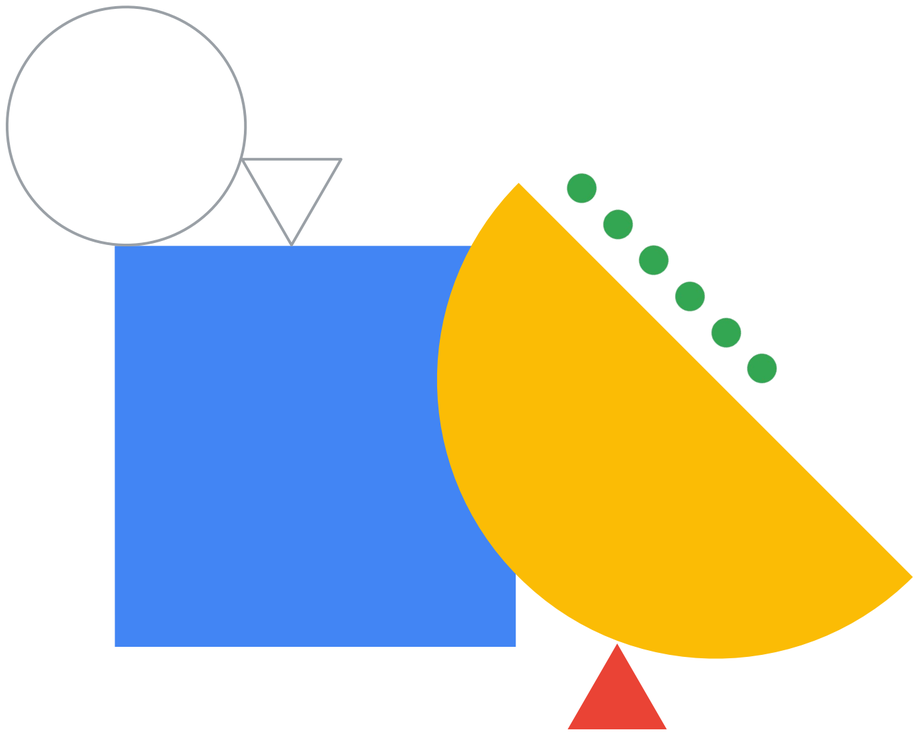
Google Cloud

Preparing for Your Associate Cloud Engineer Journey



Module 2: Planning and Configuring a Cloud Solution

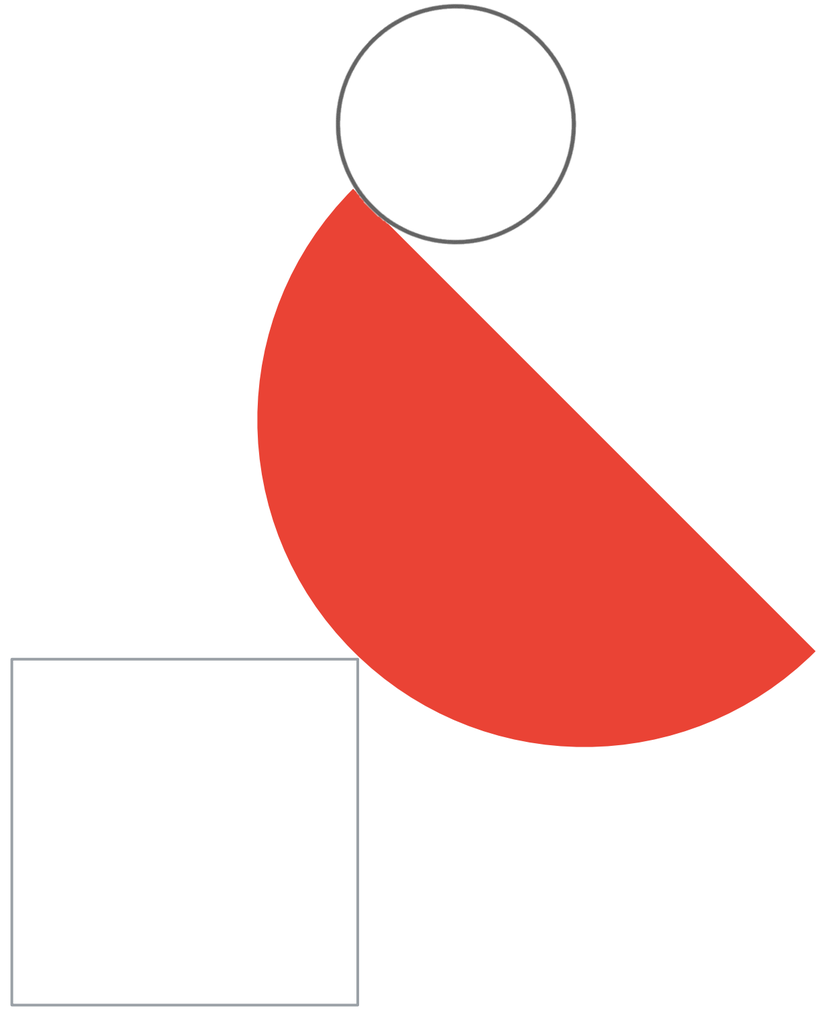
Module agenda

01 Selecting resources for Cymbal Superstore's cloud solutions

02 Diagnostic questions

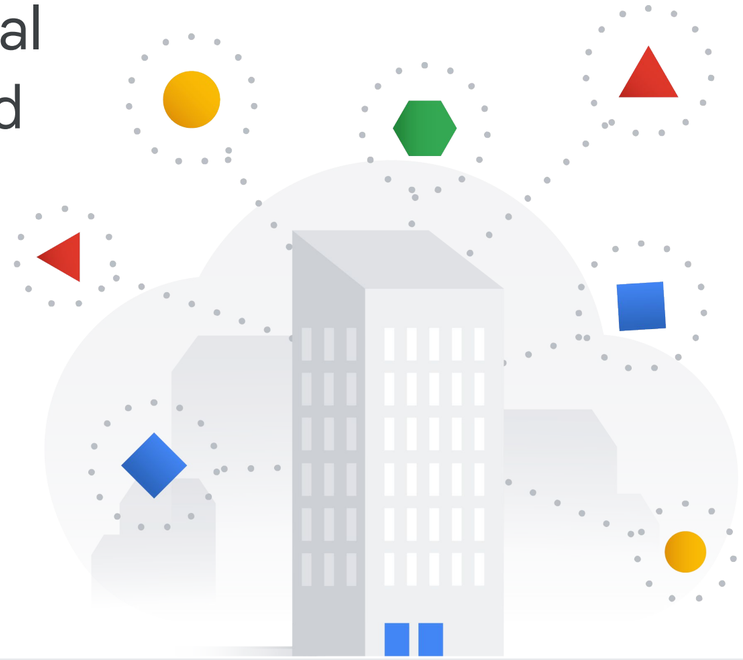
03 Review and study planning

Selecting resources for Cymbal Superstore's cloud solutions



The next step:

planning and configuring Cymbal Superstore's cloud solutions



- Planning and configuring compute resources
- Planning and configuring data storage options
- Planning and configuring network resources

Cymbal Superstore

Cymbal Superstore's existing applications

Ecommerce

Cymbal Superstore has an existing web application that provides an interface for customers to look at and order products.

Requirements:

- Compute: Container architecture
- Data: Relational backend
- Networking: Needs to be globally available
- Need analytical capabilities to inform marketing efforts

Transportation Management

Delivery services is becoming an important aspect of Cymbal Superstore's customer interactions. Cymbal Superstore would like to use Google Services to keep track of truck location.

Requirements:

- Dashboard of truck location in near real-time
- Analysis of truck mileage for preventive maintenance

Supply Chain

Cymbal Superstore has decided to migrate their legacy supply chain application to the cloud

Requirements:

- Available local to their HQ
- Currently implemented in virtual machines with a LINUX operating system and a LAMP stack

Cymbal Superstore's ecommerce solution

Ecommerce Requirements

- Compute: Container architecture
- Data: Relational backend
- Networking: Needs to be globally available
- Need analytical capabilities to inform marketing efforts

Ecommerce Cloud Solution

- Compute: Google Kubernetes Engine
- Data: Spanner
- Networking: External http(s) load balancing
- Feed historic sales data to BigQuery

Cymbal Superstore's transportation management solution

Transportation Management

Requirements

- Dashboard of truck location in near real-time
- Analysis of truck mileage for preventive maintenance

Transportation Management Cloud Solution

- Delivery: Pub/Sub
- Compute: Cloud Run functions
- Orchestration: Dataflow
- Storage: Bigtable
- Network: Regional

Cymbal Superstore's supply chain solution

Supply Chain

Cymbal Superstore has decided to migrate their legacy supply chain application to the cloud

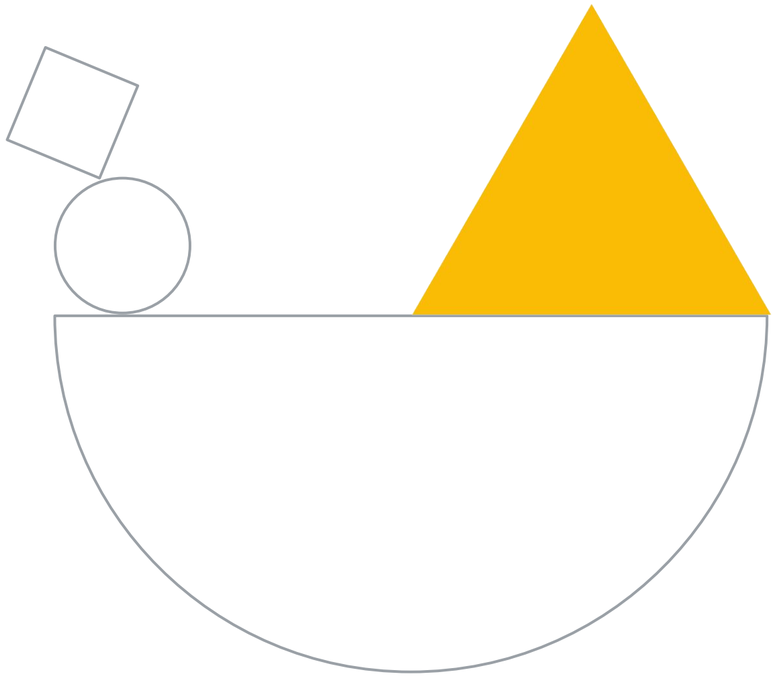
Requirements:

- Available local to their HQ
- Currently implemented in virtual machines with a LINUX operating system and a LAMP stack

Supply Chain Cloud Solution

- Compute: Compute Engine
- Data: Cloud SQL
- Networking:
  - Internal to VPC for backing database
  - Regional External https access

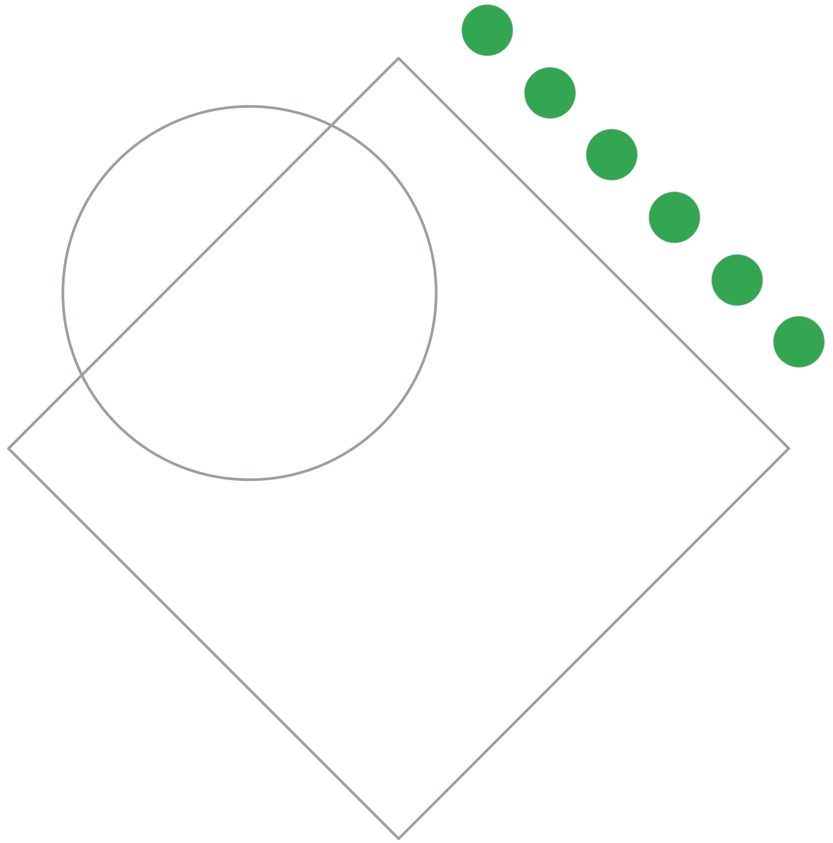
Diagnostic questions



Please complete the diagnostic questions now

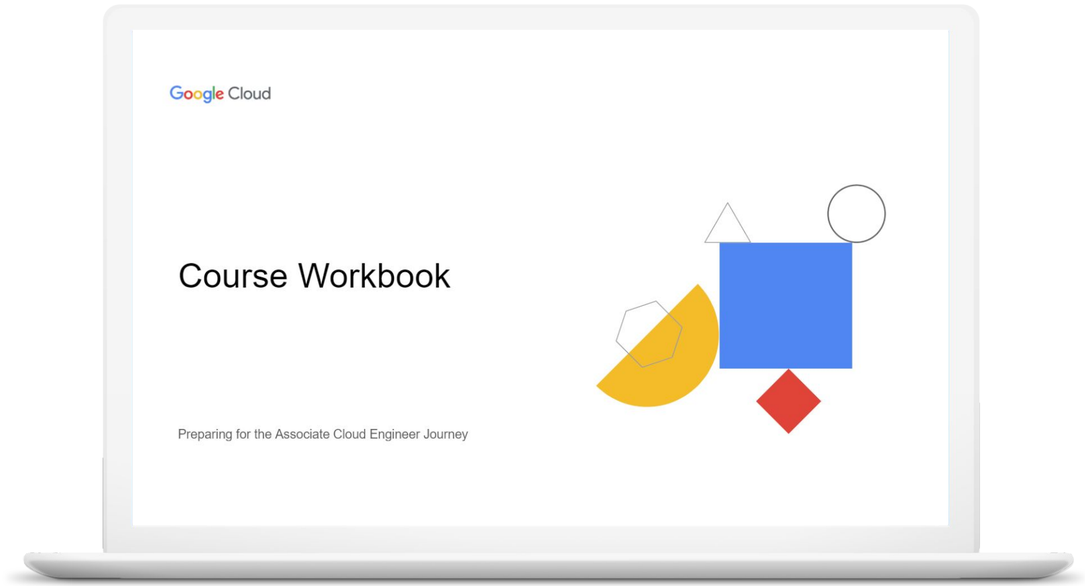
- The diagnostic questions are available in the workbook.

Review and study planning



Your study plan:

Planning and configuring cloud solutions



2.1 Planning and configuring compute resources

2.2 Planning and configuring data storage options

2.3 Planning and configuring network resources

2.1 Planning and configuring compute resources

Considerations include:

- Selecting appropriate compute choices for a given workload (e.g., Compute Engine, Google Kubernetes Engine, Cloud Run, Cloud Run functions)
- Using spot VM instances and custom machine types as appropriate

2.1 Diagnostic Question 01 Discussion

Cymbal Superstore decides to migrate their supply chain application to Google Cloud. You need to configure specific operating system dependencies.

What should you do?

A. Implement an application using containers on Cloud Run.

B. Implement an application using code on App Engine.

C. Implement an application using containers on Google Kubernetes Engine.

D. Implement an application using virtual machines on Compute Engine.

2.1 Diagnostic Question 01 Discussion

Cymbal Superstore decides to migrate their supply chain application to Google Cloud. You need to configure specific operating system dependencies.

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Infrastructure as a service:

	Google Compute Engine Virtual machines running in Google's global data centers	Google Kubernetes Engine Logical infrastructure powered by Kubernetes, the open source container orchestration system
Use When You Need...	• Complete control • Ability to make OS level changes • To be able to move to the cloud without rewriting your code • To use custom VM images	• No dependencies on a specific OS • Increased velocity and operability • To manage containers in production
Typical Use Cases	• Any workload requiring a specific OS or configuration • On-premises software that you want to run in the cloud	• Containerized workloads • Cloud-native distributed systems • Hybrid applications

Platform as a service:

	App Engine	Cloud Run	Cloud Run functions
	Flexible, zero-ops platform for building apps	Deploy code or containers that listens for requests or events	Serverless execution environment for building and connecting cloud services
Use When You Need...	• To just focus on writing code • Developer velocity • To minimize operational overhead	• Scales to meet demand • Pay for what you use • Supports API endpoints	• For event-driven workloads • Scales to meet demand • Minimal configuration
Typical Use Cases	• Web sites • Apps (of course!) • Gaming back ends • IoT applications	• Web frameworks • Microservices	• Statistical analysis • Image thumbnail generation • Post a comment to a Slack channel after a GitHub commit

2.1 Diagnostic Question 02 Discussion

Cymbal Superstore decides to pilot a cloud application for their point of sale system in their flagship store. You want to focus on code and develop your solution quickly, and you want your code to be portable.

How do you proceed?

A. SSH into a Compute Engine VM and execute your code.

B. Package your code to a container image and post it to Cloud Run.

C. Implement a deployment manifest and run kubectl apply on it in Google Kubernetes Engine.

D. Code your solution in Cloud Run functions.

2.1 Diagnostic Question 02 Discussion

Cymbal Superstore decides to pilot a cloud application for their point of sale system in their flagship store. You want to focus on code and develop your solution quickly, and you want your code to be portable.

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C. Implement a deployment manifest and run kubectl apply on it in Google Kubernetes Engine.

D. Code your solution in Cloud Run functions.

2.1 Diagnostic Question 03 Discussion

An application running on a highly-customized version of Ubuntu needs to be migrated to Google Cloud. You need to do this in the least amount of time with minimal code changes.

How should you proceed?

A. Create Compute Engine Virtual Machines and migrate the app to that infrastructure.

B. Deploy the existing application to App Engine.

C. Deploy your application in a container image to Cloud Run.

D. Implement a Kubernetes cluster and create pods to enable your app.

2.1 Diagnostic Question 03 Discussion

An application running on a highly-customized version of Ubuntu needs to be migrated to Google Cloud. You need to do this in the least amount of time with minimal code changes.

How should you proceed?

A. **Create Compute Engine Virtual Machines and migrate the app to that infrastructure.**

B. Deploy the existing application to App Engine.

C. Deploy your application in a container image to Cloud Run.

D. Implement a Kubernetes cluster and create pods to enable your app.

2.1 Diagnostic Question 04 Discussion

You want to deploy a microservices application. You need full control of how you manage containers, reliability, and autoscaling, but don't want or need to manage the control plane.

Which compute option should you use?

A. Cloud Run
B. App Engine
C. Google Kubernetes Engine
D. Compute Engine

2.1 Diagnostic Question 04 Discussion

You want to deploy a microservices application. You need full control of how you manage containers, reliability, and autoscaling, but don't want or need to manage the control plane.

Which compute option should you use?

A. Cloud Run
B. App Engine
C. Google Kubernetes Engine ✓
D. Compute Engine

2.1 Planning and configuring compute resources

Courses

[Google Cloud Fundamentals: Core Infrastructure](#)

- M3 Virtual Machines and Networks in the Cloud
- M5 Containers in the Cloud
- M6 Applications in the Cloud

[Getting Started with Google Kubernetes Engine](#)

- M2 Introduction to Containers and Kubernetes

[Architecting with Google Compute Engine](#)

- M3 Virtual Machines

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[Essential Google Cloud Infrastructure: Foundation](#)

- M3 Virtual Machines

Skill Badge

Google Cloud

[Develop your Google Cloud Network](#)

Documentation

[Choosing the right compute option in GCP: a decision tree](#)

[Application Hosting Options](#)

[Tutorials | Compute Engine Documentation](#)

2.2 Planning and configuring data storage options

Considerations include:

- Product choice

  (e.g., Cloud SQL, BigQuery, Firestore, Spanner, Bigtable)
- Choosing storage options

  (e.g., zonal Persistent Disk, regional Persistent Disk, Standard, Nearline, Coldline, Archive)

2.2 Diagnostic Question 05 Discussion

Cymbal Superstore needs to analyze whether they met quarterly sales projections. Analysts assigned to run this query are familiar with SQL.

A. BigQuery
B. Cloud SQL
C. Spanner
D. Firestore

What data solution should they implement?

2.2 Diagnostic Question 05 Discussion

Cymbal Superstore needs to analyze whether they met quarterly sales projections. Analysts assigned to run this query are familiar with SQL.

What data solution should they implement?

A. **BigQuery** ✓
B. Cloud SQL
C. Spanner
D. Firestore

Comparing Data Storage and Database Options

Relational		Non-relational		Object	Warehouse
 Cloud SQL	 Spanner	 Firestore	 Bigtable	 Cloud Storage	 BigQuery
Good for: Web frameworks	**Good for:** RDBMS+scale, HA, HTAP	**Good for:** Hierarchical, mobile, web	**Good for:** Heavy read + write, events	**Good for:** Binary or object data	**Good for:** Enterprise data warehouse
Such as: CMS, eCommerce	**Such as:** User metadata, Ad/Fin/MarTech	**Such as:** User profiles, Game State	**Such as:** AdTech, financial, IoT	**Such as:** Images, media serving, backups	**Such as:** Analytics, dashboards

2.2 Diagnostic Question 06 Discussion

Cymbal Superstore's supply chain application frequently analyzes large amounts of data to inform business processes and operational dashboards.

A. Archive
B. Coldline
C. Nearline
D. Standard

What storage class would make sense for this use case?

2.2 Diagnostic Question 06 Discussion

Cymbal Superstore's supply chain application frequently analyzes large amounts of data to inform business processes and operational dashboards.

What storage class would make sense for this use case?

A. Archive
B. Coldline
C. Nearline
D. **Standard** ✓

Storage Classes and use cases summary

	Standard	Nearline	Coldline	Archive
Use when you need...	• No retrieval cost • No minimum storage duration	• Very low cost per GB stored and can accept higher per-operation costs • 30-day minimum storage duration	• Even lower cost per GB stored and can accept higher per-operation costs • 90-day minimum storage duration	• Lowest cost per GB stored and can accept the highest per-operation costs • 365-day minimum storage duration
Typical use cases	“Hot” data and/or stored for only brief periods of time like data-intensive computations	Infrequently (i.e., no more than once per month) accessed data. Ideal for back-up and serving long-tail multimedia content.	Very infrequently accessed data - ie, once a year. Typically this is for disaster recovery, or for financial data that has to be kept for a certain length of time to meet regulatory needs.	Data archiving, online backup, and disaster recovery

2.2 Diagnostic Question 07 Discussion

Cymbal Superstore has a need to populate visual dashboards with historical time-based data. This is an analytical use-case.

Which two storage solutions could they use?

A. BigQuery
B. Cloud Storage
C. Firestore
D. Cloud SQL
E. Bigtable

2.2 Diagnostic Question 07 Discussion

Cymbal Superstore has a need to populate visual dashboards with historical time-based data. This is an analytical use-case.

Which two storage solutions could they use?

A. **BigQuery** ✓
B. Cloud Storage
C. Firestore
D. Cloud SQL
E. **Bigtable** ✓

Comparing storage options: use cases

	Firestore	Bigtable	Cloud Storage	Cloud SQL	Spanner	BigQuery
Type	NoSQL document	NoSQL wide column	Blobstore	Relational SQL for OLTP	Relational SQL for OLTP	Relational SQL for OLAP
Best for	Storing, syncing, and querying data	"Flat" data, Heavy read/write, events, analytical data	Structured and unstructured binary or object data	Web frameworks, existing applications	Large-scale database applications (> ~2 TB)	Interactive querying, offline analytics
Use cases	Mobile, web, and server development	AdTech, Financial and IoT data	Images, large media files, backups	User credentials, customer orders	Whenever high I/O, global consistency is needed	Data warehousing

2.2 Planning and configuring data storage options

Courses

[Google Cloud Fundamentals: Core Infrastructure](#)

- M4 Storage in the Cloud

[Architecting with Google Compute Engine](#)

- M5 Storage and Database Services

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

- M2 Storage and Database Services

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Google Cloud

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

Documentation

[Cloud Storage Options](#)

[Storage classes](#)

[Data lifecycle | Cloud Architecture Center](#)

2.3 Planning and configuring network resources

Considerations include:

- Load balancing
- Availability of resource locations in a network
- Network Service Tiers

2.3 Diagnostic Question 08 Discussion

Cymbal Superstore is piloting an update to its ecommerce app for the flagship store in Minneapolis, Minnesota. The app is implemented as a three-tier web service with traffic originating from the local area and resources dedicated for it in us-central1. You need to configure a secure, low-cost network load-balancing architecture for it.

How do you proceed?

A. Implement a premium tier global external Application Load Balancer connected to the web tier as the frontend, and a regional internal Application Load Balancer between the web tier and backend.

B. Implement a global external proxy Network Load Balancer connected to the web tier as the frontend, and a premium tier passthrough Network Load Balancer between the web tier and the backend.

C. Configure a standard tier regional external Application Load Balancer connected to the web tier as a frontend and a regional internal Application Load Balancer between the web tier and the backend.

D. Configure a regional internal proxy Network Load Balancer connected to the web tier as the frontend and a standard tier internal proxy Network Load Balancer between the web tier and the backend.

2.4 Diagnostic Question 09 Discussion

Cymbal Superstore is piloting an update to its ecommerce app for the flagship store in Minneapolis, Minnesota. The app is implemented as a three-tier web service with traffic originating from the local area and resources dedicated for it in us-central1. You need to configure a secure, low-cost network load-balancing architecture for it.

How do you proceed?

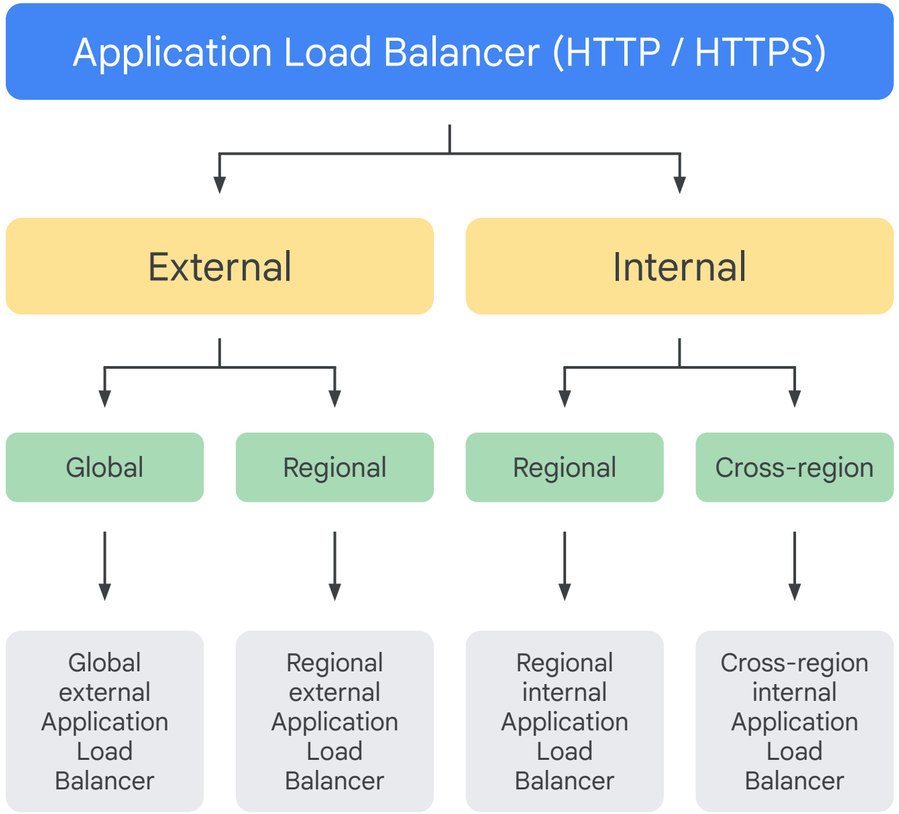
A. Implement a premium tier global external Application Load Balancer connected to the web tier as the frontend, and a regional internal Application Load Balancer between the web tier and backend.

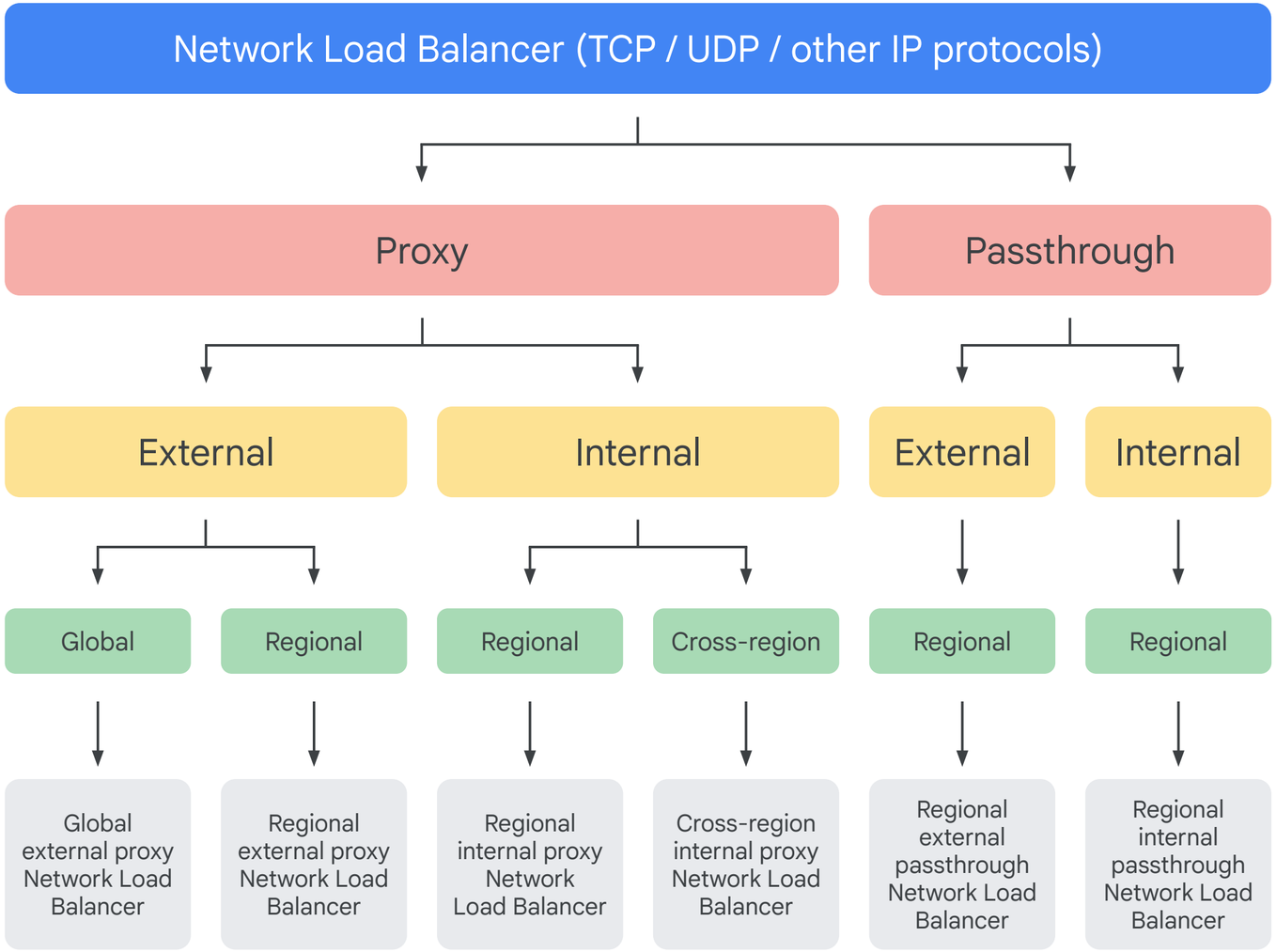
B. Implement a global external proxy Network Load Balancer connected to the web tier as the frontend, and a premium tier passthrough Network Load Balancer between the web tier and the backend.

C. Configure a standard tier regional external Application Load Balancer connected to the web tier as a frontend and a regional internal Application Load Balancer between the web tier and the backend.

D. Configure a regional internal proxy Network Load Balancer connected to the web tier as the frontend and a standard tier internal proxy Network Load Balancer between the web tier and the backend.

Types of load balancers





2.3 Diagnostic Question 09 Discussion

What Google Cloud load balancing option runs at Layer 7 of the TCP stack?

A. Global Application Load Balancer
B. Global proxy Network Load Balancer
C. Regional passthrough Network Load Balancer
D. Regional internal proxy Network Load Balancer

2.3 Diagnostic Question 09 Discussion

What Google Cloud load balancing option runs at Layer 7 of the TCP stack?

A. Global Application Load Balancer
B. Global proxy Network Load Balancer
C. Regional passthrough Network Load Balancer
D. Regional internal proxy Network Load Balancer

2.3 Planning and configuring network resources

Courses

Google Cloud Fundamentals: Core Infrastructure

- M3 Virtual Machines and Networks in the Cloud
- M4 Storage in the Cloud

Architecting with Google Compute Engine

- M2 Virtual Networks
- M5 Storage and Database Services
- M9 Load Balancing and Autoscaling

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Essential Google Cloud Infrastructure: Foundation

- M2 Virtual Networks

Essential Google Cloud Infrastructure: Core Services

- M2 Storage and Database Services

Elastic Google Cloud Infrastructure: Scaling and Automation

- M2 Load Balancing and Autoscaling

Documentation

Cloud Load Balancing overview

Cloud Load Balancing

Knowledge Check 1

Which storage class is designed for long term storage has a 365 day minimum storage agreement, and a lower storage price as compared to other storage types?

A. Standard Storage

B. Coldline Storage

C. Nearline Storage

D. Archive storage

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Knowledge Check 2

Which serverless option is based on developing and executing small snippets of code?

A. Cloud Run functions

B. Cloud Run

C. BigQuery

D. Dataflow

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