Kubernetes Cloud Native Associate KCNA Certification Part #1

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What is the KCNA certification in the context of Kubernetes and Cloud Native?	A certification that provides a broader learning path before moving to CKA and CKAD
What is the format of the KCNA exam?	Multiple Choice
How can one can reduce the overall cost of the KCNA exam?	By waiting for sales from the Linux Foundation By attending KubeCon / CloudNativeCon and utilizing a post event discount By checking for discount codes on the Linux Foundations' social media handles
Who proctors the KCNA exam when it is taken remotely?	A remote proctor who monitors your screen and camera
What is the best place to check for any changes in the KCNA exam or curriculum?	GitHub (under cncf/curriculum)
What does the KCNA curriculum include that is now a dedicated qualification?	GitOps and Prometheus
Who might be able to receive assistance for the KCNA exam from the LinuxFoundation or CNCF?	People who are part of diversity groups
What is a key benefit of Open Standards in computing and software development?	They allow for the use of multiple tools and technologies, avoiding vendor lock-in
What significant benefit do Open Standards provide in the field of computing?	They can be openly adopted, implemented and further refined by any participant
Why is Docker a good example in understanding Open Standards?	Because Docker has been instrumental in the creation of Open Standards and Open Contributions
What specific software did Docker Inc donate to the Open Container Initiative, marking the first OCI open standard?	runC, Docker's underlying runtime software
Which specification outlines how a filesystem bundle should be packaged into an image?	Image Specification
What is the purpose of the Container Storage Interface (CSI)?	It is an open standard for interfacing with storage solutions
What does the Container Runtime Interface (CRI) enable in the Kubernetes ecosystem?	It allows the kubelet to use a wide variety of container runtimes
What specification does the Open Container Initiative outline for running a filesystem bundle?	Runtime Specification
What open standard allows for the creation of OCI compliant container images?	OCI Image Specification
What is the purpose of the Open Container Initiative's Distribution Specification?	It defines a specification on the open standards and API protocols for distribution of content
What is the reference implementation of the OCI runtime specification?	runc
What is a major challenge with monolithic applications?	Changes to one area can potentially affect the entire application
In a Monolithic application, what issue can arise due to multiple applications being dependent on the same library?	Changing the library version for one application might negatively affect the other
What could the term "tight coupling" refer to in the context of monolithic applications?	A User Interface and Business Logic are hard to work on separately
What is a significant advantage of microservices in cloud-native applications?	They enhance flexibility and make the application easier to manage
What is a significant advantage of using autoscaling in Cloud Native patterns?	It allows the application to scale based on the workload at the time
What are the fundamental characteristics that define a Cloud Native Application?	Resiliency, Agility, Operability and Maintainability
What does "Self Healing" refer to in the context of Cloud Native practices?	Architecting your application to automatically resolve issues and restart processes when they fail
What is the purpose of automation in a Cloud Native application?	To provide speed and agility through automated processes that deploy infrastructure and applications rapidly and update frequently

Which automation tool is primarily focused on Infrastructure as Code (IAC)?	Terraform
How could Ansible facilitate Cloud Native automation?	Ansible is a toolset that could assist with many areas including Container and Application Lifecycles as well as infrastructure deployment
Which of the following is a key function of Terraform in Cloud Native Automation?	Terraform focuses on Infrastructure as Code (IAC), allowing for consistent, reproducible, and automated infrastructure across different environments
In the context of CI/CD, what does "Continuous Integration" encourage?	It encourages developers to frequently check in code and automatically test their projects prior to release
What best describes the concept of Continuous Delivery in the context of CI/CD?	A practice that encourages that frequent development changes with an emphasis on automated testing, leading up to a releasable build
What does the term 'Continuous Deployment' mean in the context of CI/CD?	It refers to the practice where changes are continuously deployed and released into a Production environment, often without requiring human initiation
What is the zero trust security model in a Cloud Native context?	An environment that never trusts any components and always verifies identities and integrity
What does the Cloud Native principle of "Speed, Efficiency and Cost Saving" promote?	Using autoscaling to allow applications to scale up and down based on the workload, leveraging serverless architectures when needed, and implementing proactive measures for cost saving
What is a key consideration when designing an application or infrastructure in cloud native practices?	Potential for component failure
How does the concept of 'Least Privilege' contribute to Cloud Native security?	It assigns the minimum set of permissions needed to each component or user permission, limiting the potential damage from exploits and security breaches
In the context of a Cloud Native ecosystem, what does "Secure by Default" mean?	Implementing secure practices and leveraging processes and tools to ensure components are secure from the start
What are Kubernetes "replicas" used for in the context of Self Healing?	Replicas are used to ensure a given number of instances of a deployment are running, and to replace any that fail, thereby providing self-healing functionality
Which of the following options correctly lists the key pillars of Cloud Native Architecture?	Microservices, Containers, DevOps, Continuous Delivery
Why is service discovery important in Cloud Native applications?	It allows for automatic detection of services
It prevents the use of Environment Variables and DNS services in Kubernetes Firewall rules and network ACLs	Environment Variables and built-in DNS
What does the term 'Auto' in Autoscaling refer to?	Auto for Automated or Automatic
What is Autoscaling?	A pattern to facilitate automatic scaling of infrastructure or application components
Which Autoscaling types reacts when metrics hit a given threshold?	Reactive Autoscaling
Which Autoscaling method could use AI and Machine Learning to scale in anticipation of demand?	Predictive Autoscaling
What type of Autoscaling would an organization use if it knows its workload is going to increase exponentially at specific dates and times?	Scheduled Autoscaling
What does Vertical Scaling involve?	A change of configuration to the underlying infrastructure
What is Horizontal Scaling?	The addition or removal of resources in relation to the existing resources
What's the implication of unused resources in cloud environments?	They typically have a cost implication around them

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What is a key consideration when designing your application for Autoscaling?	Making sure that the application can both scale and perform as expected
In the context of Autoscaling, what does the Cluster Autoscaler tool do?	It automatically adjusts the size of a Kubernetes Cluster based on the workload
What is the function of Horizontal Pod Autoscalers (HPA) in Kubernetes?	They scale the number of replicas for an application
What are Vertical Pod Autoscalers (VPA) in Kubernetes used for?	They scale the resource requests and limits of a pod
What is Keda in the context of Autoscaling?	It is an event driven architecture that makes use of ScaledObjects
What is the key difference in using Serverless computing services as compared to managing your own servers?	Serverless servers manage the servers, reducing the burden of maintenance
What is a key characteristic of Serverless architecture?	It runs in response to events
What is AWS Lambda an example of?	FAAS (Function as a Service)
Which two aspects of Serverless computing are critical to understand from a cost perspective?	Code execution and autoscaling
What is one of the challenges posed by Serverless solutions from a Cloud Native viewpoint?	They may lead to vendor lock-in due to lack of standardized APIs
What is the scaling model referred to as when using Serverless and its event-driven architecture?	Scale to zero
Which of the following open source solutions provide Serverless functionality on top of Kubernetes?	Knative and OpenFaas
What does provisioned concurrency in Serverless offerings refer to?	The number of instances that can run simultaneously
What is a possible disadvantage of using Serverless architecture?	It may incur latency during periods where the application in less active
What is the purpose of the CloudEvents specification?	It provides a consistent way of describing event data across different services, platforms and systems
What organisation hosts the CloudEvents specification?	The Cloud Native Computing Foundation
How can CloudEvents be used according to the CloudEvents specification?	Agnostically across various services, platforms and systems
How does Serverless architecture handle concurrency?	It typically manages concurrency as part of the application
Which feature of Serverless offerings helps manage the workload and billing?	Budget thresholds
What does CNCF stand for?	Cloud Native Computing Foundation
What is the CNCF's mission?	To make cloud native computing ubiquitous
What is the sequence of the CNCF project maturity levels?	Sandbox, Incubated, Graduated
The "Crossing the Chasm" concept in the CNCF project maturity model represents which transition?	From Incubated to Graduated
The "Chasm" phase in the CNCF Project Maturity levels represents the bridge to which user category?	Early Majority
What is the role of the Technical Oversight Committee (TOC) in the CNCF?	To evaluate the maturity of CNCF projects
What is the significance of Sandbox, Incubation, and Graduation stages in the CNCF?	They signal the level of maturity of a given project to enterprises
Which acronym represents the Special Interest Groups within the CNCF?	SIG
What was the change in CNCF's terminology to avoid confusion with other projects?	SIG to TAG
What does TAG stand for within the CNCF?	Technical Advisory Group

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What does the CNCF Technical Oversight Committee consider to establish a project's maturity?	Demonstrating adoption, healthy rate of changes, external committers from different organisations and implementation of CNCF Code of Conduct
How is conflict resolution generally handled within CNCF governance?	Through discussion and voting
What are the "TOC" and "SIG" acronyms in the context of CNCF?	TOC: Technical Oversight Committee; SIG: Special Interest Group
What is the significance of the CNCF Landscape page?	It provides an overview of of the ecosystem of cloud native projects, including those in Sandbox, Incubated and Graduated Stages
Which group, according to the "Crossing the Chasm" model, is most susceptible to risk and will wait for market adoption to increase before utilizing a project themselves?	Late Majority
What is the main objective of the role of a DevOps Engineer?	To bridge the gap between development and operations
Which role places a heavier emphasis on reliability, including aspects such as uptime, availability, scalability, resilience, and robustness?	Site Reliability Engineer
What does a CloudOps Engineer primarily focus on?	Management, delivery, optimization and consumption of workloads on Cloud Infrastructure
Which role can be considered the bridge between traditional IT Security and DevOps?	DevSecOps Engineer
What does the role of a Full Stack Developer encompass?	Specializing in both Frontend and Backend Development
What is the primary responsibility of a Cloud Architect?	To architect Cloud applications, infrastructure and solutions
What is the primary function of a Data Engineer's role?	To design and build systems that manipulate and provide access to data
Which of these roles is considered to have a crossover with DevOps, particularly when it comes to the skillsets involved?	Site Reliability Engineer
What is the primary focus of a Security Engineer?	Promoting and adhering to security best practices
What is the primary focus of FinOps in an organisation?	To manage and optimise the financial aspect of cloud operations, ensuring cost effectiveness and efficiency
What is chroot?	A process that allows you to change the root directory for a running process and its children
What was Docker originally called?	DotCloud
What are the two key ingredients that Docker brought together to create its solution?	Linux Namespaces and cgroups
Why are Docker containers preferred over virtual machines?	They are faster to deploy and consume less system resources
How many namespaces were originally added to the Linux kernel in 2002?	6
What is the network namespace in Linux used for?	To provide an isolated networking stack with its own IP addresses and connectivity
What is the purpose of the mount namespace in Linux?	To allow the use of independent mount points that are visible by processes within the namespace
What is the main advantage of using Docker Desktop compared to traditional Docker?	It is more flexible and is easier to reset
What is the purpose of the "i" flag when running the 'docker run' command?	To make the container interactive
What is the purpose of the "t" flag when running the 'docker run' command?	To create a terminal input/output environment (tty) for interacting with the container
What is the purpose of the 'docker run' command followed by an image name (e.g., 'ubuntu')?	To start a new container using the specified image
What is the function of Docker Extensions in Docker Desktop?	To allow developers to bundle Docker-based apps for easy installation and running.

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What is one key difference between managing resources in Docker Desktop on a Mac compared to Windows?	On a Mac, you can customise shared resources in the Preferences, while on Windows, you cannot
What does Docker Desktop use to run an isolated instance for Docker?	A hidden virtual machine or "subsystem"
What is a container image?	A portable self-contained bundle of software and dependencies
What is the difference between a container and a container image?	A container is a running instance of the software, while the container image is a bundle of software
What is a container registry?	A service for hosting and distributing container images
What is a tag in the context of container images?	A label used to distinguish a version of a container image
What is the purpose of the "latest" tag in Docker?	To be used as a default tag when working with images if a tag is not specified
What is a union filesystem in the context of container images?	A filesystem that combines individual layers into a single view
What is a digest in the context of container images?	A secure and unique identifier from an image in the container registry
What is the difference between a digest and an image ID?	A digest is a checksum taken from a container registry, while an image ID is a checksum based on the local container image
What is the command used to validate the Docker version and configuration?	docker version
What is the container engine being used by Docker?	containerd
What is the purpose of the -rm option when running a Docker container?	To remove the container when it exits
What command, in the original Docker command syntax, would display all containers, irrespective of their state, including those that have exited? docker ps docker ps -a docker container list docker container list -a	docker ps -a
How can you override the default command in a Docker container when running it?	Add the command to the end of the docker run command
What does the it option do when running a Docker container?	Runs the container in interactive mode with a terminal
Which command is used to remove a Docker container?	docker rm
Which command line option is used to list all the parameters available to the Docker command?	docker--help
What is the purpose of running a container as a non-root user?	To improve security by securing privileges
What does the command "docker run --rm nginx" do?	Pulls the nginx image if it does not exist, runs a container, and removes the container upon exit
What is the purpose of the "-d" option in the command "docker run -d --rm -P nginx"?	Detaches the container from the terminal so that it runs in the background
What is the purpose of using the "-p" option in the command "docker run -d --rm -p 12345:80 nginx"?	Specifies the port to be used for connectivity to the container
What is the purpose of using a volume in Docker?	To store and manage data in a container
What is the better approach for managing files used by a container instead of modifying them directly within the container?	Use a volume that contains the data and pass it on to the container
How do you publish all exposed ports of a container when running it with Docker?	-P
Which command is used to execute another process inside a running Docker container?	docker exec
Which package manager is used in Alpine Linux?	apk
What is the primary purpose of the LABEL instruction in a Dockerfile?	To provide metadata about the container image

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Which LABEL is used to mention the author of the container?	org.opencontainers.image.authors
What does the WORKDIR instruction do in a Dockerfile?	Sets the working directory for subsequent instructions and creates a directory if required
What is a drawback of having too many layers in a container image?	Potential inefficiencies in image size and build times
What is the difference between the CMD and RUN instructions in a Dockerfile?	CMD specifies the command that will be executed when the container runs, while RUN executes commands during the build process
What is the purpose of a multistage build in a Dockerfile?	To reduce the size of the final container image
In a multistage Dockerfile, how can you copy a binary from one stage to another?	By using the COPY directive with the --from flag
What is the function of the Logical AND operator (&&) in a Dockerfile?	To run multiple commands in sequence, only if the previous command is successful
What was the purpose of the adduser command in our Dockerfile?	To create a new user with reduced privileges
What does the ENTRYPOINT in a Dockerfile do?	Specifies the command to run when the container is started
What is the primary advantage of using Docker Buildx for building and pushing container images compared to Docker Build?	Buildx simplifies building and managing multiarch images by allowing simultaneous builds for multiple target platforms
What does the docker system prune command do?	Removes stopped containers, unused networks, dangling images, and dangling build cache
What is the primary function of Container Orchestration?	Supporting the operational needs in running containers
Which of the following is not a feature of Container Orchestration?	Database Management
Which of these is a means of expanding Kubernetes to have functionality outside of core functionality?	CRDs
What does CRD stand for in the context of Container Orchestration?	Custom Resource Definitions
Which tool is considered the gold standard for Container Orchestration?	Kubernetes
Which of the following is not a key area where Container Orchestration excels?	Cybersecurity Threat Detection
What is the primary benefit of Container Orchestration in the deployment of complex applications?	It standardizes the deployment and integrates with components like networking, storage, security and autoscaling
In the context of Container Orchestration, what is the purpose of 'self-healing'?	Automatically fixing or healing containers when they fail
Which component is responsible for spawning and running containers in a Kubernetes architecture?	Low-Level Container Runtime
What is the role of the Kubelet in the Kubernetes architecture?	It acts as the Kubernetes component for maintaining Pods
How is ETCD used in the Kubernetes architecture?	It is used as the source of truth and the backing store for all data
What is the role of the Kube-Api Server in the Kubernetes architecture?	It acts as the center point of the Kubernetes cluster and provides a RESTful interface
What is the function of the Kube-Scheduler in the Kubernetes architecture?	It determines which nodes are valid placements for Pods according to resources and constraints
What role does the Kube-Proxy play in the Kubernetes infrastructure?	It dynamically configures TCP/UDP and SCTP Forwarding on the system that it runs
What is the role of the Controller-Manager in the Kubernetes architecture?	It is a control loop that monitors the state of your cluster and makes or requests changes
Which component bridges functionality of the cloud provider to the Kubernetes server?	Cloud-Controller-Manager
What protocol is used by distributed systems to ensure that each node in the cluster agrees on the same state even in the face of failures?	RAFT

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How do nodes in a highly available Kubernetes configuration connect to the API server?	They connect via loadbalancer
What is a Pod in the context of Kubernetes?	The smallest and simplest unit in the Kubernetes object model you create or deploy
Which of the following correctly represents the hierarchy of Kubernetes components, from broadest to most specific?	Cluster, Node, Pod, Container
When does the Kubernetes Kube-Scheduler determine the node placement for a pod?	After the pod has been created and registered in ETCD
If a Kubernetes cluster hosted on a public cloud provider fails to provision a requested load balancer service, which component might be responsible for this failure?	The Cloud-Controller-Manager
Which of the following is considered a component of a Kubernetes node?	Kube-Proxy
Which of the following is considered a component of the Kubernetes control-plane?	Cloud-Controller-Manager
What is the smallest deployable unit of compute in Kubernetes?	Pod
How do you check the status of pods running in Kubernetes?	kubectl get pods
How do you view the logs of a specific pod in Kubernetes?	kubectl logs <pod_name>
What is the command to create a port-forward tunnel in Kubernetes for testing purposes?	kubectl port-forward pod/<pod_name> <local_port>:<pod_port>
How do you run a command inside a specific container in a running pod?	kubectl exec -it <pod_name> -c <container_name> -- <command>
How can you see logs of a particular container from a multi-container pod?	kubectl logs <pod_name> -c <container_name>
Which command would you use to view the logs of a container that has crashed and restarted?	kubectl logs pod/<pod_name> -c <container_name> -p
What is the Kubernetes object YAML configuration management command that provides a declarative approach?	kubectl apply -f <config_file.yaml>
How do you run a pod with a specific image in Kubernetes?	kubectl run nginx --image=nginx
In Kubernetes, what is the purpose of a sidecar container in a pod?	To perform a specific task in tandem with the main container
Which command is used to execute an interactive shell inside a running container in a Kubernetes pod?	kubectl exec -it <pod_name> -c <container_name> --bash
Which Linux namespace is the default shared in a Kubernetes Pod?	Network
Kubernetes network model allows pods to communicate without NAT. True or False?	True
What is a valid container restart policy in Kubernetes?	Never, OnFailure, Always
What command allows you to view the YAML declaration specification from the command line?	kubectl explain [object]
In a Kubernetes Pod, what is used to run tasks that must complete successfully before the main application containers start?	Init Containers
What is a key benefit of using Kubernetes Namespaces?	Isolating resources and limiting the scope of user privileges
How can you describe a namespace within a Kubernetes cluster?	A virtual cluster within Kubernetes, used for isolating resources
Which command is used to view all resources within all namespaces in a Kubernetes cluster?	kubectl get all -A
What is the purpose of the 'kube-system' namespace in Kubernetes?	It is for objects created by the Kubernetes system
If you run a command without specifying a namespace in Kubernetes, which namespace will it run in?	default

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How can a new namespace be created in Kubernetes?	kubectl create namespace mynamespace
How can you run a pod in a specific namespace in Kubernetes?	kubectl -n mynamespace run pod
Which namespace is readable by all users, including those who are not authenticated?	kube-public
How can you delete a pod named 'nginx' in a specific namespace called mynamespace in Kubernetes?	kubectl -n mynamespace delete pod/nginx
What are the default namespaces provided with a standard Kubernetes installation?	default, kube-system, kube-public, kube-node-lease
If a resource is "Namespaced" in Kubernetes, what does this mean?	It is tied to a particular Namespace and exists within the context of that Namespace
What command will change the current context to use a specific namespace	kubectl config set-context --current --namespace=mynamespace
What will happen to the resources inside a namespace if the namespace is deleted in Kubernetes?	The resources will also be deleted
What is the function of Kubernetes Deployment?	It provides an object that delivers declarative updates for applications
What feature of Deployments ensures the number of Pods is as expected in case of a Pod crash or deletion?	Replication
Which Kubernetes feature allows you to revert to an older version of an application during a problematic update?	Rollbacks
When scaling the number of Deployment replicas, which command is used?	kubectl scale
What does the maxSurge: 25% setting in the deployment strategy signify?	It allows Kubernetes to increase the number of Pods by 25% above the desired amount during an update
What does the maxUnavailable: 25% setting in a Kubernetes Deployment strategy signify?	Up to 25% of the Pods can be unavailable during the update process
What is the effect of changing the image of a Deployment?	It creates a new ReplicaSet
How can you monitor a Kubernetes Deployment's update in real time?	kubectl rollout status deployment/<name>
In case of a Deployment failure, which Kubernetes command can be used to revert to a functioning version?	kubectl rollout undo deployment/>
What happens when you roll back to a specific revision of a Deployment?	It reuses the original ReplicaSet and becomes the latest revision
What is the purpose of 'kubectl annotate' command in Kubernetes?	To add annotations to an object
What happens when you delete a Kubernetes Deployment?	Both the Deployment and the linked ReplicaSets are deleted
What is the recommended object for running applications in a Kubernetes cluster?	Deployments
Which Kubernetes component provides a way to expose an application running on a set of Pods as a network service?	Service
Which of the following is NOT one of the primary service types available in Kubernetes to expose services?	SwitchBalancer
What is the default service in Kubernetes that establishes a service with an internal IP address, reachable only within the cluster?	ClusterIP
Which Kubernetes service type allows services to be technically available outside of the cluster, if your nodes IP address are externally accessible?	NodePort
What is the service type in Kubernetes that creates what would be in DNS terms, a CNAME, i.e. an alias of another domain?	ExternalName
What is a "Headless" service in Kubernetes?	A ClusterIP service that has no IP

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Which Kubernetes service type is dependent on your Kubernetes offering and may vary significantly between On-Prem and Cloud?	LoadBalancer
Which Kubernetes service is only accessible within the cluster?	ClusterIP
What do EndPoints in Kubernetes represent?	The IP addresses assigned to the nodes that the service points to
What does the command 'kubectl expose' do in Kubernetes?	It exposes a Kubernetes deployment as a service
What is the primary use case of a ClusterIP service in Kubernetes?	To establish a service with an internal IP address, reachable only within the cluster
What is the function of a LoadBalancer service type in Kubernetes?	To provide a mechanism for automatic load distribution across multiple nodes and pods
What is the distinguishing feature of a Headless service in Kubernetes?	It provides a DNS implementation with no proxy, so each pod handles its own traffic
How would you specifically define a Headless Service in a Kubernetes YAML specification?	By setting spec.clusterIP:None in the Service YAML specification
In terms of core abstractions provided by Kubernetes for service networking, how many types of services are primarily defined?	Four
What is the primary function of a Job in Kubernetes?	To create one or more pods and ensure a specified number of them successfully terminate
Which command is used to create a Kubernetes job named "calculatepi"?	kubectl create job calculatepi
In a Kubernetes Job, what does the parameter completions: 20 signify?	It indicates that the job will create 20 pods overall to do the task
What does the parameter parallelism: 5 signify in a Kubernetes Job specification?	It defines the number of pods that should be running in parallel
What does the kubectl explain job.spec command do?	It provides detailed documentation for the structure and fields of a job specification
What are CronJobs in Kubernetes?	They are time-based job schedulers
What does a CronJob create according to the schedule?	Job objects
How many completed and failed jobs are kept by default according to the successfulJobsHistoryLimit field in a CronJob?	Three
When a CronJob is deleted, what happens to the associated jobs and pods?	They are deleted along with the CronJob
Which of the following commands can be used to create a Kubernetes ConfigMap with specific values using the command line interface?	kubectl create configmap colour-configmap --from-literal=COLOUR=red --from-literal=KEY=value
How can you check a Kubernetes ConfigMap's values?	kubectl describe configmap/colour-configmap
Which of the following commands is used to create a ConfigMap in Kubernetes from a file containing key-value entries?	kubectl create configmap colour-configmap --from-env-file=configmap-colour.properties
How can a pod be configured to use a ConfigMap's values?	By using the 'envFrom' field in the pod's yaml specification
What happens when you set a Kubernetes ConfigMap as 'immutable'?	It can't be changed once set
What is a significant advantage of using ConfigMaps in Kubernetes?	They provide a centralized location for configuration data on the cluster
What Kubernetes version provided a feature as stable that allows a ConfigMap to be immutable?	Kubernetes 1.21
What is the purpose of using Kubernetes Secrets?	To store and manage sensitive information like passwords, tokens, keys, etc.
What is the difference between a Secret and a ConfigMap in Kubernetes?	Secrets are for storing confidential information while ConfigMaps are for non-secret configuration data
How is the sensitive data stored in Kubernetes Secrets?	It is encoded
What is the encoding mechanism used in Kubernetes Secrets?	Base64

What is the potential risk when using secrets in Kubernetes?	If someone gains access to etcd or retrieves the secret as yaml, they could potentially get the value
What command is used to create a secret in Kubernetes?	kubectl create secret
What type is assigned when creating a generic secret in Kubernetes?	Opaque
How does Kubernetes use labels for resource selection?	Many Kubernetes components use labels to select the resources they should operate on
In Kubernetes, how does a service identify which pods it should route traffic to?	Services use labels to select the pods they should route to
What does the "--selector" option do in a "kubectl get" command?	It filters and displays users based on the provided label
What is the difference between the "-l" and "--selector" options in Kubernetes commands?	"-l" and "--selector" both are used to filter resources based on labels and are interchangeable
How can labels be used to create 'scopes' or 'environments' within a Kubernetes cluster?	Labels can be used to designate resources as belonging to groups such as 'development', 'testing' or 'production'
What operational benefits can be derived from the effective use of labels in a Kubernetes environment?	They enable the development of a strategic approach, improving overall efficiency and effectiveness for operations
How could effective use of Kubernetes labels contribute to better cloud cost management?	Labels can be used to identify and delete unused or idle resources, thus saving costs
What is the main purpose of the Kubernetes API?	It provides operations to create, read, update and delete resources
How do users typically interact with the Kubernetes API?	Using command line tools like kubectl and Helm
Which component of Kubernetes uses the API to track the state of pods and nodes, and to schedule pods onto nodes?	kube-scheduler
What is the role of Admission Controllers in Kubernetes API?	They enforce policies and modify resources as part of processing requests
Which step does not belong in the path a request to the Kubernetes API follows?	Network Optimization
If the --authorization-mode flag is not specified when starting the API server, what default mode does the Kubernetes API server use?	AlwaysAllow
What feature allows you to extend the Kubernetes API by defining new resource types?	Custom Resource Definitions
In the path a request to the Kubernetes API follows, which step occurs immediately after Authorization?	Admission Control
What would be a potential use case for an Admission Controller in a Kubernetes cluster?	Enforcing a policy that a certain namespace doesn't exceed a given memory threshold
If you want to quickly list all available API resources in your current Kubernetes cluster from the command line, which command would you use?	kubectl api-resources
The Kubernetes API is often described as a CRUD interface. What does CRUD stand for in this context?	Create, Read, Update, Delete
What are the three crucial stages that a request to the Kubernetes API goes through in the context of security and policy enforcement?	Authentication, Authorization, Admission Control
How does the kubectl proxy command in Kubernetes handle API server authentication?	It automatically handles authentication with the Kubernetes API Server
For how long is the Kubernetes API guaranteed to be backward compatible following a release?	One year
What is the purpose of Role Based Access Control (RBAC) in Kubernetes?	Assigning specific roles to users and groups
What does the kubeconfig file contain?	Cluster details and user information
What is the purpose of Certificate Authority (CA) in Kubernetes?	To create and verify certificates in the cluster

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How are Users and Groups typically managed in Kubernetes?	Managed externally
What does a ClusterRole in Kubernetes define?	Permissions on resources across cluster resources
What does the command kubectl auth can-i * * check?	If the user has permissions to perform any action on any resource
How are permissions assigned to a user in Kubernetes using RBAC?	Through the user's membership or group membership assigned by a ClusterRoleBinding
Which command is used to create an RSA private key?	openssl genrsa -out user.key 4096
What does the "O" stand for in the subject line of a Kubernetes certificate?	Organization
How is a new user, such as "batman", associated with a group in Kubernetes RBAC?	Through the "O" field in the certificate subject
What does the "CN" stand for in the subject line of a Kubernetes certificate?	Common Name
Which of the following statements accurately describes the difference between Roles and ClusterRoles in Kubernetes?	ClusterRoles are used to define permissions at the cluster level, while Roles are used to define permissions at the namespace level
In Kubernetes, if a Pod is deployed without an explicitly assigned Service Account, which Service Account is automatically assigned?	default
What is the primary function of the kube-scheduler in Kubernetes?	To schedule applications to run on various nodes
Which of the following is NOT one of the main operations employed by the Kube-Scheduler?	Replicating
What happens during the "Filtering" stage of the Kube-Scheduler's process?	It finds nodes that meet the scheduling requirements
What is the purpose of the schedulerName field in a pod's specification?	To specify which scheduler should dispatch the pod
Which language is most typically used for creating a custom scheduler in Kubernetes?	Golang
What does the nodeName field in a pod specification indicate?	The specific node to schedule the pod into
What is the role of the nodeSelector field in a pod's specification?	To specify labels that that must match a node's label for the pod to be scheduled on that node
What is the primary characteristic of ephemeral storage in Kubernetes?	It does not survive across restarts
In the context of Kubernetes, what is an example of ephemeral storage?	emptyDir
What is the primary purpose of a Persistent Volume (PV) in Kubernetes?	To store data that persists beyond the lifecycle of a pod
What does the Reclaim Policy 'Retain' imply in Kubernetes storage?	The data is kept until the volume is manually deleted
How is a PersistentVolumeClaim (PVC) in Kubernetes typically used?	To claim storage resources defined by a PersistentVolume
In Kubernetes, what is the significance of setting a volume's emptyDir.medium to Memory?	It configures the volume as a high-performance cache area
What happens to a Kubernetes PersistentVolume with a Reclaim Policy of 'Delete' after its associated PVC is deleted?	The underlying storage is deleted along with the volume
In the video example what was the purpose of adding a nodeSelector to the pod configuration?	To ensure the pod runs on a specific node due to storage limitations
How is dynamic provisioning of storage in Kubernetes different from manual provisioning?	In dynamic provisioning, volumes are created automatically when a PVC is made
Which storage solution is known for providing comprehensive storage capabilities, including block, file, and object storage, in distributed systems?	Ceph

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What is the primary difference between Deployments and StatefulSets in Kubernetes?	StatefulSets provide a sticky identity for each pod
When a StatefulSet is used in Kubernetes, how does each pod manage its storage?	Each pod creates its own Persistent Volume Claim
What is the purpose of the 'serviceName' in a StatefulSet's configuration?	It is used to define a headless service for network identity
What happens to the data volume if a pod in a StatefulSet is deleted and recreated?	The data persists and is reattached to the new pod
What is a key benefit of using StatefulSets for stateful applications in Kubernetes?	They provide stable network IDs for each pod
In a StatefulSet's updateStrategy, what is the purpose of the 'partition' value?	It indicates the starting point for a rolling update
How are pods in a Kubernetes StatefulSet named?	Sequentially, starting from zero and prefixed with the StatefulSet name
What is the primary function of NetworkPolicies in Kubernetes?	To classify Pods as isolated and control their communication
In Kubernetes, what does an 'Ingress' rule in a NetworkPolicy define?	The traffic allowed to enter to pods
How does a NetworkPolicy in Kubernetes become effective?	It becomes effective after it is applied
When a pod is created using kubectl run in Kubernetes, what type of label is automatically assigned to it?	run:<name>
Which component is essential for the enforcement of NetworkPolicies in Kubernetes?	A Container Network Interface (CNI) plugin
What is the default behaviour of a pod in a Kubernetes cluster that does not have any NetworkPolicies applied to it?	It can send and receive traffic from any source
How do NetworkPolicies behave when multiple policies are applied to a set of pods in Kubernetes?	Policies are additive and cumulative in effect
What Kubernetes feature defines privilege and access control settings for a Pod or Container?	Security Contexts
What is the primary function of Admission Controllers in Kubernetes?	To act as gatekeepers for pod creation and modification
What Kubernetes security feature was deprecated in version 1.21 and removed in version 1.25?	Pod Security Policies
Which tool is an open-source runtime security project that integrates with Kubernetes for identifying abnormal behavior and potential security threats?	Falco
Which protocol is recommended for enhanced authentication in large-scale Kubernetes deployments?	Open ID Connect (OIDC)
Which tool is designed for vulnerability and misconfiguration scanning in Kubernetes clusters?	Kubescape
Which of the following is a common option for Pod Admission Controllers in Kubernetes?	Kyverno and Open Policy Agent Gatekeeper
In the Kubernetes security context example, what is the outcome of setting allowPrivilegeEscalation: false in the container's security context?	It prevents the escalation of privileges in the container
Which sequence correctly represents the 4C's of Cloud Native Security?	Cloud, Clusters, Containers, Code
What is the primary function of Helm in Kubernetes?	Simplifying the management of Kubernetes applications
Which of the following is required for Helm's plugin installation?	git
What is the purpose of Helm Charts in Kubernetes?	To facilitate deployment and management of applications
How can Helm Charts be packaged for distribution?	Using the helm package command
What are the two main components of a Service Mesh?	Data Plane and Control Plane

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What pattern is commonly used in the Data Plane of a Service Mesh?	Sidecar pattern
What is one of the key security features provided by a Service Mesh?	Mutual TLS
What does SMI stand for in the context of Service Meshes?	Service Mesh Interface
What is the primary goal of the Service Mesh Interface (SMI)?	To offer a common, interoperable interface for various Service Mesh solutions
Which aspect is NOT directly addressed by Service Mesh Interface (SMI) API specifications?	Data storage
In the context of Service Meshes, what is the role of the Control Plane?	Serves as a management hub, both configuring and redirecting proxies
What is the primary purpose of Observability in Cloud Native systems?	To accurately measure a system's state through its output
Which of the following is not a type of telemetry in the context of Cloud Native Observability?	Encryption
In Cloud Native Observability, what are Logs primarily used for?	To output messages from programs, applications, and processes
What characteristic of Metrics makes them essential for Observability?	They are time-based and measured at set intervals
What is a Counter in the context of Cloud Native Observability?	A cumulative metric that increases over time
Which of these is an example of a Trace in Cloud Native Observability?	Tracking the process of a request through a system
What role do Alerts play in Cloud Native Observability?	They provide notifications about system anomalies or issues
What are the three fundamental pillars of Cloud Native Observability?	Logs, Metrics and Traces
Which pillar of Cloud Native Observability would be most useful for predicting future resource usage?	Metrics
In Cloud Native Observability, which format would be considered user-friendly for outputting logging data whilst supporting complex and hierarchical data?	JSON
In which layer of a software system do OpenTracing and OpenTelemetry primarily operate?	Application
What does the kubectl top command do in a Kubernetes environment?	Shows the current resource utilization for pods or nodes
Who was the original creator of Prometheus before it was donated to CNCF?	SoundCloud
What is the significance of the 'kube-prometheus operator' project?	It is a solution for setting up Kubernetes with Prometheus and Grafana
What is the primary purpose of Kube-State-Metrics?	To gather state metrics about the state of objects via the Kubernetes API
What is the primary role of the Node-exporter in Prometheus?	To provide hardware and OS metrics from the Kernel
What is the primary role of the Prometheus Adapter?	To adapt Kubernetes information to Prometheus metrics
What is PromQL primarily used for in Prometheus?	Querying and exploring metrics
Grafana is primarily used for which of the following in an observability stack?	Real-time performance analysis and troubleshooting
What is a primary benefit of designing applications in a Cloud Native manner?	They can run across different public, hybrid, and private cloud offerings
Which of the following is a characteristic of On-Demand instances in cloud computing?	They can be spun up in seconds and disposed of as needed
What is a key consideration when using Reserved Instances in cloud computing?	They involve upfront payment for a committed period with potential cost savings

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What is a significant risk associated with using Spot Instances in cloud computing?	There is no guarantee of instance availability
What is the concept of 'Right Sizing' in the context of cloud computing?	Scaling cloud resources based on actual usage and needs
Which aspect of cloud cost management is enhanced by detecting cloud anomalies?	Keeping costs under control by identifying unexpected charges
What is a primary function of KubeCost in cloud-native environments?	It helps in monitoring and managing Kubernetes' costs
In the GitOps paradigm for Kubernetes, which tool is specifically designed to ensure that the state of a cluster matches the configuration stored in a Git repository?	Flux