal user	

accounts, and you cannot add normal users to the cluster through an API call. What mechanism is typically used to manage user authentication and access to a Kubernetes cluster?	implement an external identity provider (e.g., LDAP or OIDC) to authenticate and manage user access
How often are new versions of Kubernetes released?	every four months (3x yearly)
What are two different ways that you can create new pods on a worker node with a definition file? (select two)	create a definition file and place it in the static pod directory of /etc/kubernetes/manifests through the Kubernetes HTTP API endpoint
In the context of service mesh, what does "east-west traffic" refer to?	traffic flowing between services within the same data center or cluster
What type of deployment approach involves the creation of step-by-step instructions to provision an application or infrastructure?	imperative
What component of a Kubernetes cluster is made up of a collection of independent services that are essentially the "brains" of a cluster?	control plane
What is the primary purpose of using spread constraints in Kubernetes?	to distribute pods of a specific service evenly across all nodes in the cluster to improve load balancing
By default, Kubernetes implements a flat network to enable communication and networking between pods. What is this network called?	pod network
How can Prometheus gather a list of targets for metric collection besides using a static list of configured targets?	by using service discovery to gather a list of targets dynamically
Which of the following is NOT a reason to use namespaces in a Kubernetes cluster?	isolate hostile or potentially dangerous workloads from others
To prevent connectivity issues to application pods that might be scaling up and down, what Kubernetes object sits in front of pods to provide reliable networking and redirect traffic to healthy pods?	service
Which significant development has occurred regarding Docker and its relationship with Kubernetes?	Docker has been deprecated in favor of the Containerd runtime
In Kubernetes, what is the primary difference between Taints and Tolerations and Node Affinity?	Taints and Tolerations allow a node to repel a set of pods, while Node Affinity is used to attract pods to a set of nodes
What Prometheus component is responsible for sending messages to systems or administrators via email, Slack messages, or 3rd party solutions?	alertmanager
To pull an image from your private repository, you must authenticate with the registry to download a private image. What command allows you to log in to Docker Hub?	docker login
What was the original container runtime that Kubernetes used to schedule and run containers?	Docker
The Kubernetes control plane is a critical component of using a Kubernetes cluster. Select the true statements about the control plane (select three)	control plane nodes should be spread across failure domains,you should run 3 or 5 control plane nodes for high availability, control plane nodes can be physical servers, virtual machines, or cloud instances
What are the characteristics of cloud-native architecture? (select three)	team practices such as cooperation, integration, and open governance, applications that are resilient, scalable, observable, highly automated, and easily updated, applications that meet and respond to modern business demands
When comparing push-based and pull-based deployment approaches, what is the primary difference between the two?	Push-based deployments require integration with an external system that has direct access to the Kubernetes cluster, while pull-based deployments apply changes from within the cluster itself
In terms of Kubernetes, what are the differences between a Working Group and a Special Interest Group (SIG)? (select two)	SIGs are focused on specific technical areas of the Kubernetes project, such as storage, networking, or scalability; Working

	Groups are formed to address concerns and initiatives that affect multiple SIGs or the project as a whole.
After months of work, you are ready to deploy your customer-facing application on a Kubernetes cluster. To ensure high availability and take advantage of failure domains, what feature can you use to ensure pods are scheduled across all available nodes?	spread constraints
You have placed a ReplicaSet definition file in the /etc/kubernetes/manifests folder on a worker node in an attempt to create it. Why won't kubelet create the new resource?	the kubelet monitors the /etc/kubernetes/manifests directory for static pod definitions, not for ReplicaSet definitions
Which governing body is responsible for creating open standards for container formats and runtimes?	Open Container Initiative (OCI)
What is a microservices architecture?	independent services built to work together to create an application
You are managing a Kubernetes cluster for a company's microservices-based application. One of the development teams is deploying a new pod in the default namespace, but they haven't specified any resource requirements in the pod's definition file. What will be the result regarding resource limits for this pod?	a pod in Kubernetes will run with no limits on CPU and memory in a default namespace
Which of the following Kubernetes components are found on worker nodes? (select three)	kube-proxy, container runtime, kubelet
Collecting metrics in a containerized environment can be challenging since many workloads are short-lived. What options can be used to successfully collect metrics in this environment using Prometheus? (select two)	collect metrics directly at the platform level using node-exporter, use Container Advisor (cAdvisor) to export container-based metrics,
In the provided ReplicaSet definition file, what is the purpose of defining a selector even though the pod definition is included? apiVersion: apps/v1 kind: ReplicaSet metadata: name: bryan-replicaset spec: replicas: 3 selector: matchLabels: app: bryan-app template: metadata: labels: app: bryan-app spec: containers: - name: my-container image: nginx:latest	to identify pods that might have been created before the ReplicaSet was created
The kubelet service on every worker node performs several functions. Which of the following is not one of them?	downloads images needed to start containers
In the Kubernetes architecture, where are all the Kubernetes objects defined?	Kubernetes API
Which of the following is NOT one of the major control plane services that run on every control plane node?	kubelet
You have a high-performing app you want to schedule on the same node to minimize latency between an application container and the data processing container. What scheduler feature can you use so the containers will be scheduled on the same node?	affinity
Which job role is typically responsible for designing infrastructure and applications to be cloud-native?	Cloud Architect

Why are open standards critical for developing and consuming cloud-native tools?	give developers confidence that the products will work as expected and will integrate well with other tools
What is the correlation between a Service Level Indicator (SLI) and a Service Level Objective (SLO)?	SLO is a target or goal that defines an acceptable level of performance for one or more SLIs over a certain period of time
Which Kubernetes components will you find running on a control plane node? (select four)	controllers, API server, etcd, scheduler
In a Kubernetes cluster, what is the default communication behavior between pods when no explicit network policy is applied?	all incoming and outgoing network traffic is allowed for all pods
You are responsible for monitoring an application from which you want to obtain metrics. However, the application cannot be queried directly by Prometheus. What can you use to scrape these metrics and convert them into a format that Prometheus supports?	Prometheus Exporter
You have many application workloads running on your Kubernetes cluster. You decide that the resources on Node1 and Node2 need to be dedicated to production workloads, so you apply a taint to the node using the NoSchedule effect. However, the existing non-production workloads continue to run on Node1 and Node2. What can you change to ensure non-production workloads are rescheduled on other nodes?	change the effect to NoExecute to ensure the non-production workloads will be evicted immediately
When using a GitOps approach for continuous deployment and integration, what is the single source of truth for applications, configurations, and the system's desired state?	A Git version control system (GitHub, GitLab, BitBucket, etc.)
What command is used to view information about all pods across all namespaces running on a Kubernetes cluster?	kubectl get pods --all-namespaces
What is the primary purpose of the kubectl proxy command?	to create a secure tunnel for accessing the Kubernetes cluster's internal API server
What GitOps tool offers a full range of CI/CD capabilities, such as image building, preview environments, and deployment to Kubernetes?	Jenkins X
Which of the following best describes the architectural relationship between pods and containers?	containers run inside of a pod and are defined by a controller specification (spec)
How does Prometheus collect metrics from its configured targets?	by scraping targets who expose the metrics through an HTTP endpoint
What system allows containers to discover services and establish connectivity in an environment using service discovery and service mesh?	DNS
Your colleague has created a ReplicaSet definition file and is ready to deploy it. Based on the definition file below, what labels are used to match the labels defined on the existing or newly created pods? apiVersion: apps/v1 kind: ReplicaSet metadata: name: bryan-app labels: application: web-app tier: backend spec: replicas: 3 selector: matchLabels: app: prod-web-app template: metadata: labels: app: prod-web-app	app: prod-web-app

customer: marketing spec: containers: ...	
How can you label a node in Kubernetes to mark it for specific workloads or purposes?	use the command kubectl label nodes bryan-node-1 environment=production to assign the label to the node
Which of the following are subgroups available in the Kubernetes API? (select three)	batch, apps, storage.k8s.io
You're a Kubernetes administrator responsible for ensuring that a specific node in your cluster is reserved for critical workloads. What Kubernetes features can you use to achieve this goal?	Create a taint on the dedicated node and define tolerations in the pod specifications. Use NodeAffinity to ensure the pods are scheduled on the correct node.
What metric below would be the best choice for a service level indicator?	application error rates
What is the significance of using declarative configurations in cloud-native architecture?	Allowing for version control and reproducibility for consistent states.
What tool oversees communication between pods in a Kubernetes cluster?	Service Mesh
Under default settings, how long does Kubernetes wait before taking action when a node's 'Ready' condition is reported as 'False' or 'Unknown'?	5 minutes
By default, what is the enablement of communication between pods in different namespaces in Kubernetes?	Communication between pods in different namespaces is enabled by default.
What is a critical factor that needs to be checked before performing a rolling update in Kubernetes?	Node Capacity for New Pods
What is the significance of using a minimal base image in container security?	It reduces the attack surface by limiting the number of components that can be exploited.
In Kubernetes, what capability does a CNI need to manage traffic for workloads?	Controlling individual traffic flows.
What vendor-agnostic CNCF project provides a set of tools, APIs, and SDKs to create and manage logs, metrics, and traces?	OpenTelemetry
In most cases metrics are available on _____ endpoint of the HTTP server	/metrics
Which CNCF project is a Distributed Tracing Platform?	Jaeger Jaeger, inspired by Dapper and OpenZipkin, is a distributed tracing platform created by Uber Technologies and donated to Cloud Native Computing Foundation. It can be used for monitoring microservices-based distributed systems:
What are two ways to package, deploy, and manage a Kubernetes application?	Helm Charts and Kubernetes Operators
Which deployment strategy offers zero-downtime and instant rollback?	Blue-Green
Which deployment method rolls out front-end features to a consistent, small subset of users initially to test the effectiveness of a feature?	Canary Deployments
Which CNCF project for continuous integration and continuous delivery (CI/CD) comes with both a CLI and Web UI?	Argo comes with a powerful UI that helps visualize relations between different objects and monitor them better while with Flux you rely completely on CLI. You can add on the web UI to Flux but it still stays experimental.
Which of the following is an industry-standard container runtime with an emphasis on simplicity, robustness and portability?	containerd
Which of the following statement is true about replication?	Deployments were designed to replace the legacy Replication-Controllers
What are two ways to attach metadata to Kubernetes Objects?	Labels and Annotations

What provides a "record of intent" for the Kubernetes API?	Kubernetes objects
Which of the following container runtime is a low-level runtime specialized to run in linux?	LXC
Which mechanism in Kubernetes allows you to select information for fields such as name, namespace or status of a Kubernetes object?	Field Selectors
Kubernetes utilizes a "hub-and-spoke" API pattern. Which Kubernetes component is responsible as the hub for communication?	API Server
What Kubernetes component is responsible for maintaining a stable set of stateless pods?	ReplicaSet
A Kubernetes developer wants to prevent a job from living after a certain amount of time when it has finished execution. Which Kubernetes feature would allow this functionality?	TTL-after-finished-controller
Which mechanism in Kubernetes cleans up related resources before deleting an object?	Owners
By default, if no policies exist in a namespace, then all ingress and egress traffic is allowed to and from pods in that namespace? Is the following statement TRUE or FALSE?	True
Which storage API resource is a piece of storage in the cluster that has been provisioned by an administrator or dynamically provisioned using Storage Classes	PersistentVolume
What are the two areas of concern for securing Kubernetes?	Securing the cluster components that are configurable, Securing the applications which run in the cluster
What is the security pipeline order that a user must pass through in the Kubernetes API to reach an application?	Transport Security > Authentication > Authorization > Admission Control
What best describes the purpose of the Container Networking Interface?	a specification and libraries for writing plugins to configure network interfaces in Linux containers
What is the successor to PodSecurityPolicies?	Admission Controller
Cluster Autoscaler scales to _____ nodes with 30 pods per node	1,000
When managing the scale of a group of replicas using the HorizontalPodAutoscaler, it is possible that the number of replicas keeps fluctuating frequently due to the dynamic nature of the metrics evaluated. This is sometimes referred to as _____	Thrashing
What is a fast serverless framework for Kubernetes with a focus on developer productivity and high performance?	Fission
Which kubectl command can be used to list all available API groups?	kubectl api-versions
What command can you use to create a Redis deployment with the redis image and 3 copies?	kubectl create deployment redis --image=redis --replicas=3
How does Kubernetes achieve spread for pods across different nodes in a cluster?	Utilizing node affinity and anti-affinity rules to control pod placement.
What is a node in a Kubernetes cluster?	A worker machine in the Kubernetes cluster.
What cloud-native standard is focused on defining a common specification for serverless functions?	OpenFaaS
How can a Kubernetes administrator ensure that a deployed pod is scheduled on a node with GPU hardware?	Specify the node selector in the pod's YAML configuration.
Where is the Kubernetes client configuration file, often referred to as the kubeconfig file, typically stored on a client machine?	In the user's home directory under ~/.kube/config.
Select three valid container runtimes that can be used with Kubernetes.	CRI-O, Docker, containerd
Which Kubernetes resource is used to expose Pods and provide network access to them?	Service

In a Kubernetes cluster hosting various application workloads, you've designated Node1 and Node2 exclusively for production tasks by applying a NoSchedule taint. Surprisingly, the existing non-production workloads persist on these nodes. What adjustment can you make to ensure the rescheduling of non-production workloads onto different nodes?	Apply a NoExecute taint on Node1 and Node2.
Which options below are NOT benefits of using GitOps for app deployment and management?	Easier management of apps in different clouds, No downtime in deployments, More reliance on certain cloud providers.
What is north-south communication in a Kubernetes cluster primarily concerned with?	External traffic entering and leaving the cluster.
What is the collective group overseeing Kubernetes direction within CNCF?	Kubernetes Steering Committee
What is the primary component for interacting with a Kubernetes cluster?	Control Plane
In a cloud-native organization aiming for fast iterative deployments, which tool or approach is commonly used to automate the continuous integration and continuous delivery of software?	CI/CD
What is the primary function of a Container Runtime in the context of container orchestration?	It runs containers on a host operating system by executing container images.
Among the four pillars of GitOps, which one is characterized by maintaining configurations in a file-based structure?	Declarative Configuration.
What are the main types of services in Kubernetes for enabling communication within a cluster?	NodePort, ClusterIP, LoadBalancer, and ExternalName
What notable development has taken place concerning Docker and its association with Kubernetes?	Kubernetes has deprecated Docker as a container runtime in favor of other alternatives
What are the essential characteristics that define a cloud-native application's architecture?	Resiliency, Agility, Observability, Kubernetes
In the Cloud Native Computing Foundation (CNCF), how are conflicts typically resolved, and what are some of the key techniques used in this process?	Conflicts are primarily addressed through consensus building and mediation techniques.
What are the key differences between using a StatefulSet and a Deployment in Kubernetes?	StatefulSets are used for stateful applications that require stable identities and storage, whereas Deployments are ideal for stateless applications.
What is the primary advantage of using Docker containers?	Simplified application deployment