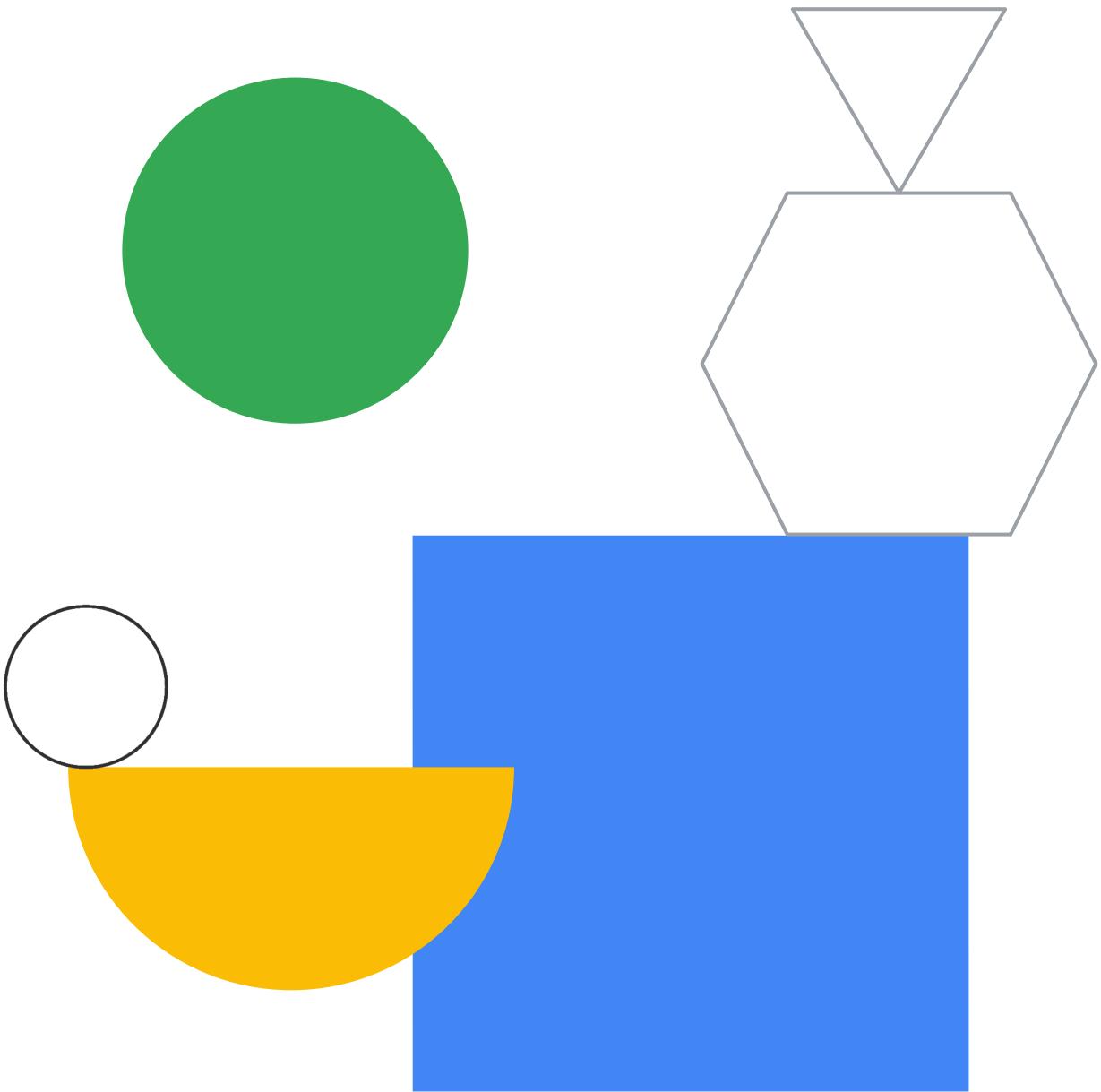


Preparing for Your Associate Cloud Engineer Journey

Module 4: Ensuring Successful Operation of a Cloud Solution



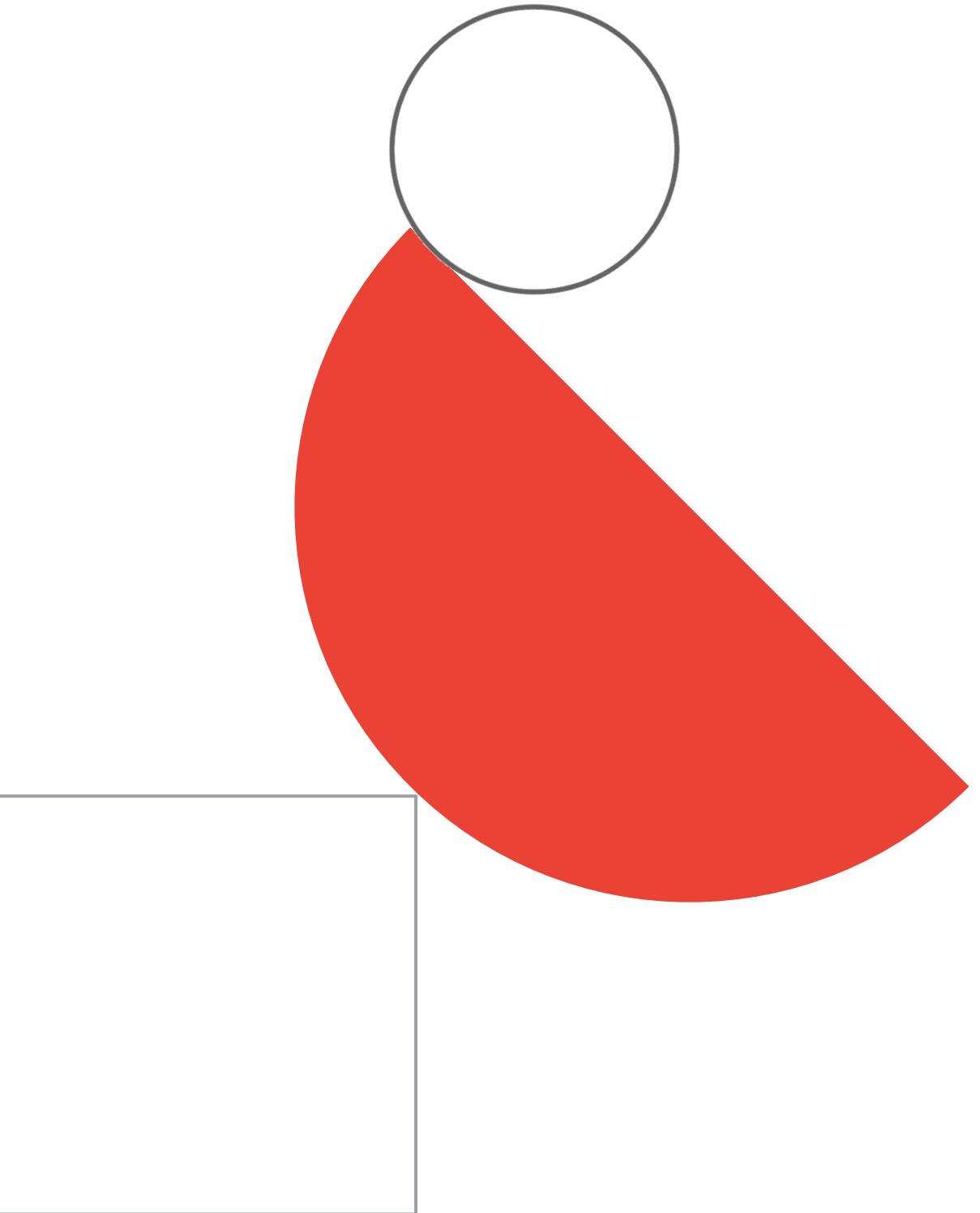


Module agenda

- 01** Managing Cymbal Superstore's cloud solutions
- 02** Diagnostic questions
- 03** Review and study planning

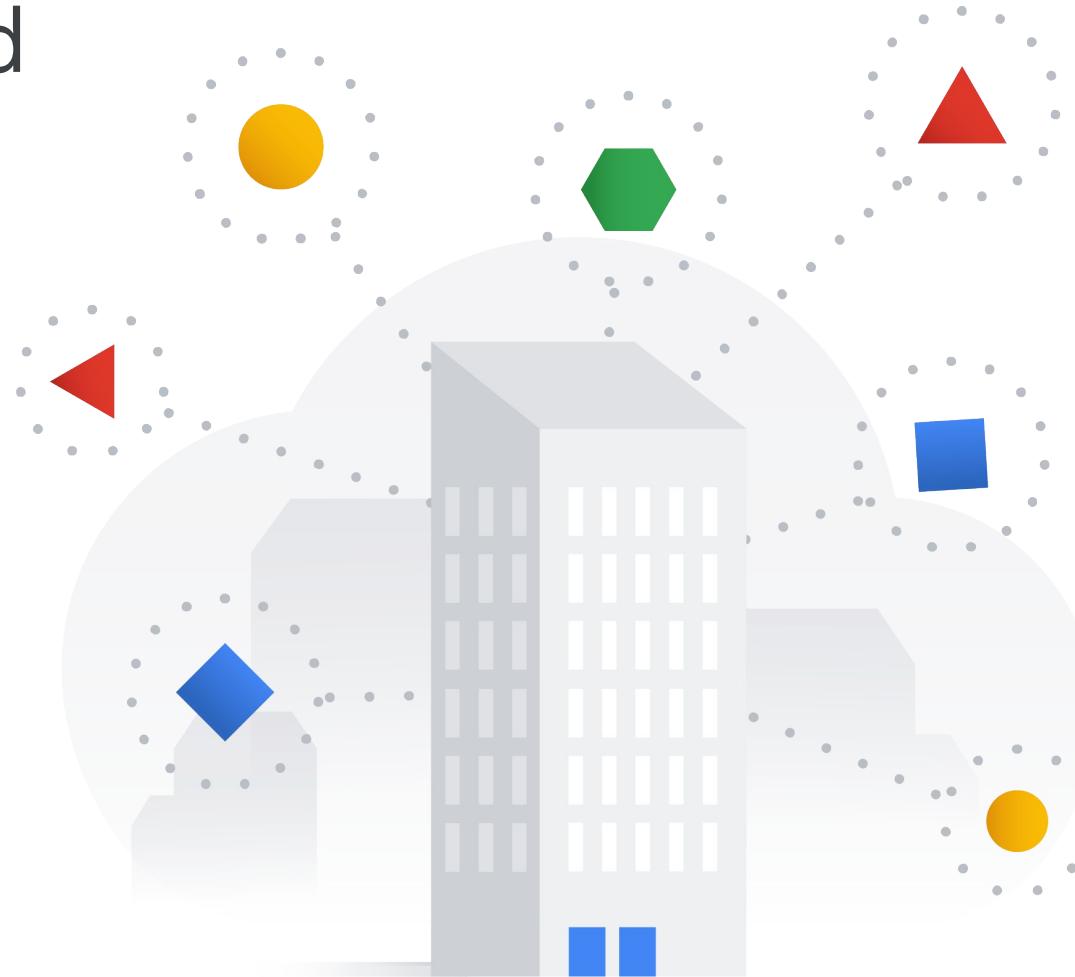


Managing Cymbal Superstore's cloud solutions



The next step:

managing Cymbal
Superstore's cloud
solutions



- Managing Compute Engine resources
- Managing GKE resources
- Managing Cloud Run resources
- Managing storage and database solutions
- Managing networking resources
- Monitoring and logging



Managing Cymbal Superstore's supply chain app

Upgrading managed instance groups:

```
gcloud compute instance-groups managed  
rolling-action start_update cymball_supplychain_ig \  
--version=template=cymball_supplychain_ig_templat  
e_<yyymmdd> \  
--type=proactive\  
--region=us-central1
```

Managing Cymbal Superstore's ecommerce app

```
apiVersion: networking.k8s.io/v1
kind: Ingress
metadata:
  name: cymbal-ecommerce-ingress
  annotations:
    # If the class annotation is not specified
    it defaults to "gce".
    kubernetes.io/ingress.class: "gce"
spec:
  rules:
  - http:
      paths:
      - path: /sales
        pathType: ImplementationSpecific
        backend:
          service:
            name: sales-service
            port:
              number: 60000
```

```
      - path: /support
        pathType: ImplementationSpecific
        backend:
          service:
            name: support-service
            port:
              number: 80
```

Here is an example of an ingress object that implements an external layer 7 (http(s)) load balancer

Managing Cymbal Superstore's transportation management app

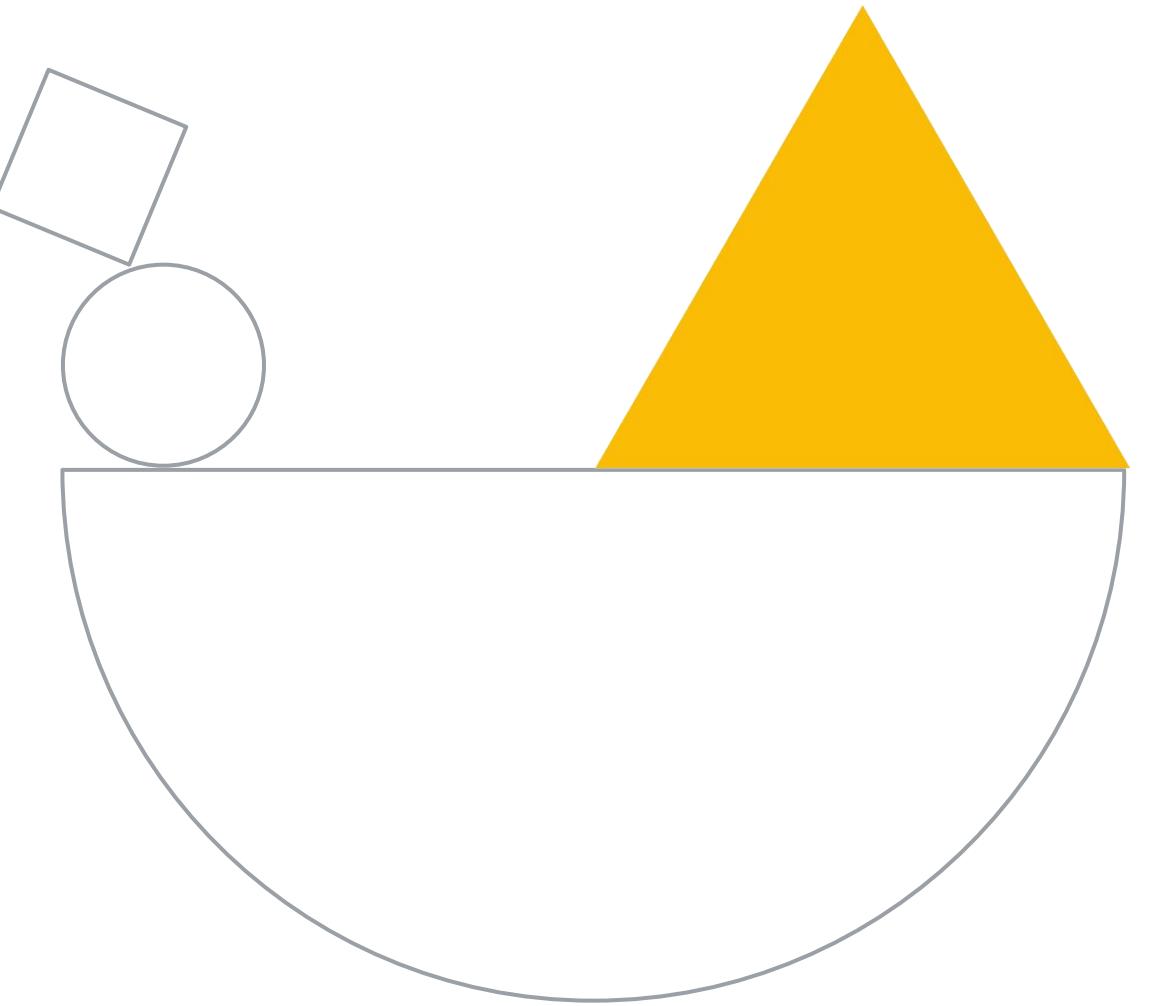
Querying external data such as Bigtable data with BigQuery:

1. create a table definition file
2. create a permanent external table in BigQuery

```
bq mk --external_table_definition=cymbal_trans_mngt_bt_def /  
cymbal_data_set.trans_mngt_ext_tbl
```

3. Query the data using the permanent table reference in the from clause of a sql query

Diagnostic questions

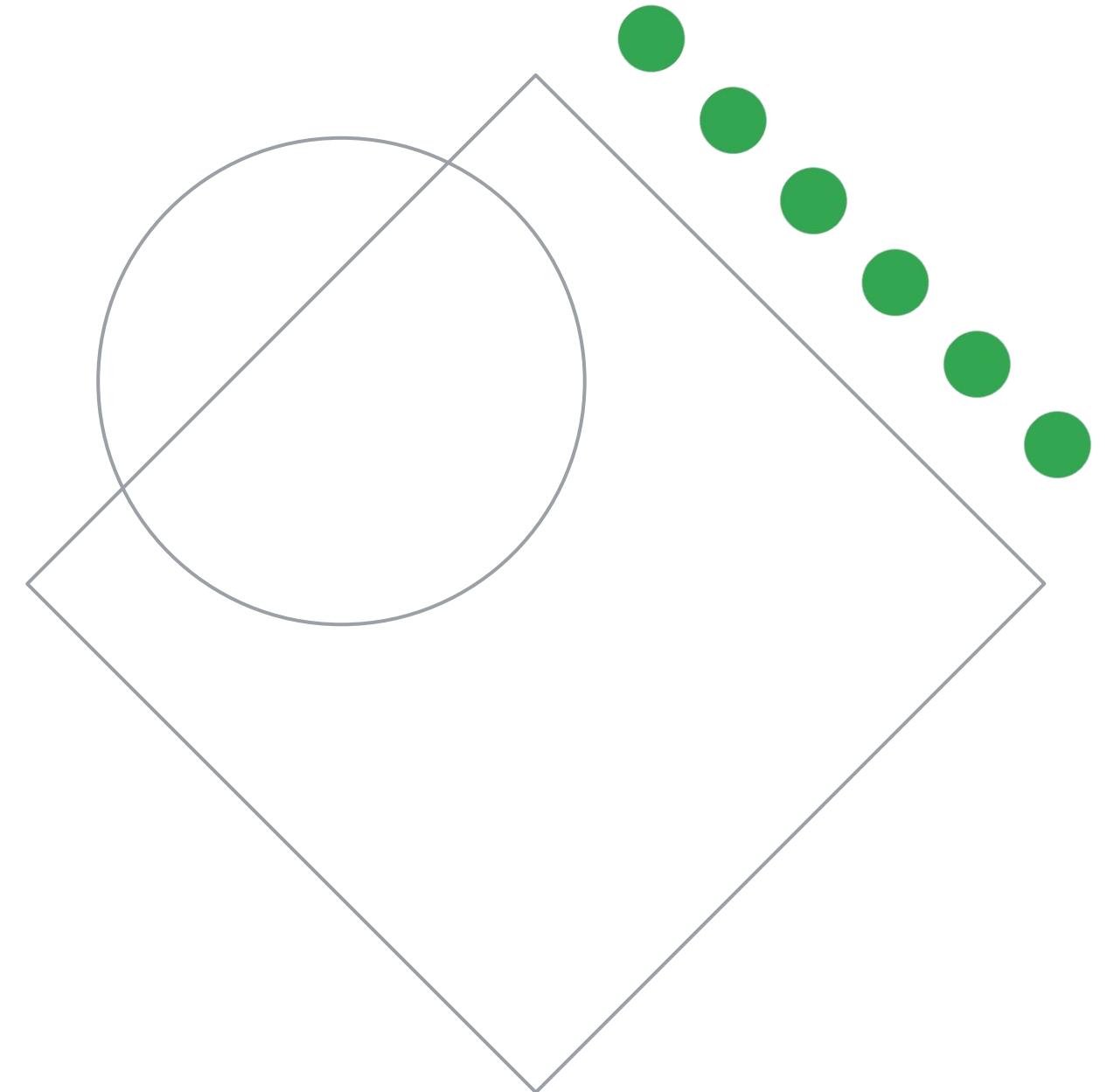


Please complete the diagnostic questions now

The diagnostic questions are also available in the workbook.

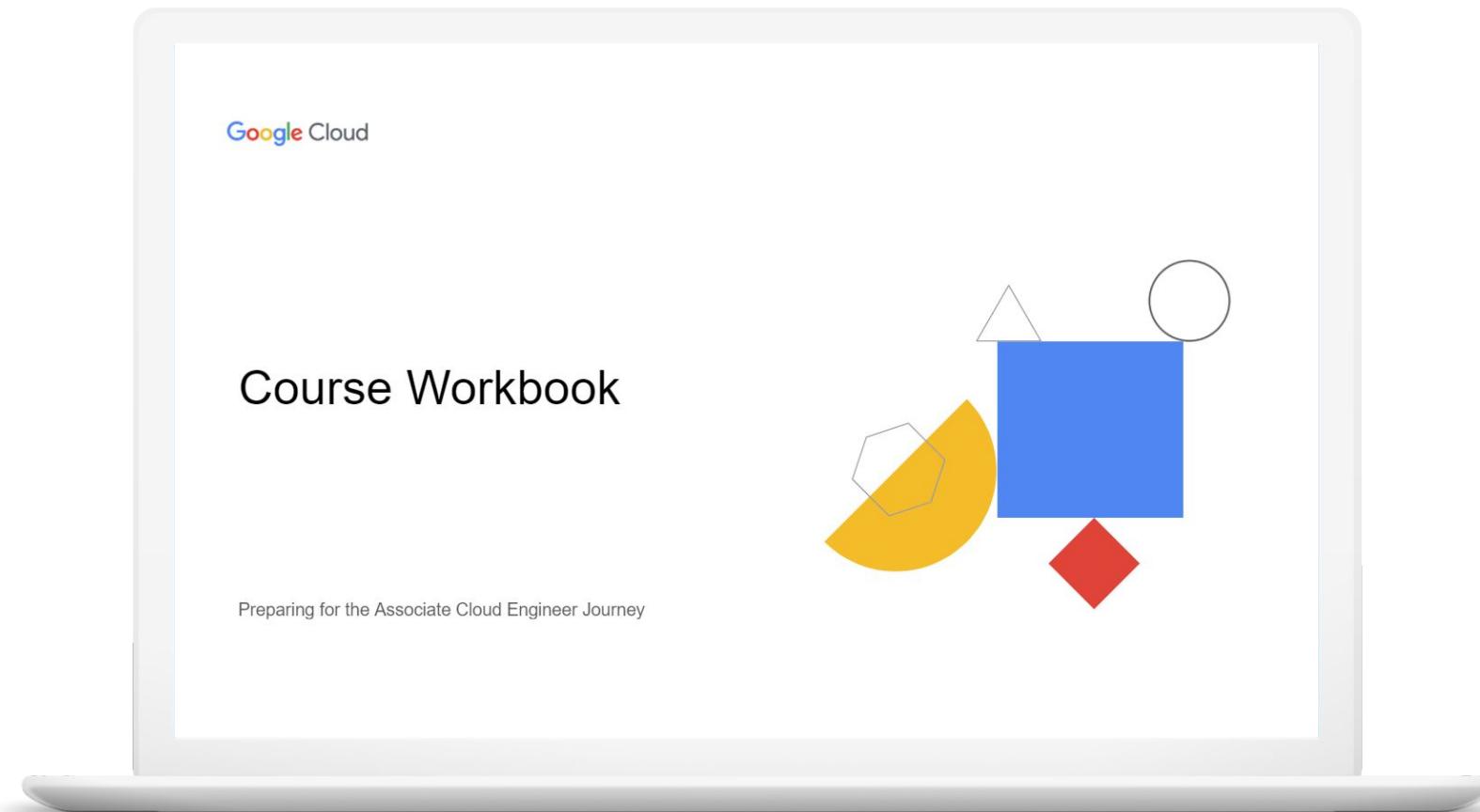


Review and study planning



Your study plan:

Ensuring successful operation of a cloud solution



4.1

Managing Compute Engine resources

4.2

Managing Google Kubernetes Engine resources

4.3

Managing Cloud Run resources

4.4

Managing storage and database solutions

4.5

Managing networking resources

4.6

Monitoring and logging

4.1

Managing Compute Engine resources

Considerations include:

- Remotely connecting to the instance
- Viewing current running VM inventory (e.g., instance IDs, details)
- Working with snapshots (e.g., create a snapshot from a VM, view snapshots, delete a snapshot, schedule a snapshot)
- Working with images (e.g., create an image from a VM or a snapshot, view images, delete an image)

4.1 | Diagnostic Question 01 Discussion

You want to view a description of your available snapshots using the command line interface (CLI). What gcloud command should you use?

- A. gcloud compute snapshots list
- B. gcloud snapshots list
- C. gcloud compute snapshots get
- D. gcloud compute list snapshots



4.1 | Diagnostic Question 01 Discussion

You want to view a description of your available snapshots using the command line interface (CLI). What gcloud command should you use?

- A. **gcloud compute snapshots list**
- B. gcloud snapshots list
- C. gcloud compute snapshots get
- D. gcloud compute list snapshots



Getting information about snapshots

To list Compute Engine disk snapshots:

```
gcloud compute snapshots list --project PROJECT_ID
```

To describe snapshots:

```
gcloud compute snapshots describe SNAPSHOT_NAME
```

4.1 | Diagnostic Question 02 Discussion

You have a scheduled snapshot you are trying to delete, but the operation returns an error.

What should you do to resolve this problem?

- A. Delete the downstream incremental snapshots before deleting the main reference.
- B. Delete the object the snapshot was created from.
- C. Detach the snapshot schedule before deleting it.
- D. Restore the snapshot to a persistent disk before deleting it.



4.1 | Diagnostic Question 02 Discussion

You have a scheduled snapshot you are trying to delete, but the operation returns an error.

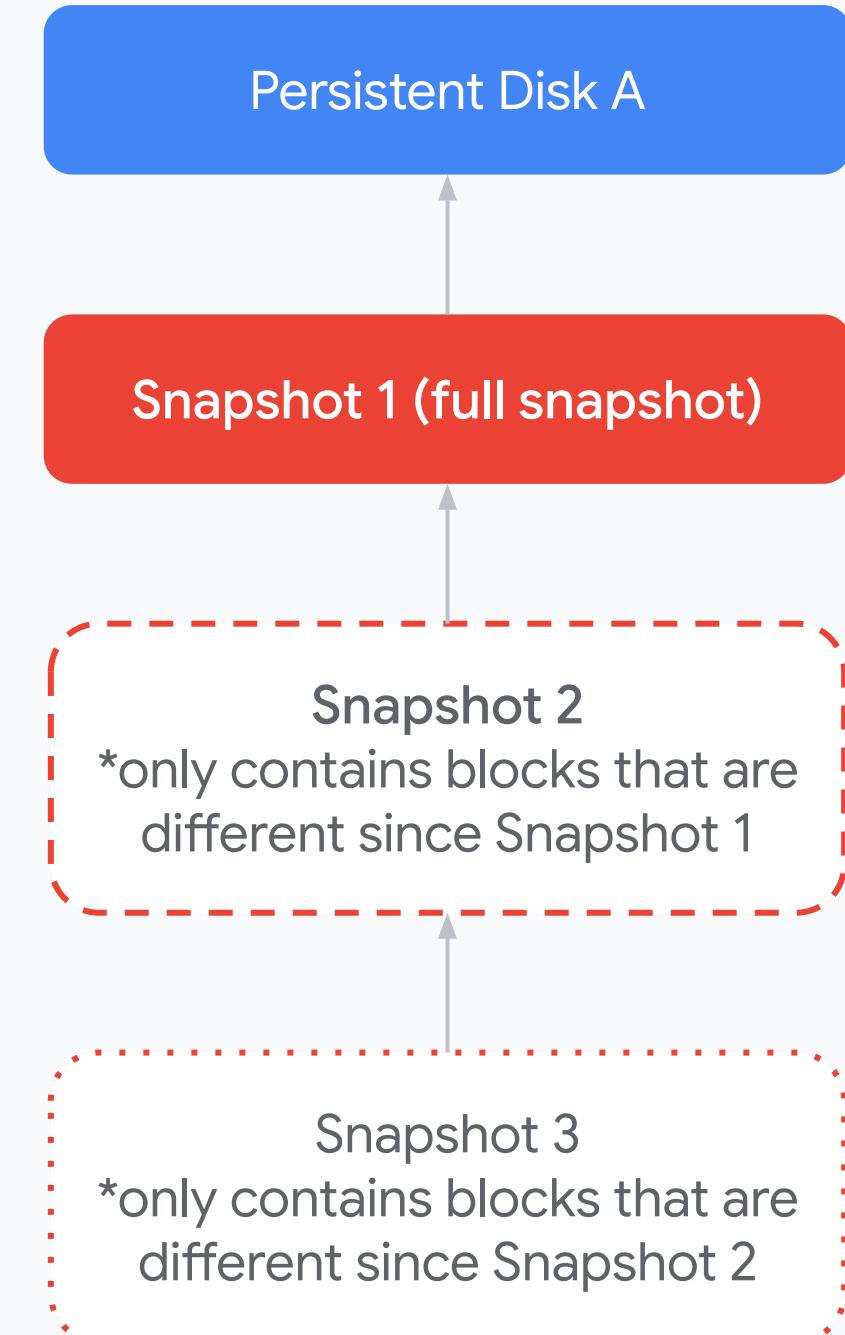
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- A. Delete the downstream incremental snapshots before deleting the main reference.
- B. Delete the object the snapshot was created from.
- C. **Detach the snapshot schedule before deleting it.**
- D. Restore the snapshot to a persistent disk before deleting it.



Snapshots are incremental

Creating a Snapshot



4.1

Managing Compute Engine resources

Courses

[Google Cloud Fundamentals: Core Infrastructure](#)

- M3 Virtual Machines and Networks in the Cloud

[Architecting with Google Compute Engine](#)

- M3 Virtual Machines
- M9 Load Balancing and Autoscaling



[Essential Google Cloud Infrastructure: Foundation](#)

- M3 Virtual Machines

[Elastic Google Cloud Infrastructure: Scaling and Automation](#)

- M2 Load Balancing and Autoscaling



Documentation

[Working with persistent disk snapshots | Compute Engine Documentation](#)

[Working with persistent disk snapshots | Compute Engine Documentation](#)

[Persistent disk snapshots | Compute Engine Documentation](#)

4.2

Managing Google Kubernetes Engine resources

Considerations include:

- Viewing current running cluster inventory (e.g., nodes, pods, services)
- Configuring Google Kubernetes Engine to access Artifact Registry
- Working with node pools (e.g., add, edit, or remove a node pool)
- Working with Kubernetes resources (e.g., Pods, Services, Statefulsets)
- Managing Horizontal and Vertical autoscaling configurations.

4.2 | Diagnostic Question 03 Discussion

Cymbal Superstore's GKE cluster requires an internal Application Load Balancer. You are creating the configuration files required for this resource.

What is the proper setting for this scenario?

- A. Annotate your ingress object with an ingress.class of "gce."
- B. Configure your service object with a type: LoadBalancer.
- C. Annotate your service object with a "neg" reference.
- D. Implement custom static routes in your VPC.

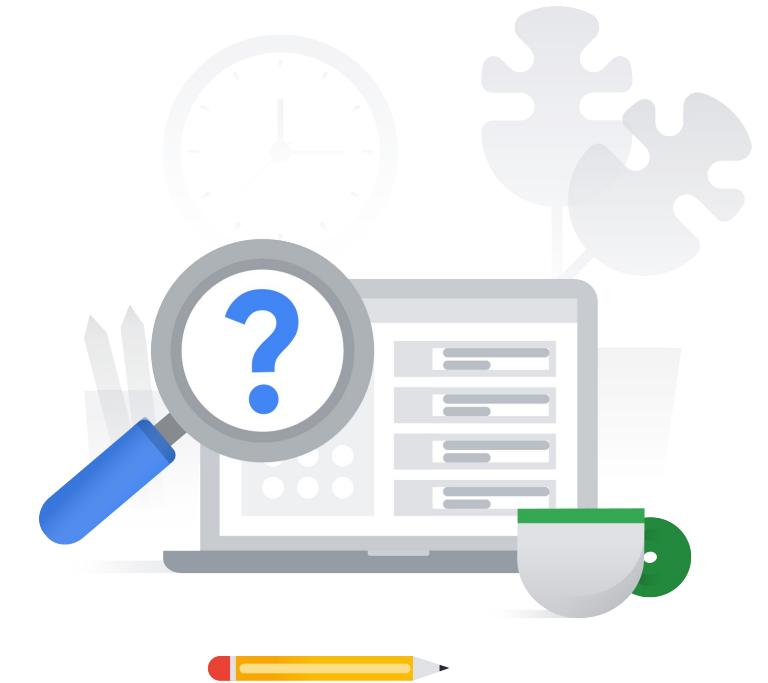


4.2 | Diagnostic Question 03 Discussion

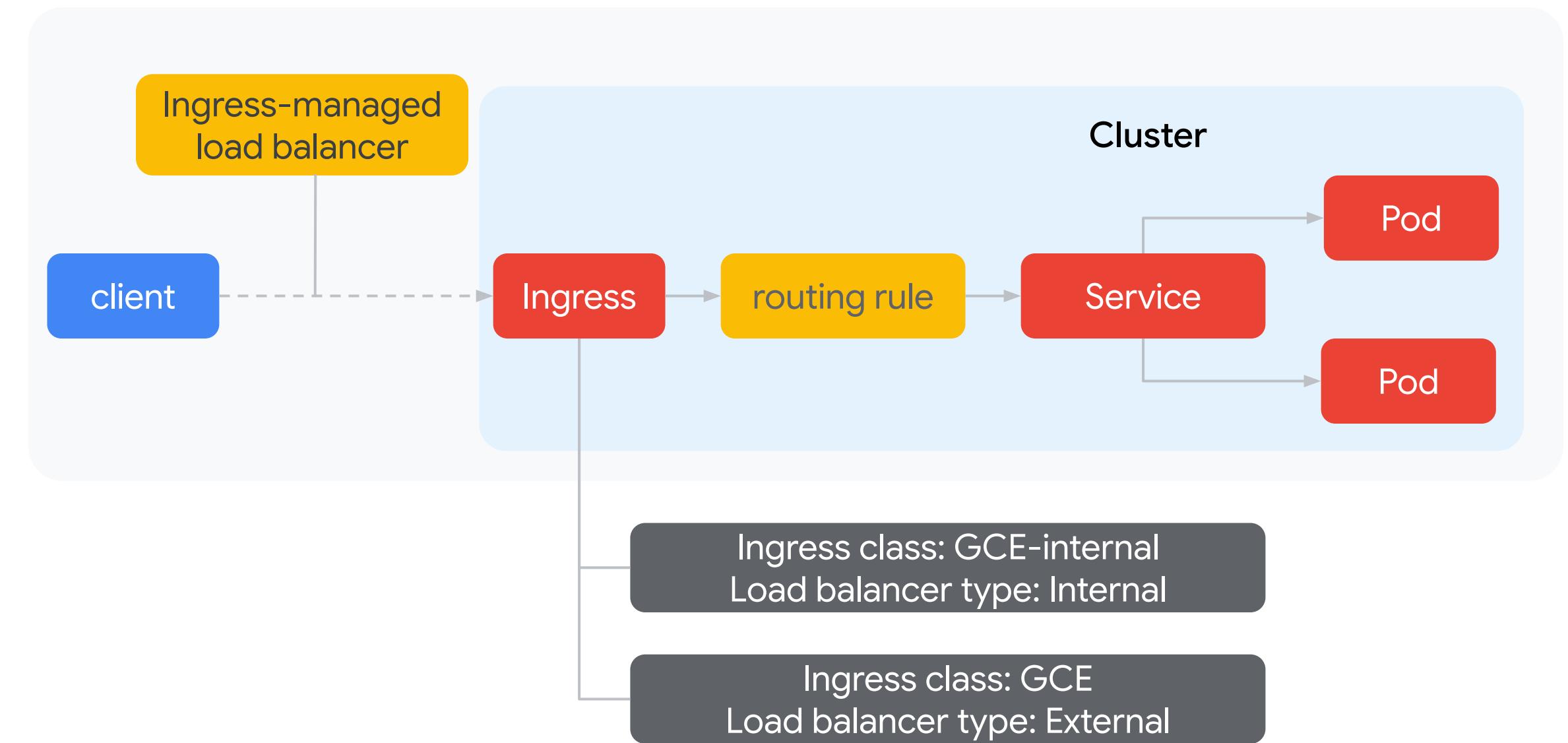
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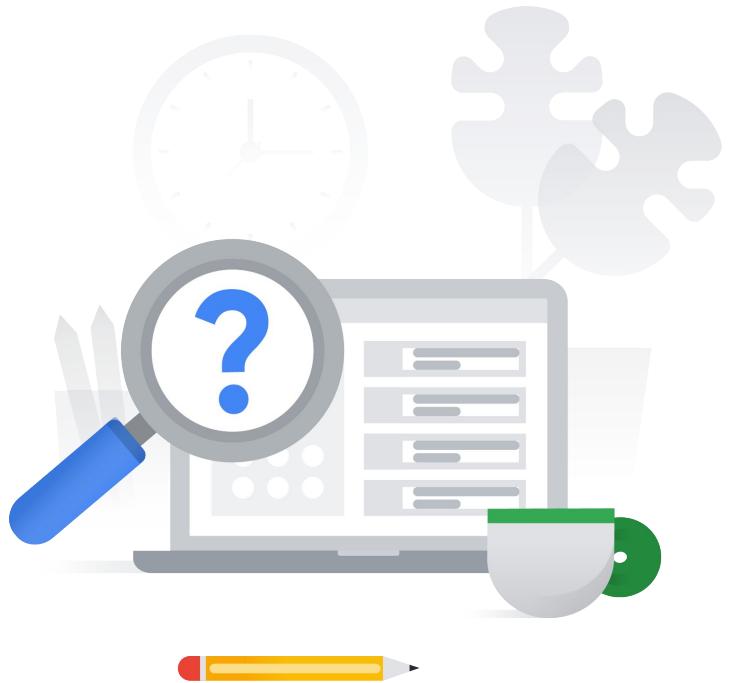
Internal vs External load balancing in Kubernetes



4.2 | Diagnostic Question 04 Discussion

What Kubernetes object provides access to logic running in your cluster via endpoints that you define?

- A. Pod templates
- B. Pods
- C. Services
- D. Deployments



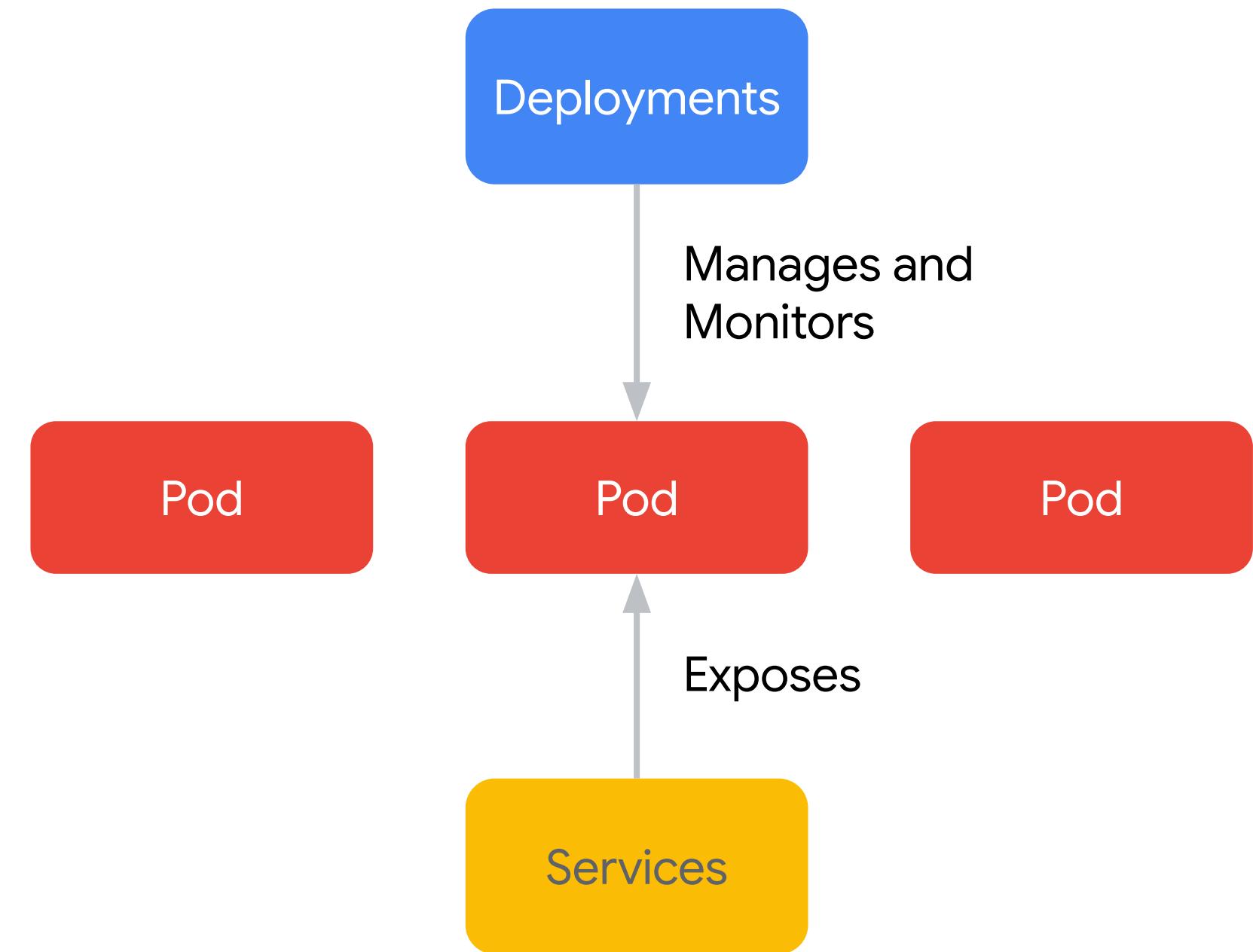
4.2 | Diagnostic Question 04 Discussion

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Kubernetes objects

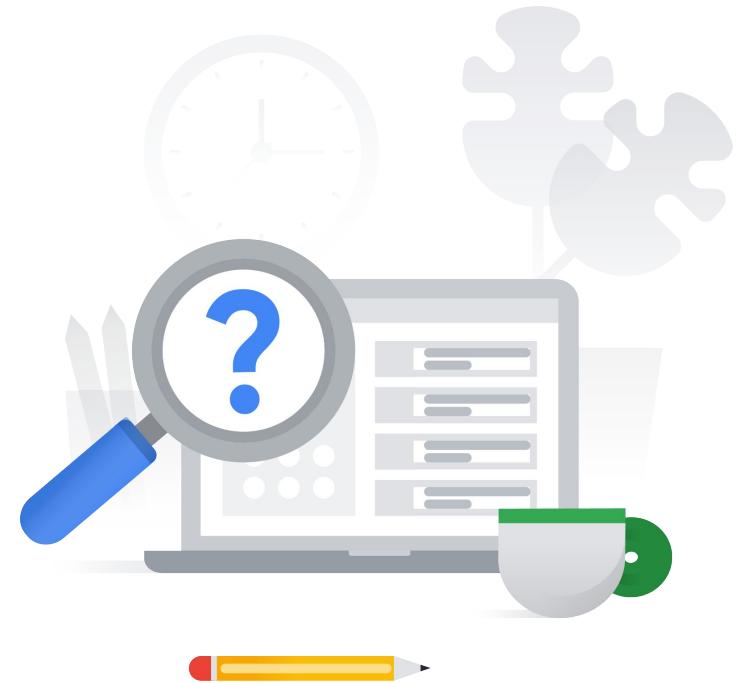


4.2

Diagnostic Question 05 Discussion

What is the declarative way to initialize and update Kubernetes objects?

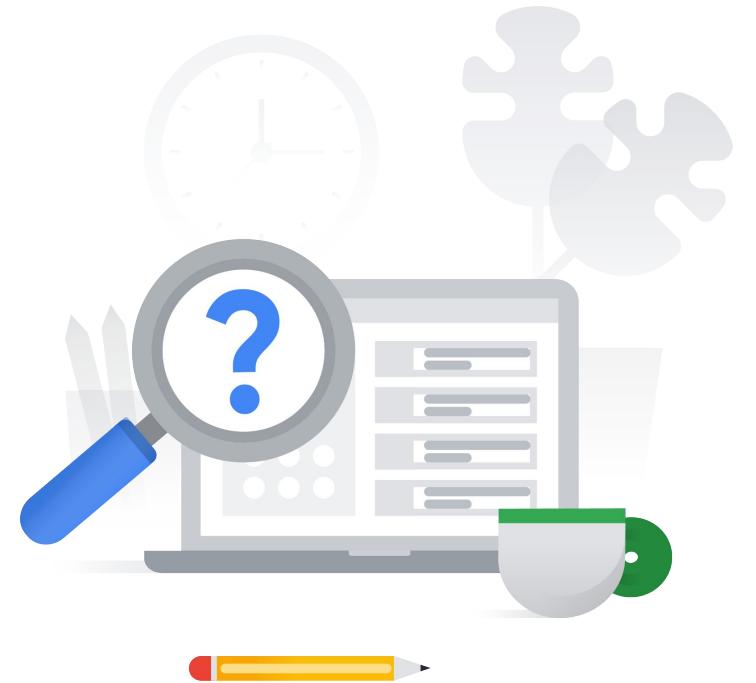
- A. kubectl apply
- B. kubectl create
- C. kubectl replace
- D. kubectl run



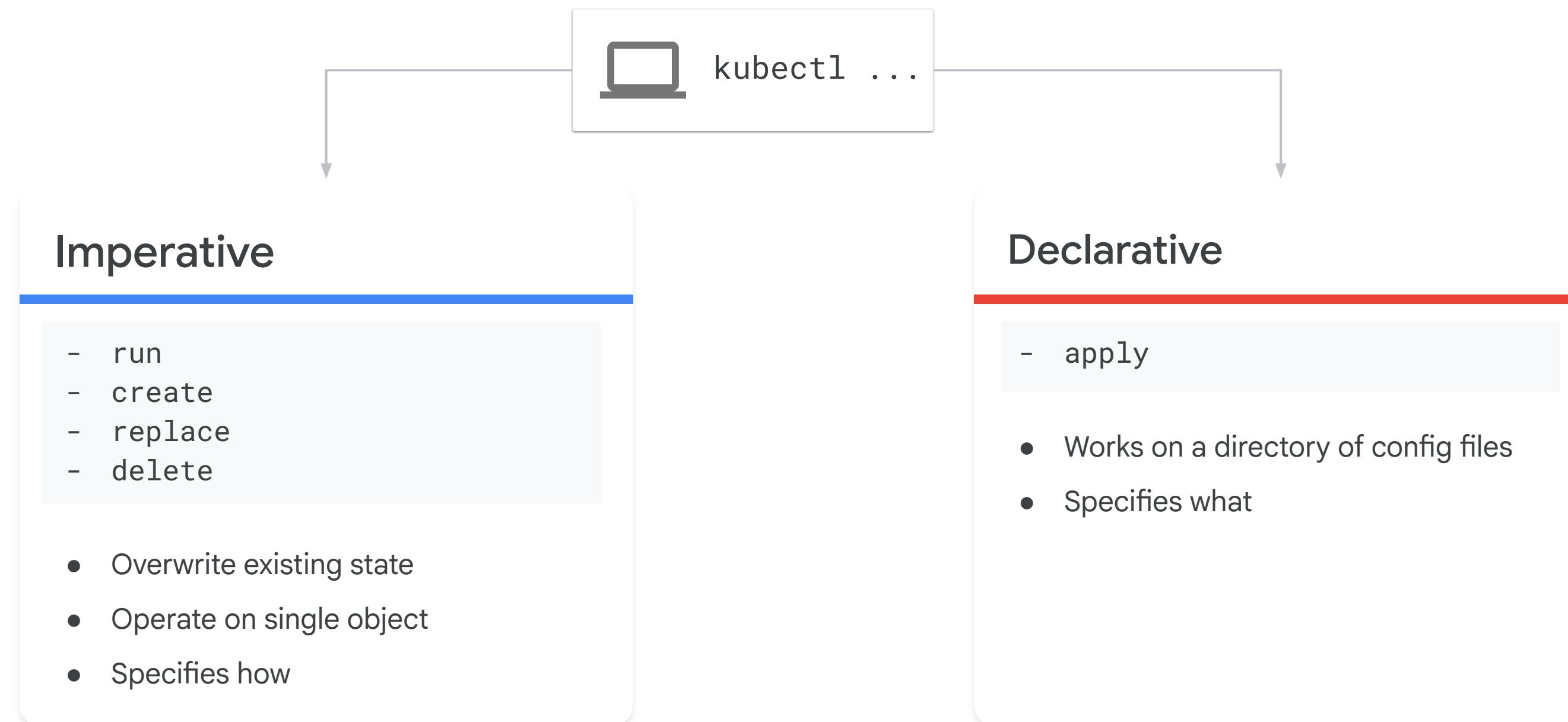
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What is the declarative way to initialize and update Kubernetes objects?

- A. kubectl apply
- B. kubectl create
- C. kubectl replace
- D. kubectl run



Types of kubectl commands



4.2

Managing Google Kubernetes Engine resources

Courses

[Google Cloud Fundamentals: Core Infrastructure](#)

- M5 Containers in the Cloud

[Getting Started with Google Kubernetes Engine](#)

- M3 Kubernetes Architecture
- M4 Kubernetes Operations

Skill Badge



[Develop your Google Cloud Network](#)

Documentation

[Ingress for internal Application Load Balancers](#)

[Ingress for external Application Load Balancers](#)

[Configure Ingress for external Application Load Balancers](#)

[Configuring Ingress for internal Application Load Balancers](#)

[GKE overview | Kubernetes Engine Documentation](#)

[Pod | Kubernetes Engine Documentation](#)

[Deployment | Kubernetes Engine Documentation](#)

[Services | Kubernetes Engine Documentation](#)

[Overview of deploying workloads | Kubernetes Engine Documentation](#)

[Kubernetes Object Management](#)

4.3 | Managing Cloud Run resources

Considerations include:

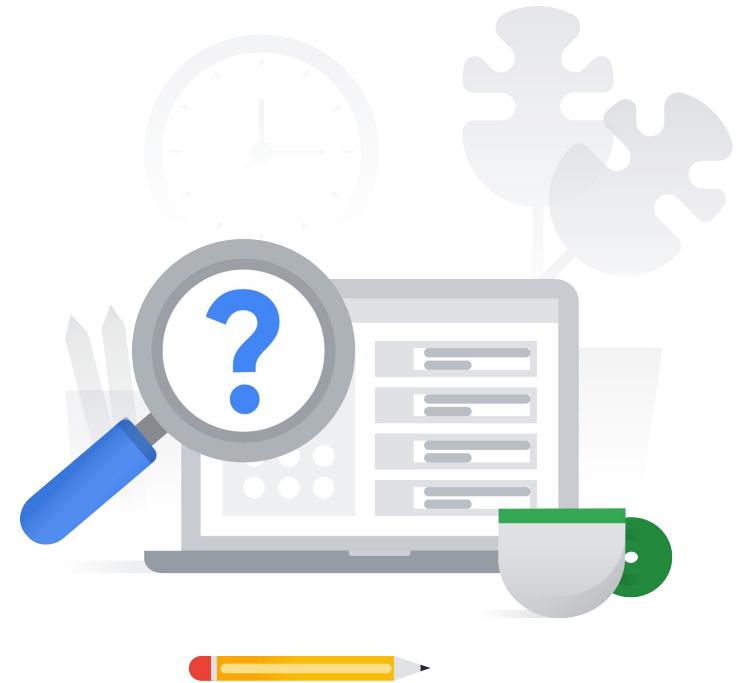
- Deploying new versions of an application
- Adjusting application traffic splitting parameters
- Setting scaling parameters for autoscaling instances

4.3 | Diagnostic Question 06 Discussion

You have a Cloud Run service with a database backend. You want to limit the number of connections to your database.

- A. Set Min instances.
- B. Set Max instances.
- C. Set CPU Utilization.
- D. Set Concurrency settings.

What should you do?

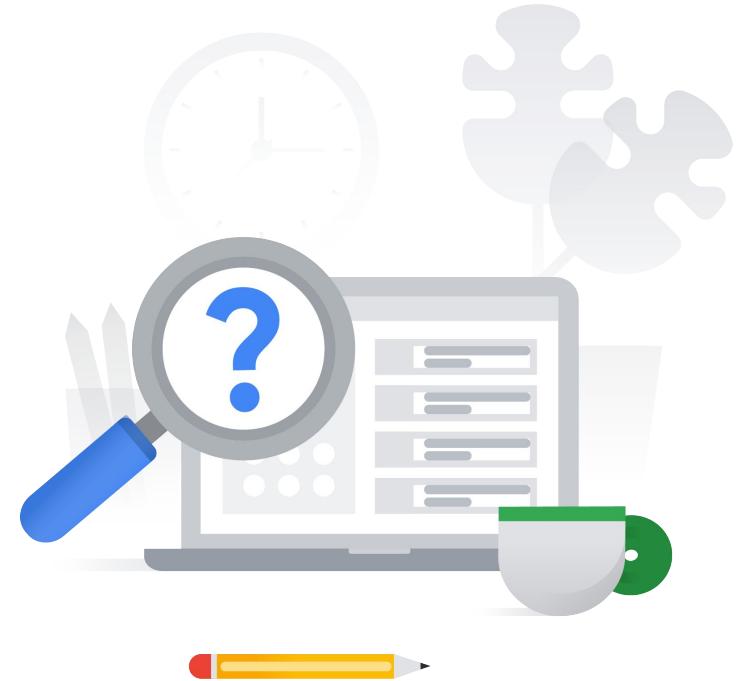


4.3 | Diagnostic Question 06 Discussion

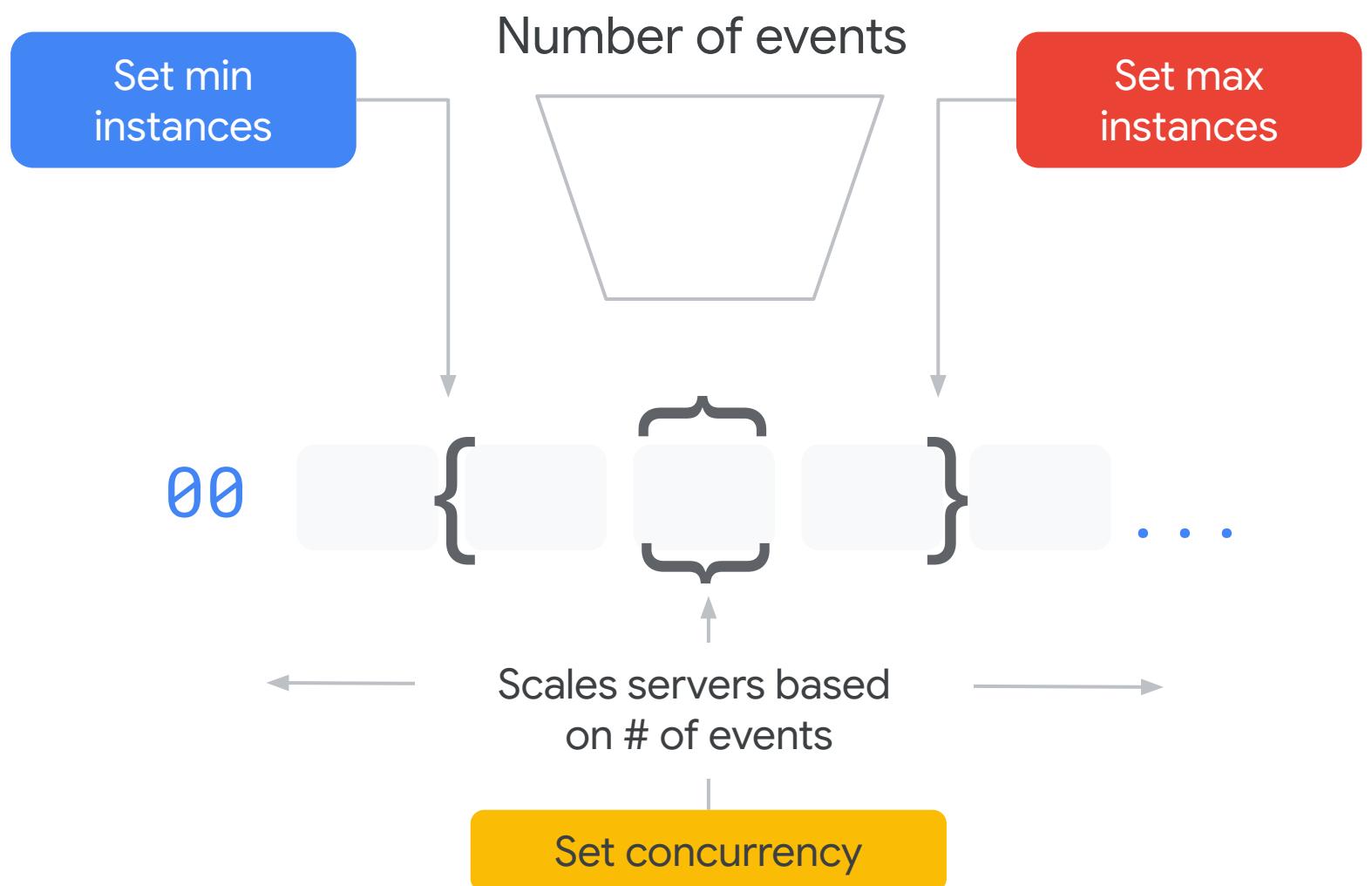
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Cloud Run autoscaling



4.3

Managing Cloud Run resources

Courses

[Google Cloud Fundamentals: Core Infrastructure](#)

- M6 Applications in the Cloud

Documentation

[About container instance autoscaling | Cloud Run Documentation](#)

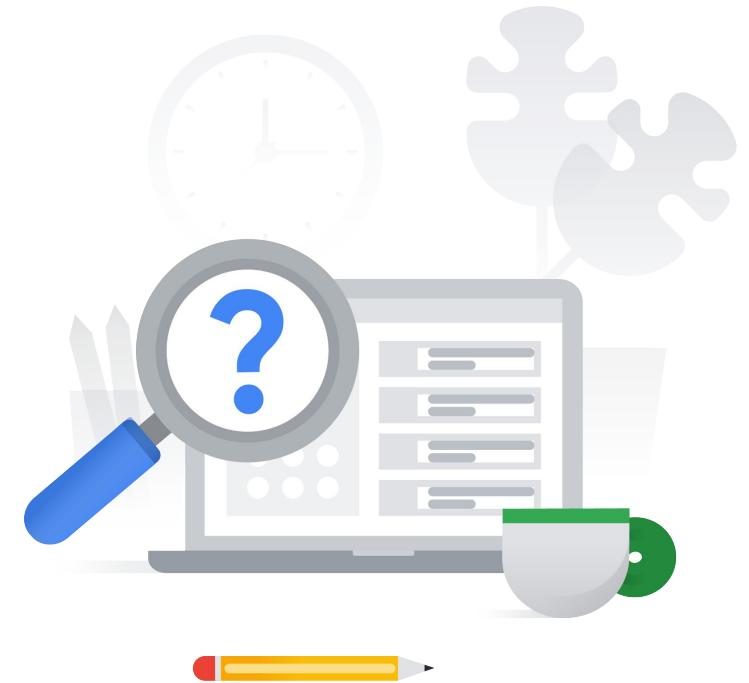
4.4

Managing storage and database solutions

Considerations include:

- Managing and securing objects in Cloud Storage buckets
- Setting object lifecycle management policies for Cloud Storage buckets
- Executing queries to retrieve data from data instances (e.g., Cloud SQL, BigQuery, Spanner, Firestore, AlloyDB)
- Estimating costs of data storage resources
- Backing up and restoring database instances (e.g., Cloud SQL, Firestore)
- Reviewing job status (e.g., Dataflow, BigQuery)

4.4 | Diagnostic Question 07 Discussion

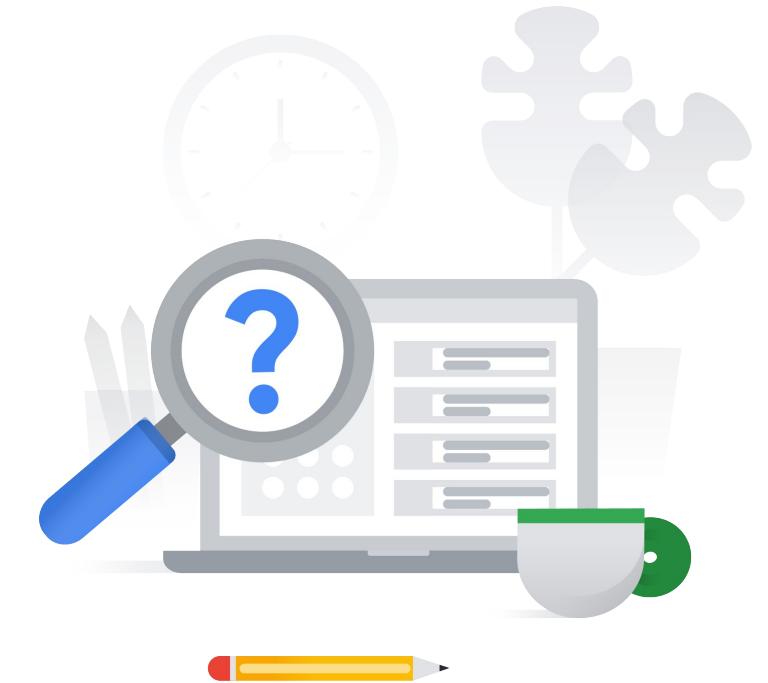


You want to implement a lifecycle rule that changes your storage type from Standard to Nearline after a specific date.

What conditions should you use?
(Pick two.)

- A. Age
- B. CreatedBefore
- C. MatchesStorageClass
- D. IsLive
- E. NumberofNewerVersions

4.4 | Diagnostic Question 07 Discussion



You want to implement a lifecycle rule that changes your storage type from Standard to Nearline after a specific date.

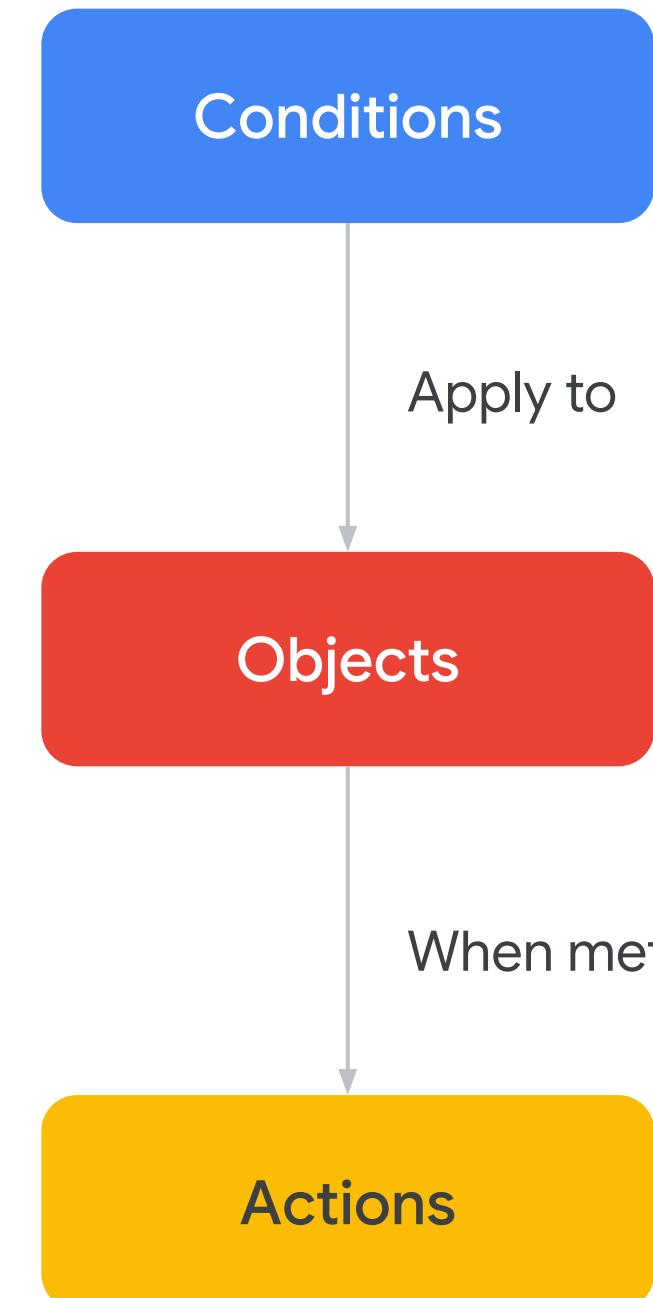
What conditions should you use?
(Pick two.)

- A. Age
- B. CreatedBefore
- C. MatchesStorageClass
- D. IsLive
- E. NumberofNewerVersions



Cloud Storage Lifecycle Actions

- Age
- Createdbefore
- Customtimebefore
- ...



- Delete
- SetStorageClass
- ...

4.4 | Managing storage and database solutions

Courses

[Google Cloud Fundamentals: Core Infrastructure](#)

- M4 Storage in the Cloud

[Architecting with Google Compute Engine](#)

- M5 Storage and Database Services



=

[Essential Google Cloud Infrastructure: Core Services](#)

- M2 Storage and Database Services



Documentation

[Object Lifecycle Management | Cloud Storage](#)

4.5 | Managing networking resources

Considerations include:

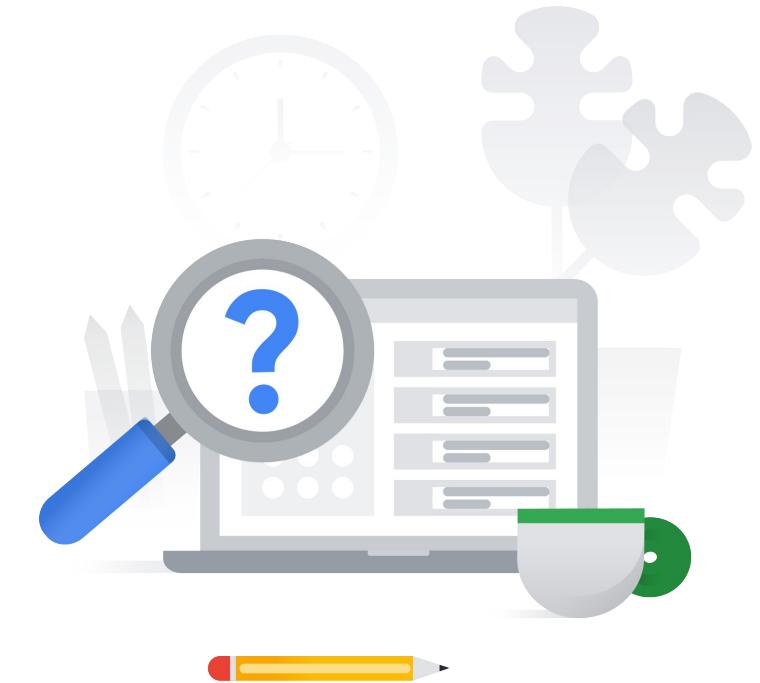
- Adding a subnet to an existing VPC
- Expanding a subnet to have more IP addresses
- Reserving static external or internal IP addresses
- Working with Cloud DNS and Cloud NAT

4.5 | Diagnostic Question 08 Discussion

Cymbal Superstore has a subnetwork called mysubnet with an IP range of 10.1.2.0/24. You need to expand this subnet to include enough IP addresses for at most 2000 users or devices.

What should you do?

- A. gcloud compute networks subnets expand-ip-range mysubnet --region us-central1 --prefix-length 20
- B. gcloud networks subnets expand-ip-range mysubnet --region us-central1 --prefix-length 21
- C. gcloud compute networks subnets expand-ip-range mysubnet --region us-central1 --prefix-length 21
- D. gcloud compute networks subnets expand-ip-range mysubnet --region us-cetnral1 --prefix-length 22

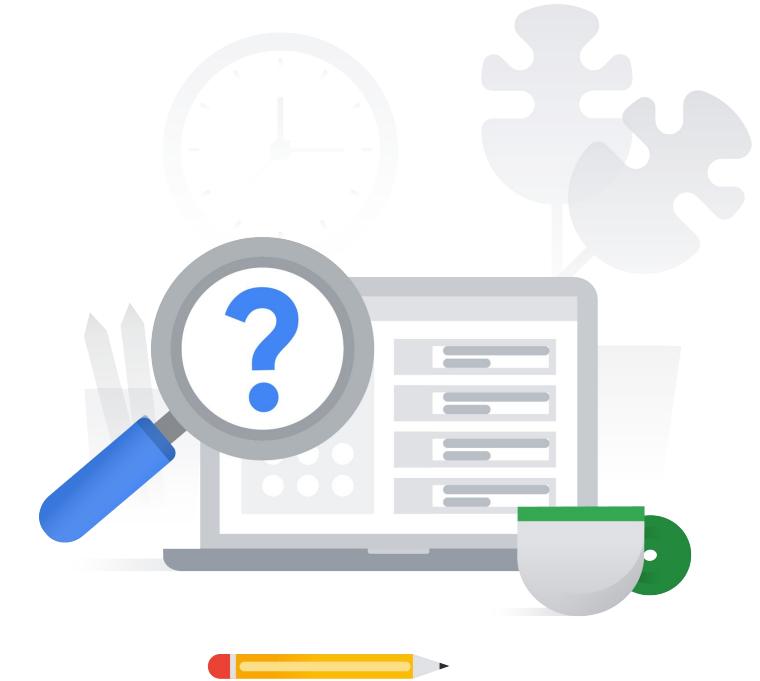


4.5 | Diagnostic Question 08 Discussion

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- B. gcloud networks subnets expand-ip-range mysubnet --region us-central1 --prefix-length 21
- C. gcloud compute networks subnets expand-ip-range mysubnet --region us-central1 --prefix-length 21** 
- D. gcloud compute networks subnets expand-ip-range mysubnet --region us-cetnral1 --prefix-length 22



Expand IP addresses in a **subnet**

Current IP address range

Reduce your mask:
e.g. 24 to 20

Expanded address range

4.5

Managing networking resources

Courses

[Architecting with Google Compute Engine](#)

- M2 Virtual Networks



=

[Essential Google Cloud Infrastructure: Foundation](#)

- M2 Virtual Networks



Documentation

[gcloud compute networks subnets expand-ip-range](#)
[Using VPC networks](#)

4.6 | Monitoring and logging

Considerations include:

- Creating Cloud Monitoring alerts based on resource metrics
- Creating and ingesting Cloud Monitoring custom metrics (e.g., from applications or logs)
- Exporting logs to external systems (e.g., on-premises, BigQuery)
- Configuring log buckets, log analytics, and logs routers
- Viewing and filtering logs in Cloud Logging
- Viewing specific log message details in Cloud Logging
- Using cloud diagnostics to research an application issue
- Viewing Google Cloud status
- Configuring and deploying Ops Agent
- Deploying Managed Service for Prometheus
- Configuring audit logs

4.6 | Diagnostic Question 09 Discussion

Cymbal Superstore's supply chain management system has been deployed and is working well. You are tasked with monitoring the system's resources so you can react quickly to any problems. You want to ensure the CPU usage of each of your Compute Engine instances in us-central1 remains below 60%. You want an incident created if it exceeds this value for 5 minutes. You need to configure the proper alerting policy for this scenario.

What should you do?

- A. Choose resource type of VM instance and metric of CPU load, condition trigger if any time series violates, condition is below, threshold is .60, for 5 minutes.
- B. Choose resource type of VM instance and metric of CPU utilization, condition trigger all time series violates, condition is above, threshold is .60 for 5 minutes.
- C. Choose resource type of VM instance, and metric of CPU utilization, condition trigger if any time series violates, condition is below, threshold is .60 for 5 minutes.
- D. Choose resource type of VM instance and metric of CPU utilization, condition trigger if any time series violates, condition is above, threshold is .60 for 5 minutes.

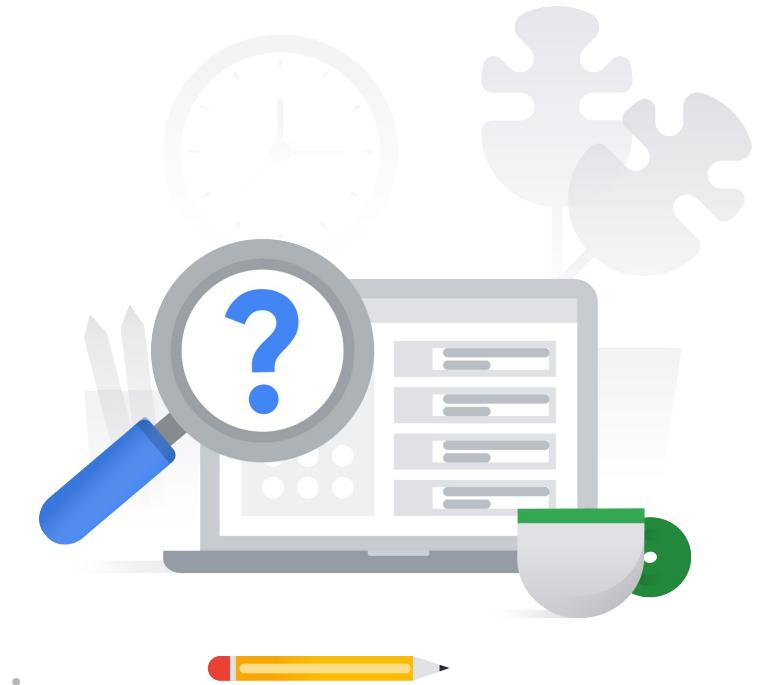


4.6 | Diagnostic Question 09 Discussion

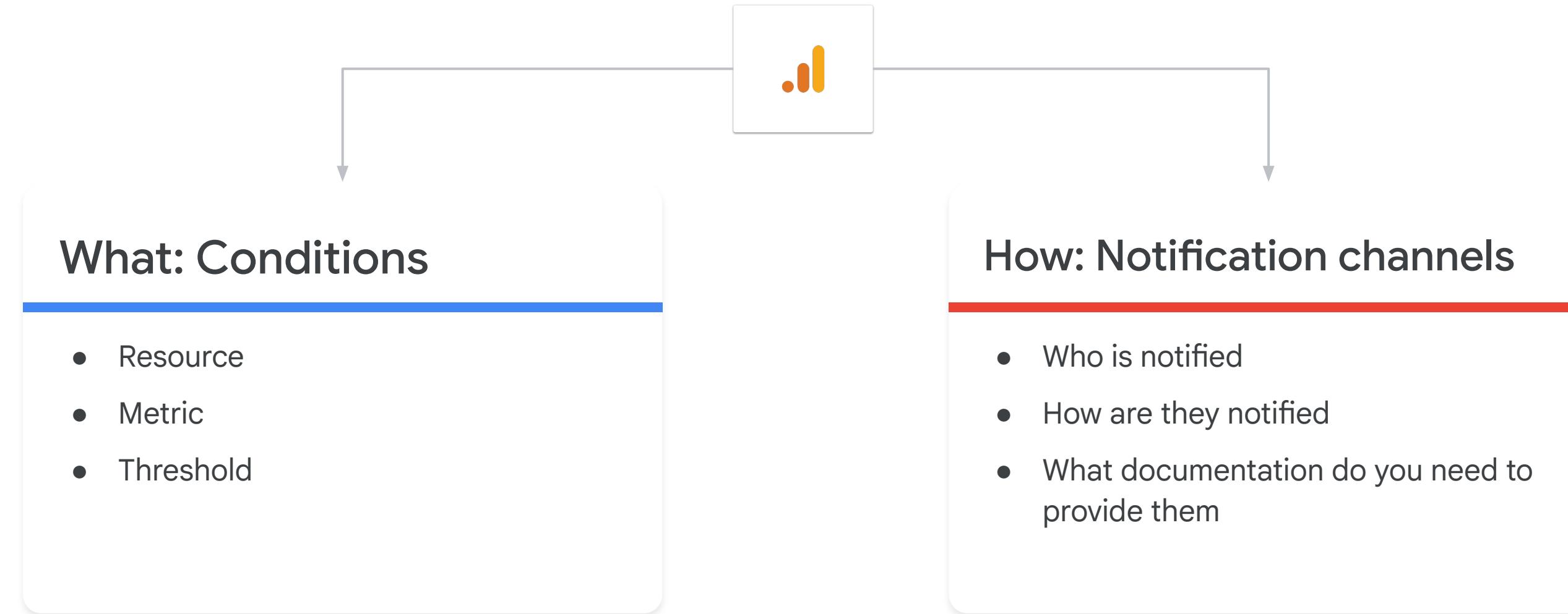
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Cloud operations custom alerts



4.6 | Monitoring and logging

Courses

[Architecting with Google Compute Engine](#)



- M7 Resource Monitoring

[Essential Google Cloud Infrastructure: Core Services](#)



- M4 Resource Monitoring

Skill Badges



[Set Up an App Dev Environment on Google Cloud](#)



[Develop your Google Cloud Network](#)

Documentation

[Managing metric-based alerting policies](#) | [Cloud Monitoring](#)
[Introduction to alerting](#) | [Cloud Monitoring](#)

Knowledge Check 1

What GKE object implements an Application Load Balancer?

- A. Service
- B. Pod
- C. Deployment
- D. Ingress



Knowledge Check 1

What GKE object implements an Application Load Balancer?

- A. Service
- B. Pod
- C. Deployment
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Knowledge Check 2

Which Cloud Run autoscaling setting should you set if you want to limit cost?

- A. Min Instances
- B. Max instances
- C. Concurrency settings
- D. CPU utilization



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