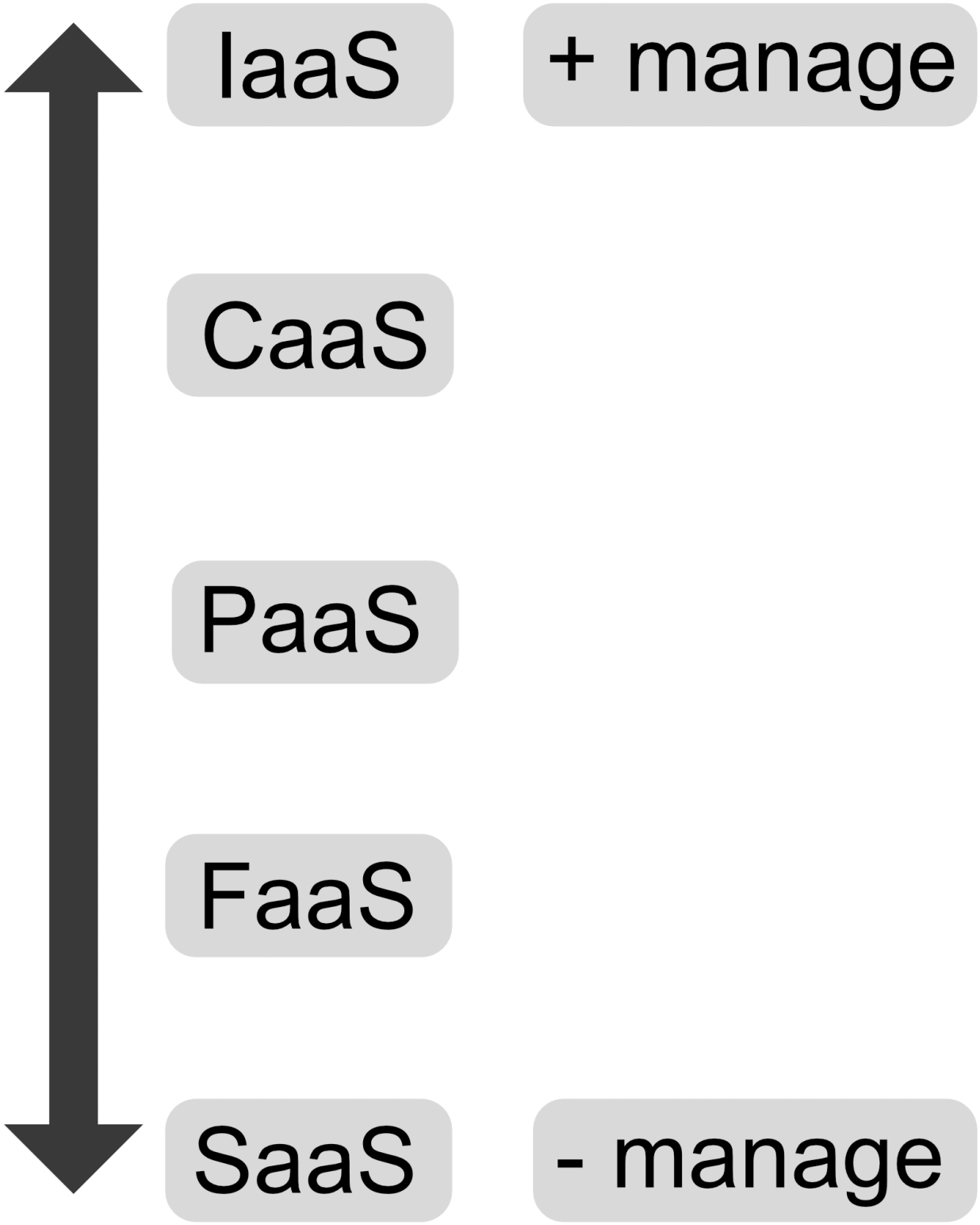
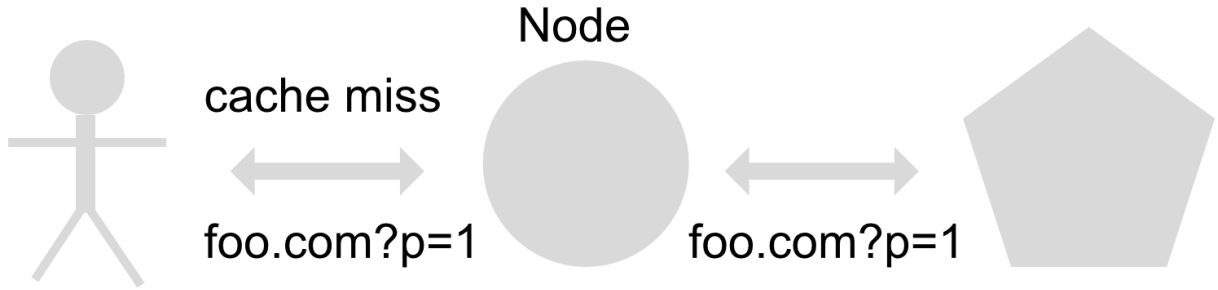
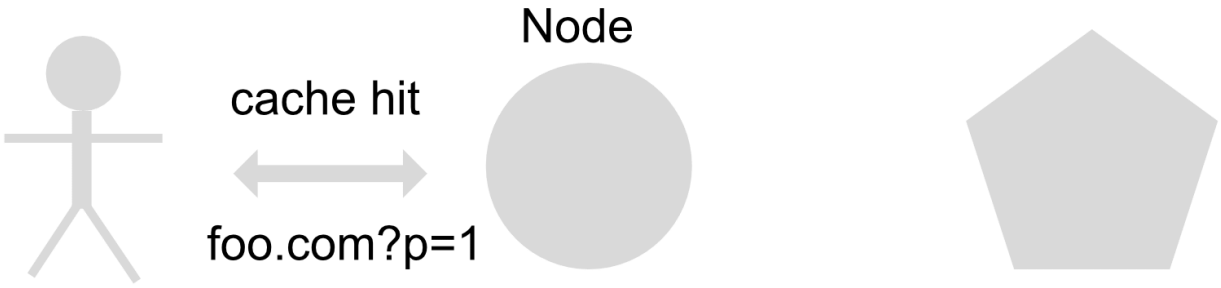
Chapter 1: Google Cloud Platform Developer Fundamentals

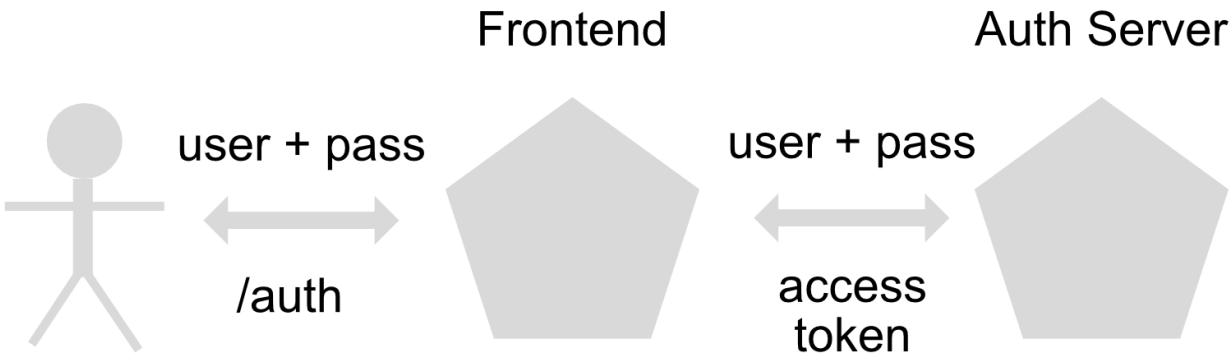


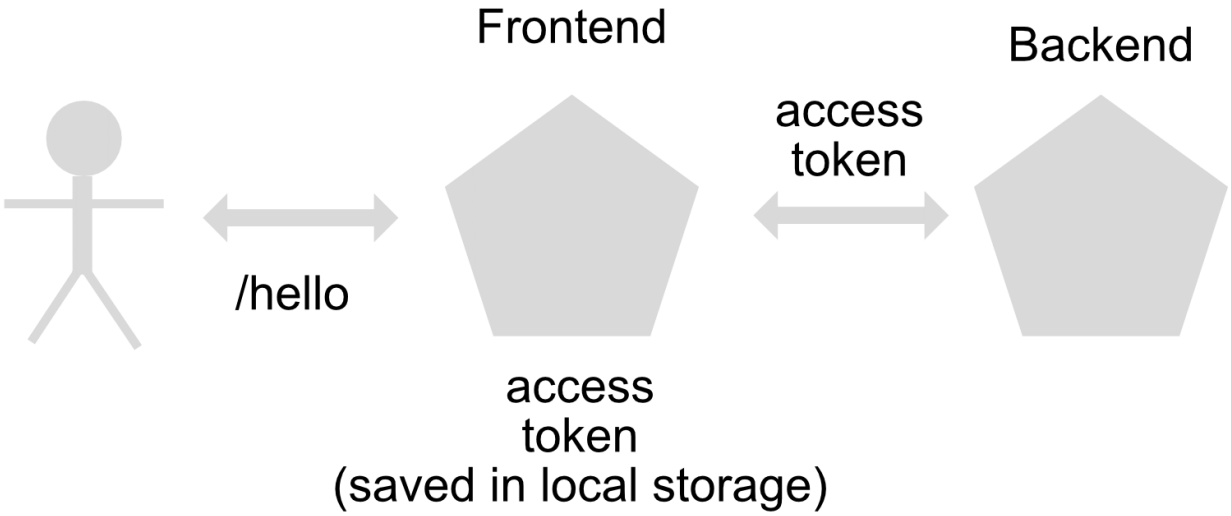

Node
cache miss
foo.com?p=1
foo.com?p=1

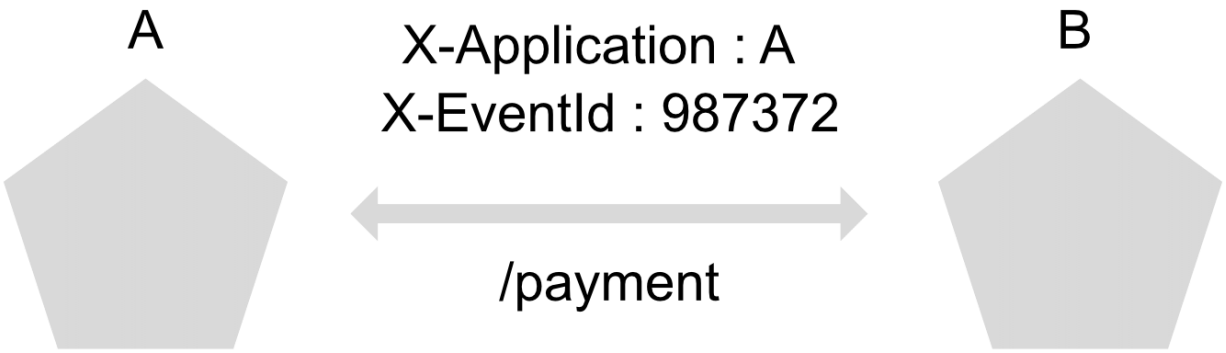

Node
cache hit
foo.com?p=1

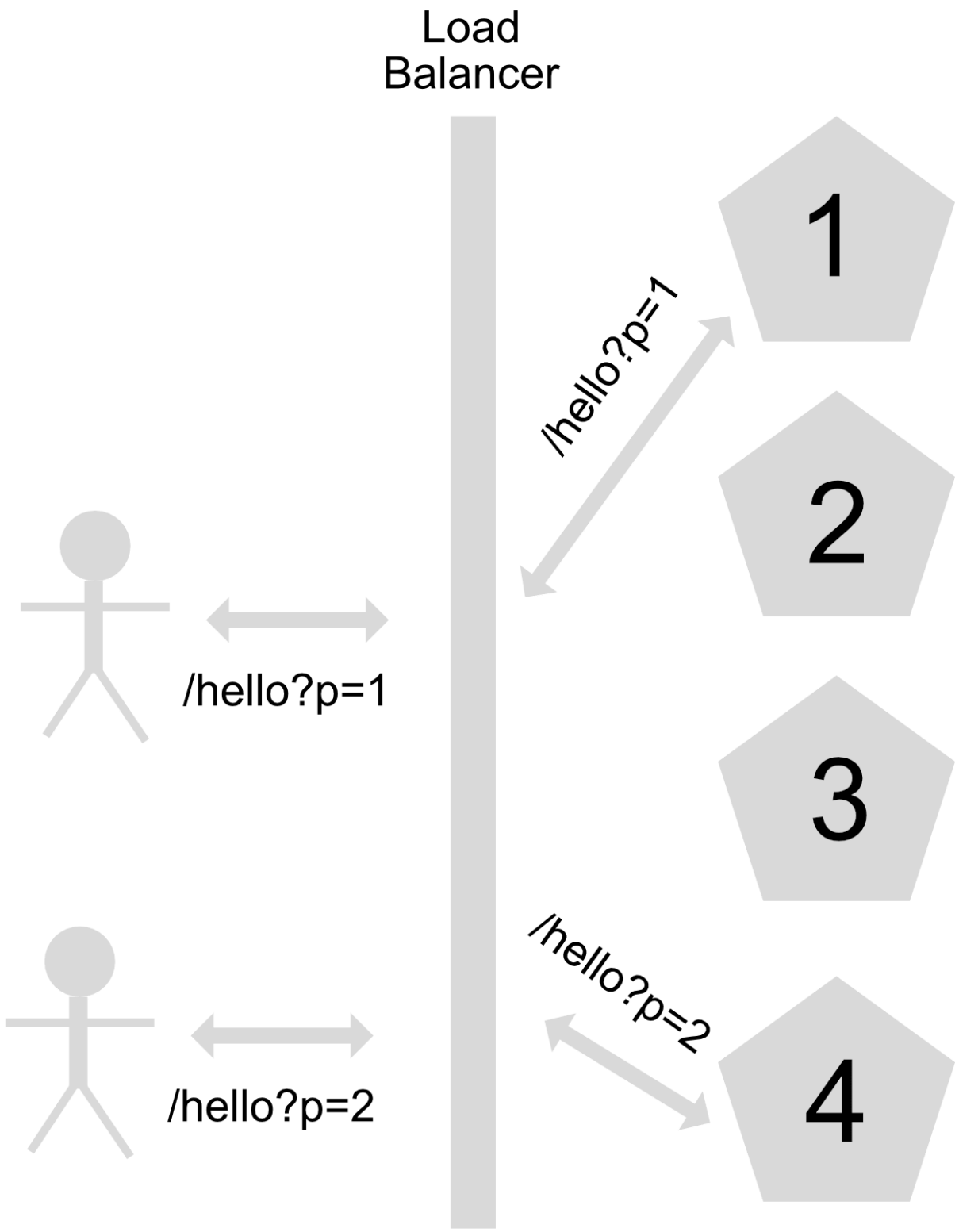
monolith pattern

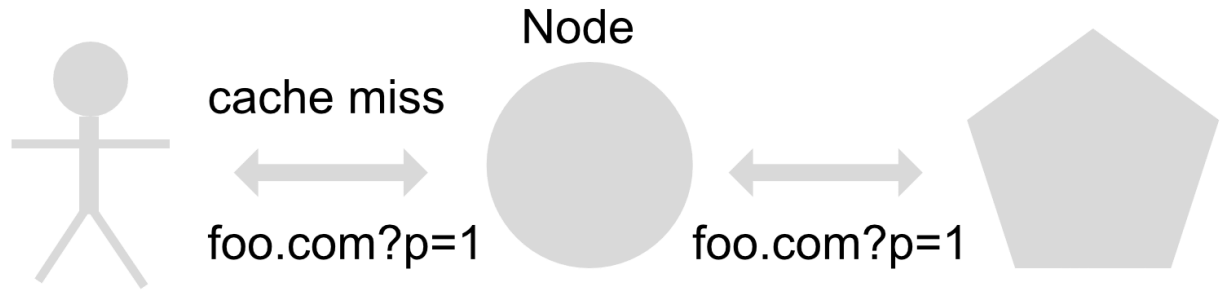
microservice pattern

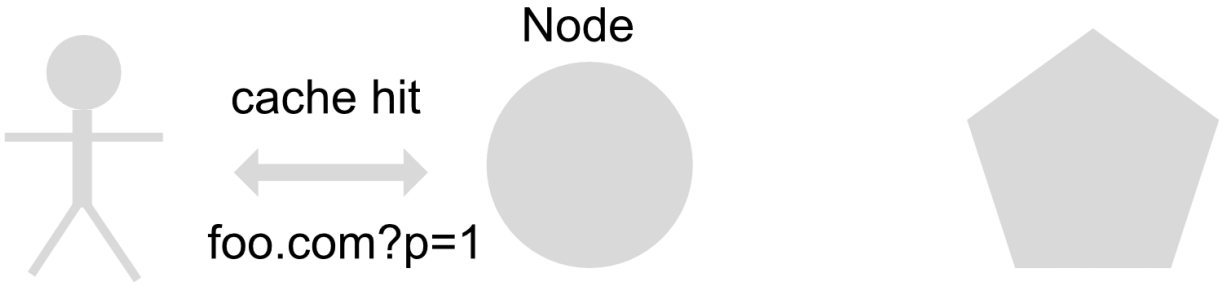

Frontend
Auth Server
user + pass
/auth
user + pass
access
token


Frontend
Backend
access
token
/hello
access
token
(saved in local storage)

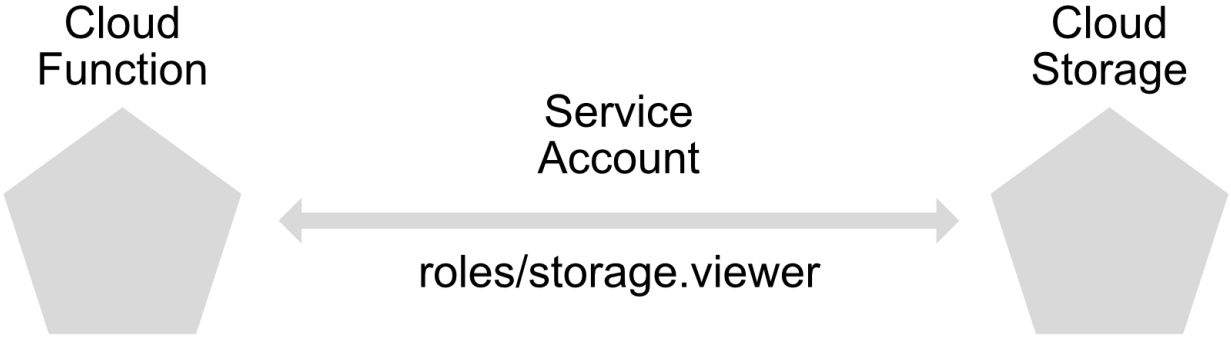

A
X-Application : A
X-EventId : 987372
B
/payment


Load
Balancer
1
2
3
4
/hello?p=1
/hello?p=1
/hello?p=2
/hello?p=2

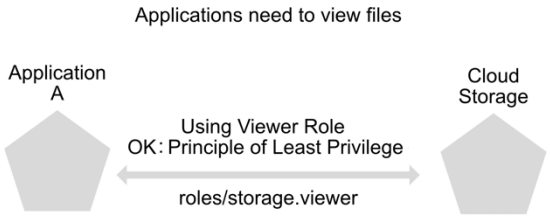

Node
cache miss
foo.com?p=1
foo.com?p=1

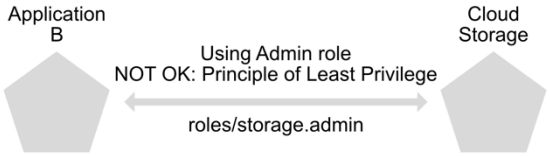

Node
cache hit
foo.com?p=1

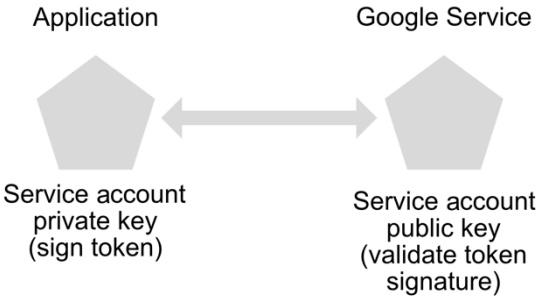
A
B
topic
Publisher
Subscriber

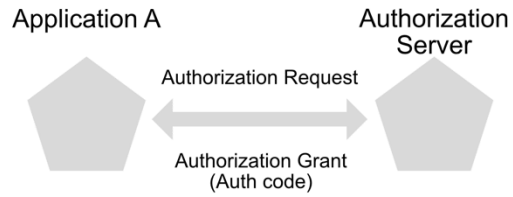

Cloud
Function
Cloud
Storage
Service
Account
roles/storage.viewer

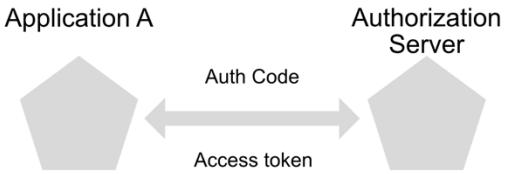
Chapter 2: Security Fundamentals and Best Practices



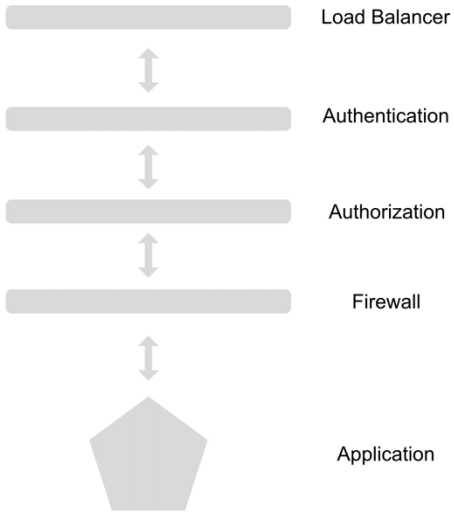


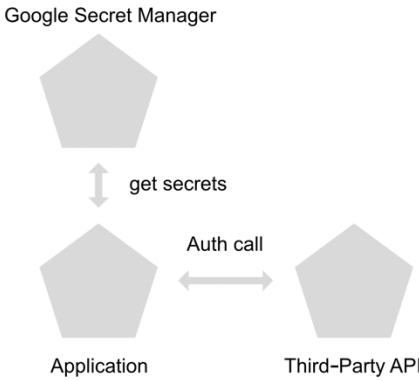



Application A
Authorization Server
Authorization Request
Authorization Grant
(Auth code)

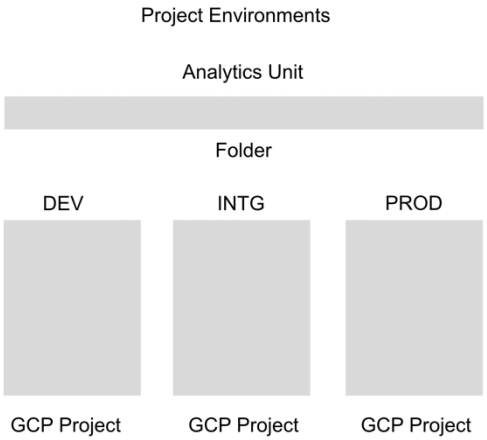

Application A
Authorization Server
Auth Code
Access token

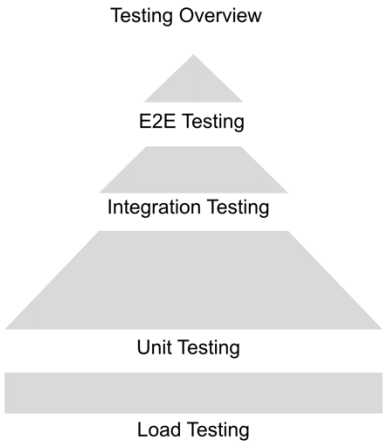
Application A
Application B
Access token
200 OK

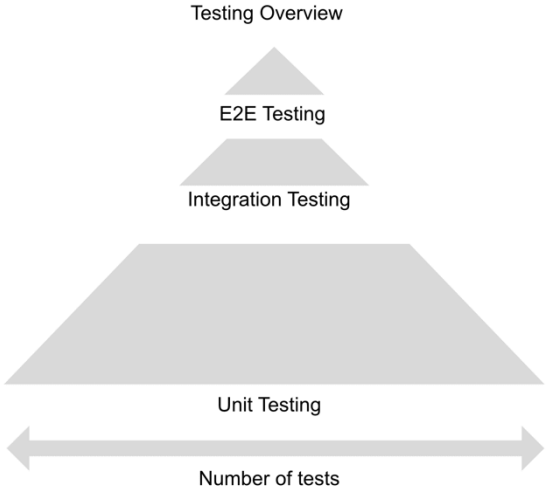

Load Balancer
Authentication
Authorization
Firewall
Application

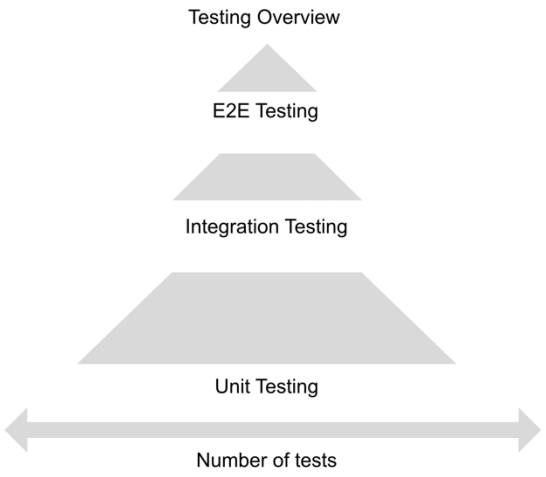

Google Secret Manager
get secrets
Auth call
Application
Third-Party API

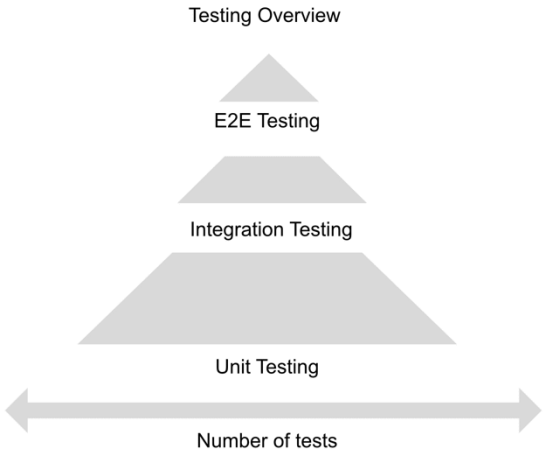
Chapter 3: Application Modernization Using Google Cloud

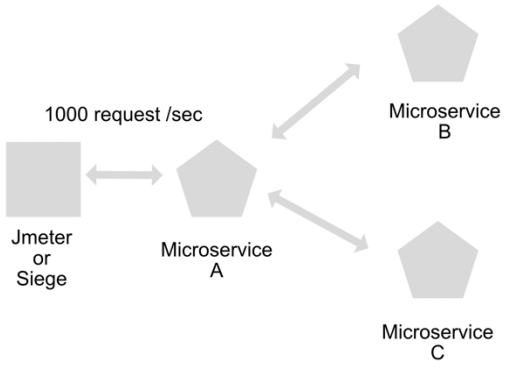


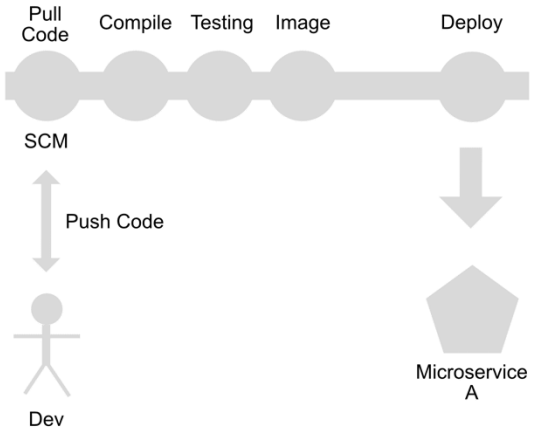


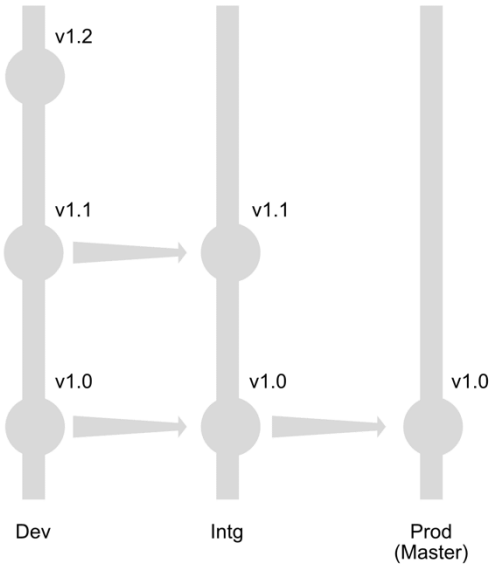


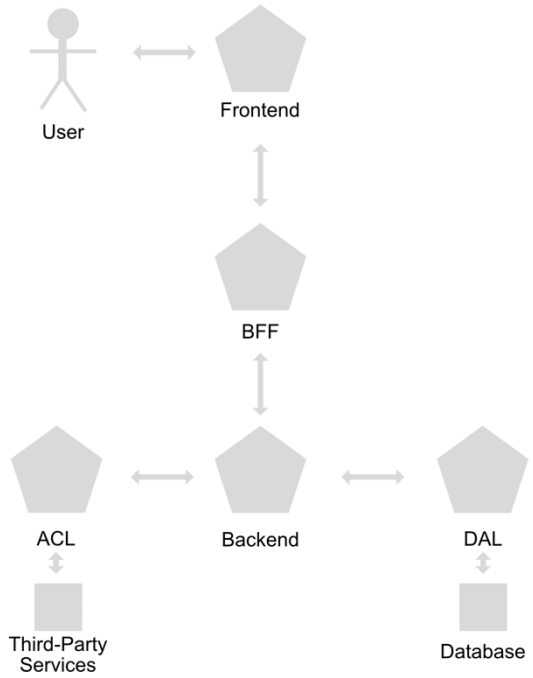

Testing Overview
E2E Testing
Integration Testing
Unit Testing
Number of tests

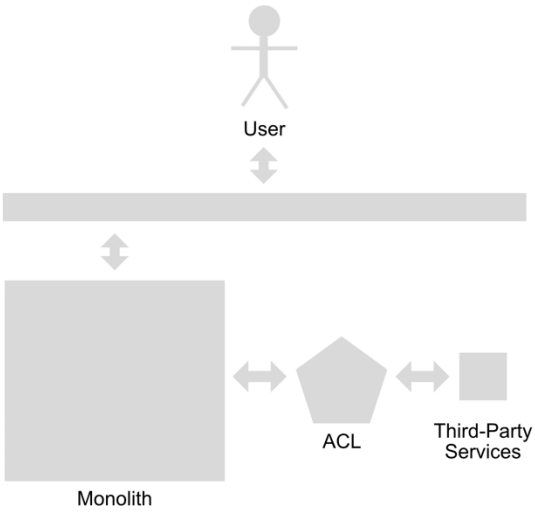

Testing Overview
E2E Testing
Integration Testing
Unit Testing
Number of tests


1000 request /sec
Jmeter
or
Siege
Microservice
A
Microservice
B
Microservice
C

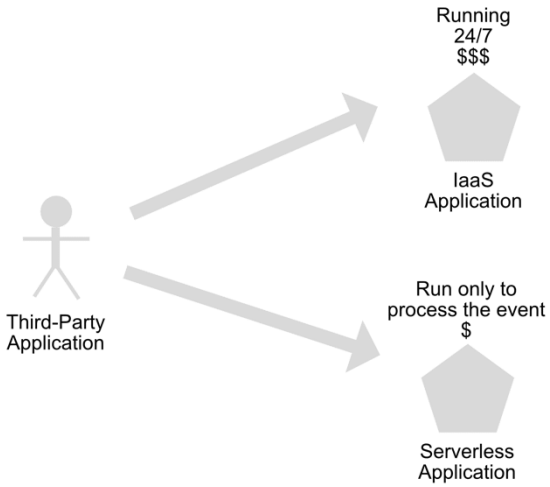

Pull Code
Compile
Testing
Image
Deploy
SCM
Push Code
Dev
Microservice A

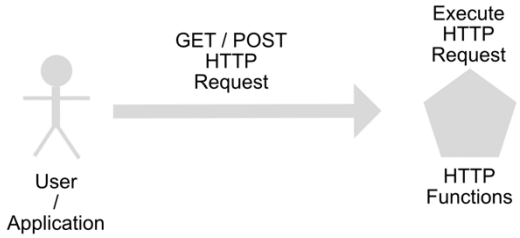

v1.2
v1.1
v1.1
v1.0
v1.0
v1.0
Dev
Intg
Prod (Master)

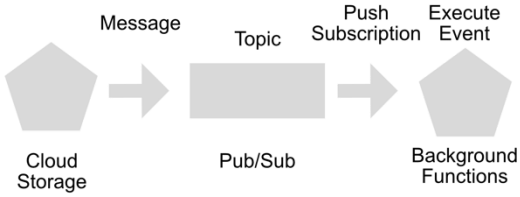

User
Frontend
BFF
ACL
Backend
DAL
Third-Party
Services
Database

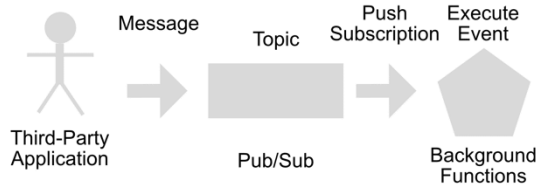

User
Monolith
ACL
Third-Party
Services

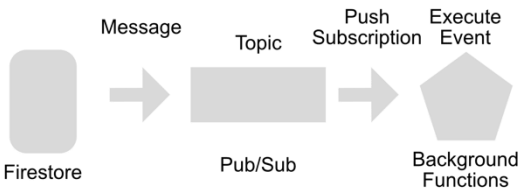
Chapter 4: Using Cloud Functions and Google App Engine



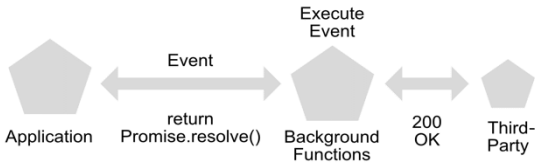


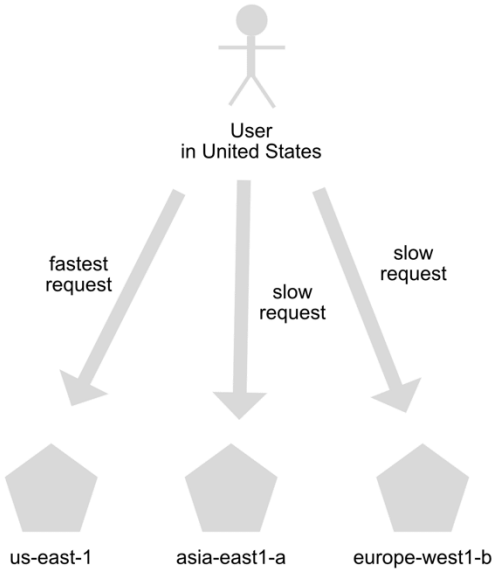


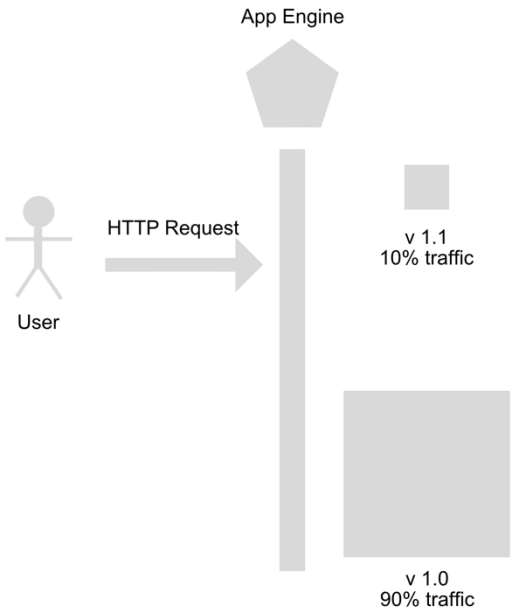




Execute
HTTP
Request
GET / POST
HTTP
Request
200 OK
User
/
Application
HTTP
Functions

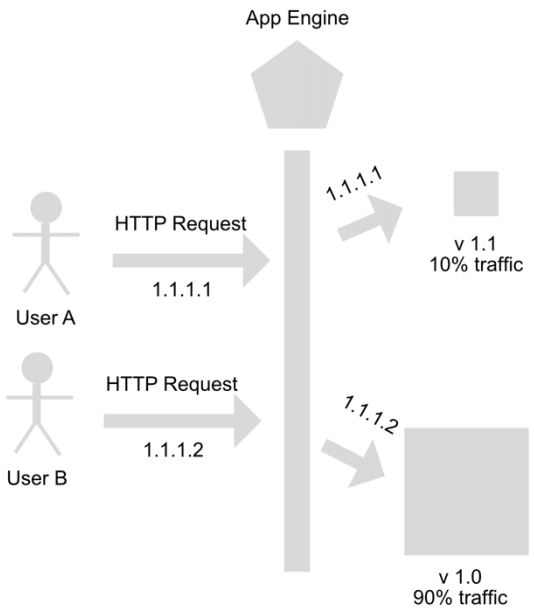

Execute
Event
Event
return
Promise.resolve()
Application
Background
Functions
200
OK
Third-
Party

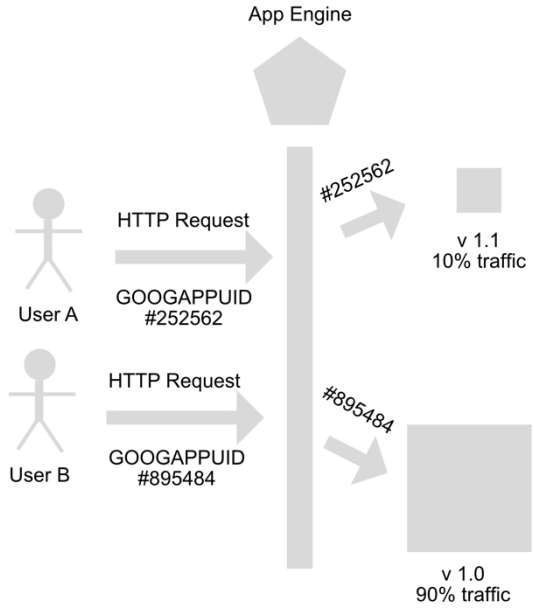

User
in United States
fastest
request
slow
request
slow
request
us-east-1
asia-east1-a
europe-west1-b


App Engine
HTTP Request
User
v 1.1
10% traffic
v 1.0
90% traffic

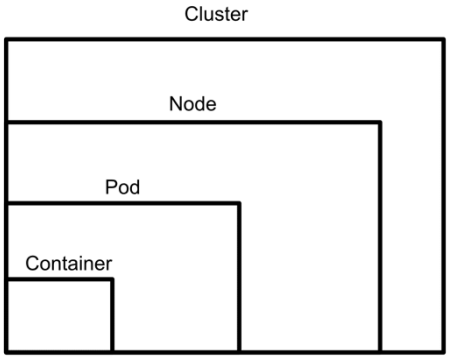
..../image94753.png
v 1.1
10% traffic

..../image23474.png
v 1.0
90% traffic


App Engine
HTTP Request
1.1.1.1
User A
1.1.1.1
v 1.1
10% traffic
HTTP Request
1.1.1.2
User B
1.1.1.2
v 1.0
90% traffic


App Engine
HTTP Request
GOOGAPPUID
#252562
User A
#252562
v 1.1
10% traffic
HTTP Request
GOOGAPPUID
#895484
User B
#895484
v 1.0
90% traffic

Chapter 5: Virtual Machines and Container Applications on Google Cloud Platform



Firewall

Add tags and firewall rules to allow specific network traffic from the Internet

- [x] Allow HTTP traffic
- [ ] Allow HTTPS traffic

Management, security, disks, networking, sole tenancy

You will be billed for this instance. Compute Engine pricing

Create Cancel

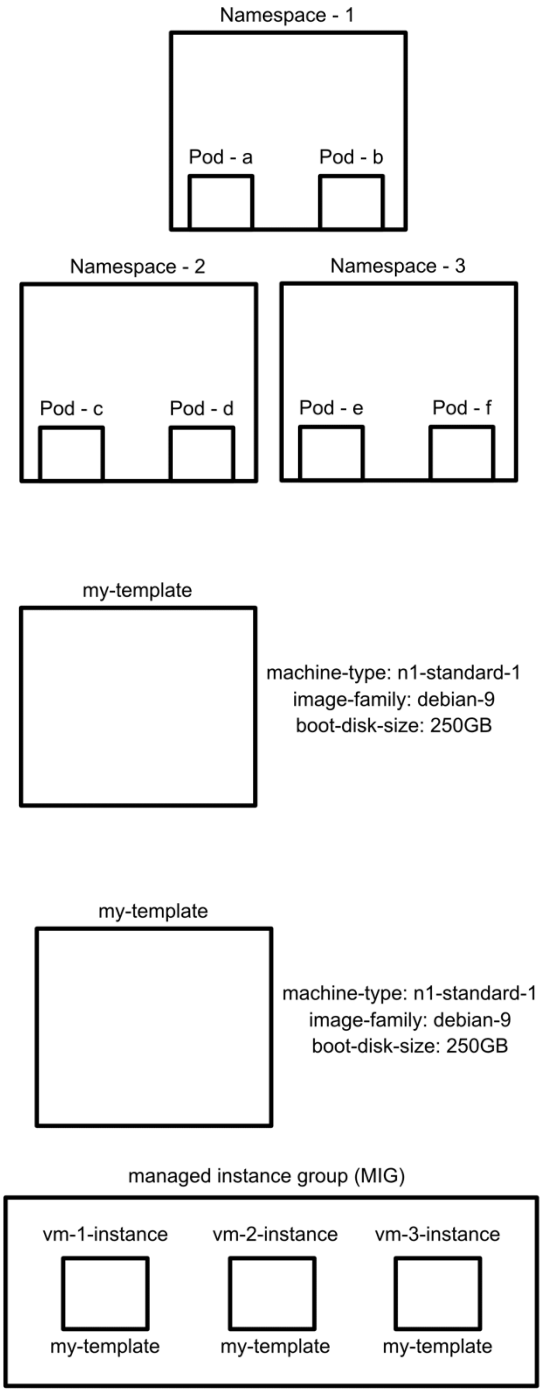
Equivalent REST or command line

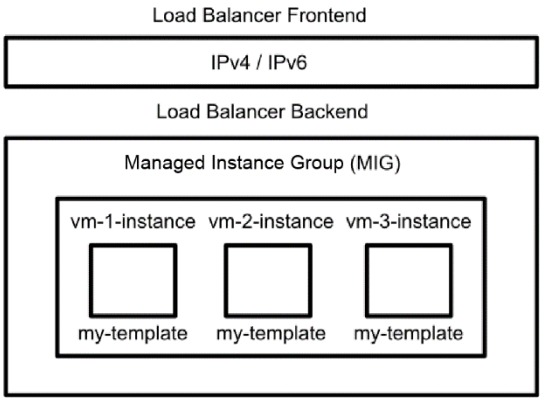
Automation

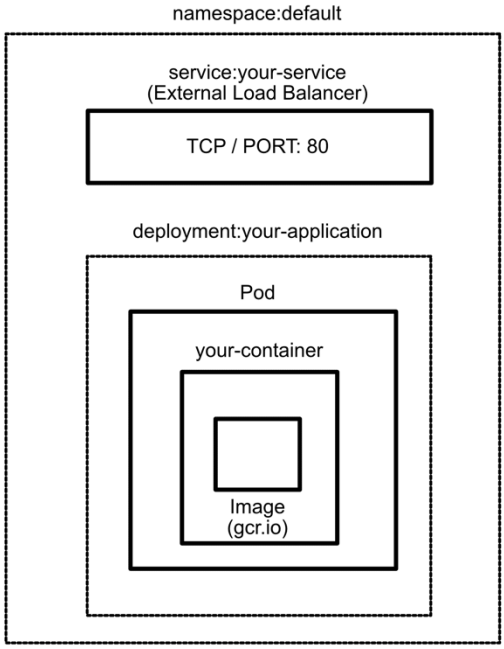
Startup script (Optional)

You can choose to specify a startup script that will run when your instance boots up or restarts. Startup scripts can be used to install software and updates, and to ensure that services are running within the virtual machine. Learn more

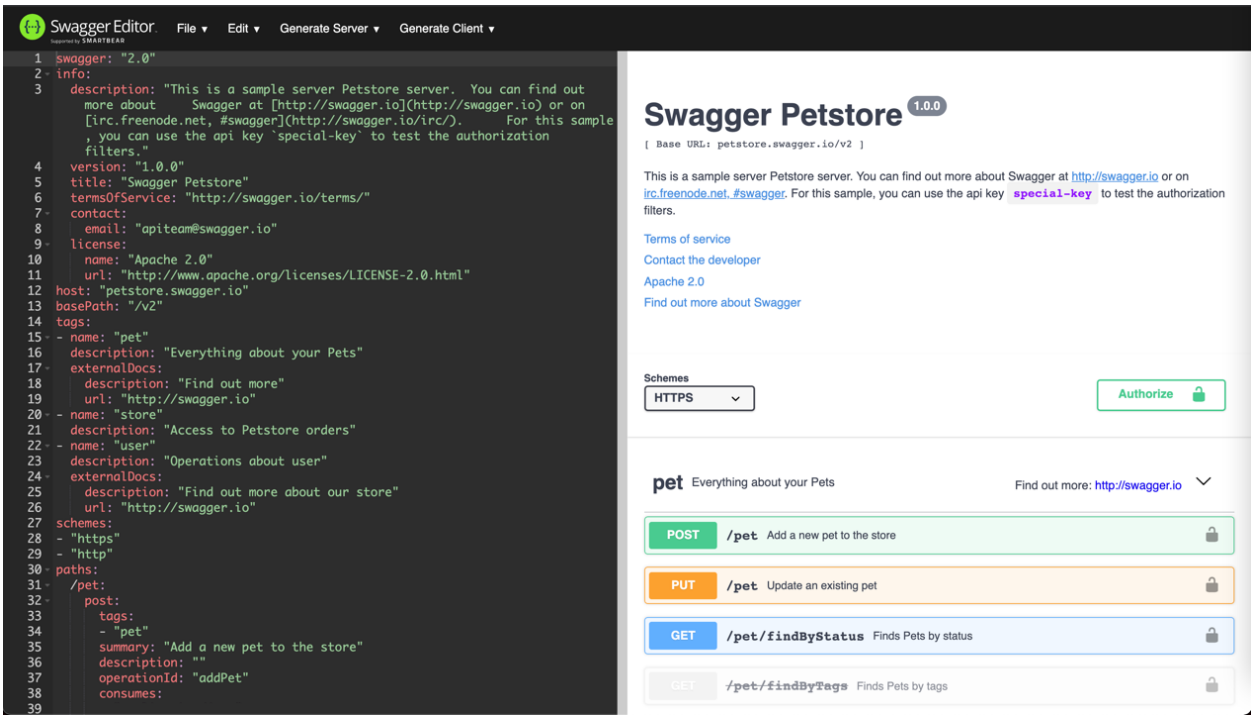
```
#!/bin/bash
```

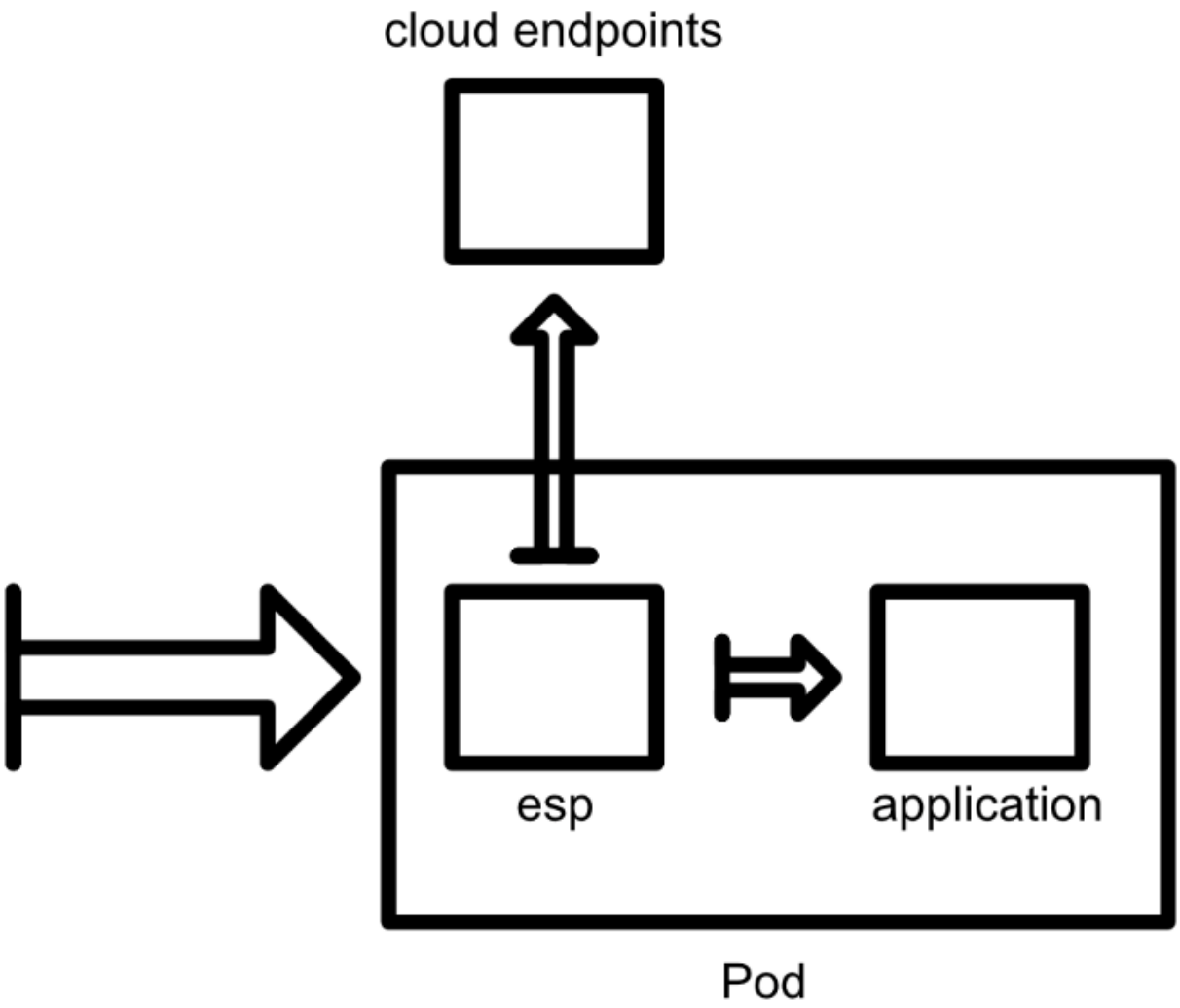

Namespace - 1
Pod - a
Pod - b
Namespace - 2
Namespace - 3
Pod - c
Pod - d
Pod - e
Pod - f
my-template
machine-type: n1-standard-1
image-family: debian-9
boot-disk-size: 250GB
my-template
machine-type: n1-standard-1
image-family: debian-9
boot-disk-size: 250GB
managed instance group (MIG)
vm-1-instance
vm-2-instance
vm-3-instance
my-template
my-template
my-template

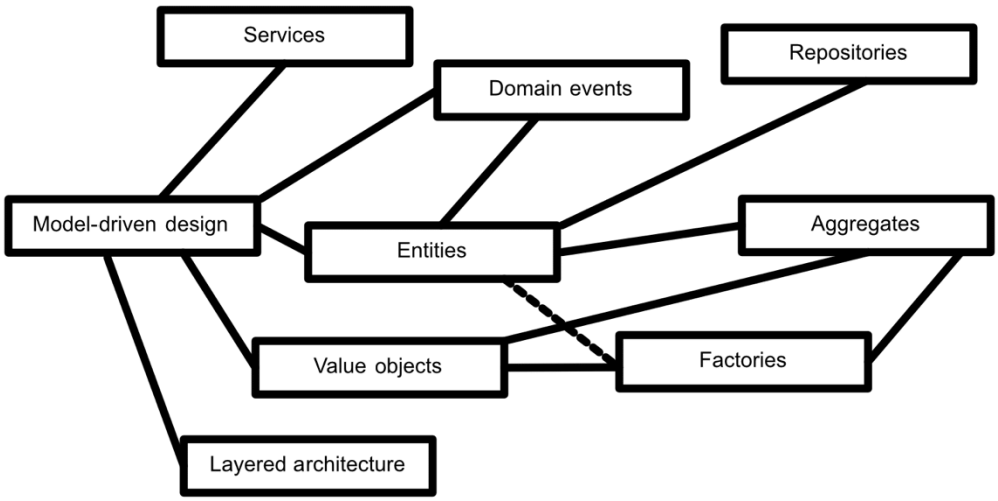

Load Balancer Frontend
IPv4 / IPv6
Load Balancer Backend
Managed Instance Group (MIG)
vm-1-instance
vm-2-instance
vm-3-instance
my-template
my-template
my-template

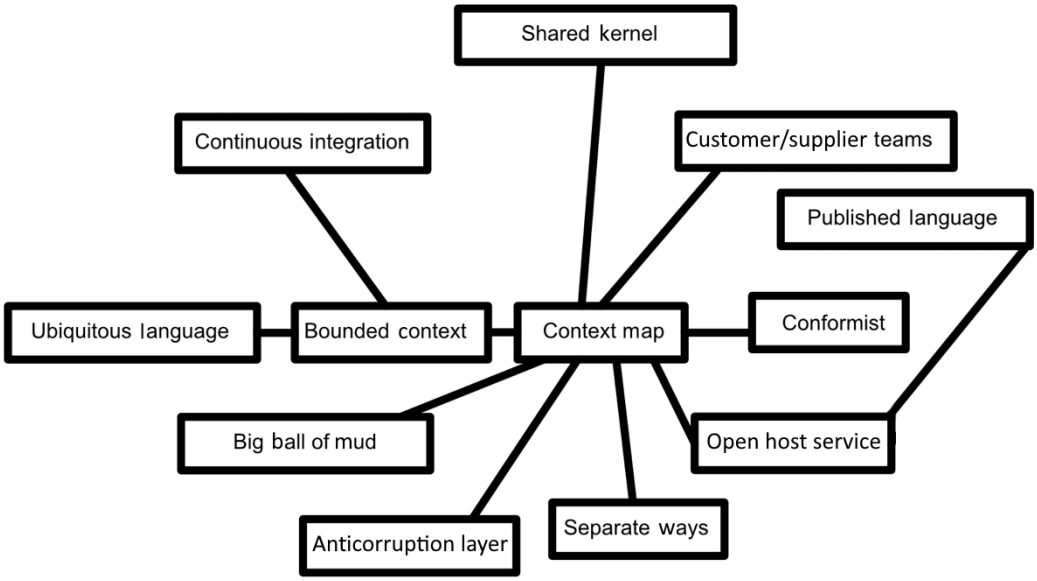

namespace:default
service:your-service
(External Load Balancer)
TCP / PORT: 80
deployment:your-application
Pod
your-container
Image
(gcr.io)

Chapter 6: Managing APIs on Google Cloud Platform

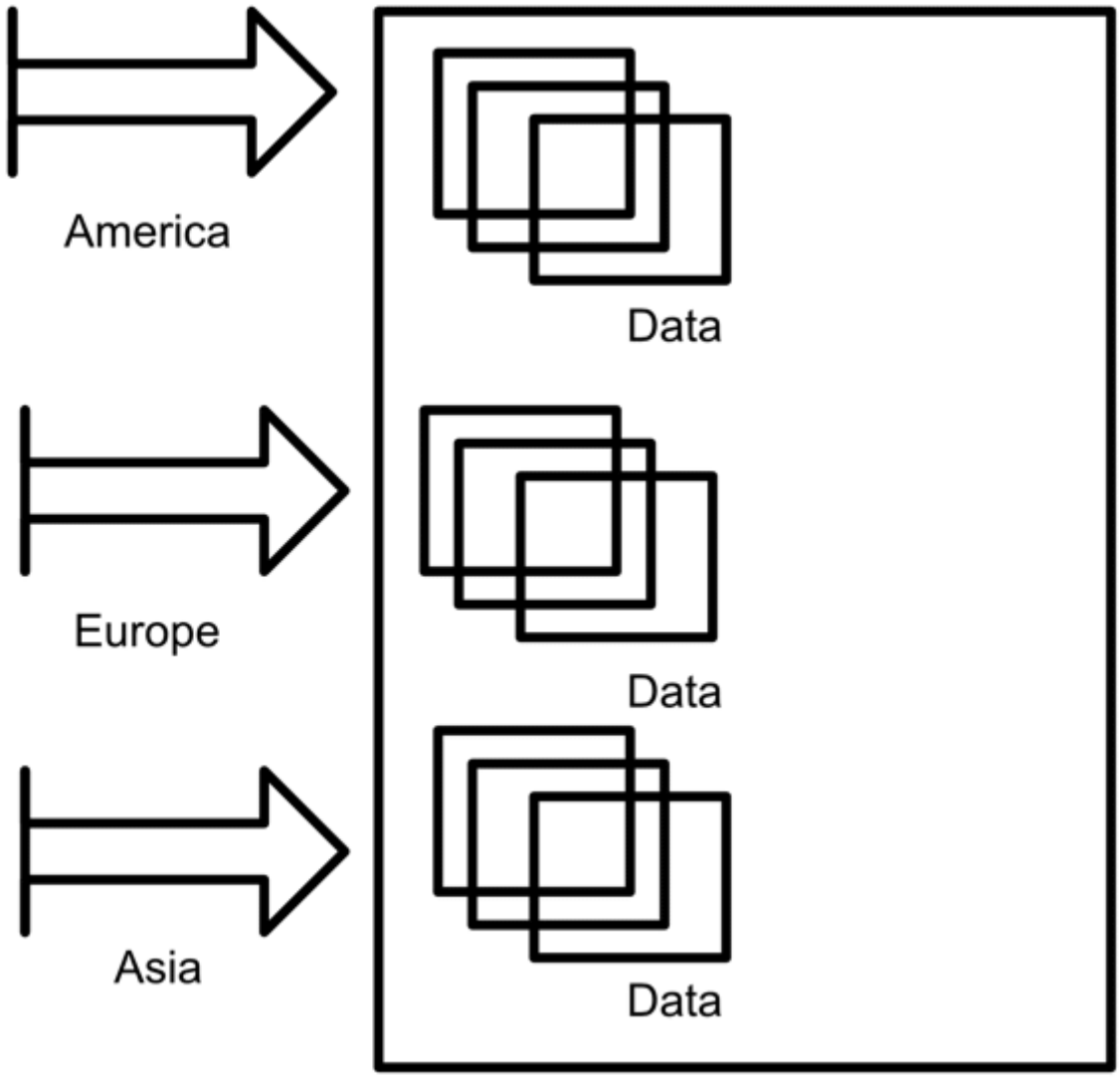


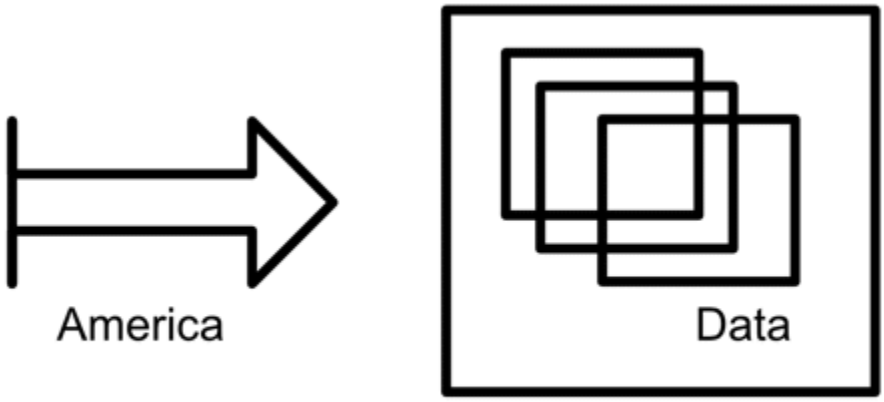

cloud endpoints
esp
application
Pod


Services
Repositories
Domain events
Model-driven design
Entities
Aggregates
Value objects
Factories
Layered architecture


Shared kernel
Continuous integration
Customer/supplier teams
Published language
Ubiquitous language
Bounded context
Context map
Conformist
Big ball of mud
Open host service
Anticorruption layer
Separate ways

Chapter 7: Handling Unstructured Data





America

Standard

Nearline - 30 days

Coldline - 90 days

Archive 365 days

Storage costs

Standard $$$$

Nearline - $$$

Coldline - $$

Archive - $

Retrieval costs

Standard $

Nearline - $$

Coldline - $$$

Archive - $$$$

Standard - Hot data

S

Availability:
region: 99.9%
multi-region: 99.95%
dual-region: 99.95%

storage cost: $$$$
retrieval cost: $

Use cases:
Good for frequently accessed data.
Websites, streaming videos and mobile apps.

Nearline - 30 days

N

Availability:
region: 99%
multi-region: 99.9%
dual-region: 99.9%

storage cost: $$$
retrieval cost: $$

Use cases:
Data backup and long-tail multimedia content.

Coldline - 90 days

C

Availability:
region: 99%
multi-region: 99.9%
dual-region: 99.9%

storage cost: $$
retrieval cost: $$$

Use cases:
Disaster recovery.

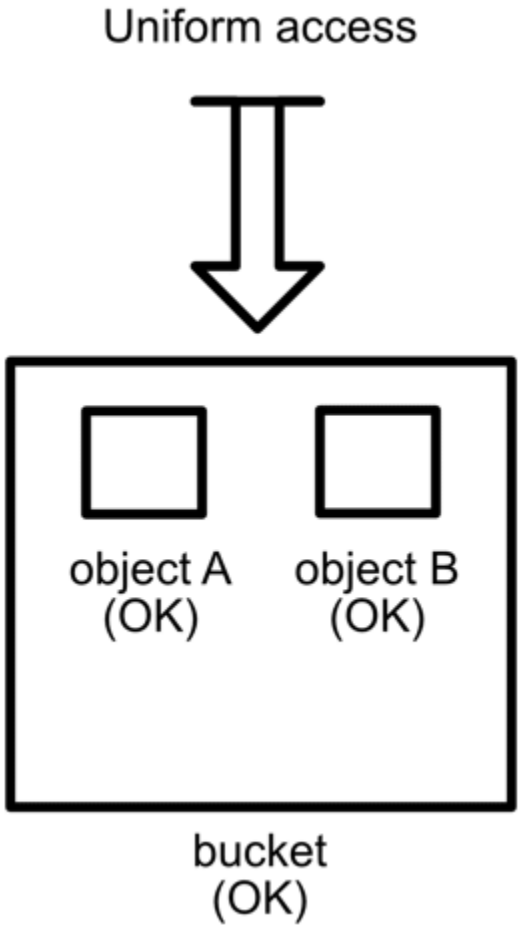
Archive 365 days

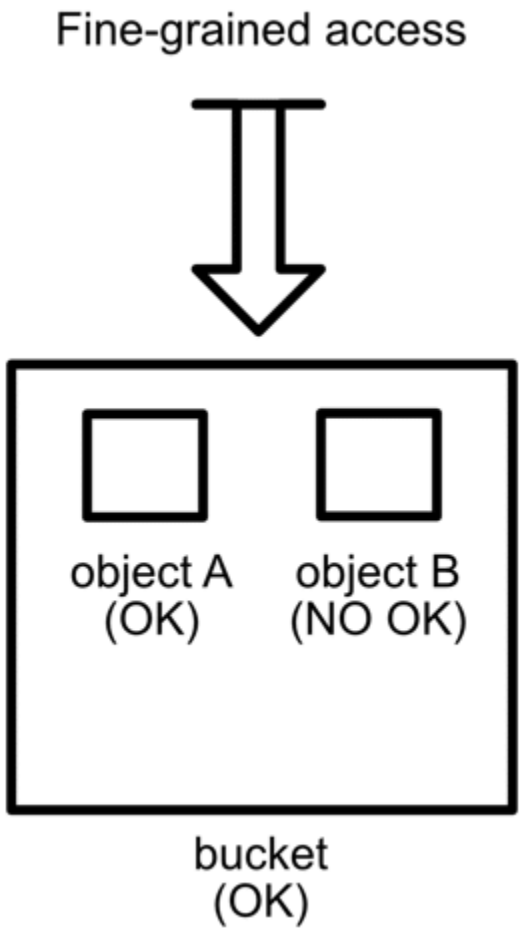
A

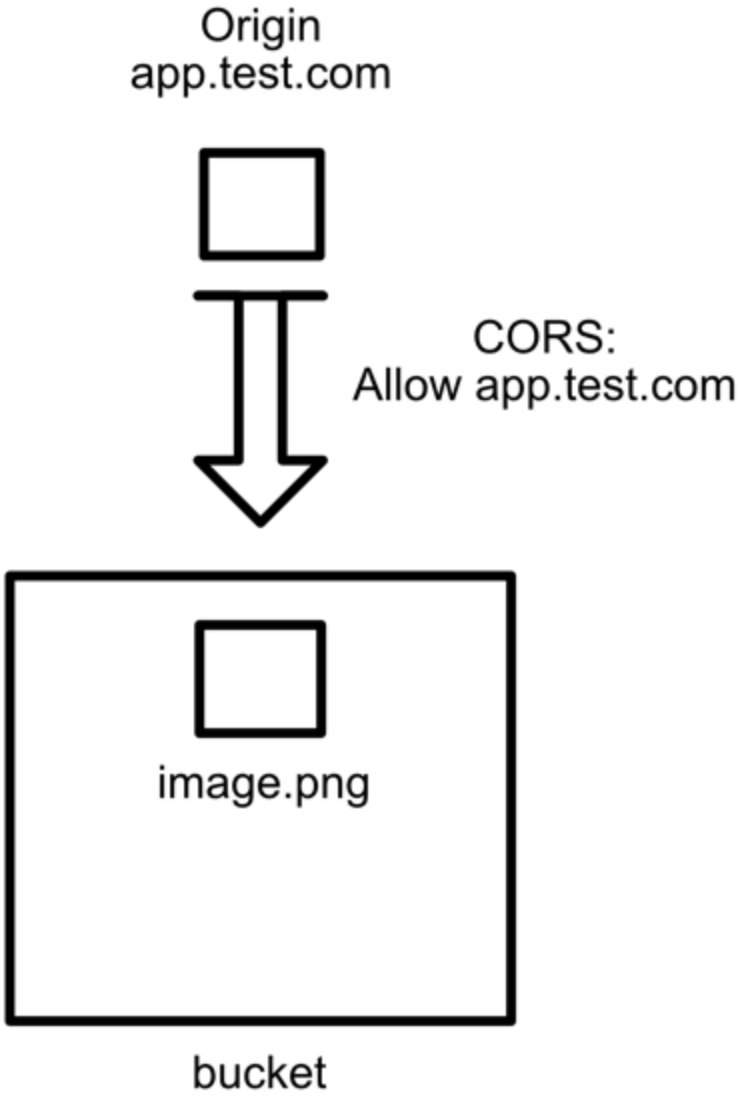
Availability:
region: 99%
multi-region: 99.9%
dual-region: 9i9.9%

storage cost: $
retrieval cost: $$$$

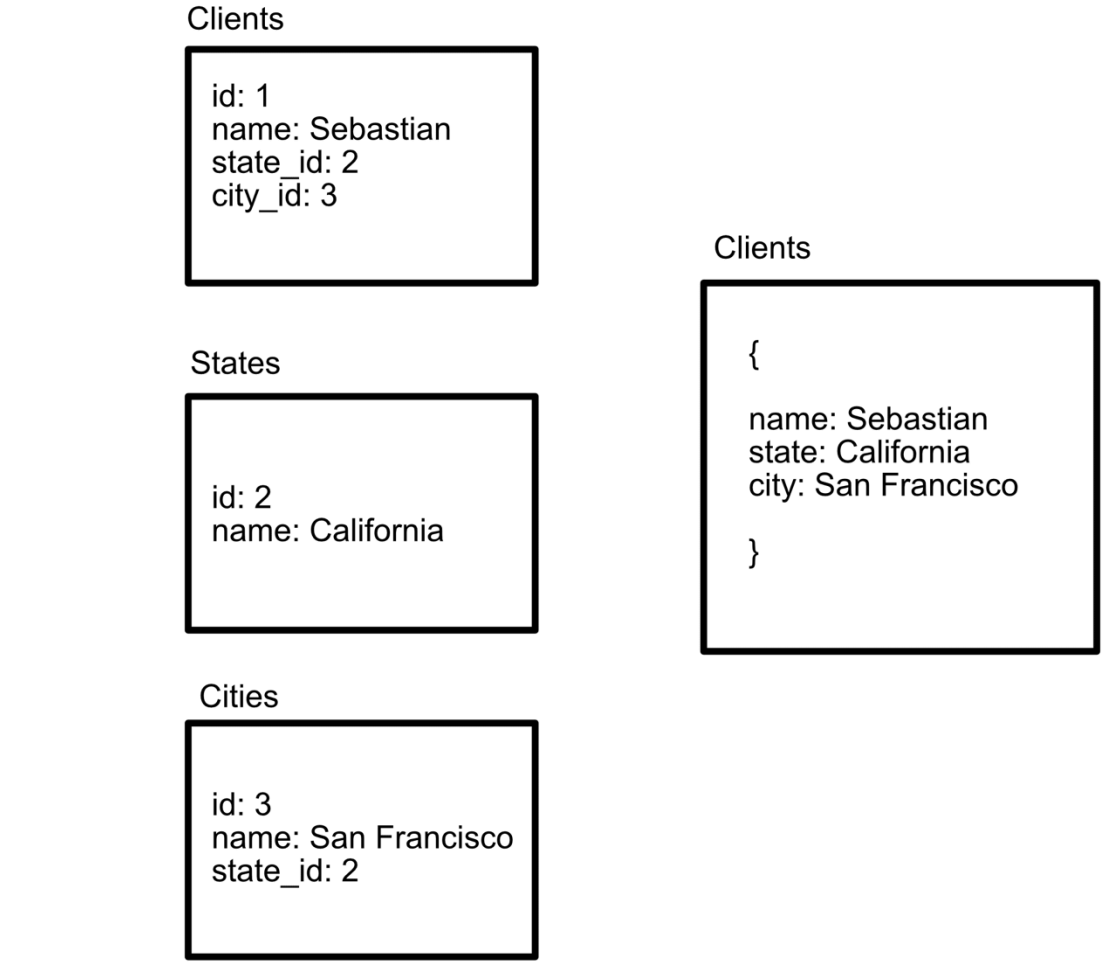
Use cases:
Regulatory archives.

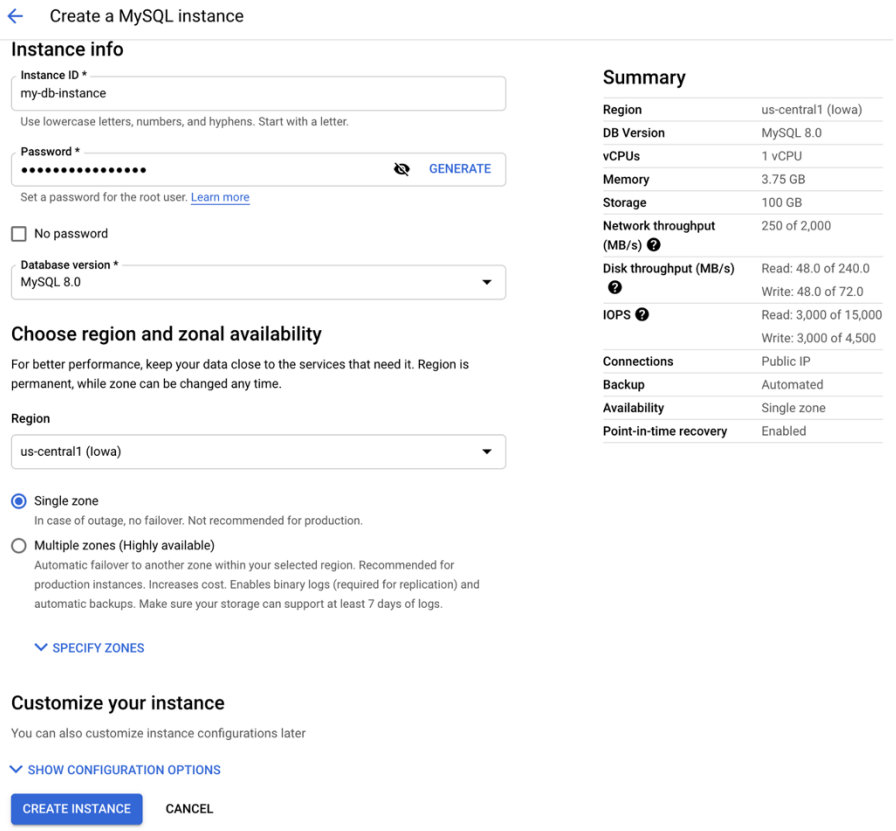


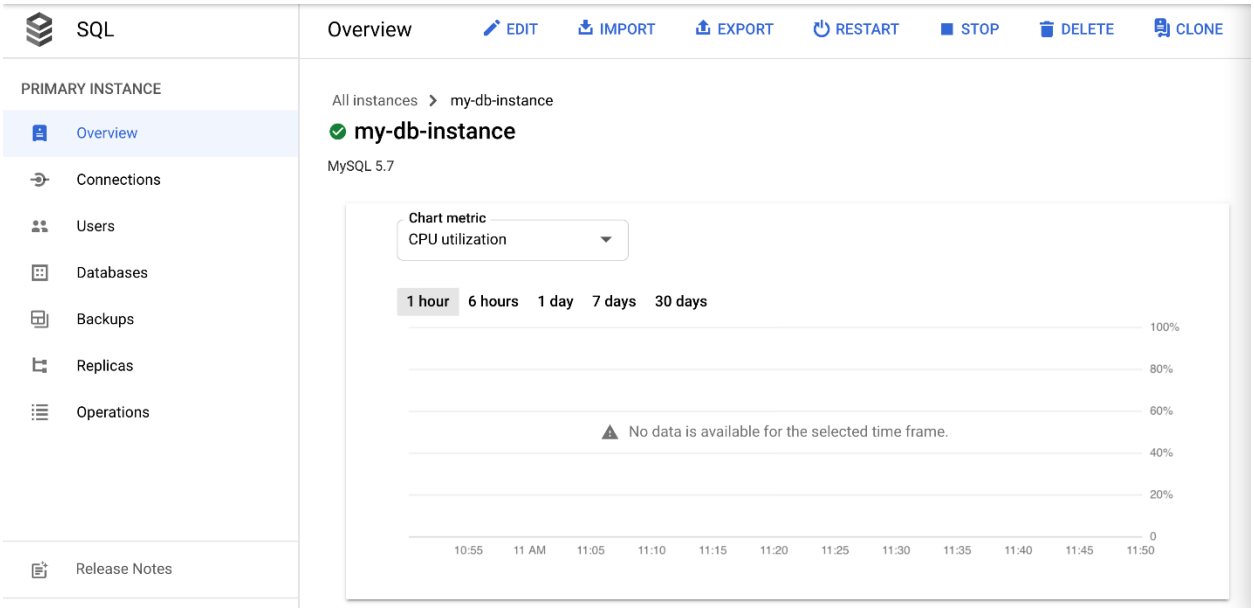

Fine-grained access
object A
(OK)
object B
(NO OK)
bucket
(OK)


Origin
app.test.com
CORS:
Allow app.test.com
image.png
bucket

Chapter 8: Databases and Event Messages in Google Cloud




Create a MySQL instance
Instance info
Instance ID *
my-db-instance
Use lowercase letters, numbers, and hyphens. Start with a letter.
Password *
GENERATE
Set a password for the root user. Learn more
No password
Database version *
MySQL 8.0
Choose region and zonal availability
For better performance, keep your data close to the services that need it. Region is permanent, while zone can be changed any time.
Region
us-central1 (Iowa)
Single zone
In case of outage, no failover. Not recommended for production.
Multiple zones (Highly available)
Automatic failover to another zone within your selected region. Recommended for production instances. Increases cost. Enables binary logs (required for replication) and automatic backups. Make sure your storage can support at least 7 days of logs.
SPECIFY ZONES
Customize your instance
You can also customize instance configurations later
SHOW CONFIGURATION OPTIONS
CREATE INSTANCE
CANCEL
Summary
Region us-central1 (Iowa)
DB Version MySQL 8.0
vCPUs 1 vCPU
Memory 3.75 GB
Storage 100 GB
Network throughput (MB/s) 250 of 2,000
Disk throughput (MB/s) Read: 48.0 of 240.0 Write: 48.0 of 72.0
IOPS Read: 3,000 of 15,000 Write: 3,000 of 4,500
Connections Public IP
Backup Automated
Availability Single zone
Point-in-time recovery Enabled


SQL
Overview
EDIT
IMPORT
EXPORT
RESTART
STOP
DELETE
CLONE
PRIMARY INSTANCE
Overview
Connections
Users
Databases
Backups
Replicas
Operations
Release Notes
All instances > my-db-instance
my-db-instance
MySQL 5.7
Chart metric
CPU utilization
1 hour
6 hours
1 day
7 days
30 days
No data is available for the selected time frame.
100%
80%
60%
40%
20%
0
10:55
11 AM
11:05
11:10
11:15
11:20
11:25
11:30
11:35
11:40
11:45
11:50

SQL

Connections

PRIMARY INSTANCE

- Overview
- Connections
- Users
- Databases
- Backups
- Replicas
- Operations

All instances > my-db-instance

my-db-instance

MySQL 8.0

Networking

Choose a network path for connecting to this instance. For extra security, consider using the Cloud SQL proxy. Learn more

☐ Private IP

Requires additional APIs and permissions, which may require your system admin. Can't be disabled once enabled. Learn more

☑ Public IP

Authorize a network or use Cloud SQL Proxy to connect to this instance. Learn more

ⓘ You have not authorized any external networks to connect to your Cloud SQL instance. External applications can still connect to the instance through the Cloud SQL Proxy. Learn more

Authorized networks

ADD NETWORK

SAVE DISCARD CHANGES

SQL

Users

PRIMARY INSTANCE

- Overview
- Connections
- Users
- Databases
- Backups
- Replicas
- Operations

All instances > my-db-instance

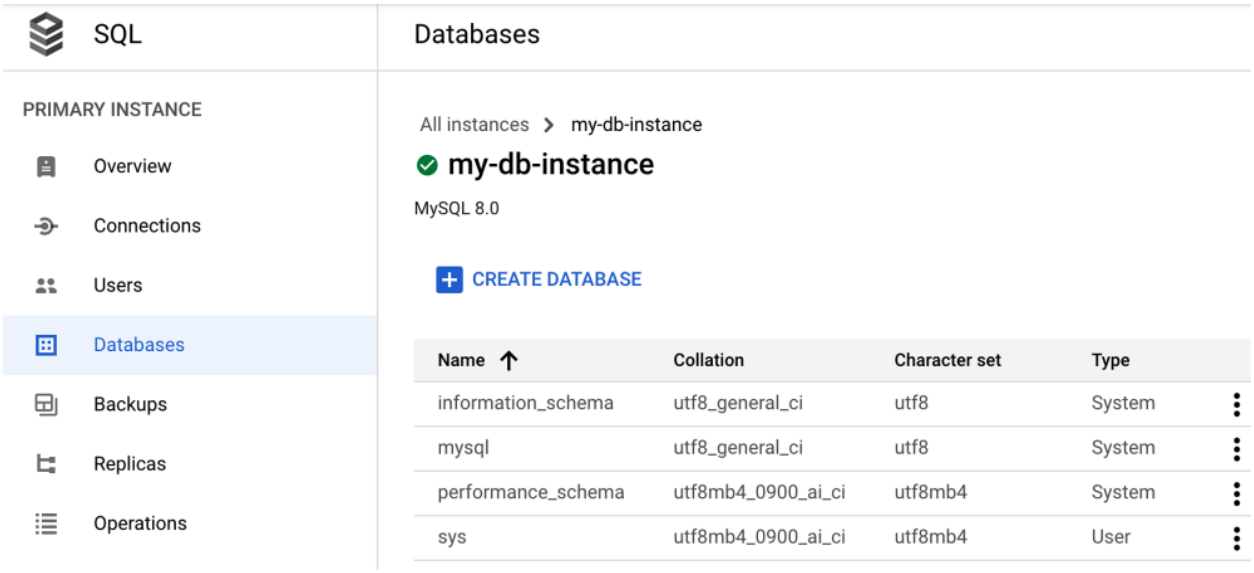
my-db-instance

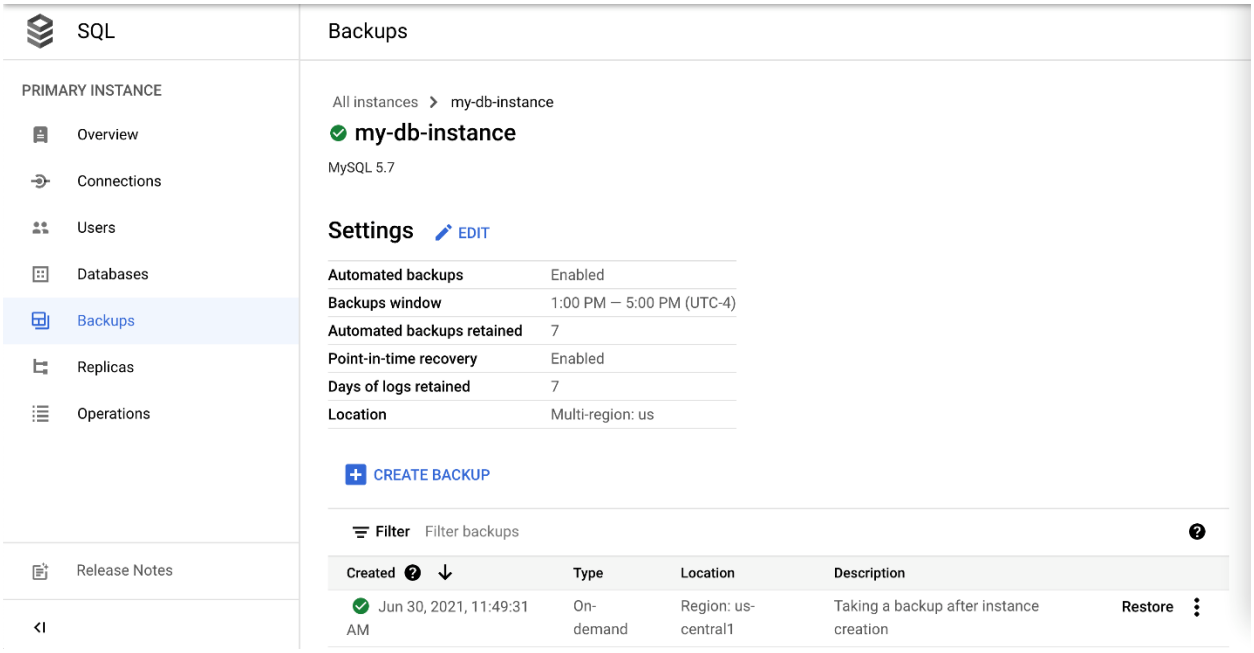
MySQL 8.0

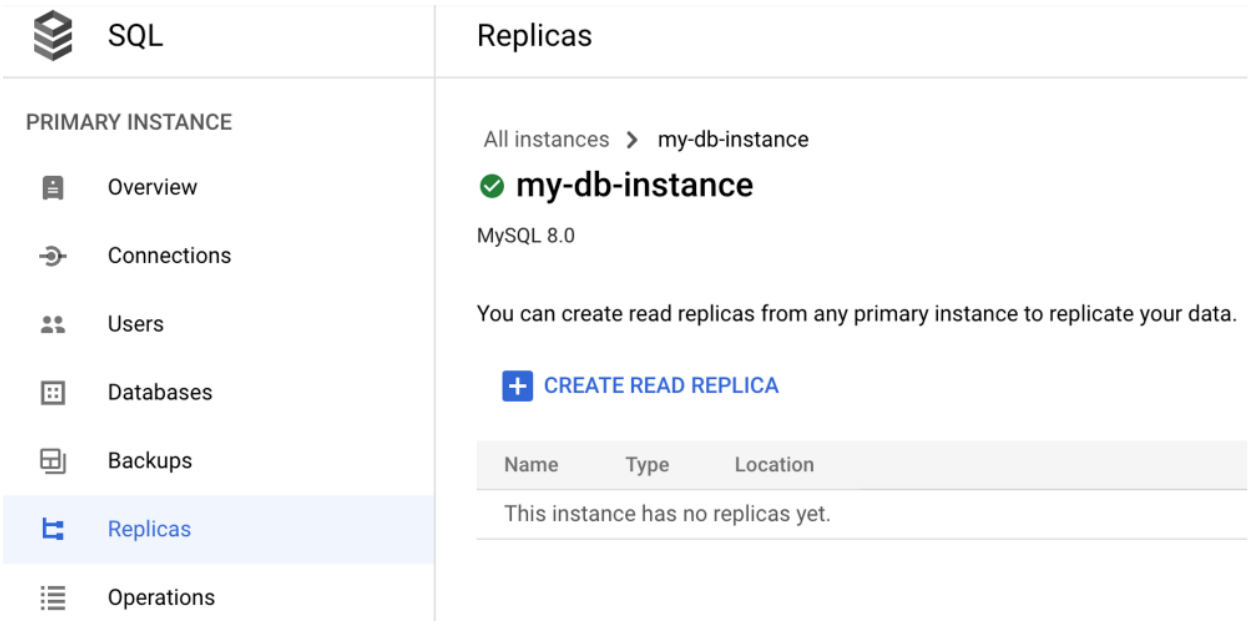
User accounts enable users and applications to connect to your instance. Learn more

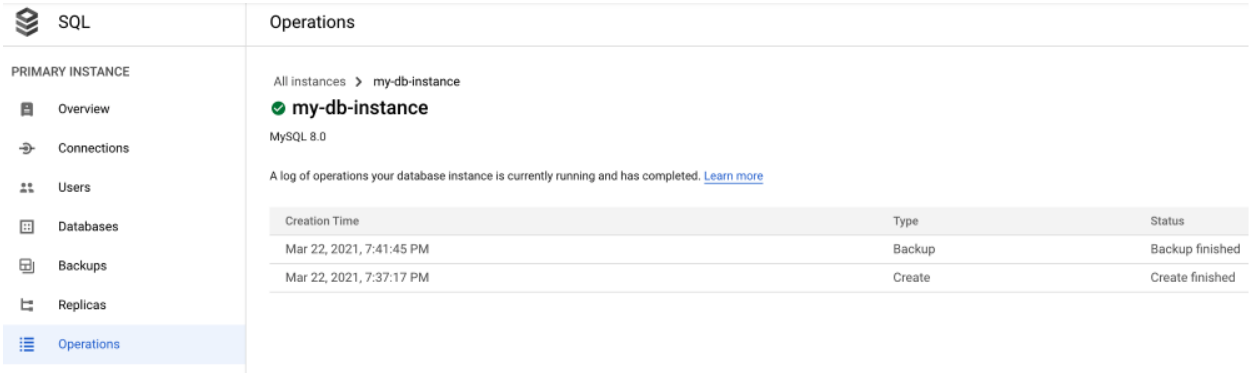
ADD USER ACCOUNT

User name ↑	Host name	
root	% (any host)	⋮

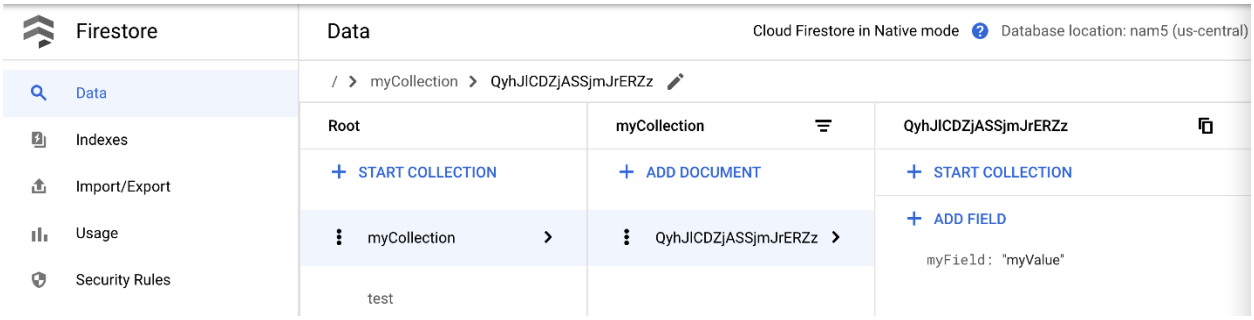

SQL
Databases
PRIMARY INSTANCE
Overview
Connections
Users
Databases
Backups
Replicas
Operations
All instances > my-db-instance
my-db-instance
MySQL 8.0
CREATE DATABASE
Name
Collation
Character set
Type
information_schema
utf8_general_ci
utf8
System
mysql
utf8_general_ci
utf8
System
performance_schema
utf8mb4_0900_ai_ci
utf8mb4
System
sys
utf8mb4_0900_ai_ci
utf8mb4
User


SQL
Backups
PRIMARY INSTANCE
Overview
Connections
Users
Databases
Backups
Replicas
Operations
Release Notes
All instances > my-db-instance
my-db-instance
MySQL 5.7
Settings
EDIT
Automated backups
Enabled
Backups window
1:00 PM — 5:00 PM (UTC-4)
Automated backups retained
7
Point-in-time recovery
Enabled
Days of logs retained
7
Location
Multi-region: us
CREATE BACKUP
Filter
Filter backups
Created
Type
Location
Description
Jun 30, 2021, 11:49:31 AM
On-demand
Region: us-central1
Taking a backup after instance creation
Restore


SQL
Replicas
PRIMARY INSTANCE
Overview
Connections
Users
Databases
Backups
Replicas
Operations
All instances > my-db-instance
my-db-instance
MySQL 8.0
You can create read replicas from any primary instance to replicate your data.
CREATE READ REPLICA
Name
Type
Location
This instance has no replicas yet.


SQL
Operations
PRIMARY INSTANCE
Overview
Connections
Users
Databases
Backups
Replicas
Operations
All instances > my-db-instance
my-db-instance
MySQL 8.0
A log of operations your database instance is currently running and has completed. Learn more
Creation Time
Type
Status
Mar 22, 2021, 7:41:45 PM
Backup
Backup finished
Mar 22, 2021, 7:37:17 PM
Create
Create finished

	Native mode	Datastore mode
	Enable all of Cloud Firestore's features, with offline support and real-time synchronization. SELECT NATIVE MODE	Leverage Cloud Datastore's system behavior on top of Cloud Firestore's powerful storage layer. SELECT DATASTORE MODE
API	Firestore	Datastore
Scalability	Automatically scales to millions of concurrent clients	Automatically scales to millions of writes per second
App engine support	Not supported in the App Engine standard Python 2.7 and PHP 5.5 runtimes	All runtimes
Max writes per second	10,000	No limit
Real-time updates	✓	✗
Mobile/web client libraries with offline data persistence	✓	✗



Filter for documents in 'myCollection'

Add filters

Choose a field to filter by

myField

Add a condition (optional)

Only show documents where the specified field is...

(==) equal to

String

myValue

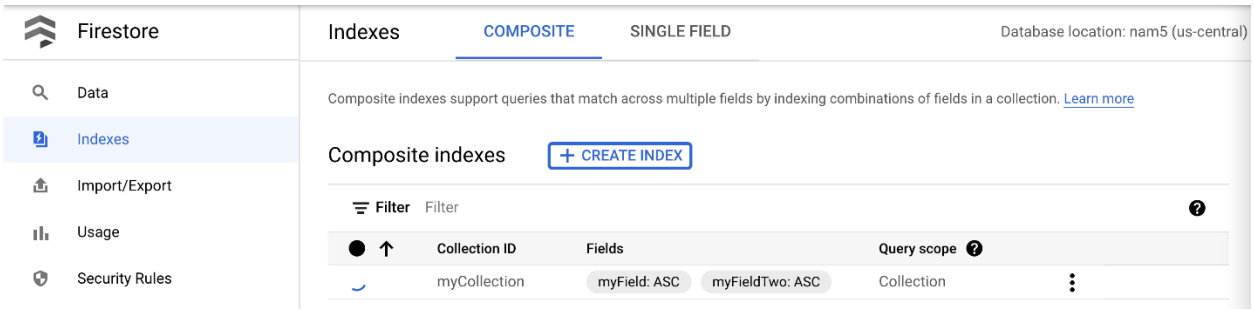
Sort results

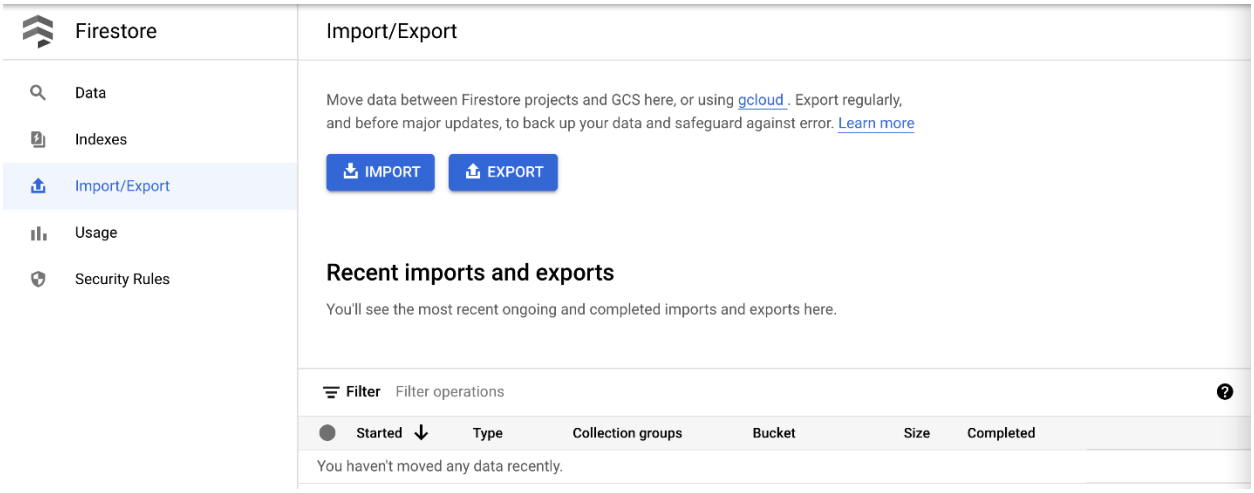
- Ascending order
- Descending order

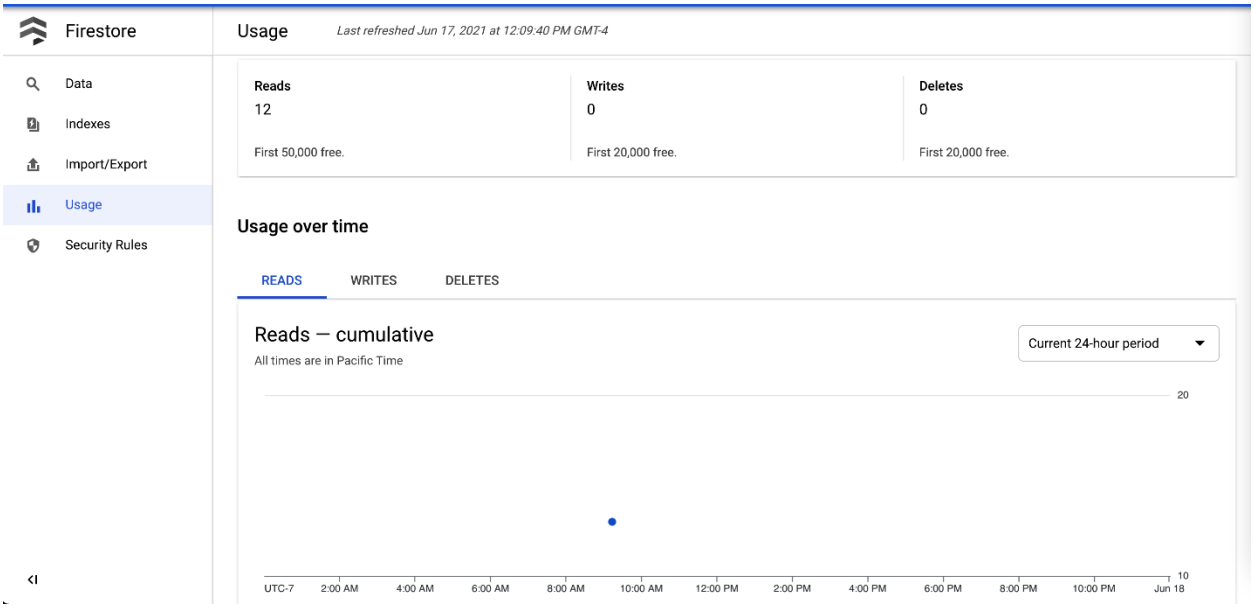
Preview query code

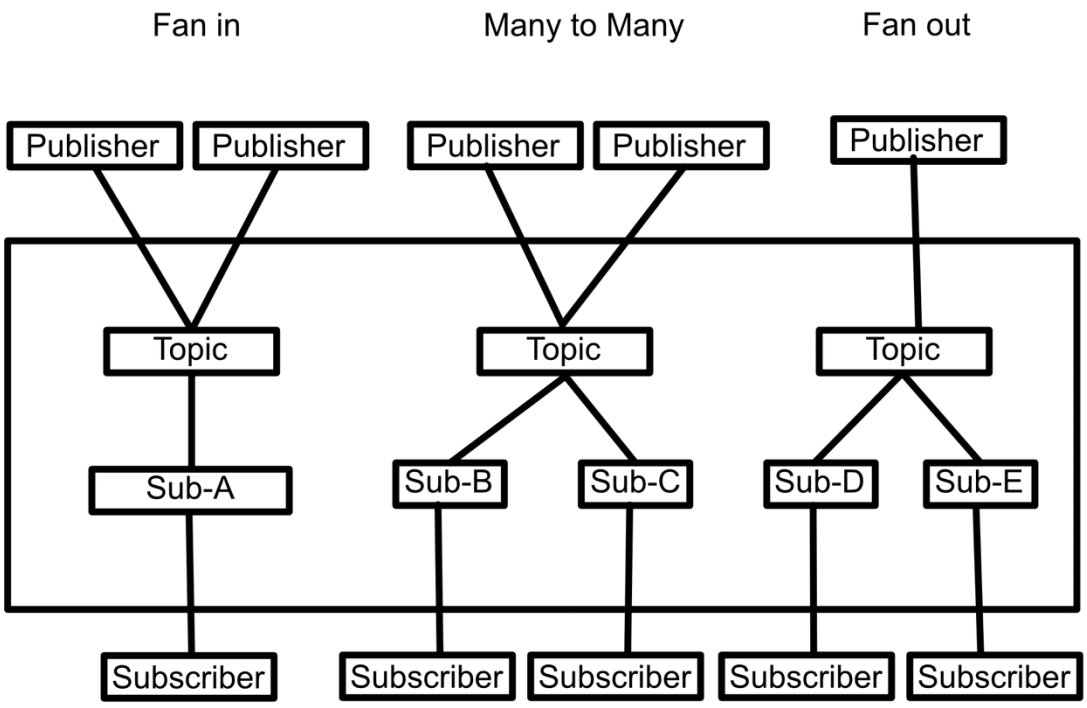
```
.collection("myCollection")
    .where("myField", "==", "myValue")
```

APPLY CLEAR FILTER CANCEL

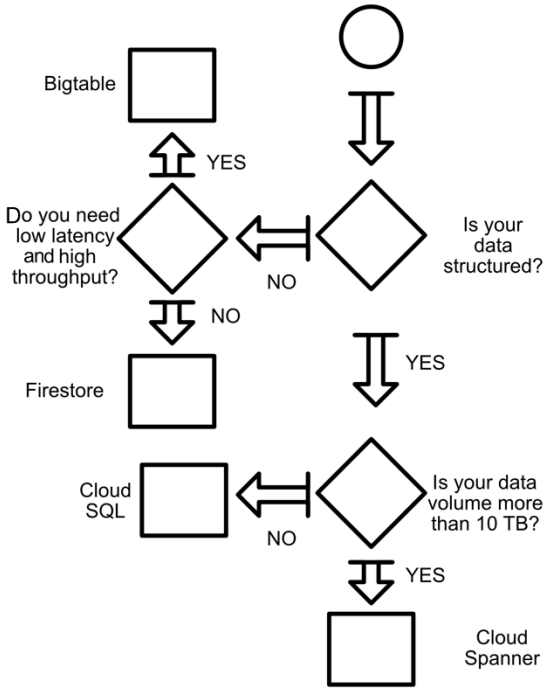

Firestore
Data
Indexes
Import/Export
Usage
Security Rules
Indexes
COMPOSITE
SINGLE FIELD
Database location: nam5 (us-central)
Composite indexes support queries that match across multiple fields by indexing combinations of fields in a collection. Learn more
Composite indexes
+ CREATE INDEX
Filter
Filter
Collection ID
Fields
Query scope
myCollection
myField: ASC
myFieldTwo: ASC
Collection

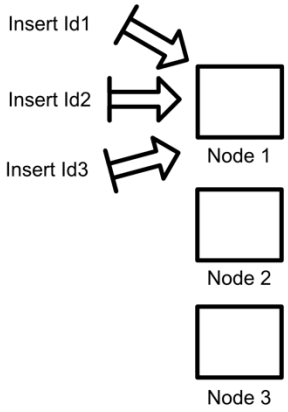

Firestore
Data
Indexes
Import/Export
Usage
Security Rules
Import/Export
Move data between Firestore projects and GCS here, or using gcloud . Export regularly, and before major updates, to back up your data and safeguard against error. Learn more
IMPORT
EXPORT
Recent imports and exports
You'll see the most recent ongoing and completed imports and exports here.
Filter
Filter operations
Started
Type
Collection groups
Bucket
Size
Completed
You haven't moved any data recently.

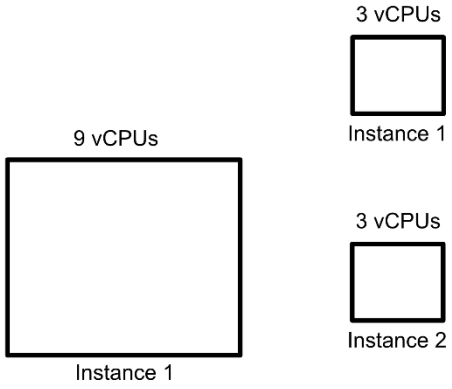

Firestore
Data
Indexes
Import/Export
Usage
Security Rules
Usage
Last refreshed Jun 17, 2021 at 12:09:40 PM GMT-4
Reads
12
First 50,000 free.
Writes
0
First 20,000 free.
Deletes
0
First 20,000 free.
Usage over time
READS
WRITES
DELETES
Reads — cumulative
All times are in Pacific Time
Current 24-hour period
20
10
UTC-7
2:00 AM
4:00 AM
6:00 AM
8:00 AM
10:00 AM
12:00 PM
2:00 PM
4:00 PM
6:00 PM
8:00 PM
10:00 PM
Jun 18

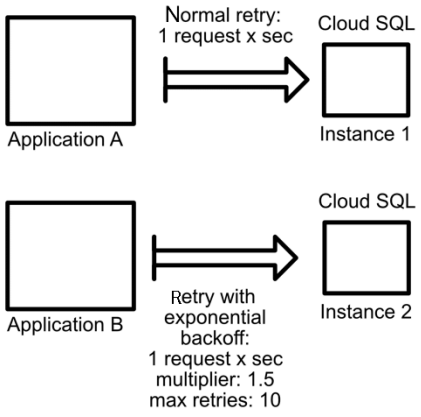

Fan in
Many to Many
Fan out
Publisher
Publisher
Publisher
Publisher
Publisher
Topic
Topic
Topic
Sub-A
Sub-B
Sub-C
Sub-D
Sub-E
Subscriber
Subscriber
Subscriber
Subscriber
Subscriber

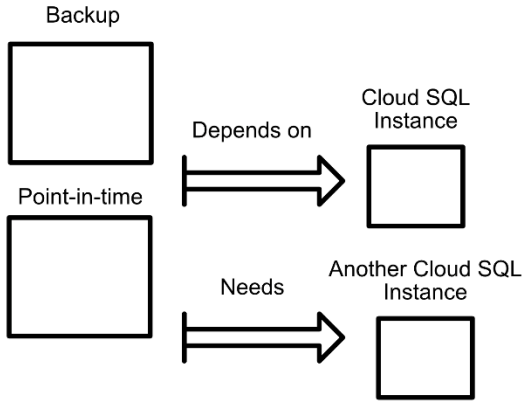
Chapter 9: Data Management and Database Strategies

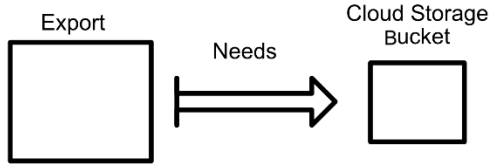


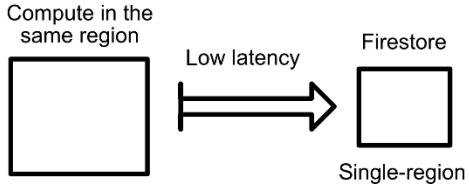



3 vCPUs
Instance 1
9 vCPUs
Instance 1
3 vCPUs
Instance 2
3 vCPUs
Instance 3


Normal retry:
1 request x sec
Cloud SQL
Instance 1
Application A
Cloud SQL
Instance 2
Application B
Retry with
exponential
backoff:
1 request x sec
multiplier: 1.5
max retries: 10

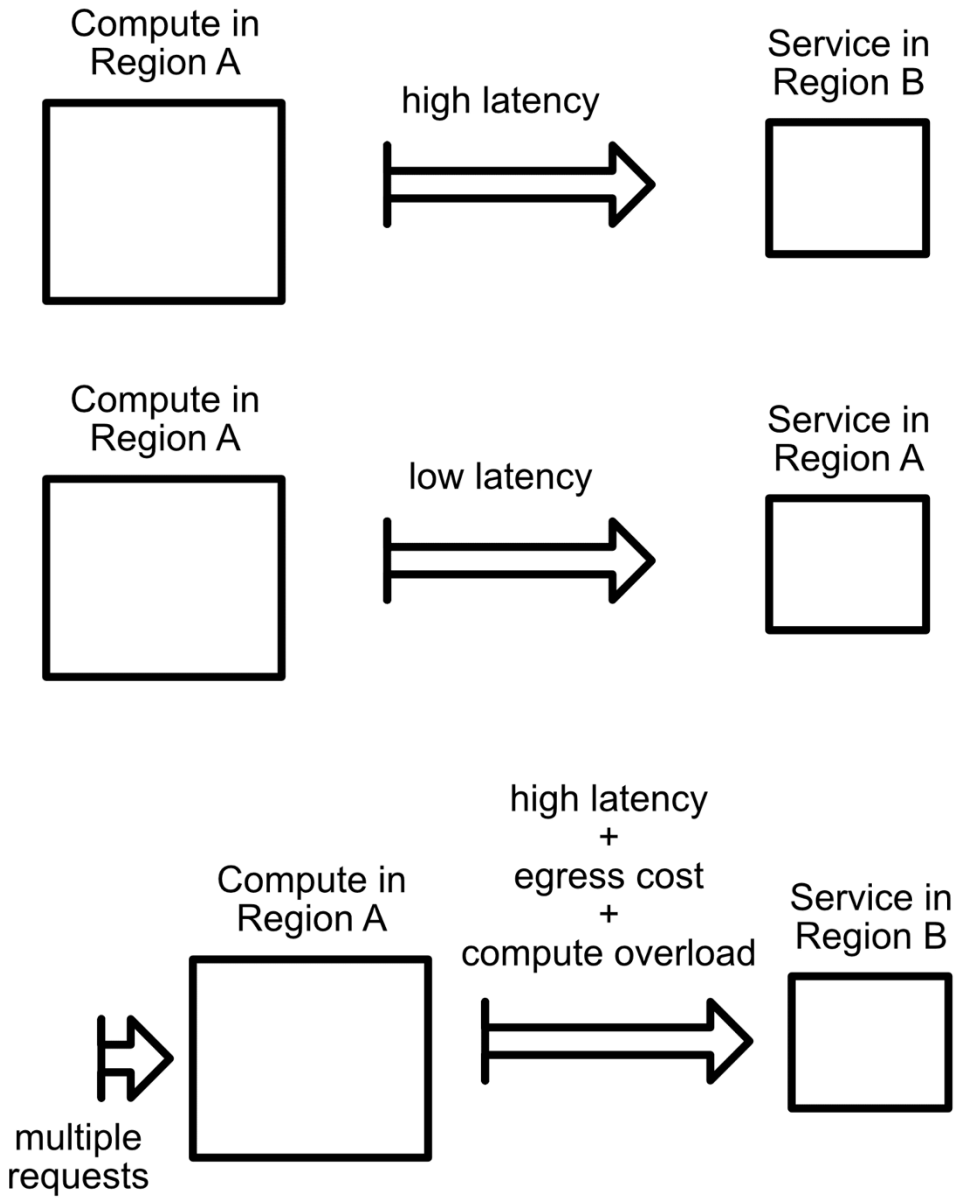

Backup
Depends on
Cloud SQL Instance
Point-in-time
Needs
Another Cloud SQL Instance

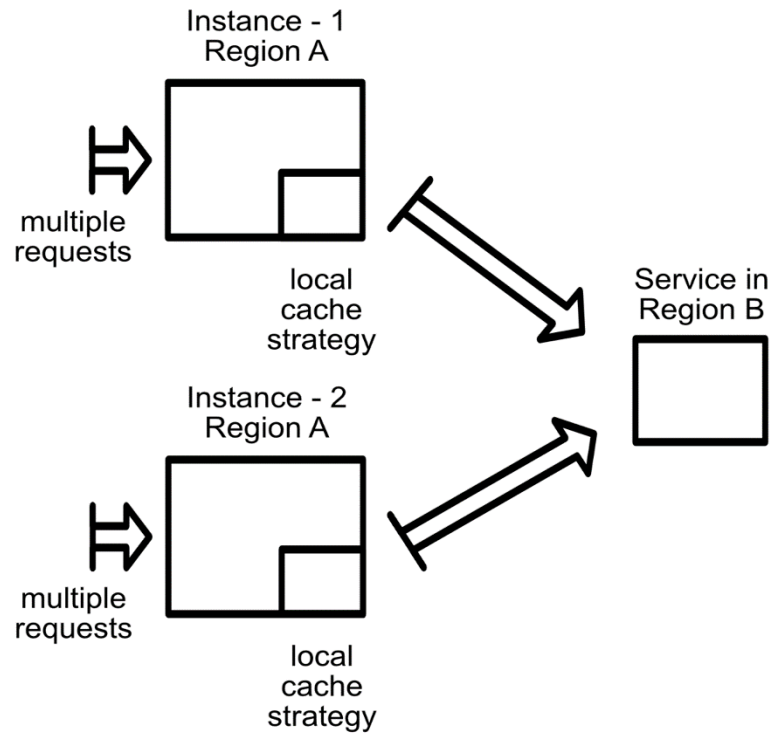

Export
Needs
Cloud Storage Bucket

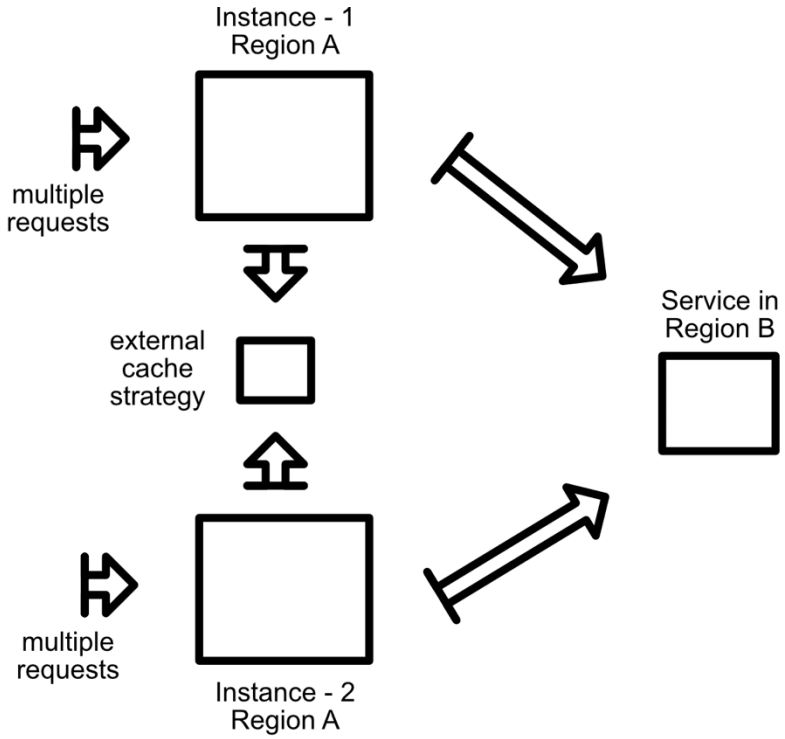

Compute in the same region
Low latency
Firestore
Single-region

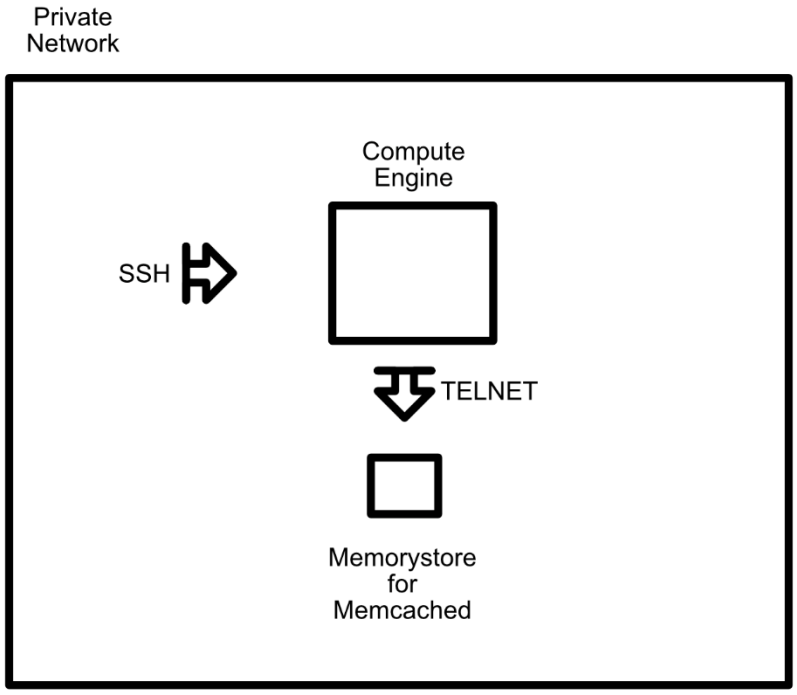
Multiple users
Multiple regions
High availability
Firestore
Multi-regional

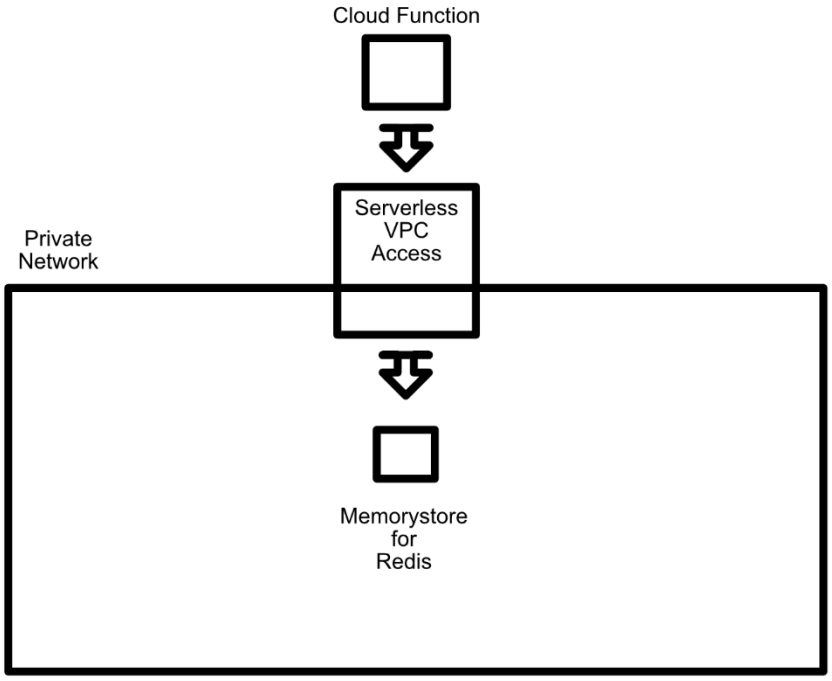
Chapter 10: Optimizing Applications with Caching Strategies on Google Cloud Platform



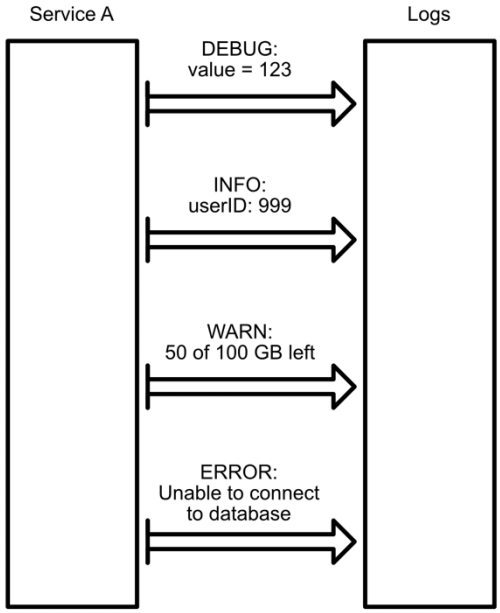

Instance - 1
Region A
multiple
requests
local
cache
strategy
Service in
Region B
Instance - 2
Region A
multiple
requests
local
cache
strategy

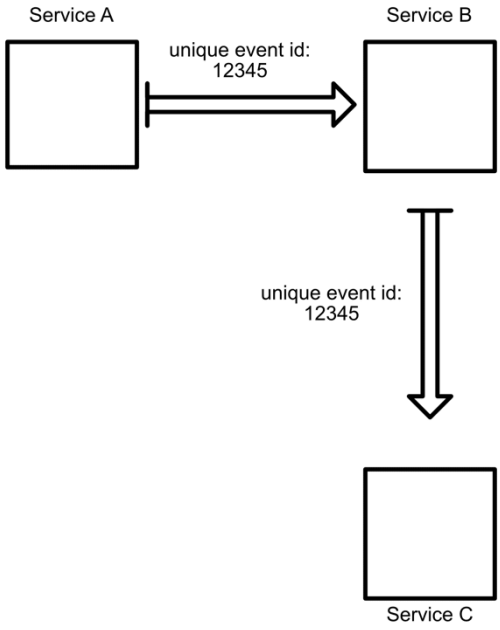

Instance - 1
Region A
multiple
requests
external
cache
strategy
Service in
Region B
multiple
requests
Instance - 2
Region A

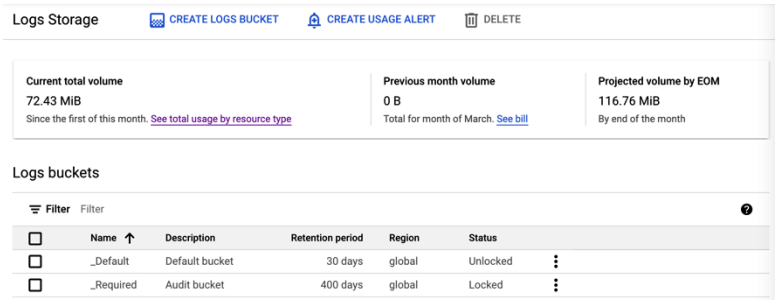

Private
Network
Compute
Engine
SSH
TELNET
Memorystore
for
Memcached

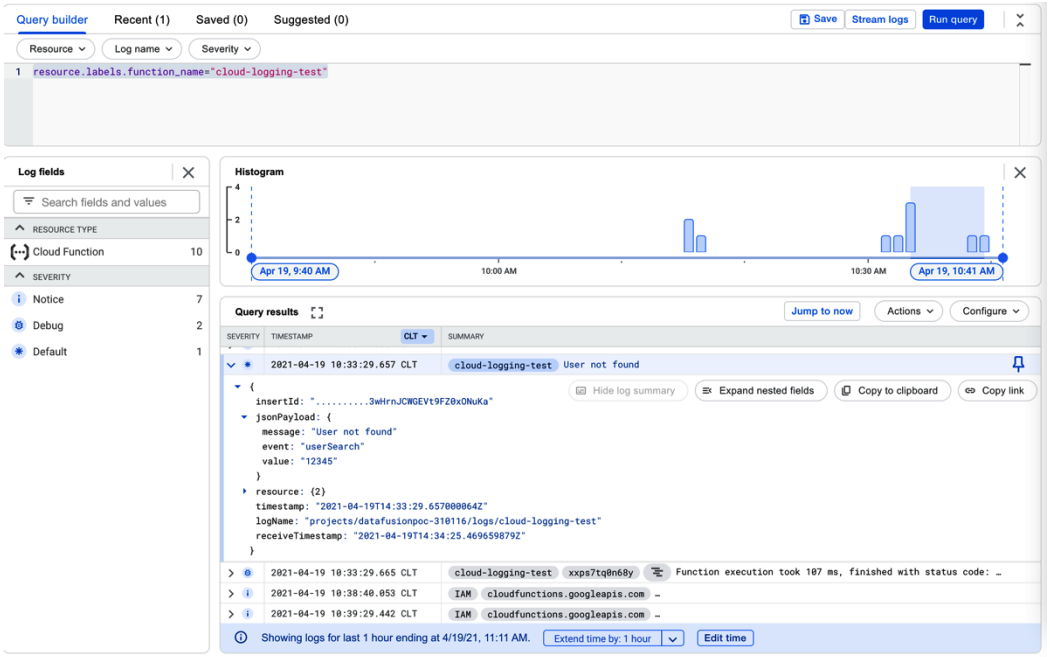

Cloud Function
Serverless
VPC
Access
Private
Network
Memorystore
for
Redis

Chapter 11: Logging on Google Cloud Platform






Logs Storage
CREATE LOGS BUCKET
CREATE USAGE ALERT
DELETE
Current total volume
72.43 MiB
Since the first of this month. See total usage by resource type
Previous month volume
0 B
Total for month of March. See bill
Projected volume by EOM
116.76 MiB
By end of the month
Logs buckets
Filter
Filter
Name
Description
Retention period
Region
Status
_Default
Default bucket
30 days
global
Unlocked
_Required
Audit bucket
400 days
global
Locked


Query builder
Recent (1)
Saved (0)
Suggested (0)
Save
Stream logs
Run query
Resource
Log name
Severity
1 resource.labels.function_name="cloud-logging-test"
Log fields
Search fields and values
RESOURCE TYPE
Cloud Function 10
SEVERITY
Notice 7
Debug 2
Default 1
Histogram
4
2
0
Apr 19, 9:40 AM
10:00 AM
10:30 AM
Apr 19, 10:41 AM
Query results
Jump to now
Actions
Configure
SEVERITY
TIMESTAMP
CLT
SUMMARY
2021-04-19 10:33:29.657 CLT
cloud-logging-test
User not found
Hide log summary
Expand nested fields
Copy to clipboard
Copy link
{
insertId: ".....3wHrnJCWGEVt9FZ0xONuKa"
jsonPayload: {
message: "User not found"
event: "userSearch"
value: "12345"
}
resource: {2}
timestamp: "2021-04-19T14:33:29.657000064Z"
logName: "projects/datafusionpoc-310116/logs/cloud-logging-test"
receiveTimestamp: "2021-04-19T14:34:25.469659879Z"
}
2021-04-19 10:33:29.665 CLT
cloud-logging-test
xxps7tq0n68y
Function execution took 107 ms, finished with status code: …
2021-04-19 10:38:40.053 CLT
IAM
cloudfunctions.googleapis.com
2021-04-19 10:39:29.442 CLT
IAM
cloudfunctions.googleapis.com
Showing logs for last 1 hour ending at 4/19/21, 11:11 AM.
Extend time by: 1 hour
Edit time

Messages

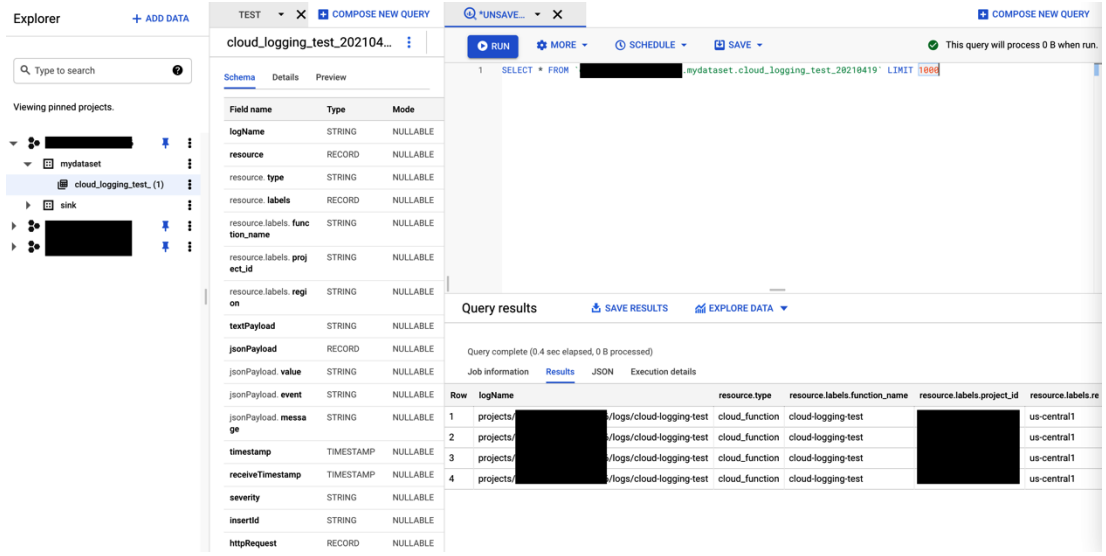
Click **Pull** to view messages and temporarily delay message delivery to other subscribers.
Select **Enable ACK messages** and then click **ACK** next to the message to permanently prevent message delivery to other subscribers. Only a few messages will be pulled at a time. Click Pull again to retrieve more messages from the backlog. Use this option cautiously in production environments. If you miss the acknowledgement deadline (10 seconds), the message will be sent again if no other subscribers of this subscription acknowledged the message. Learn more

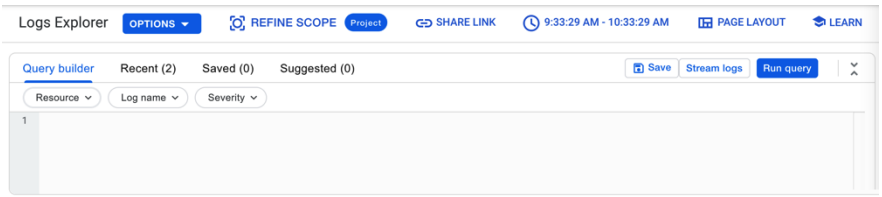
PULL Enable ack messages

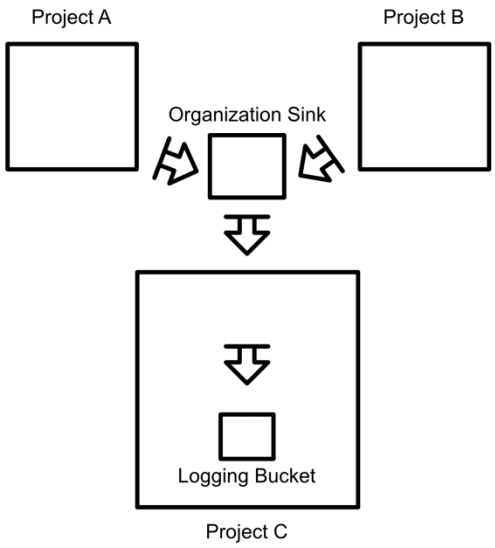
Filter Filter messages

Publish time	Attribute keys	Message body	Ack
Apr 19, 2021, 12:52:51 PM	logging.googleapis.com/timestamp	{"insertId":".....OLGsCiqHd1w9DXna.yRm.N","jsonPayload":	Deadline exceeded
Apr 19, 2021, 12:52:52 PM	logging.googleapis.com/timestamp	{"insertId":".....WLGsCiqHd1w9DXna.yRm.N","jsonPayload"	Deadline exceeded
Apr 19, 2021, 12:52:55 PM	logging.googleapis.com/timestamp	{"insertId":"000000-1417c937-c6a7-4a82-a54c-72184d16662	Deadline exceeded
Apr 19, 2021, 12:52:55 PM	logging.googleapis.com/timestamp	{"insertId":"000000-d83ccdce-1912-4e80-940e-e682cc14a62	Deadline exceeded
Apr 19, 2021, 12:52:55 PM	logging.googleapis.com/timestamp	{"insertId":"000000-e300dc6f-3c2f-4cd9-8ef3-58b1b71cc136	Deadline exceeded
Apr 19, 2021, 12:52:55 PM	logging.googleapis.com/timestamp	{"insertId":"000000-de1fb446-e8bd-491e-9718-ef2cc5eedf90"	Deadline exceeded
Apr 19, 2021, 12:52:55 PM	logging.googleapis.com/timestamp	{"insertId":"000000-cbbce78a-3e14-4c44-9f34-ff58cc4f943e"	Deadline exceeded
Apr 19, 2021, 12:52:55 PM	logging.googleapis.com/timestamp	{"insertId":"000000-1ee6df9f-87b7-4c0e-a647-ee36ec21eb53	Deadline exceeded
Apr 19, 2021, 12:52:55 PM	logging.googleapis.com/timestamp	{"insertId":"000000-7e290973-5422-4f65-992d-0072213d017	Deadline exceeded
Apr 19, 2021, 12:52:55 PM	logging.googleapis.com/timestamp	{"insertId":"000000-ca0696ca-f763-42e8-9a9b-7cb404d14f8b	Deadline exceeded
Apr 19, 2021, 12:52:55 PM	logging.googleapis.com/timestamp	{"insertId":"000000-119e0f32-17b0-4a8c-acdd-d6e8d590454	Deadline exceeded
Apr 19, 2021, 12:52:55 PM	logging.googleapis.com/timestamp	{"insertId":"000000-c2e5585e-e707-48f2-876a-3a909287bf98	Deadline exceeded
Apr 19, 2021, 12:52:55 PM	logging.googleapis.com/timestamp	{"insertId":"000000-0058287b-d5e9-427e-84f0-d0797bcbdb7	Deadline exceeded
Apr 19, 2021, 12:52:55 PM	logging.googleapis.com/timestamp	{"insertId":"000000-76b8b1cf-a05a-4b72-b1a6-ffd6deca4c68	Deadline exceeded
Apr 19, 2021, 12:52:55 PM	logging.googleapis.com/timestamp	{"insertId":"000000-38336e86-3ff2-475d-89e5-a049c47aed14	Deadline exceeded
Apr 19, 2021, 12:52:55 PM	logging.googleapis.com/timestamp	{"insertId":"000000-3301be20-24bb-4df4-acd2-e6b438007c3	Deadline exceeded
Apr 19, 2021, 12:52:55 PM	logging.googleapis.com/timestamp	{"insertId":"000000-a6f49f9d-c565-4387-8ed8-3046464f5189	Deadline exceeded
Apr 19, 2021, 12:52:55 PM	logging.googleapis.com/timestamp	{"insertId":"000000-481b75a4-0723-4fa4-bdf9-49de791f6feb	Deadline exceeded

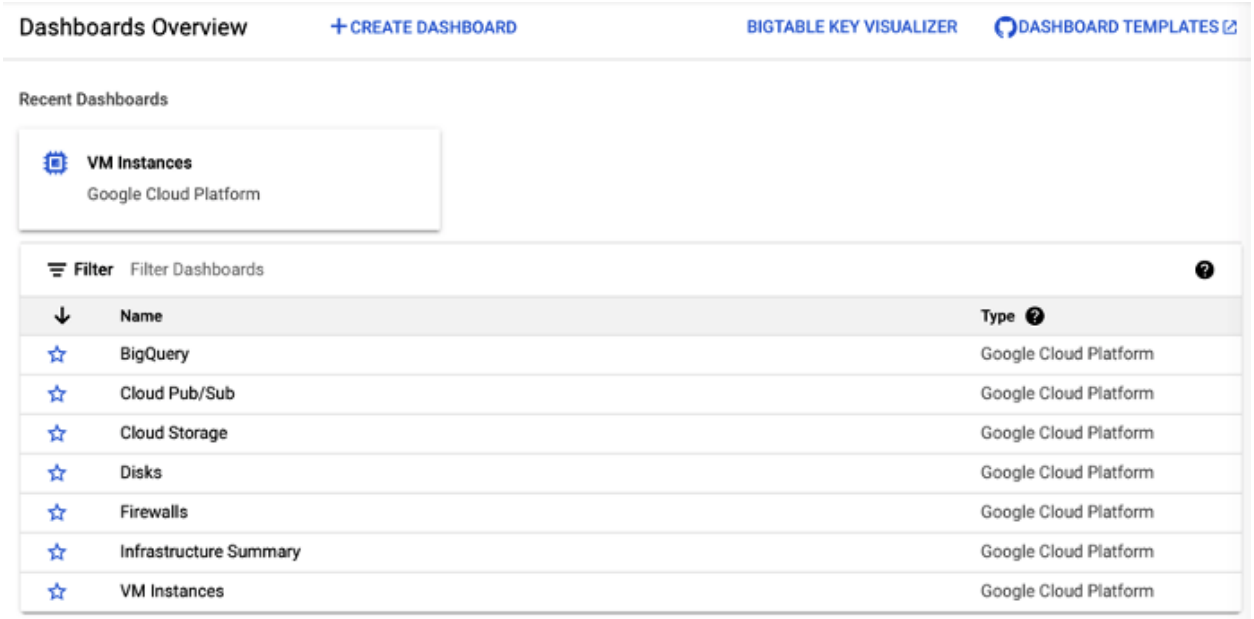
CLOSE

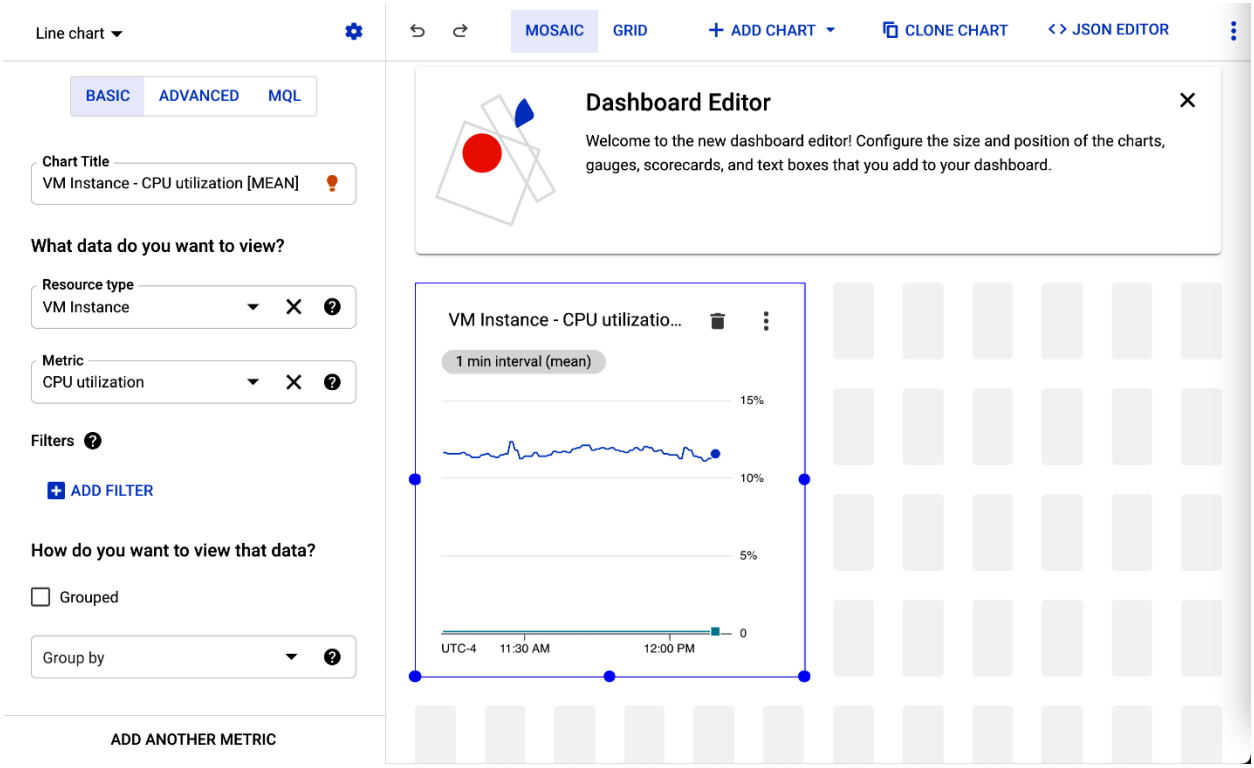


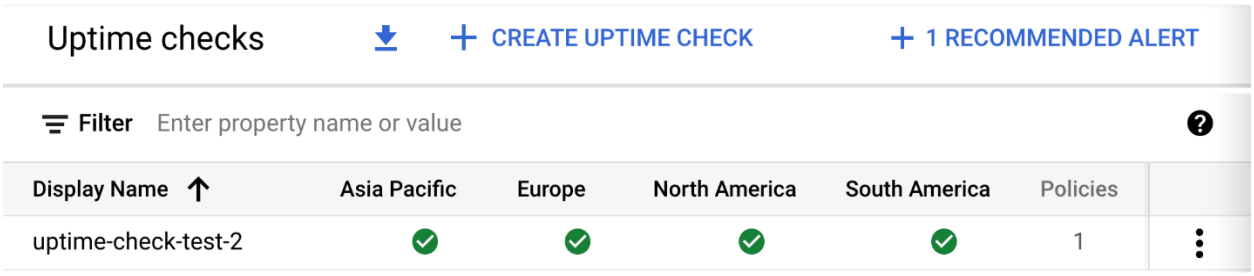

Logs Explorer
OPTIONS
REFINE SCOPE
Project
SHARE LINK
9:33:29 AM - 10:33:29 AM
PAGE LAYOUT
LEARN
Query builder
Recent (2)
Saved (0)
Suggested (0)
Save
Stream logs
Run query
Resource
Log name
Severity
1

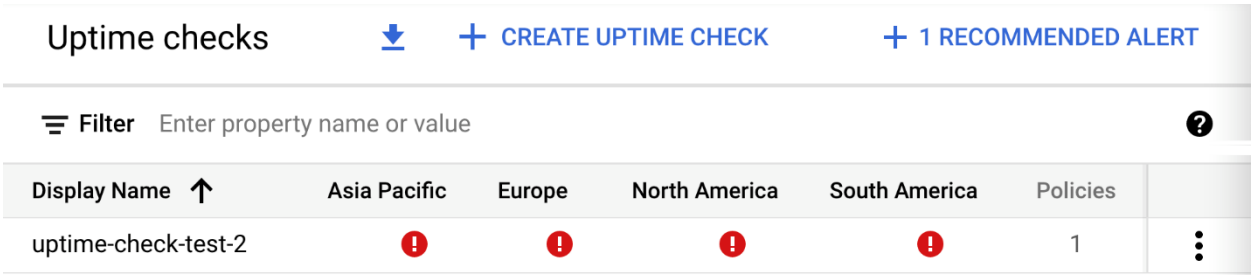

Project A
Project B
Organization Sink
Logging Bucket
Project C

Chapter 12: Cloud Monitoring, Tracing, and Debugging






Uptime checks
CREATE UPTIME CHECK
1 RECOMMENDED ALERT
Filter
Enter property name or value
Display Name
Asia Pacific
Europe
North America
South America
Policies
uptime-check-test-2
1


Uptime checks
CREATE UPTIME CHECK
1 RECOMMENDED ALERT
Filter
Enter property name or value
Display Name
Asia Pacific
Europe
North America
South America
Policies
uptime-check-test-2
1

Google Cloud

VIEW INCIDENT

Alert firing

Failure of uptime check_id uptime-check-test-2

An uptime check on test2-311919 monitoring-test is failing.

Summary

Start time
April 27, 2021 at 11:06PM UTC (43 sec ago)

Project
test2-311919

Policy
uptime-check-test-2 uptime failure

Condition
Failure of uptime check_id uptime-check-test-2

Metric
monitoring.googleapis.com/uptime_check/check_passed

Threshold
above 1

Observed
6.000

VIEW INCIDENT

Alert recovered

Failure of uptime check_id uptime-check-test-2

The uptime check for test2-311919 monitoring-test has returned to a normal state.

Summary

Start time
April 27, 2021 at 11:06PM UTC (~4 min, 30 sec ago)

Alert firing lasted
3 mins 57 secs

Project
test2-311919

Policy
uptime-check-test-2 uptime failure

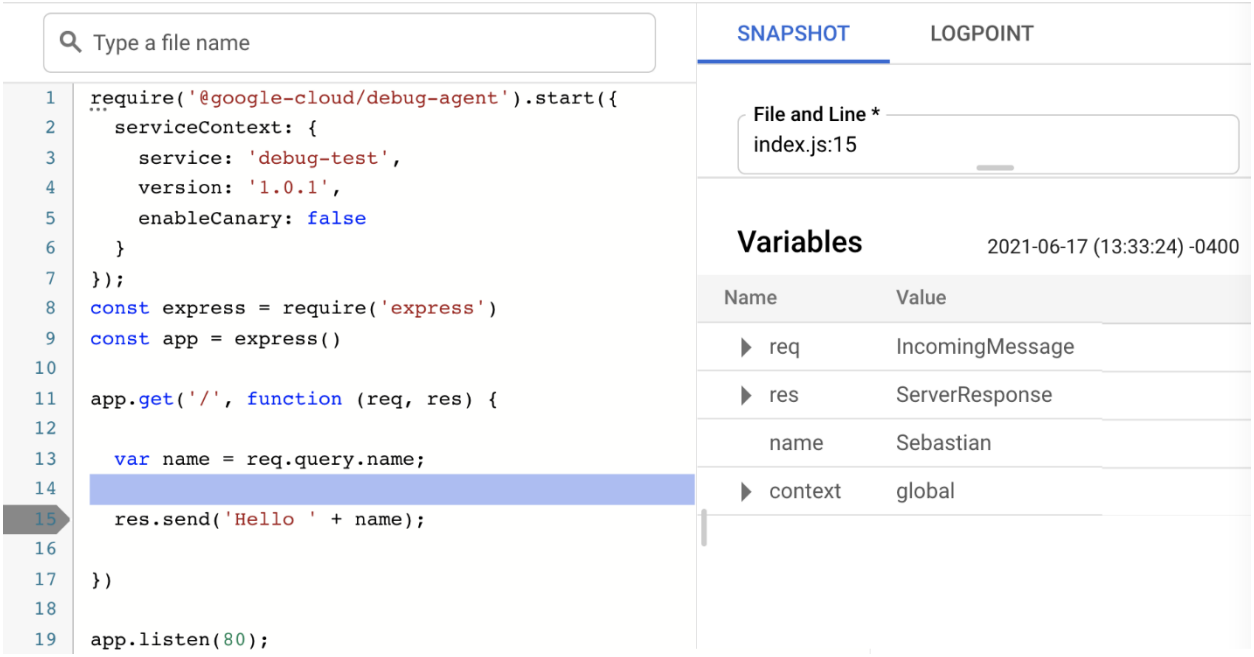
Condition
Failure of uptime check_id uptime-check-test-2

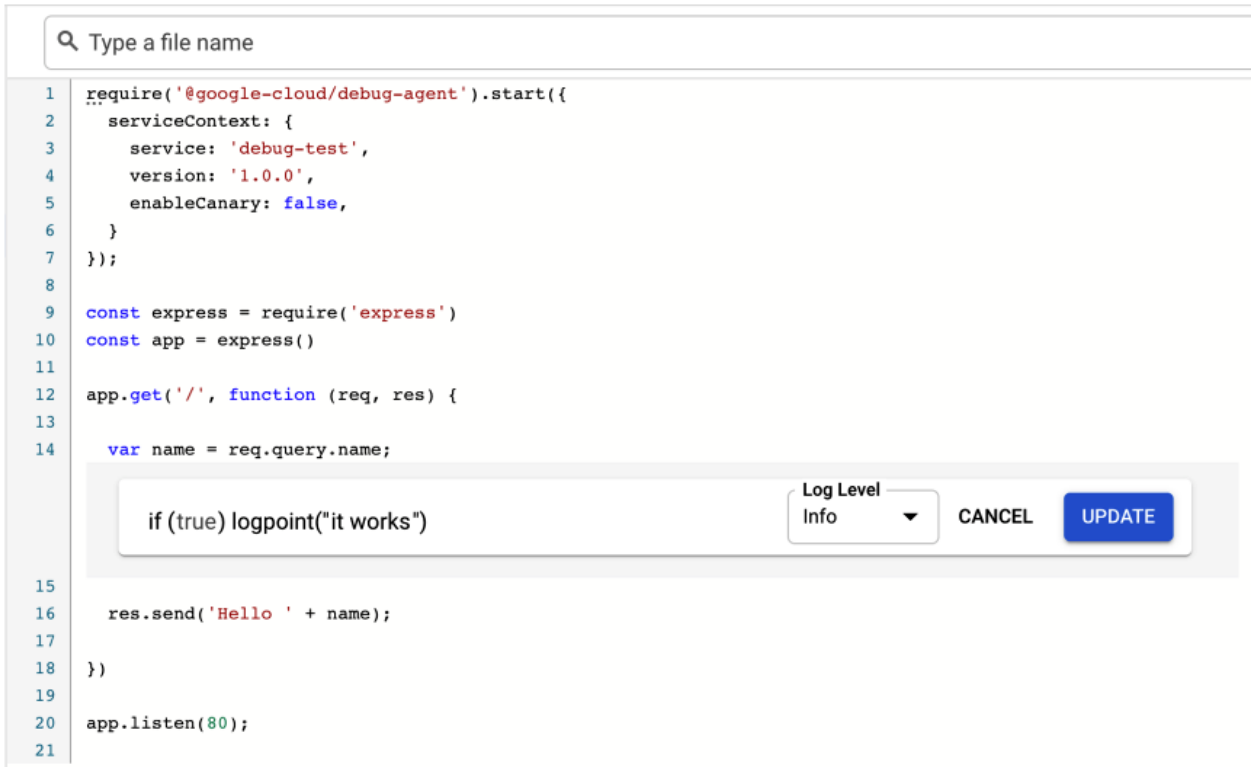
Metric
monitoring.googleapis.com/uptime_check/check_passed

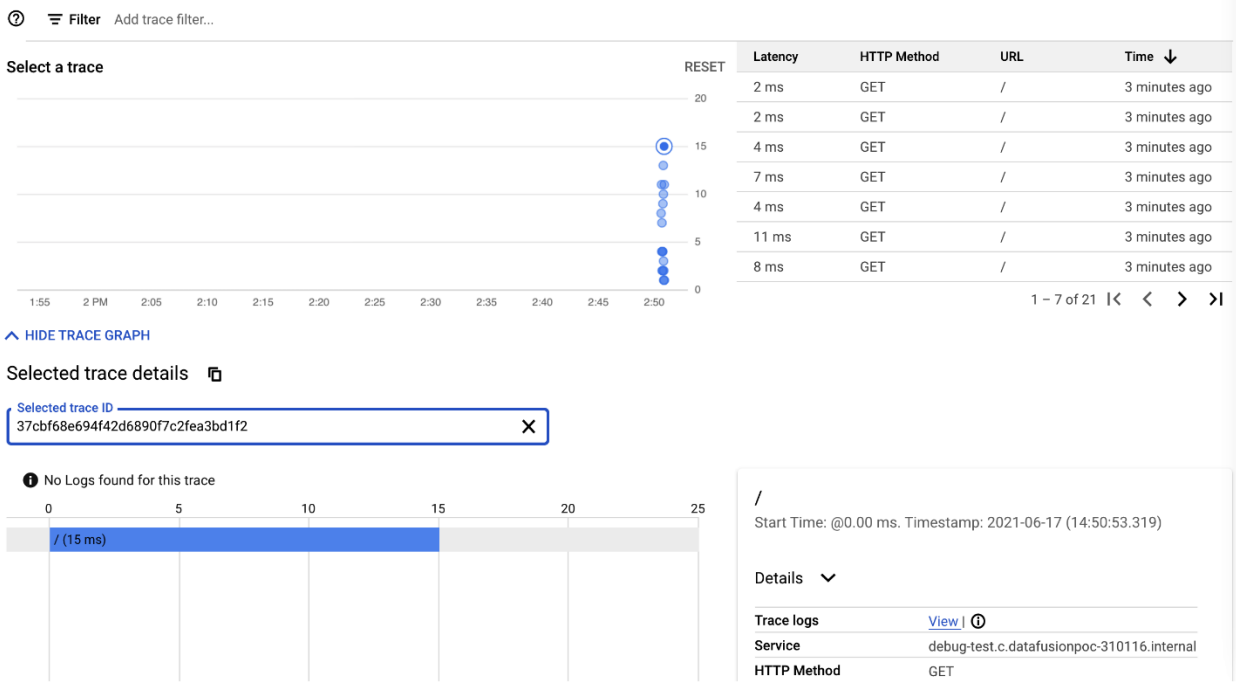
Threshold
above 1

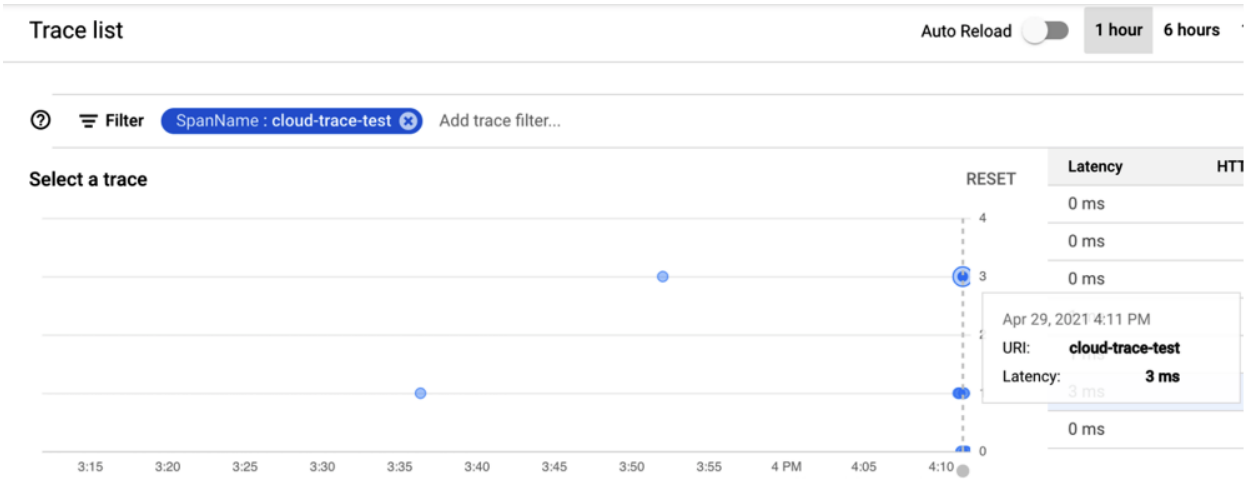
Observed
0.000

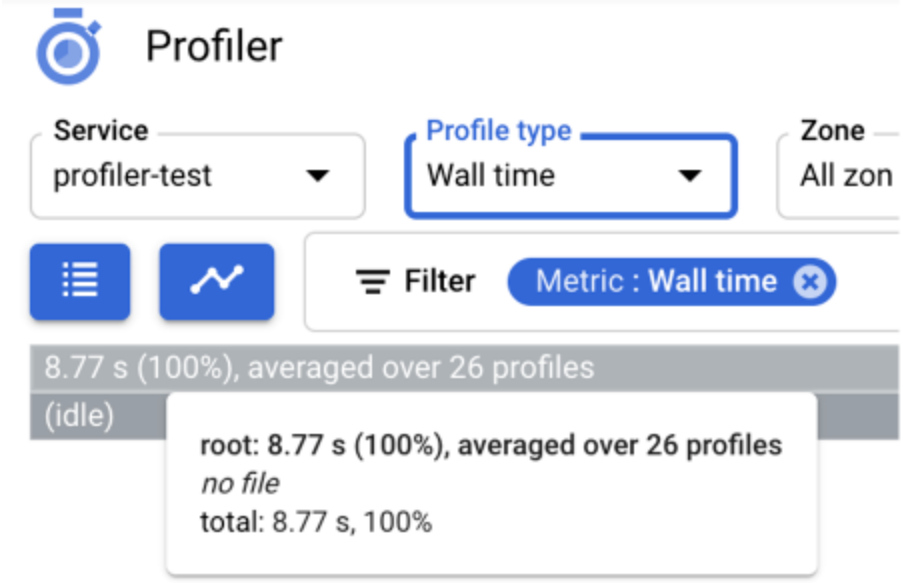
VIEW INCIDENT

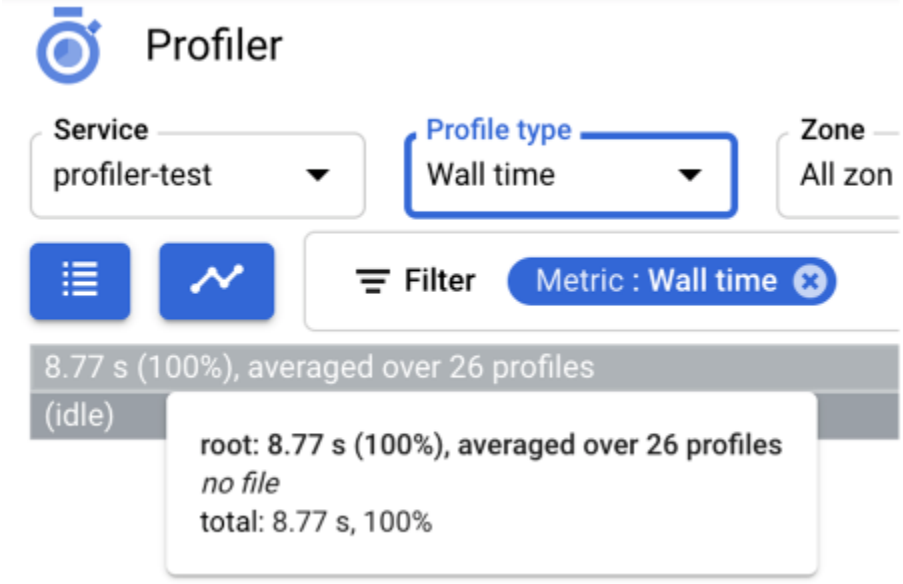

Type a file name
SNAPSHOT
LOGPOINT
File and Line *
index.js:15
Variables
2021-06-17 (13:33:24) -0400
Name
Value
req
IncomingMessage
res
ServerResponse
name
Sebastian
context
global
require('@google-cloud/debug-agent').start({
serviceContext: {
service: 'debug-test',
version: '1.0.1',
enableCanary: false
}
});
const express = require('express')
const app = express()
app.get('/', function (req, res) {
var name = req.query.name;
res.send('Hello ' + name);
})
app.listen(80);

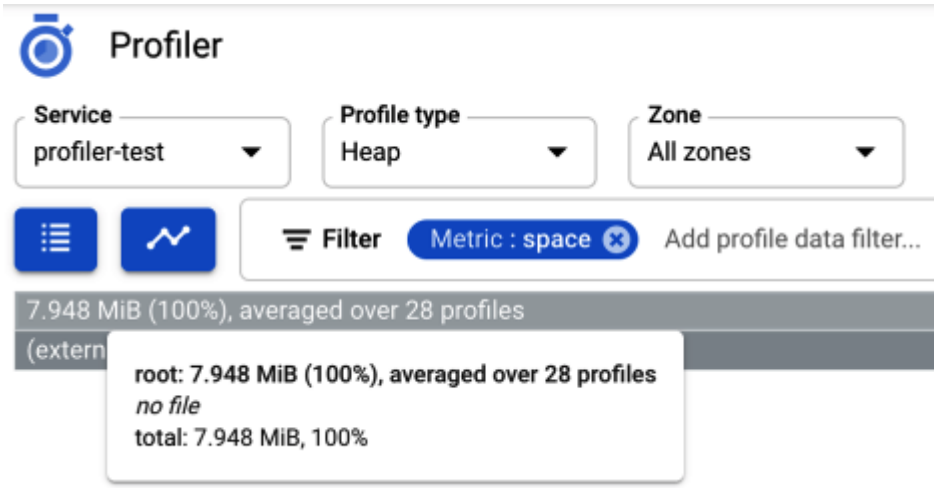

Type a file name
require('@google-cloud/debug-agent').start({
serviceContext: {
service: 'debug-test',
version: '1.0.0',
enableCanary: false,
}
});
const express = require('express')
const app = express()
app.get('/', function (req, res) {
var name = req.query.name;
if (true) logpoint("it works")
Log Level
Info
CANCEL
UPDATE
res.send('Hello ' + name);
})
app.listen(80);


Filter
Add trace filter...
Select a trace
RESET
20
15
10
5
0
1:55
2 PM
2:05
2:10
2:15
2:20
2:25
2:30
2:35
2:40
2:45
2:50
Latency
HTTP Method
URL
Time
2 ms GET / 3 minutes ago
2 ms GET / 3 minutes ago
4 ms GET / 3 minutes ago
7 ms GET / 3 minutes ago
4 ms GET / 3 minutes ago
11 ms GET / 3 minutes ago
8 ms GET / 3 minutes ago
1 – 7 of 21
HIDE TRACE GRAPH
Selected trace details
Selected trace ID
37cbf68e694f42d6890f7c2fea3bd1f2
No Logs found for this trace
0
5
10
15
20
25
/ (15 ms)
/
Start Time: @0.00 ms. Timestamp: 2021-06-17 (14:50:53.319)
Details
Trace logs
View
Service
debug-test.c.datafusionpoc-310116.internal
HTTP Method
GET

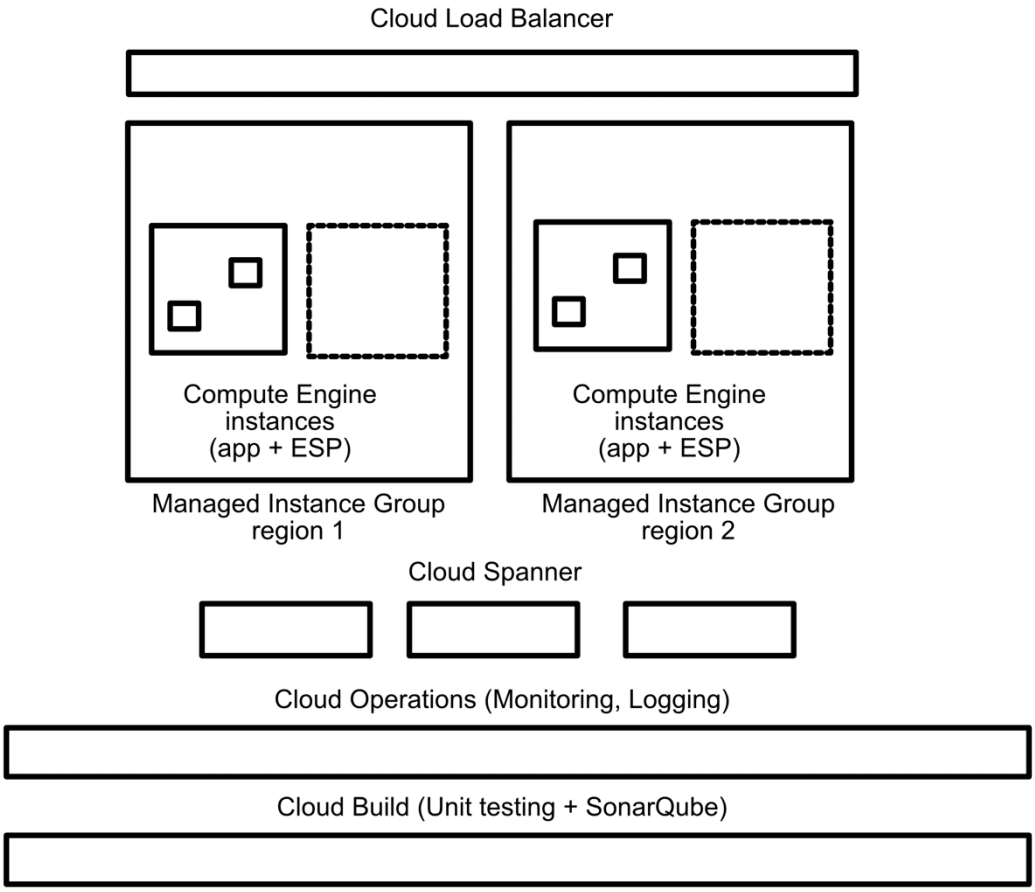

Trace list
Auto Reload
1 hour
6 hours
Filter
SpanName : cloud-trace-test
Add trace filter...
Select a trace
RESET
Latency
HTT
0 ms
0 ms
0 ms
0 ms
4
3
0
Apr 29, 2021 4:11 PM
URI:
cloud-trace-test
Latency:
3 ms
3:15
3:20
3:25
3:30
3:35
3:40
3:45
3:50
3:55
4 PM
4:05
4:10


Profiler
Service
profiler-test
Profile type
Wall time
Zone
All zon
Filter
Metric : Wall time
8.77 s (100%), averaged over 26 profiles
(idle)
root: 8.77 s (100%), averaged over 26 profiles
no file
total: 8.77 s, 100%


Profiler
Service
profiler-test
Profile type
Wall time
Zone
All zon
Filter
Metric : Wall time
8.77 s (100%), averaged over 26 profiles
(idle)
root: 8.77 s (100%), averaged over 26 profiles
no file
total: 8.77 s, 100%


Profiler
Service
profiler-test
Profile type
Heap
Zone
All zones
Filter
Metric : space
Add profile data filter...
7.948 MiB (100%), averaged over 28 profiles
(extern
root: 7.948 MiB (100%), averaged over 28 profiles
no file
total: 7.948 MiB, 100%

Chapter 13: HipLocal Sample Case Study Preparation



Chapter 14: Questions and Answers

No Images