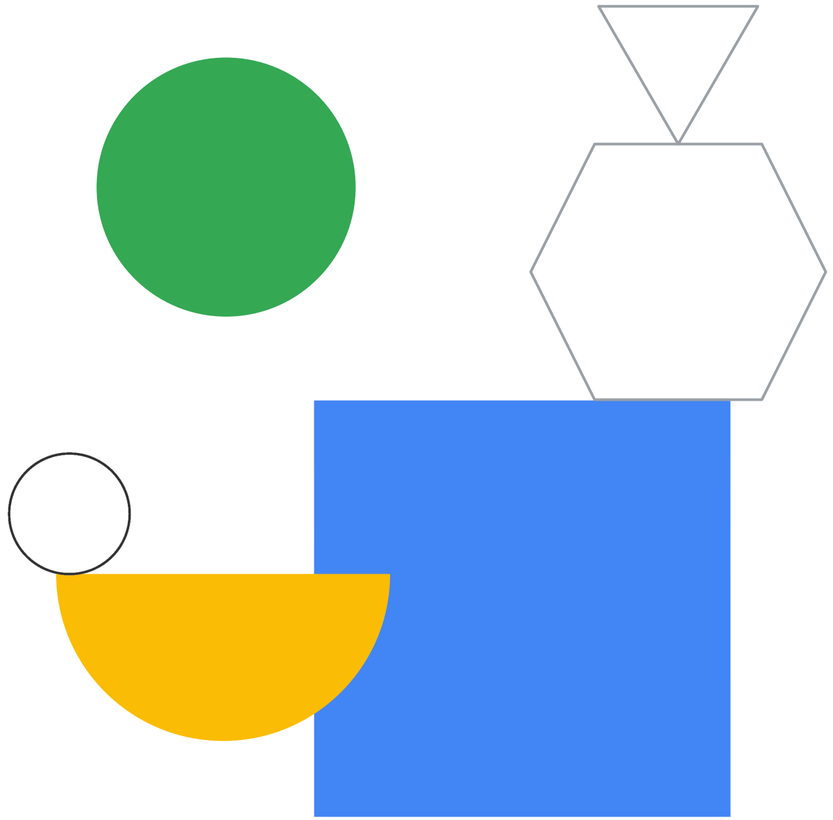
Google Cloud

Preparing for Your Associate Cloud Engineer Journey



Module 4: Ensuring Successful Operation of a Cloud Solution

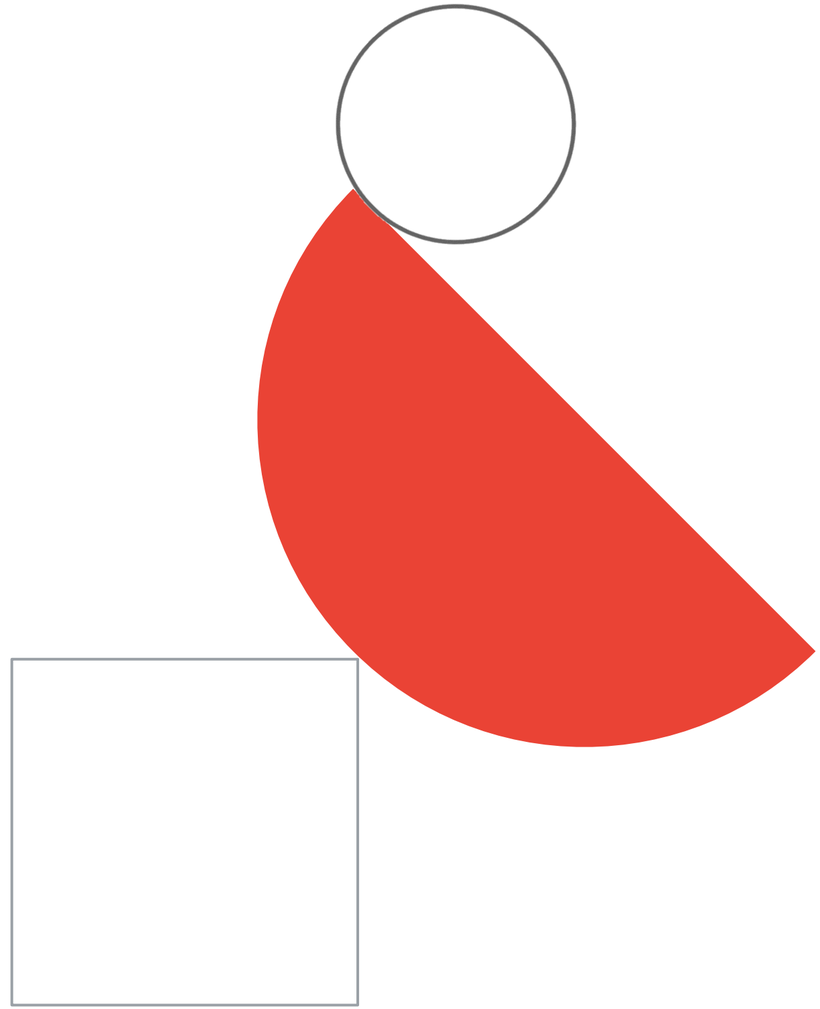
Module agenda

01 Managing Cymbal Superstore’s cloud solutions

02 Diagnostic questions

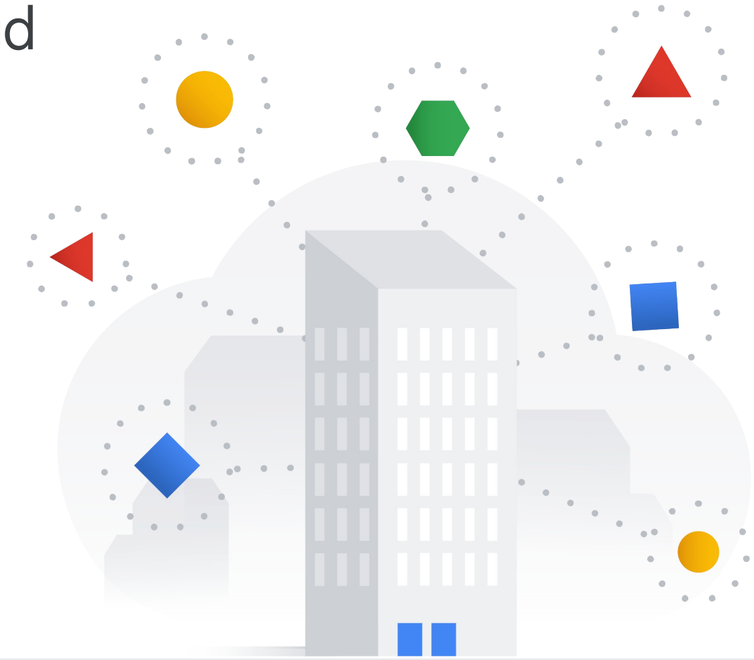
03 Review and study planning

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

Cymbal Superstore

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_<yymmdd> \
   --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

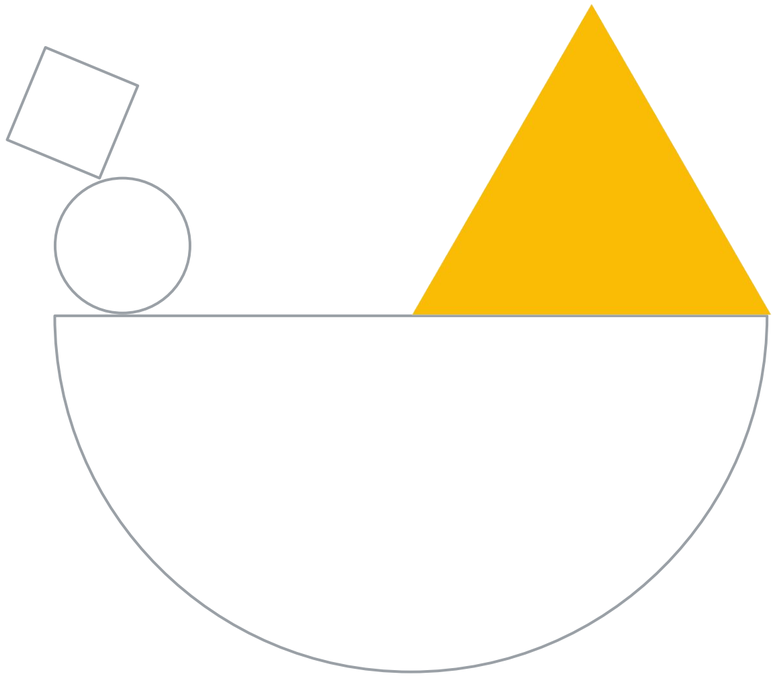
Querying external data such as Bigtable data with BigQuery:

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

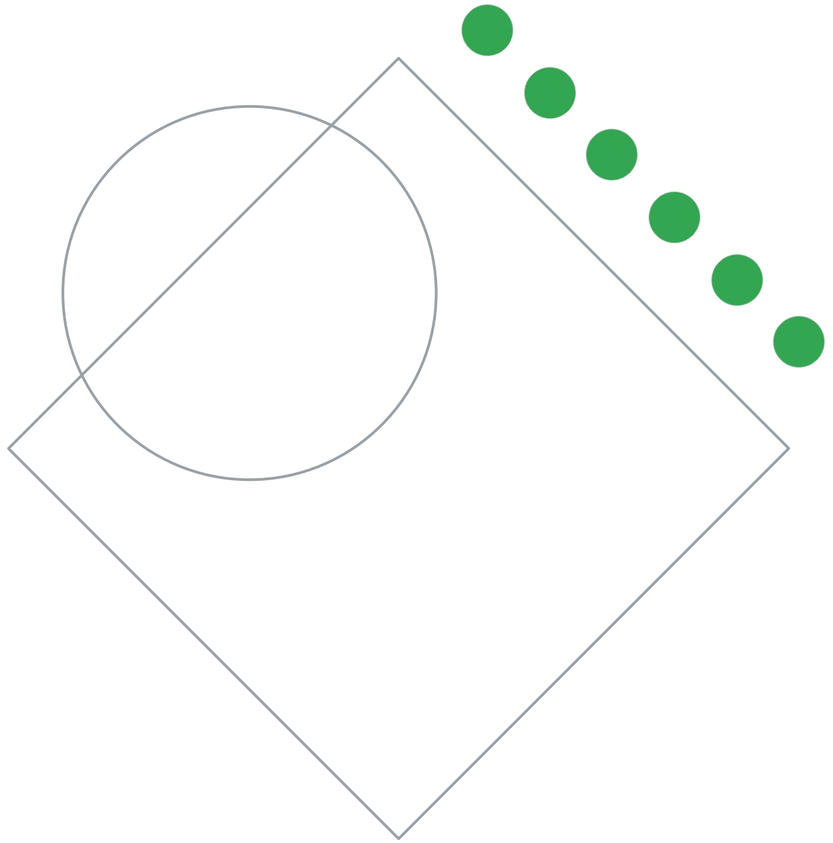
Diagnostic questions



Please complete the diagnostic questions now

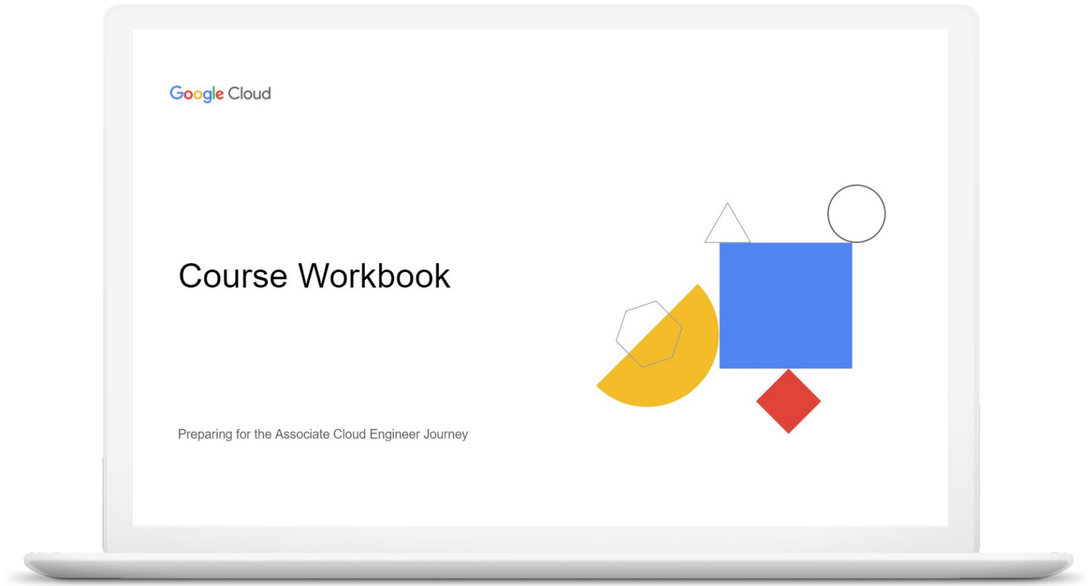
- Forms are provided for you to answer the diagnostic questions
- The instructor will provide you a link to the forms
- The diagnostic questions are also available in the workbook

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

Tasks include:

- Managing a single VM instance (e.g., start, stop, edit configuration, or delete an instance)
- Remotely connecting to the instance
- Attaching a GPU to a new instance and installing necessary dependencies
- Viewing current running VM inventory (instance IDs, details)
- Working with snapshots (e.g., create a snapshot from a VM, view snapshots, delete a snapshot)
- Working with images (e.g., create an image from a VM or a snapshot, view images, delete an image)
- Working with instance groups (e.g., set autoscaling parameters, assign instance template, create an instance template, remove instance group)
- Working with management interfaces (e.g., Cloud Console, Cloud Shell, Cloud SDK)

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?

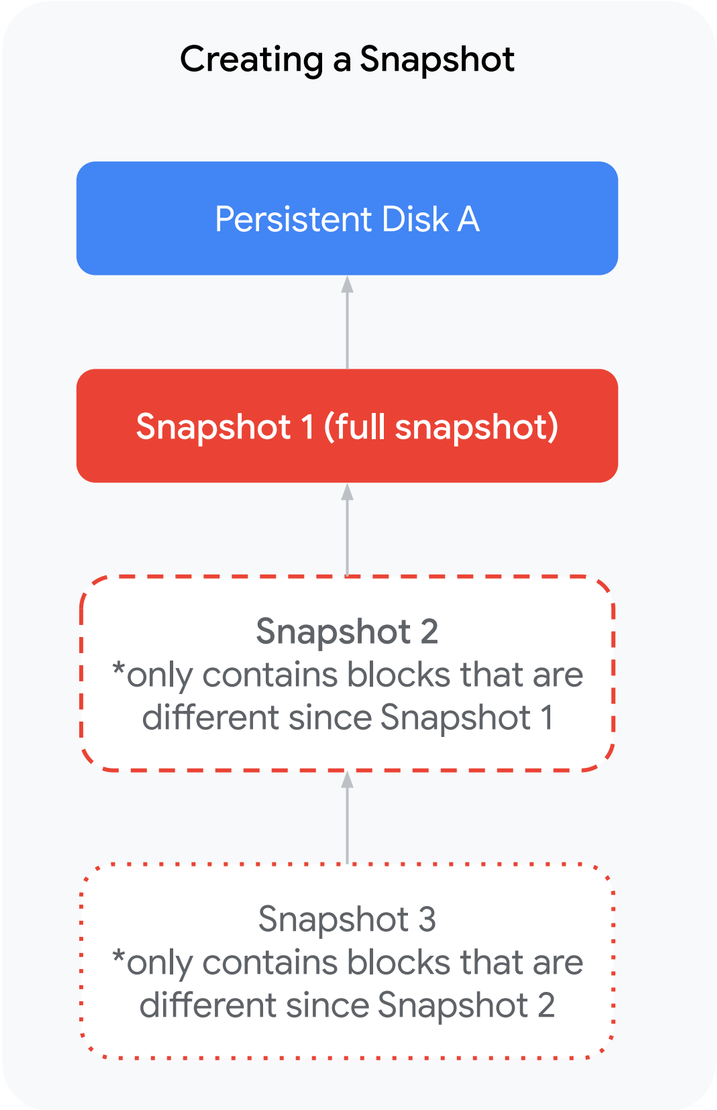
A. Delete the downstream incremental snapshots before deleting the main reference.

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.

Snapshots are incremental



4.1 Diagnostic Question 03 Discussion

Which of the following tasks are part of the process when configuring a managed instance group? (Pick two.)

A. Defining Health checks.
B. Providing Number of instances.
C. Specifying Persistent disks.
D. Choosing instance Machine type.
E. Configuring the operating system.

Implementing an instance group

01

Step 01

Create instance template e.g. identify machine type and boot disk

02

Step 02

Configure your instance group e.g. number of instances and autoscaling settings

4.1 Managing Compute Engine resources

Courses

[Google Cloud Fundamentals: Core Infrastructure](#)

- M3 Virtual Machines in the Cloud

[Architecting with Google Compute Engine](#)

- M3 Virtual Machines
- M9 Load Balancing and Autoscaling

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[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](#)

[Instance templates | Compute Engine Documentation](#)

[Instance groups | Compute Engine Documentation](#)

4.2 Managing Google Kubernetes Engine resources

Tasks include:

- Viewing current running cluster inventory (nodes, pods, services)
- Browsing Docker images and viewing their details in the Artifact Registry
- Working with node pools (e.g., add, edit, or remove a node pool)
- Working with pods (e.g., add, edit, or remove pods)
- Working with services (e.g., add, edit, or remove a service)
- Working with stateful applications (e.g. persistent volumes, stateful sets)
- Managing Horizontal and Vertical autoscaling configurations.
- Working with management interfaces (e.g., Cloud Console, Cloud Shell, Cloud SDK, kubectl)

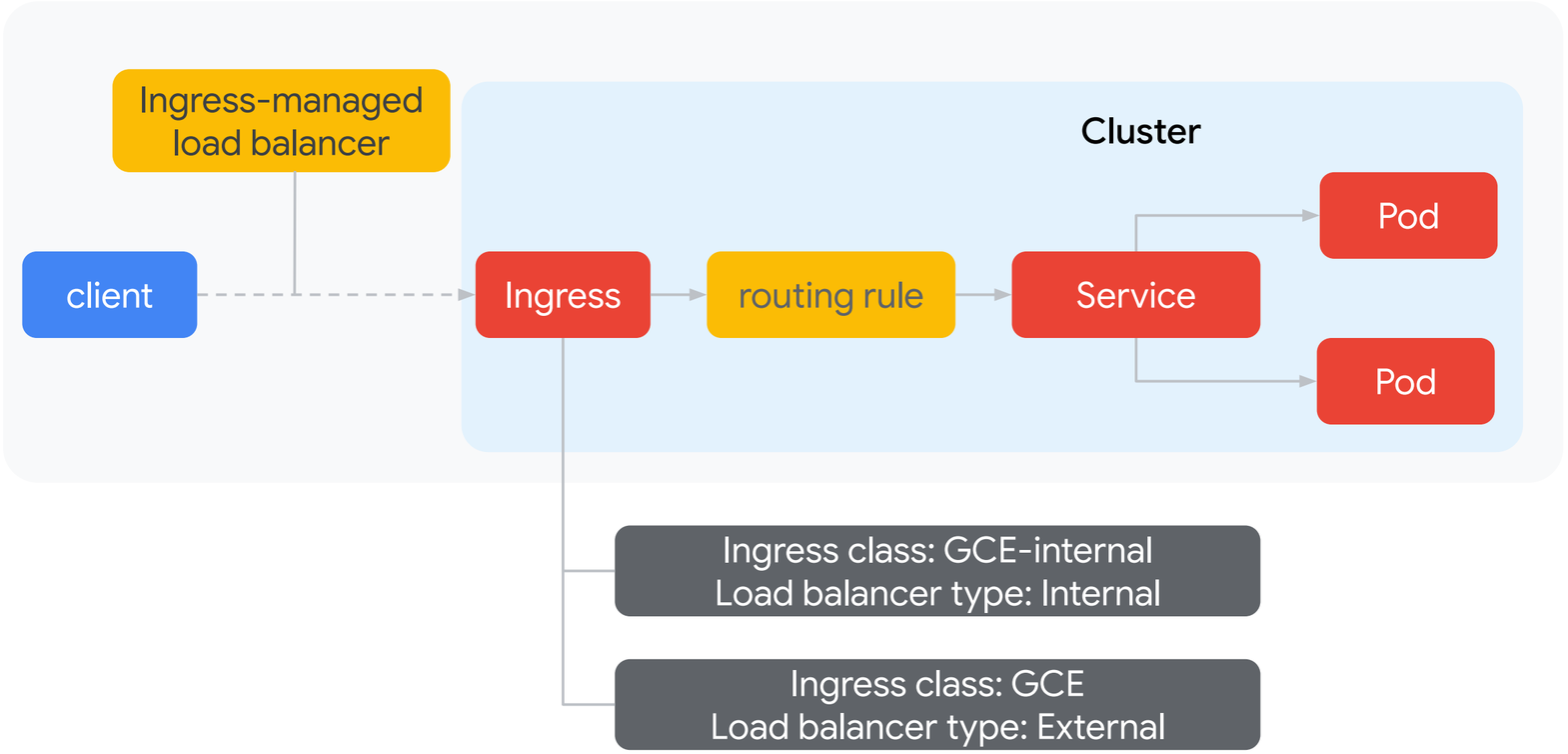
4.2 Diagnostic Question 04 Discussion

Cymbal Superstore's GKE cluster requires an internal http(s) 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.

Internal vs External load balancing in Kubernetes

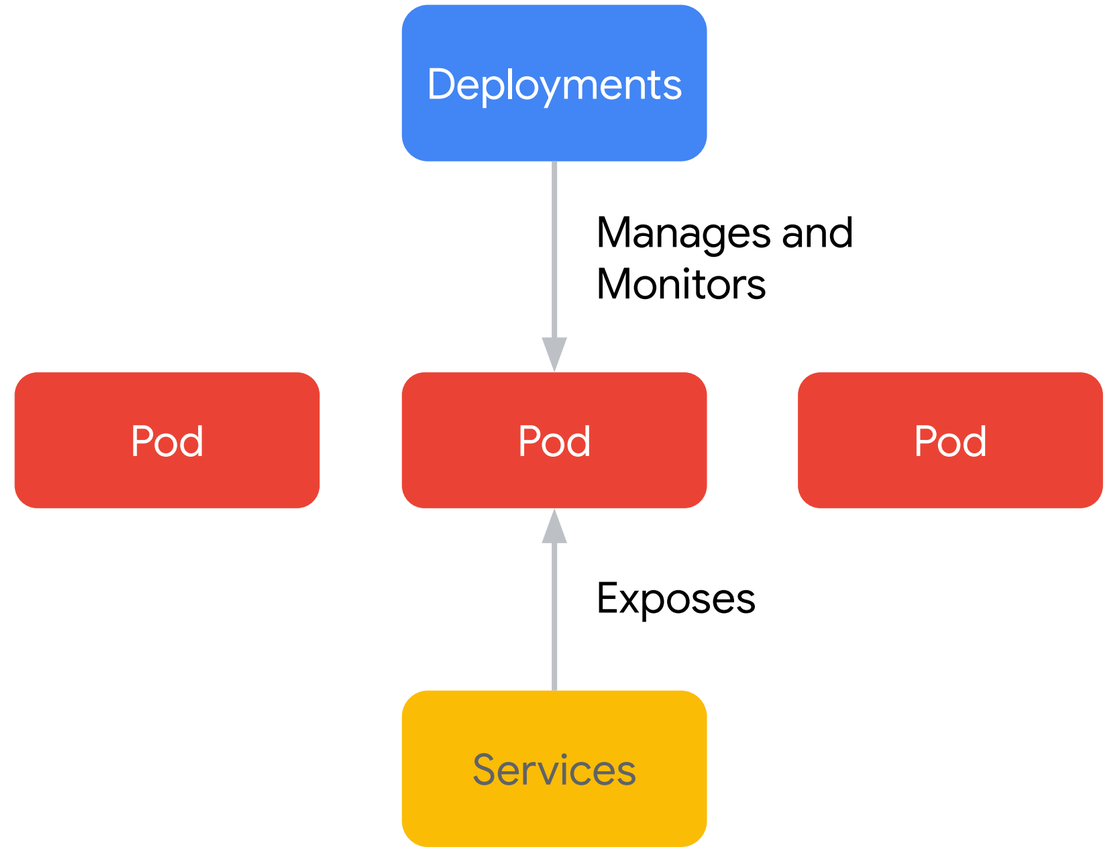


4.2 Diagnostic Question 05 Discussion

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

Kubernetes objects

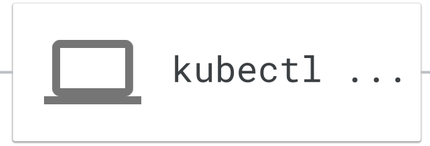


4.2 Diagnostic Question 06 Discussion

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



Imperative

```
- run
- create
- replace
- delete
```

- Overwrite existing state
- Operate on single object
- Specifies how

Declarative

```
- apply
```

- Works on a directory of config files
- Specifies what

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 Introduction to Kubernetes Workloads

Skill Badges

Google Cloud

[Set Up and Configure a Cloud Environment in Google Cloud Quest](#)

Documentation

[Ingress for Internal HTTP(S) Load Balancing](#)

[Ingress for External HTTP(S) Load Balancing](#)

[Configuring Ingress for external load balancing](#)

[Configuring Ingress for Internal HTTP(S) Load Balancing](#)

[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

Tasks include:

- Adjusting application traffic splitting parameters
- Setting scaling parameters for autoscaling instances
- Determining whether to run Cloud Run (fully managed) or Cloud Run for Anthos

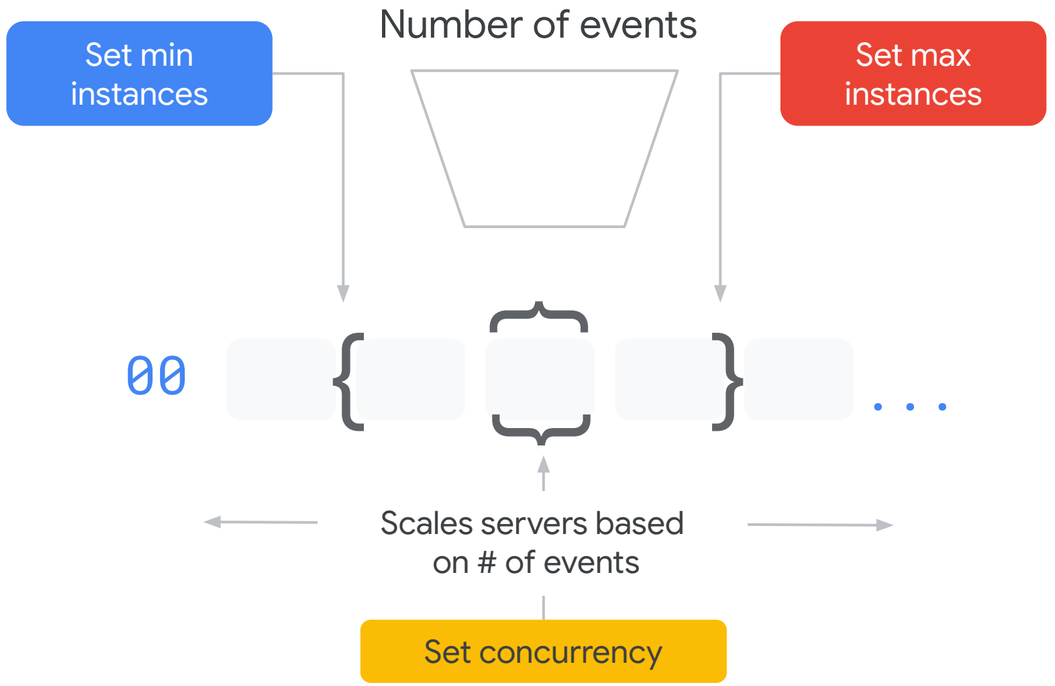
4.3 Diagnostic Question 07 Discussion

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

What should you do?

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

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

Tasks include:

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

4.4 Diagnostic Question 08 Discussion

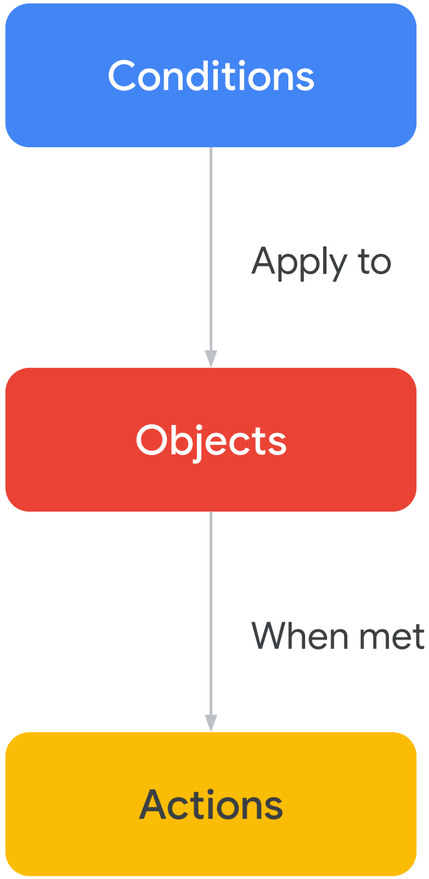
You want to implement a lifecycle rule that changes your storage type from standard to nearline after a specific date.

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

[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

Tasks 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 CloudDNS, CloudNAT, Load Balancers and firewall rules

4.5 Diagnostic Question 09 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 new users or devices.

What should you do?

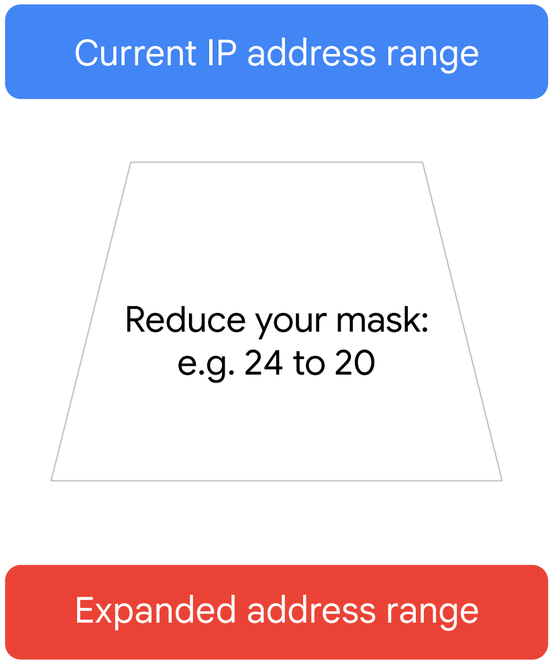
A. gcloud compute networks subnets expand-ip-range mysubnet --region us-central1 --prefix-length 20

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

Expand IP addresses in a subnet



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

Tasks include:

- Creating Cloud Monitoring alerts based on resource metrics
- Creating and ingesting Cloud Monitoring custom metrics (e.g., from applications or logs)
- Configuring log sinks to export logs to external systems (e.g., on-premises or BigQuery)
- Configuring 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 (e.g., viewing Cloud Trace data, using Cloud Debug to view an application point-in-time)
- Viewing Google Cloud Platform status

4.6 Diagnostic Question 10 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?

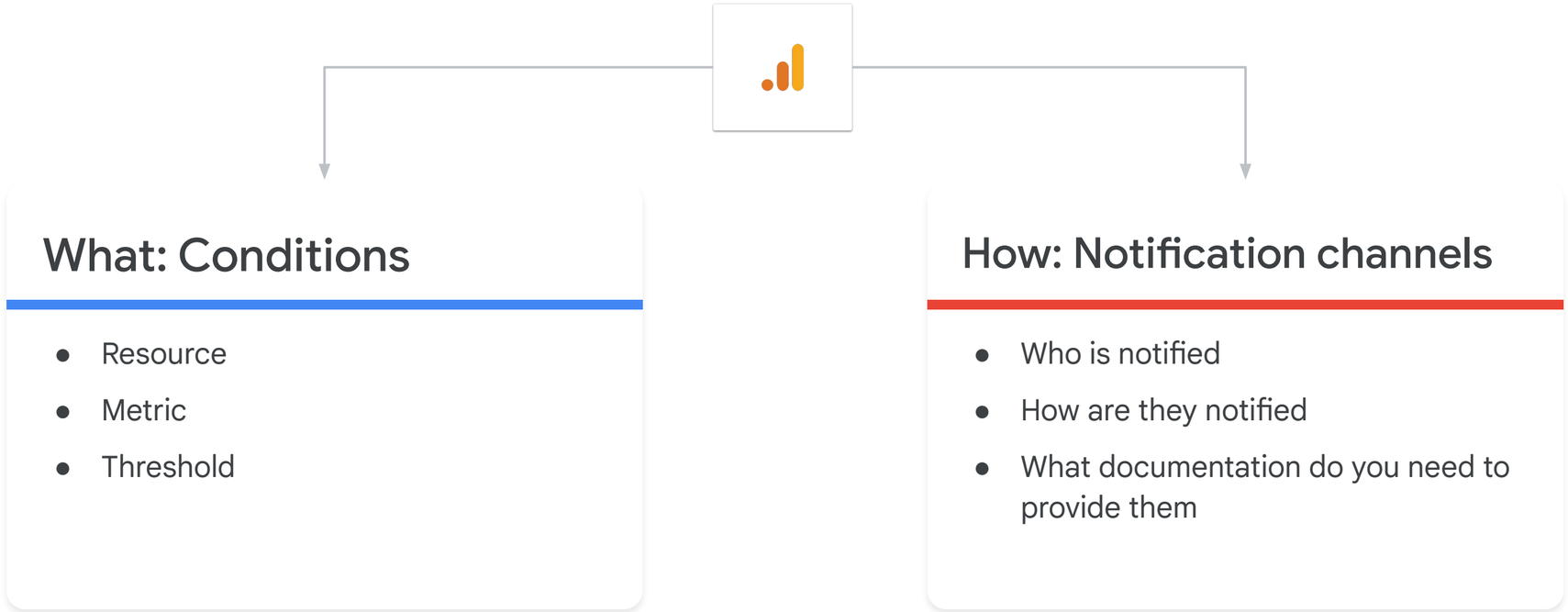
A. Choose resource type of VM instance and metric of CPU load, condition trigger if any time series violates, condition is below, threshold is .60, for 5 minutes.

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.

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

Google Cloud

[Perform Foundational Infrastructure Tasks in Google Cloud Quest](#)

Google Cloud

[Set Up and Configure a Cloud Environment in Google Cloud Quest](#)

Documentation

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

[Introduction to alerting | Cloud Monitoring](#)

Knowledge Check 1

What GKE object implements an http(s) load balancer?

A. Service

B. Pod

C. Deployment

D. Ingress

Knowledge Check 1

What GKE object implements an http(s) load balancer?

A. Service

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C. Deployment

D. Ingress

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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