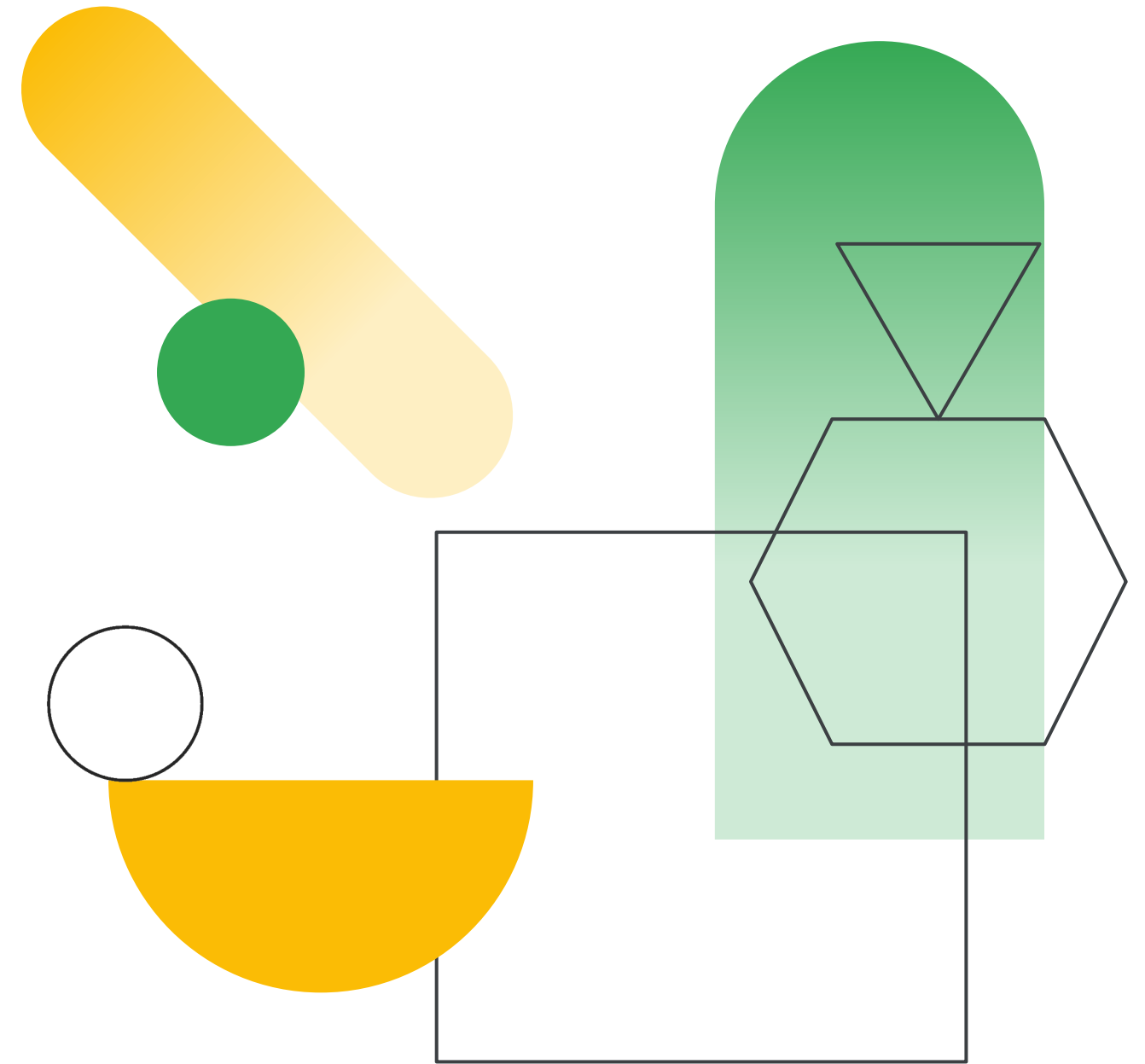




# Google Cloud Architect Design and Process Workbook



# 1a. Defining your case study

Come up with a case study. Then fill in the next slide.

Examples:

- Online Banking Portal
- Ride sharing application (like Uber)
- Online shopping site
- Something else...

# 1b. [Case Study Name Here]

Brief description:

List a few main features:

List roles of typical users:

## 2a. Writing user personas

Create two user personas that describe typical users of your application.  
Add a new slide for each persona.

### Example persona:

*Jocelyn is a busy working mom who wants to access MegaCorp Bank to check her account balances and make sure that there are enough funds to pay for her kids' music and sport lessons. She also uses the web site to automate payment of bills and see her credit account balances. Jocelyn wants to save time and money, and she wants a credit card that gives her cash back.*

## 2b. Writing user stories

Create three user stories for the roles you defined earlier.  
Create a new slide for each user story.

### Example user story:

#### *Balance Inquiry*

***As a** checking account holder, **I want to** check my available balance at any time of day, **so that** I am sure not to overdraw my account.*

# 3. Defining SLIs and SLOs

Based on the requirements of your case study, fill in the table on the next slide with SLOs and SLIs as shown in the example below.

User story	SLO	SLI
Balance Inquiry	Available 99.95%	Fraction of 200 vs 500 HTTP responses from API endpoint measured per day
Balance Inquiry	95% of requests complete in under 300 ms	Time to last byte GET requests measured every 10 seconds aggregated per minute

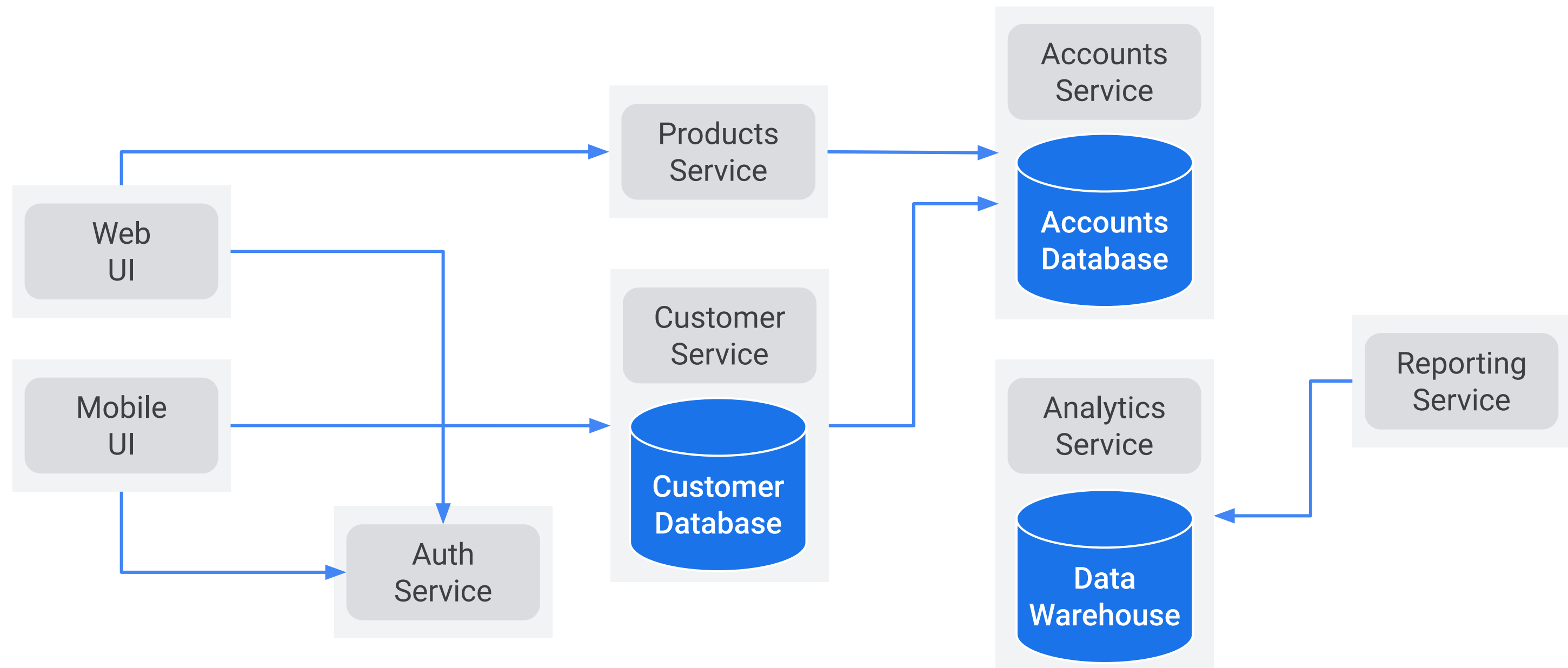
# 3. Defining SLIs and SLOs

Based on the requirements of your case study, fill in the table below with SLOs and SLIs.

User story	SLO	SLI

## 4. Design microservices for your application

Draw a diagram on the next slide showing your application's microservices and their connections. Below is an example.





## 4. Design microservices for your application

Draw a diagram showing your application's microservices and their connections.

# 5. Designing REST APIs

Fill in the table on the next slide with your services and their resources and operations as shown in the example below.

Service name	Collections	Methods
Account Service	transactions	list deposit withdraw transfer

# 5. Designing REST APIs

Fill in the table with your services and their resources and operations.

Service name	Collections	Methods

# 6. Defining storage characteristics

On the next slide fill in the required storage features. Below is an example.

Service	Structured or Unstructured	SQL or NoSQL	Strong or Eventual Consistency	Amount of Data (MB, GB, TB, PB, ExB)	Read only or Read/Write
Account Service	Structured	SQL	Strong	GB	Read/Write


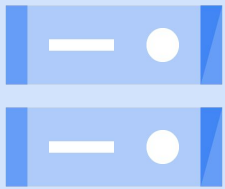

# 6. Defining storage characteristics

Fill in the required storage features.

Service	Structured or Unstructured	SQL or NoSQL	Strong or Eventual Consistency	Amount of Data (MB, GB, TB, PB, ExB)	Read only or Read/Write

# 7. Choosing Google Cloud Storage and Data Services

On the next slide choose the Google Cloud storage products for each service.  
Below is an example.

Service	 Persistent Disk	 Cloud Storage	 Cloud SQL	 Firestore	 Cloud Bigtable	 Cloud Spanner	 BigQuery
Account Service			X				

# 7. Choosing Google Cloud Storage and Data Services

Choose the Google Cloud storage products for each service.

Service	 Persistent Disk	 Cloud Storage	 Cloud SQL	 Firestore	 Cloud Bigtable	 Cloud Spanner	 BigQuery
---------	--	--	--	--	---	--	---

# 8a. Defining network characteristics for your services

On the next slide fill in the required network features. Below is an example.

Service	Internet facing or Internal only	HTTP	TCP	UDP	Multiregional?
Account	Internal only		X		No




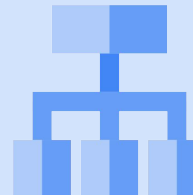
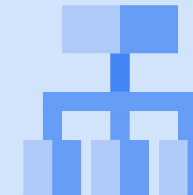
# 8a. Defining network characteristics for your services

Fill in the required network features.

Service	Internet facing or Internal only	HTTP	TCP	UDP	Multi-Regional?


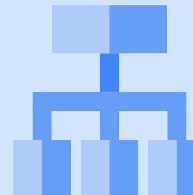
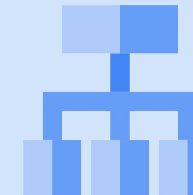
# 8b. Select the load balancers for your services

On the next slide choose the Google Cloud load balancer product(s) for each service.  
Below is an example.

Service	 HTTP	 TCP	 UDP
Account		X	

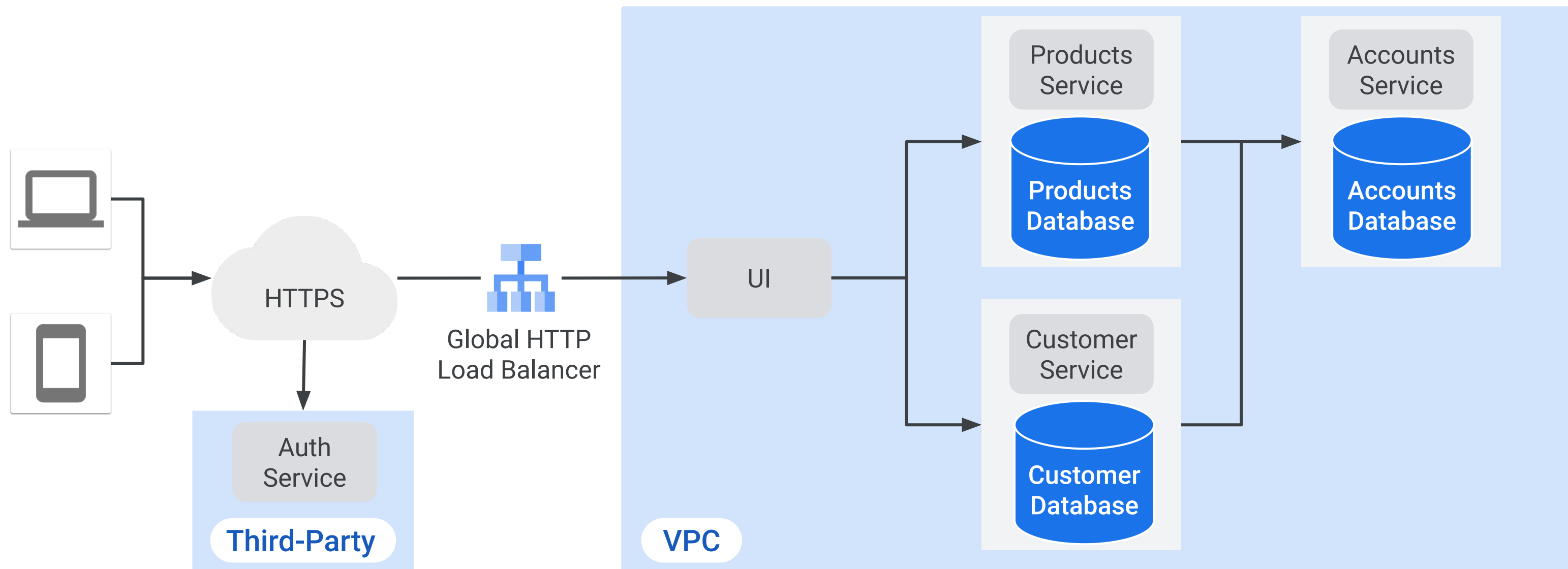
# 8b. Select the load balancers for your services

Choose the Google Cloud load balancer product(s) for each service.

Service	 HTTP	 TCP	 UDP

## 9. Diagramming your network

On the next slide draw a diagram that depicts how your services will communicate over the network. Include regions, zones, load balancers, CDN, and DNS if applicable. Below is an example.

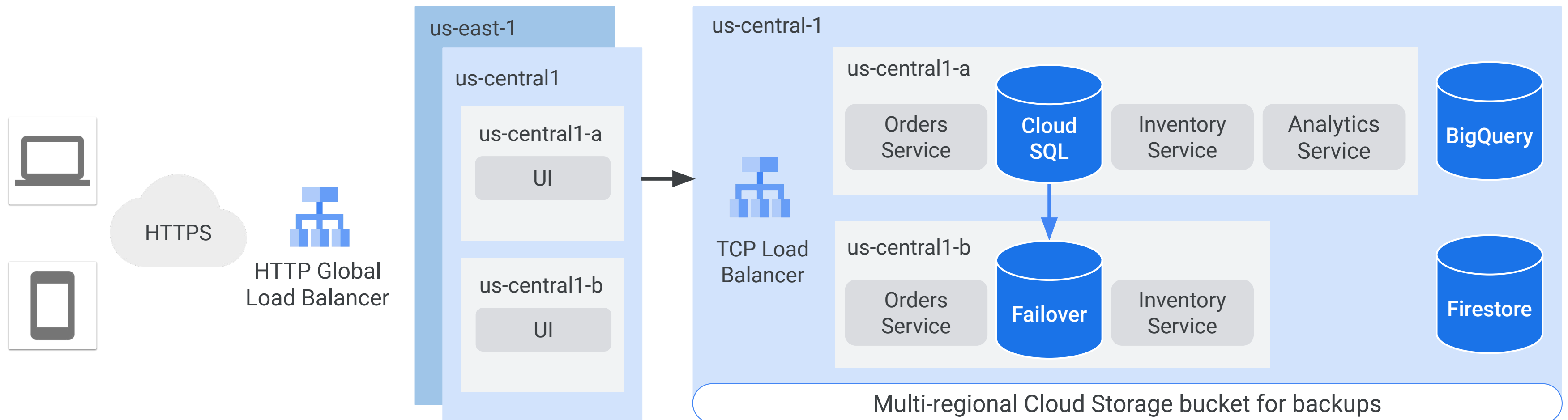


## 9. Diagramming your network

Draw a diagram that depicts how your services will communicate over the network. Include regions, zones, load balancers, CDN, and DNS if applicable.

# 10. Designing reliable, scalable applications

Even if some service is down, we want the web frontend of our application to be available nearly all the time. We also want the website to be fast with very low latency to users all over the world. On the next slide, draw a diagram that depicts how we can achieve this using Google Cloud services. Below is an example.

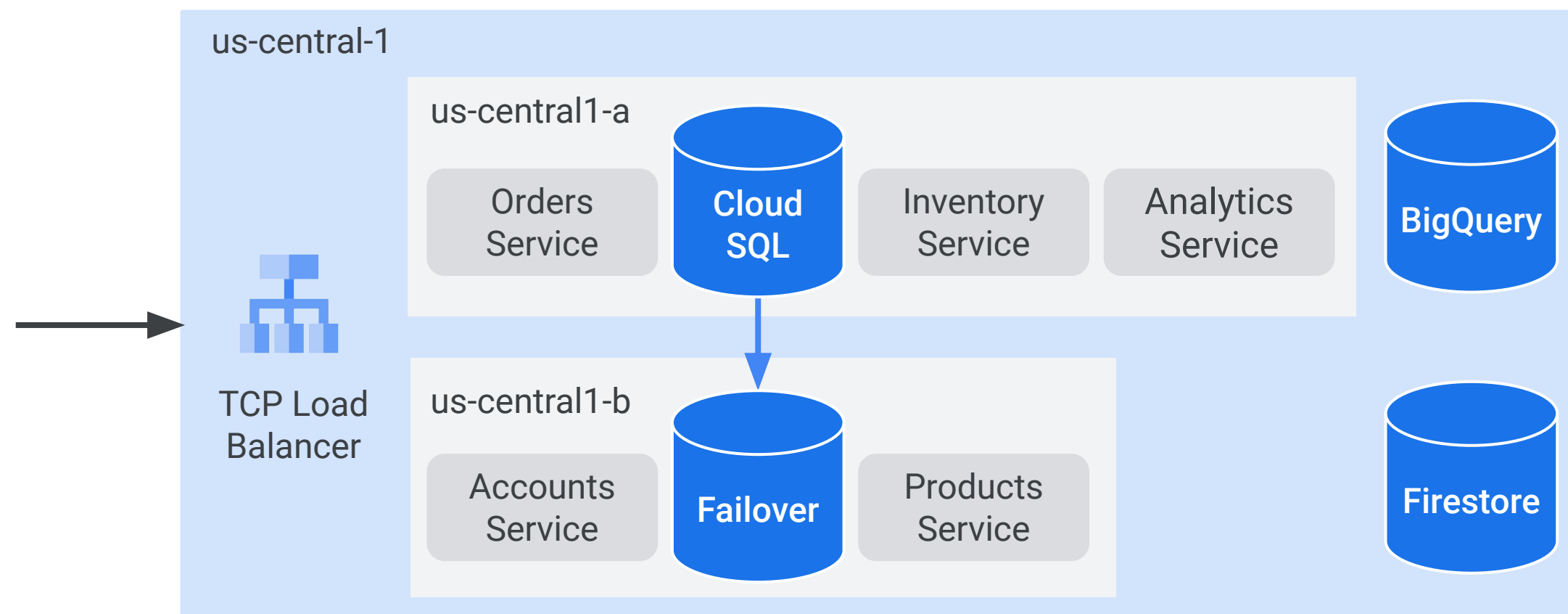


# 10. Designing reliable, scalable applications

Even if some service is down, we want the web frontend of our application to be available nearly all the time. We also want the website to be fast with very low latency to users all over the world. Draw a diagram that depicts how we can achieve this using Google Cloud services.

# 11a. Disaster recovery scenario

You've deployed for high availability by replicating resources in multiple zones. However, to meet regulatory requirements, you need a plan to recover from a disaster that brings down the entire region. The current architecture is depicted below. On the next slide, create a plan to bring up your application in another region if your main region is down. Below is an example.





# 11a. Disaster recovery scenario

You've deployed for high availability by replicating resources in multiple zones. However, to meet regulatory requirements, you need a plan to recover from a disaster that brings down the entire region. The current architecture is depicted on the previous slide. Create a plan to bring up your application in another region if your main region is down.

## 11b. Service disaster recovery scenarios

Write a high-level list of possible scenarios on the next slide. Below is an example.

Service	Scenario	Recovery Point Objective	Recovery Time Objective	Priority
Ratings Service	Programmer deleted all ratings accidentally	24 hours	1 hour	Med
Orders Service	Orders database crashes	0 (can't lose any data)	2 minutes	High

# 11b. Service disaster recovery scenarios

Write a high-level list of possible scenarios.

Service	Scenario	Recovery Point Objective	Recovery Time Objective	Priority

# 11c. Resource disaster recovery plans

For each scenario, fill in the table on the next slide. Below is an example.

Resource	Backup Strategy	Backup Location	Recovery Procedure
<i>Ratings Database</i>	<i>Daily automated backups</i>	<i>Multi-Regional Cloud Storage Bucket</i>	<i>Run Restore Script</i>
<i>Orders Database</i>	<i>Failover replica plus daily backups</i>	<i>Multi-zone deployment</i>	<i>Automated</i>

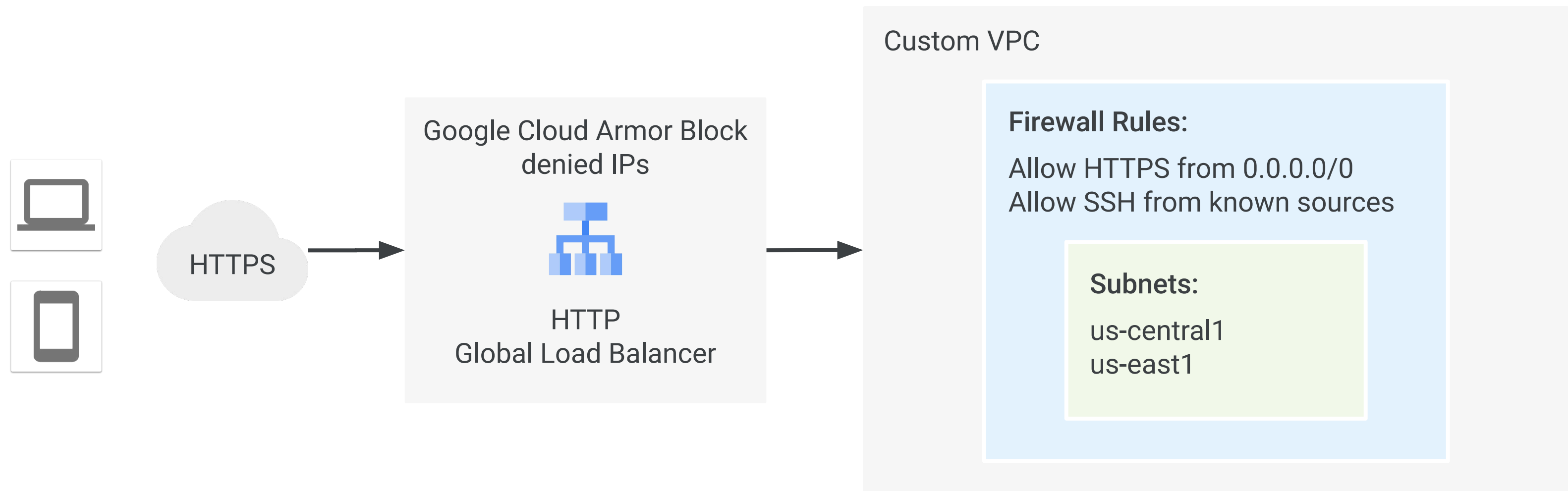
# 11c. Resource disaster recovery plans

For each scenario, fill in the table.

Resource	Backup Strategy	Backup Location	Recovery Procedure

## 12. Modeling secure Google Cloud services

Draw a diagram on the next slide that depicts how you will secure your services. Include firewalls, IAM roles, service accounts and network resources as appropriate. Below is an example.



# 12. Modeling secure Google Cloud services

Draw a diagram that depicts how you will secure your services. Include firewalls, IAM roles, service accounts and network resources as appropriate.

# 13. Cost estimating and planning

Use the [pricing calculator](#) to determine and record on the next slide the cost of your microservices. Below is an example.

Service name	Google Cloud Resource	Cost
Accounts	Cloud SQL	\$574.71/month



# 13. Cost estimating and planning

Use the [pricing calculator](#) to determine and record the cost of your microservices.

Service name	Google Cloud Resource	Cost

