

Introduction to Google Cloud Platform

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Agenda

1. Introduction GCP
2. Identity and Access Management
3. Compute Engine
4. Networking
5. Monitoring and Logging

Introduction Google Cloud Platform

- Cloud Computing platform
- Wide range of services
- On-demand
- Global scale
- Self-service

Region and Zones



Image <https://cloud.google.com/blog/topics/inside-google-cloud/expanding-our-global-infrastructure-new-regions-and-subsea-cables>

Edge Nodes



Images <https://peering.google.com/#/infrastructure>

Available Services

- Computing and hosting
- Storage
- Networking
- Big data
- Machine learning

GCP - Computing and Hosting

Cloud Functions, Cloud Run -> Serverless

App Engine -> PaaS

Kubernetes Engine -> CaaS

Compute Engine -> IaaS

GCP - Storage

Persistent Disk

-> Block Device

Cloud Storage

-> Blob store

Cloud FireStore, BigTable

-> NoSQL

Cloud SQL, Cloud Spanner

-> SQL

BiqQuery

-> IaaS

GCP - networking

- | | |
|------------------------------|------------------------------|
| Google Virtual Private Cloud | -> Virtual Private Network |
| Cloud Load Balancer | -> network load balancing |
| Cloud DNS | -> Domain Name Service |
| Cloud VPN and Interconnect | -> hybrid cloud connectivity |
| Google Cloud CDN | -> Content Delivery Network |

GCP - big data

Cloud Pub/Sub

-> asynchronous messaging

Cloud Dataflow

-> data transformation (Apache Beam)

Cloud Dataproc

-> data analytics (Spark/Hadoop)

Cloud Datalab

-> data visualization

GCP - machine learning

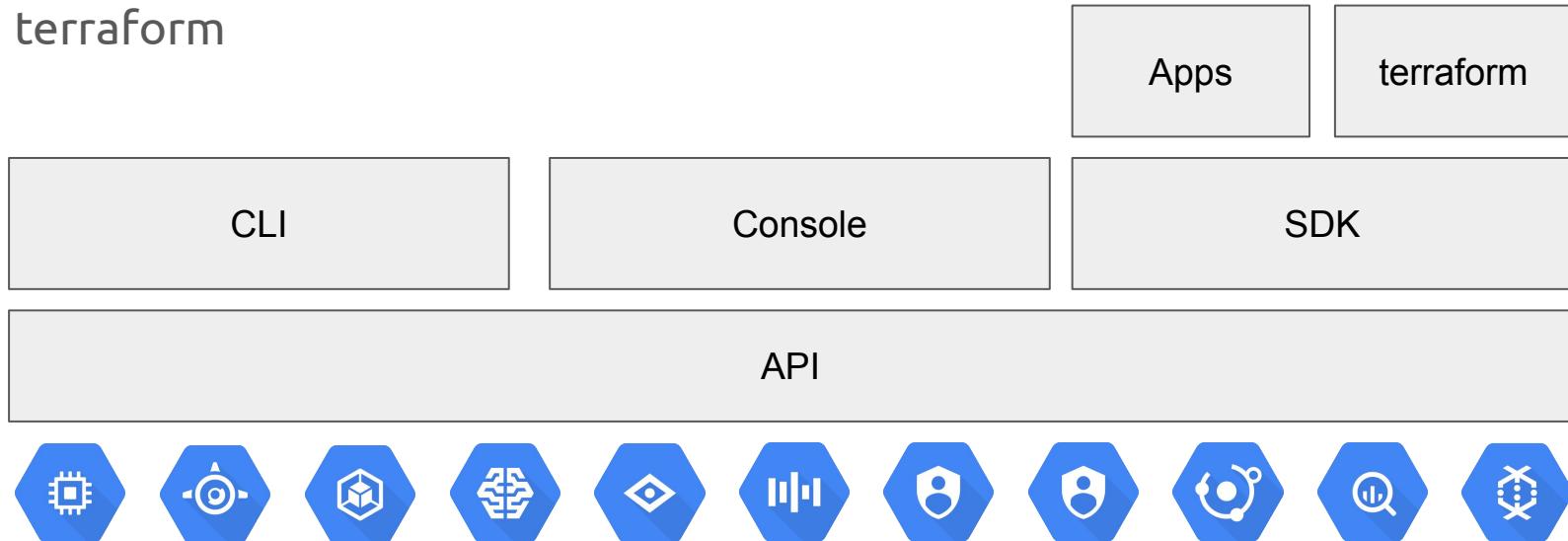
Cloud AutoML -> train ML models

Cloud ML Engine -> build and deploy ML models

ML models -> Vision, Translation, Speech to Text,
 Natural language, Video

Accessing Services

- Console
- Command Line Interface
- REST API
- terraform



Console

Google Cloud Platform mvanholsteijn

Home

Cloud Functions

Compute Engine >

App Engine >

SQL

VPC network >

PRODUCTS ▾

COMPUTE

App Engine >

Compute Engine >

Kubernetes Engine >

Cloud Functions >

Cloud Run >

STORAGE

Bigtable

Datastore >

Firebase

Filestore

Storage >

Compute Engine

CPU (%)

No data is available for the selected time frame.

15:15 15:30 15:45

Go to Compute Engine

API APIs

Requests (requests/sec)

3.0

mvanholsteijn\$ gcloud compute instances create myinstance --zone europe-west4-a
compute/v1/projects/mvanholsteijn/zones/europe-west4-a/instances/myinstance].
TYPE PREEMPTIBLE INTERNAL_IP EXTERNAL_IP STATUS
ard-1 10.164.0.2 34.90.62.26 RUNNING

Entities

Dashboard

Indexes

Admin

Command Line Interface - gcloud



Available commands for gcloud:

AI and Machine Learning

ai-platform	Manage AI Platform jobs and models.
ml	Use Google Cloud machine learning capabilities.
ml-engine	Manage AI Platform jobs and models.

API Platform and Ecosystems

endpoints	Create, enable and manage API services.
service-management	Create, enable and manage API services.
services	List, enable and disable APIs and services.

Compute

app
compute

container

functions

Data Analytics

composer
dataflow
dataproc

pubsub

Available commands for gcloud compute:

Disks

disk-types	Read Google Compute Engine virtual disk types.
disks	Read and manipulate Google Compute Engine disks.

Info

accelerator-types	Read Google Compute Engine accelerator types.
machine-types	Read Google Compute Engine virtual machine types.
operations	Read and manipulate Google Compute Engine operations.
regions	List Google Compute Engine regions.

Available commands for gcloud compute instances:

add-access-config

Create a Google Compute Engine virtual machine access configuration.

add-iam-policy-binding

Add IAM policy binding to a Google Compute Engine instance.

add-labels

Add labels to Google Compute Engine virtual machine instances.

add-metadata

Add or update instance metadata.

add-tags

Add tags to Google Compute Engine virtual machine instances.

attach-disk

Attach a disk to an instance.

create

Create Google Compute Engine virtual machine instances.

REST API

Compute Engine
Product overview
Documentation

Quickstarts
All quickstarts
Using a Linux VM
Using a Windows VM

How-to guides
All how-to guides
Creating VM instances
Managing access to VM instances
Connecting to VM instances
Adding storage
Creating and managing instance templates
Creating and managing custom images
Managing your instances
Creating and managing groups of instances
Networking
Deploying containers
Scaling your application
Monitoring activity
Labeling resources
Granting access to Compute Engine resources
Working with regions and zones
Migrating VMs to Compute Engine
Advanced VM configurations
Best practices

APIs and reference

REST Resource: v1.instances

Methods	
addAccessConfig	POST <code>/compute/v1/projects/{project}/zones/{zone}/instances/{instance}/accessConfig</code> Adds an access config to an instance's network interface.
aggregatedList	GET <code>/compute/v1/projects/{project}/aggregatedInstances</code> Retrieves aggregated list of all of the instances in your project.
attachDisk	POST <code>/compute/v1/projects/{project}/zones/{zone}/instances/{instance}/attachDisk</code> Attaches an existing Disk resource to an instance.
delete	DELETE <code>/compute/v1/projects/{project}/zones/{zone}/instances/{instance}</code> Deletes the specified Instance resource.
deleteAccessConfig	POST <code>/compute/v1/projects/{project}/zones/{zone}/instances/{instance}/accessConfig</code> Deletes an access config from an instance's network interface.
detachDisk	POST <code>/compute/v1/projects/{project}/zones/{zone}/instances/{instance}/detachDisk</code> Detaches a disk from an instance.
get	GET <code>/compute/v1/projects/{project}/zones/{zone}/instances/{instance}</code> Returns the specified Instance resource.
getIamPolicy	GET <code>/compute/v1/projects/{project}/zones/{zone}/instances/{instance}/iamPolicy</code> Gets the access control policy for a resource.

Equivalent REST request

This is the REST request with the parameters that you have selected.

```
POST https://www.googleapis.com/compute/v1/projects/mvanholsteijn/zones/us-central1-a/instances
{
  "kind": "compute#instance",
  "name": "instance-1",
  "zone": "projects/mvanholsteijn/zones/us-central1-a",
  "machineType": "projects/mvanholsteijn/zones/us-central1-a/machineTypes/n1-standard-1",
  "displayDevice": {
    "enableDisplay": false
  },
  "metadata": {
    "kind": "compute#metadata",
    "items": []
  },
  "tags": {
    "items": []
  },
  "disks": [
    {
      "kind": "compute#attachedDisk",
      "type": "PERSISTENT",
      "boot": true,
      "mode": "READ_WRITE",
      "autoDelete": true,
      "deviceName": "instance-1",
      "initializeParams": {}
    }
  ]
}
```

Line wrapping

[REST API reference](#)

Terraform



Terraform

Intro Learn Docs ▾ Community Enterprise [Download](#) [GitHub](#)

google_compute_instance

EXPAND ALL

FILTER

JUMP TO SECTION ▾

- All Providers
- ✓ Google Provider
 - Provider Info
 - Provider Configuration Reference
 - Google Provider Versions
 - Getting Started Guide
 - 2.0.0 Upgrade Guide

✓ Google Cloud Platform Data Sources

Get information about a VM instance resource within GCE. For more information see [the official documentation](#) and [API](#).

Example Usage

```
data "google_compute_instance" "appserver" {  
    name = "primary-application-server"  
    zone = "us-central1-a"  
}
```

Projects

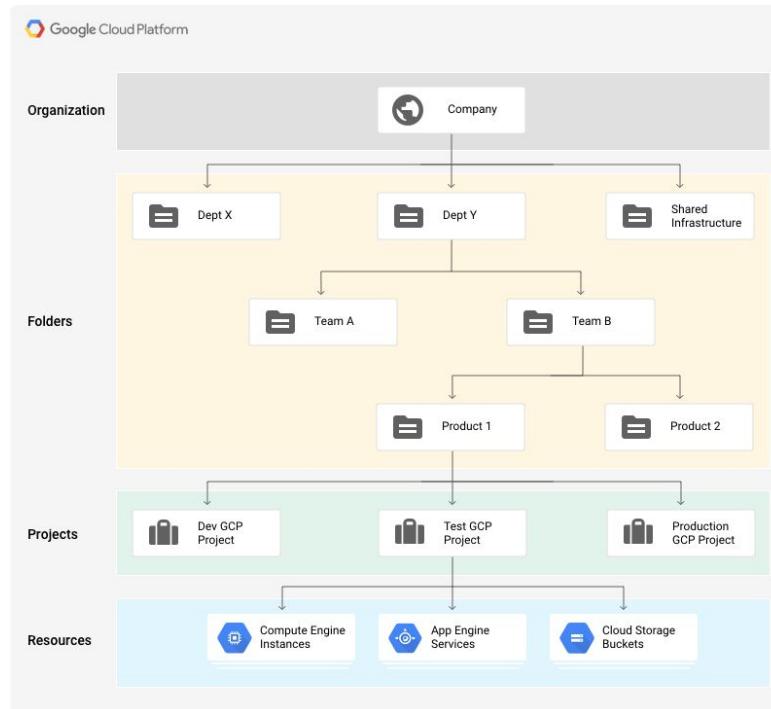


Image <https://cloud.google.com/resource-manager/img/cloud-folders-hierarchy.png>



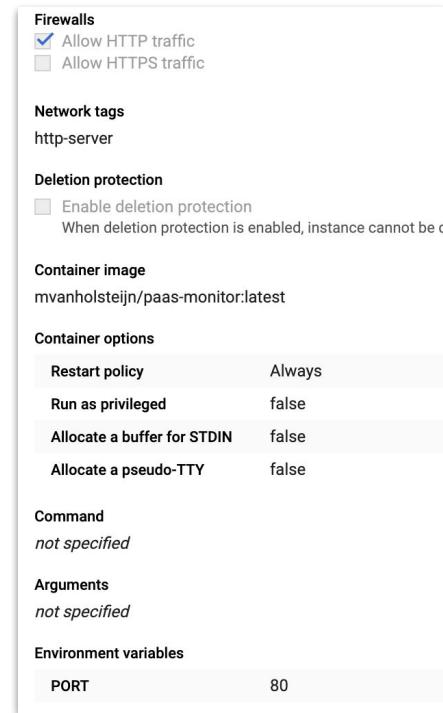
Demonstration - Create a virtual machine



Exercise - Account setup / 10 minutes

1) Create a virtual machine in your project.

- Start a container image
mvanholsteijn/paas-monitor:latest
- Set the environment variable PORT to 80
- Allow HTTP traffic

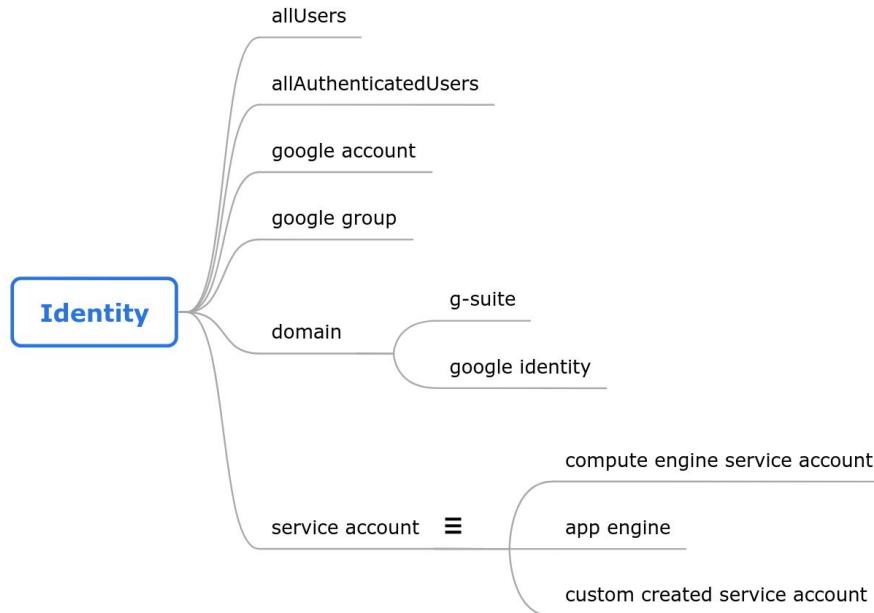


Identity And Access Management

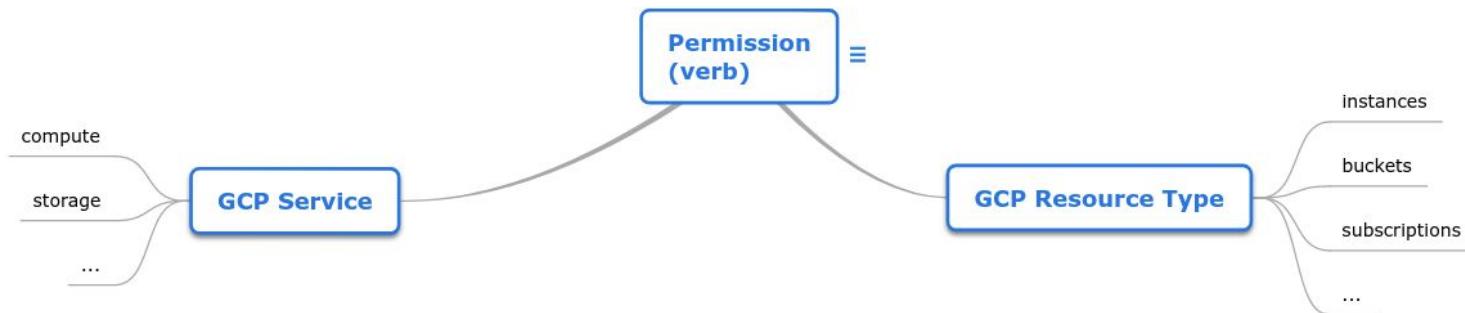
Identities, permissions, roles
policies and bindings



Identities



Permissions



`<service>.<resource-type>.<verb>`

Permissions

Storage Legacy Bucket Owner

+ EDIT ROLE

 CREATE FROM ROLE

ID

roles/storage.legacyBucketOwner

Role launch stage

General Availability

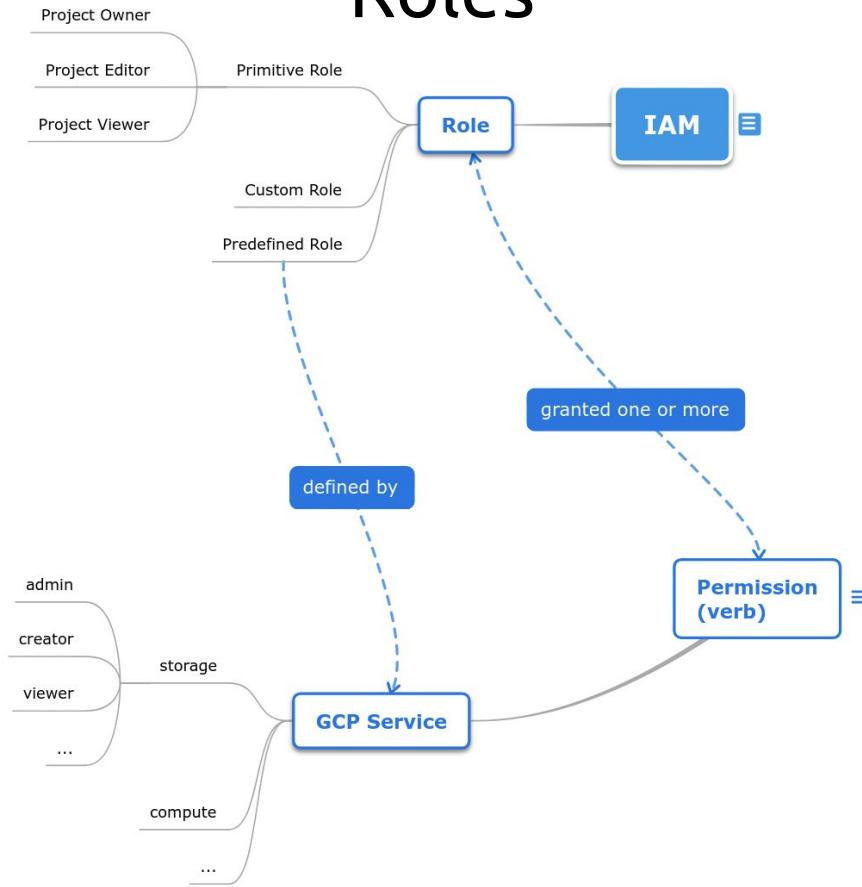
Description

Read and write access to existing buckets with object listing/creation/deletion.

7 assigned permissions

- storage.buckets.get
- storage.buckets.getIamPolicy
- storage.buckets.setIamPolicy
- storage.buckets.update
- storage.objects.create
- storage.objects.delete
- storage.objects.list

Roles



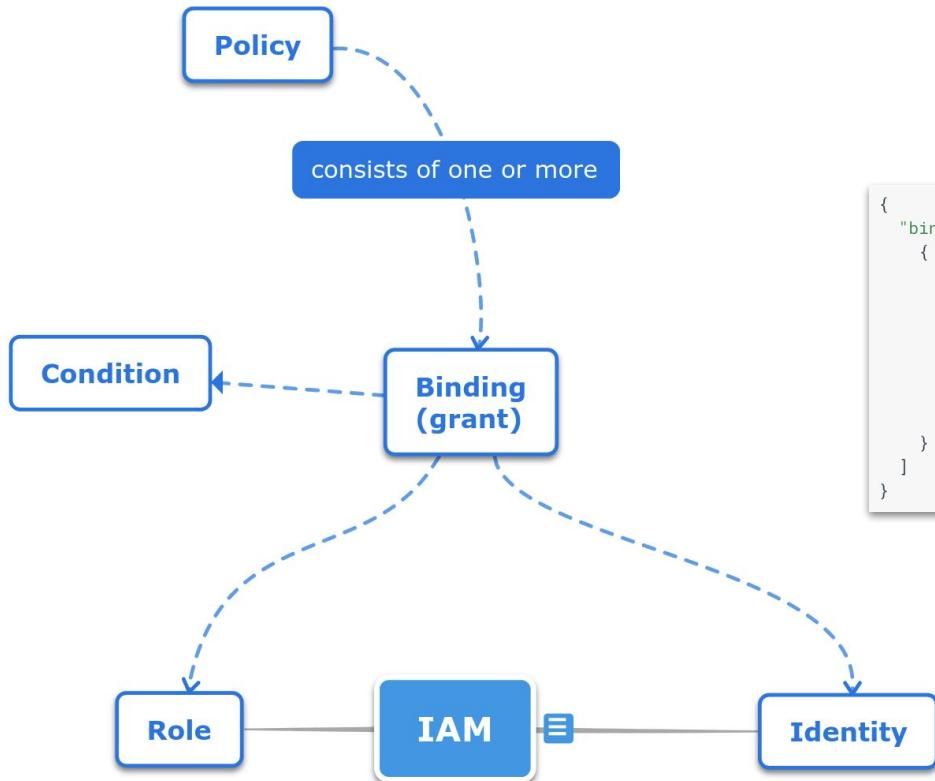
Roles

Compute Engine (15) Filter table

Type	Title	Used in	Status	⋮
<input type="checkbox"/>	Compute Admin	Compute Engine	Enabled	⋮
<input type="checkbox"/>	Compute Image User	Compute Engine	Enabled	⋮
<input type="checkbox"/>	Compute Instance Admin (beta)	Compute Engine	Enabled	⋮
<input type="checkbox"/>	Compute Instance Admin (v1)	Compute Engine	Enabled	⋮
<input type="checkbox"/>	Compute Load Balancer Admin	Compute Engine	Enabled	⋮
<input type="checkbox"/>	Compute Network Admin	Compute Engine	Enabled	⋮
<input type="checkbox"/>	Compute Network User	Compute Engine	Enabled	⋮
<input type="checkbox"/>	Compute Network Viewer	Compute Engine	Enabled	⋮
<input type="checkbox"/>	Compute OS Admin Login	Compute Engine	Enabled	⋮
<input type="checkbox"/>	Compute OS Login	Compute Engine	Enabled	⋮
<input type="checkbox"/>	Compute OS Login External User	Compute Engine	Enabled	⋮
<input type="checkbox"/>	Compute Security Admin	Compute Engine	Enabled	⋮
<input type="checkbox"/>	Compute Shared VPC Admin	Compute Engine	Enabled	⋮
<input type="checkbox"/>	Compute Storage Admin	Compute Engine	Enabled	⋮
<input type="checkbox"/>	Compute Viewer	Compute Engine	Enabled	⋮

Rows per page: 50 ▾ 1 – 15 of 15 < >

Policies

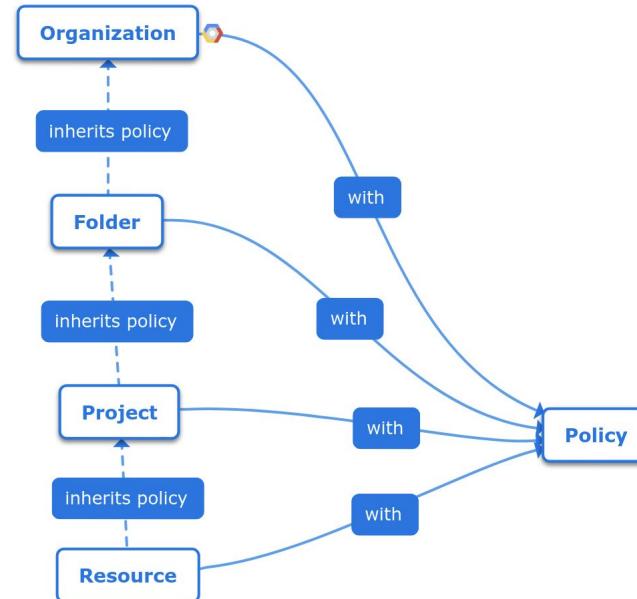
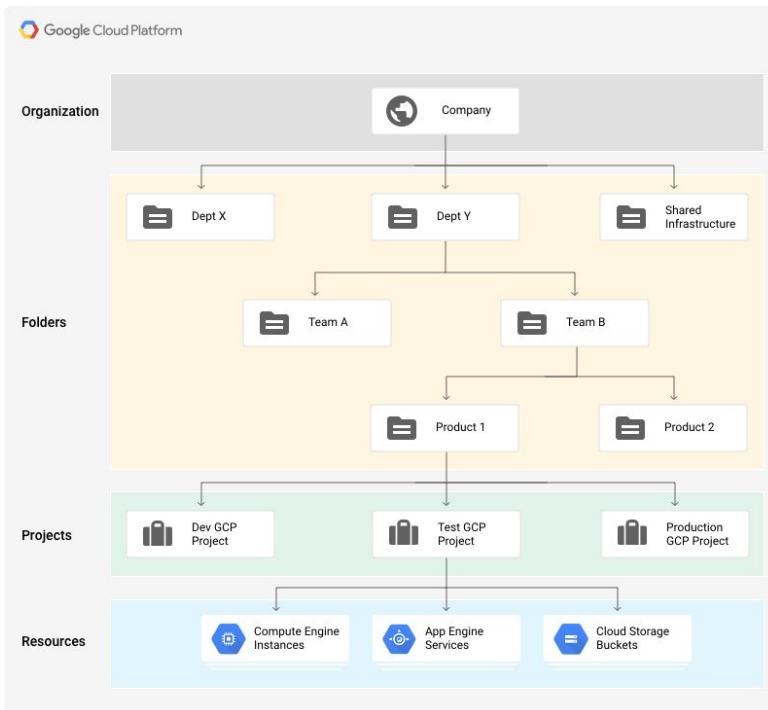


```
{  
  "bindings": [  
    {  
      "role": "roles/storage.objectViewer",  
      "members": "user:jane@example.com",  
      "condition": {  
        "title": "expires_end_of_2018",  
        "description": "Expires at midnight on 2018-12-31",  
        "expression": "request.time < timestamp(\"2019-01-01T00:00:00Z\")"  
      }  
    }  
  ]  
}
```

Policy example

```
{  
  "bindings": [  
    {  
      "members": [  
        "user:markvanholsteijn@binx.io"  
      ],  
      "role": "roles/storage.admin"  
    },  
    {  
      "members": [  
        "domain:binx.io",  
        "domain:oreilly.com",  
        "domain:xebia.com"  
      ],  
      "role": "roles/storage.objectViewer"  
    }  
    "etag": "CAU="  
  }
```

Policy attachment



The background of the image is a dramatic sky filled with dark, billowing clouds. These clouds are illuminated from below by intense orange and yellow light, resembling a sunset or fire. The light creates a bright, glowing effect at the base of the clouds, which gradually fades into the darker upper portions.

Demonstration - Granting a role



Exercise - granting a role

Grant markvanholsteijn@binx.io (or somebody else you like) the Project Viewer Role to your project.

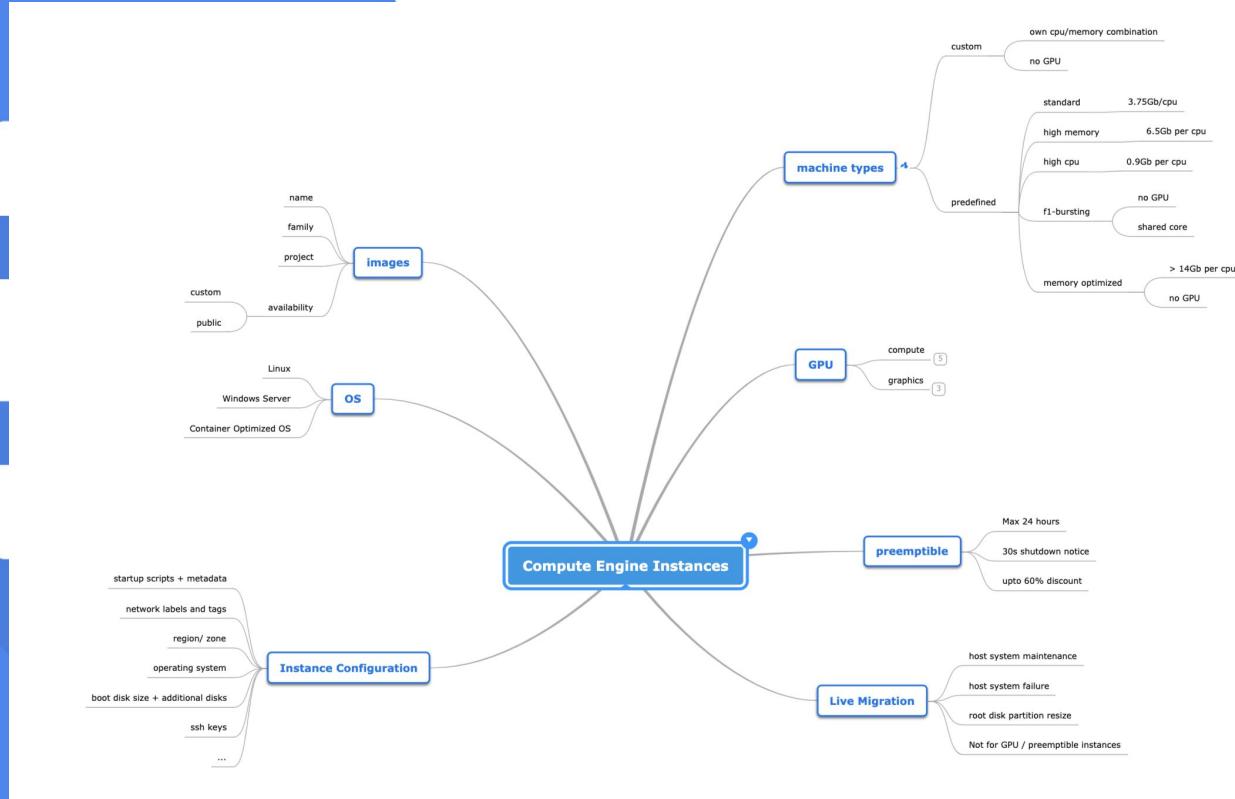
You may use the console or the Cloud Shell CLI.

```
$ gcloud projects add-iam-policy-binding $(gcloud config get-value project) \  
--member=user:markvanholsteijn@binx.io --role=roles/viewer
```

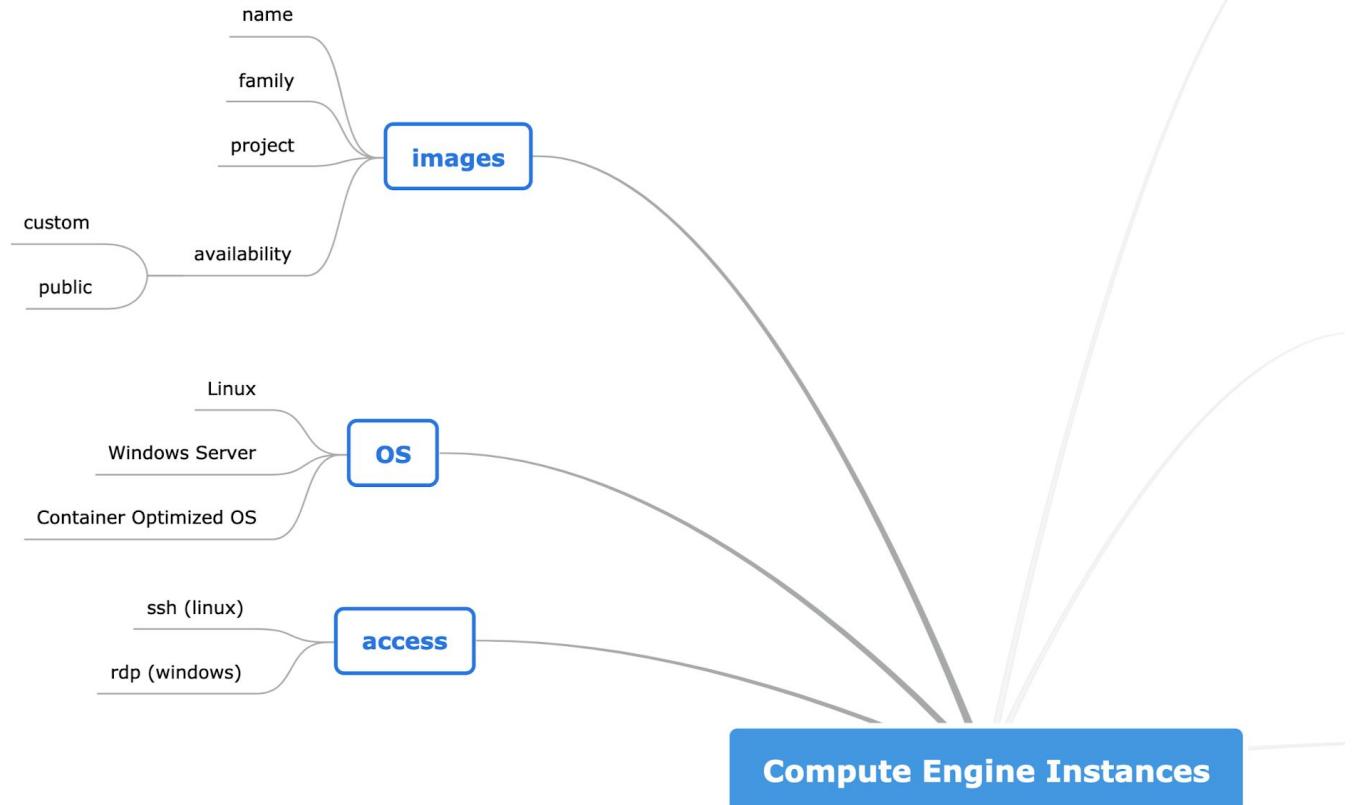
5 minute break



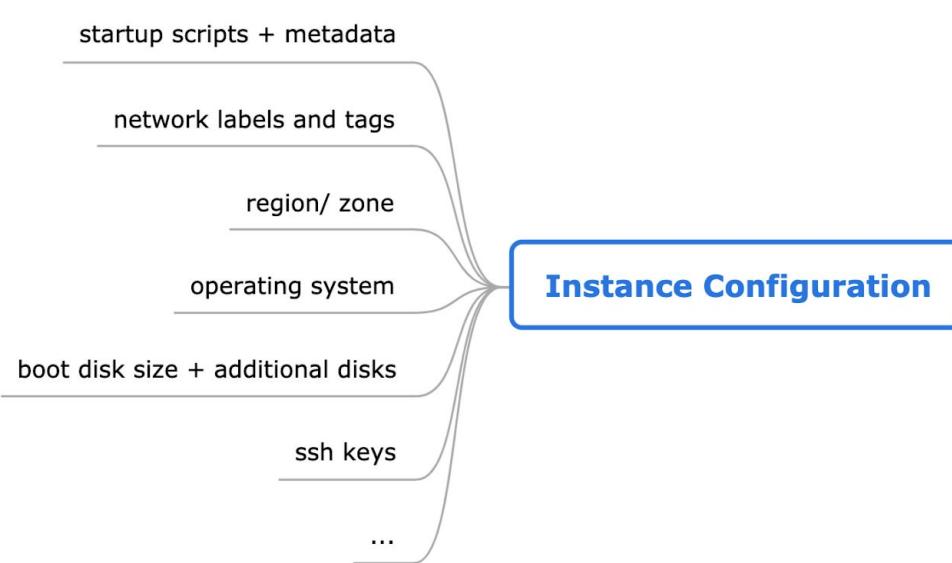
Compute Engine



Virtual Machine instances

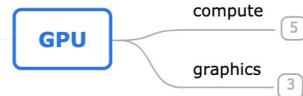
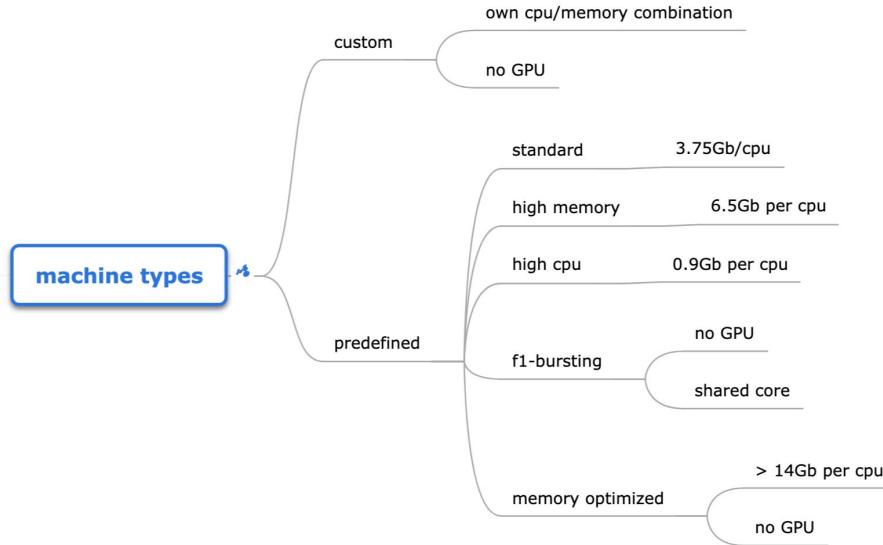


Instance Configuration

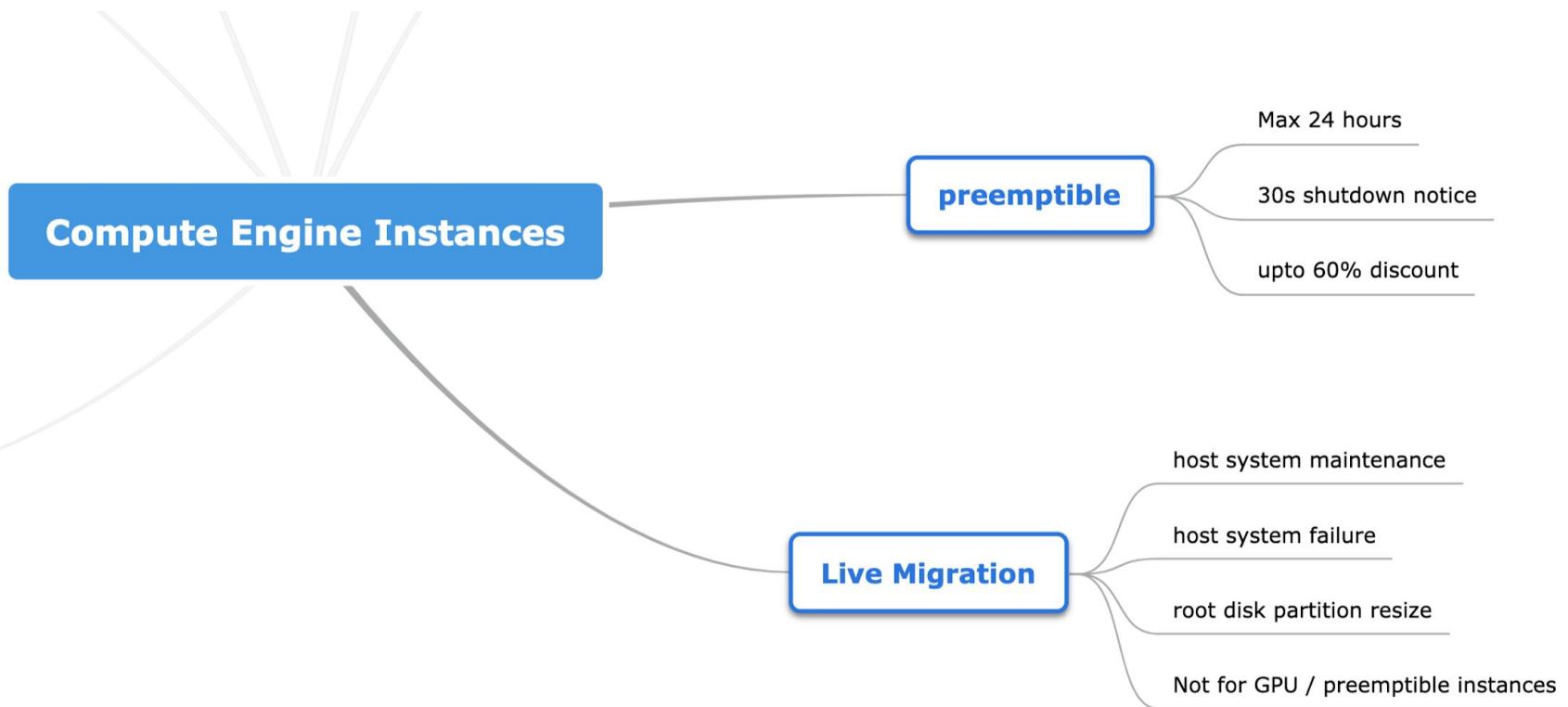


Compute Engine Instances

Machine Types



Live migration and preemptibility



Persistent disks

Per instance	Standard	SSD	Local SSD
Type access	Zonal / regional	Zonal / Regional	Instance
Max capacity	64TB	64TB	3TB
Max Read IOPS	3.000	15.000-60.000	400000-680000
Max Write IOPS	15.000	15.000-30.000	280000-360000
Max Read MB/s	240	240 - 1200	1560 - 2650
Max Write MB/s	38 - 240	38 - 400	1090 - 1400
Life span	disk	disk	Instance stop

Managed Instance Groups

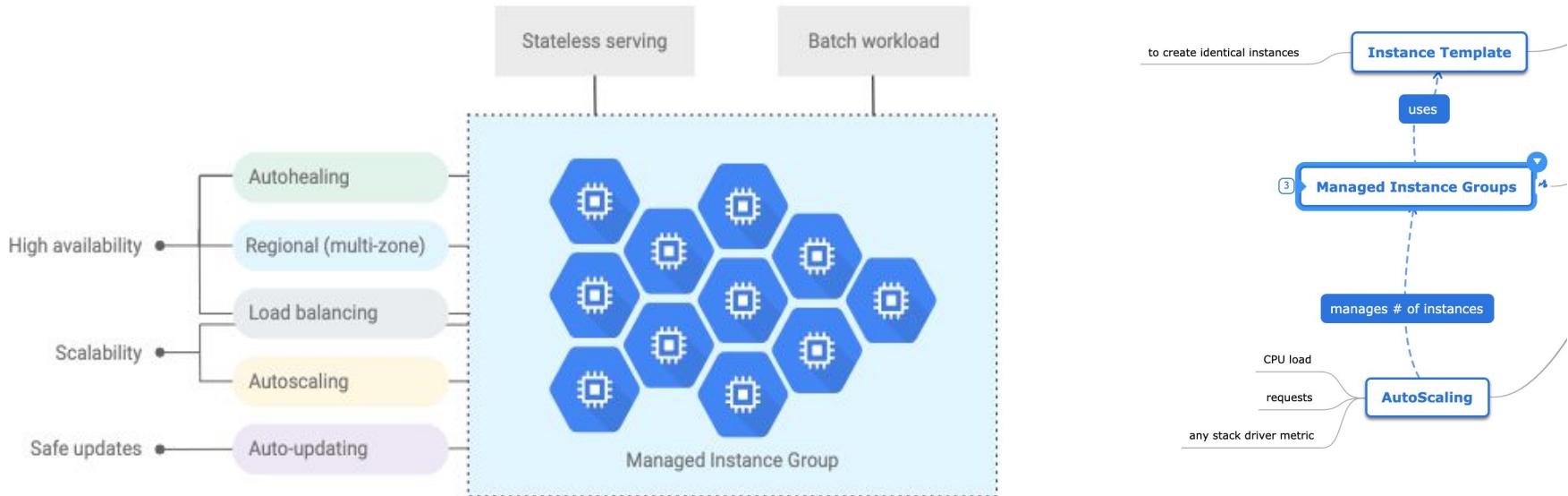


Image: <https://cloud.google.com/compute/docs/instance-groups/>



Demonstration - Deploying autoscaling group



Deploying managed instance group (15 minutes)

- Deploy a managed instance group:
 - Start a container image
mvanholsteijn/paas-monitor:latest*
 - Set the environment variable PORT to 80
 - Check the allow HTTP traffic
 - Using container optimized OS

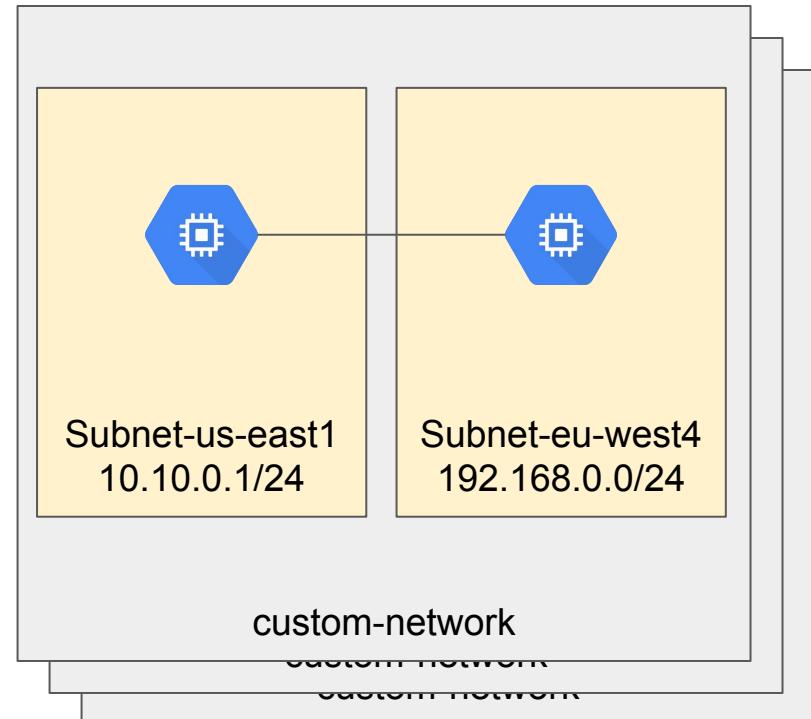
Cloud Networking



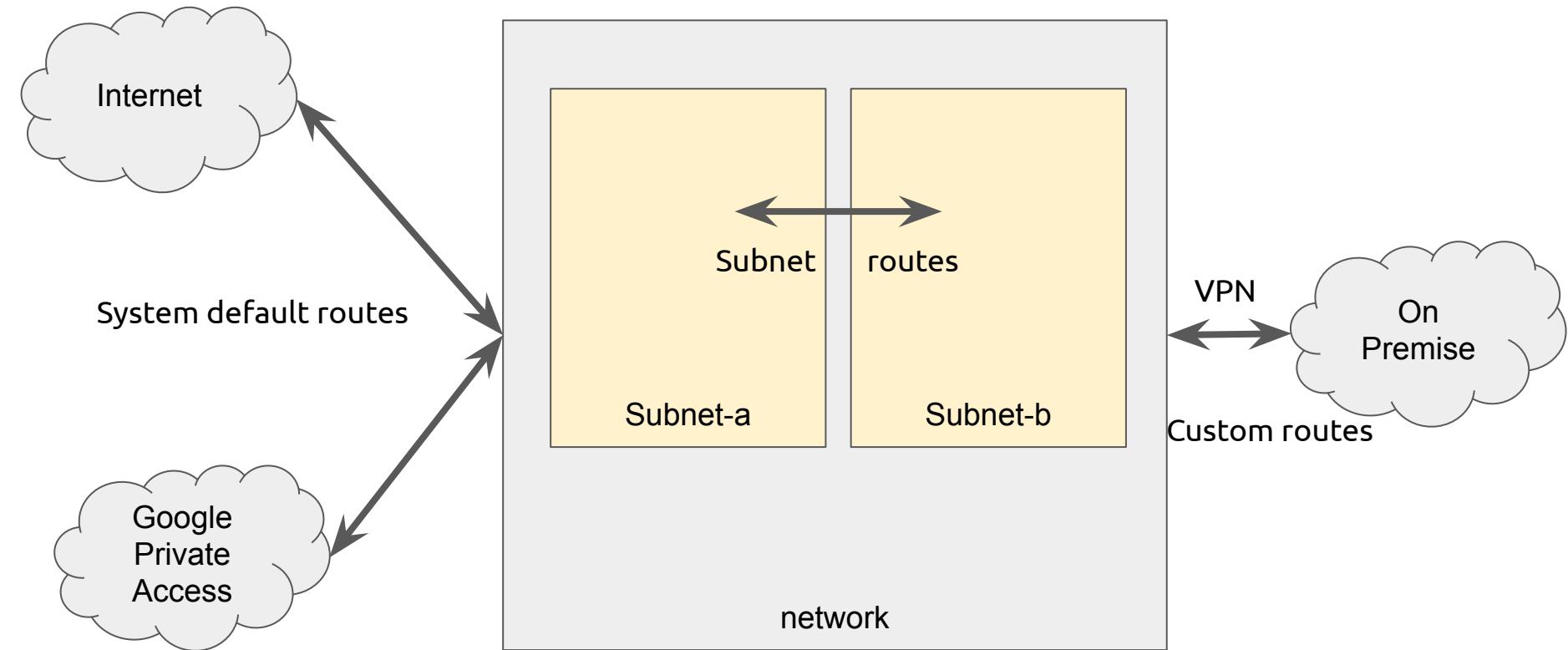
Networks and subnets

- Private networks
- Global connectivity
- Regional subnets
- Private ip address ranges*

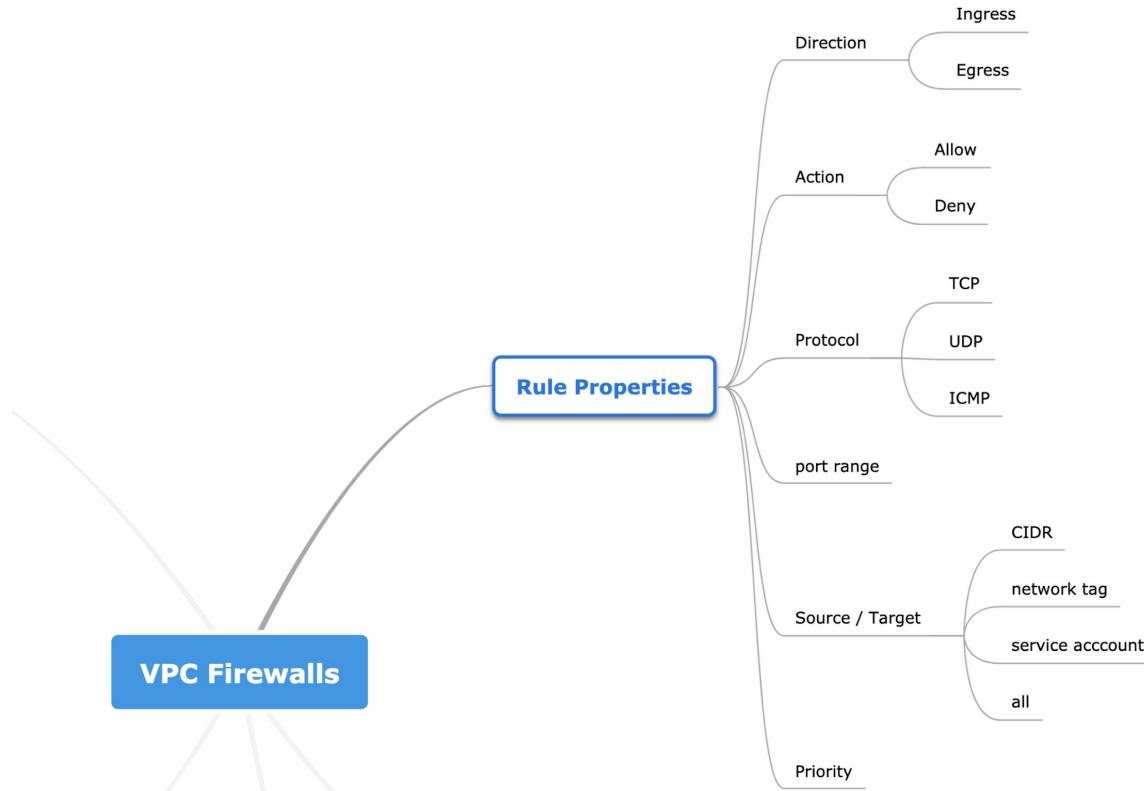
*10.0.0.0/8 192.168.0.0/16 172.16.0.0/12



Routes



Firewalls



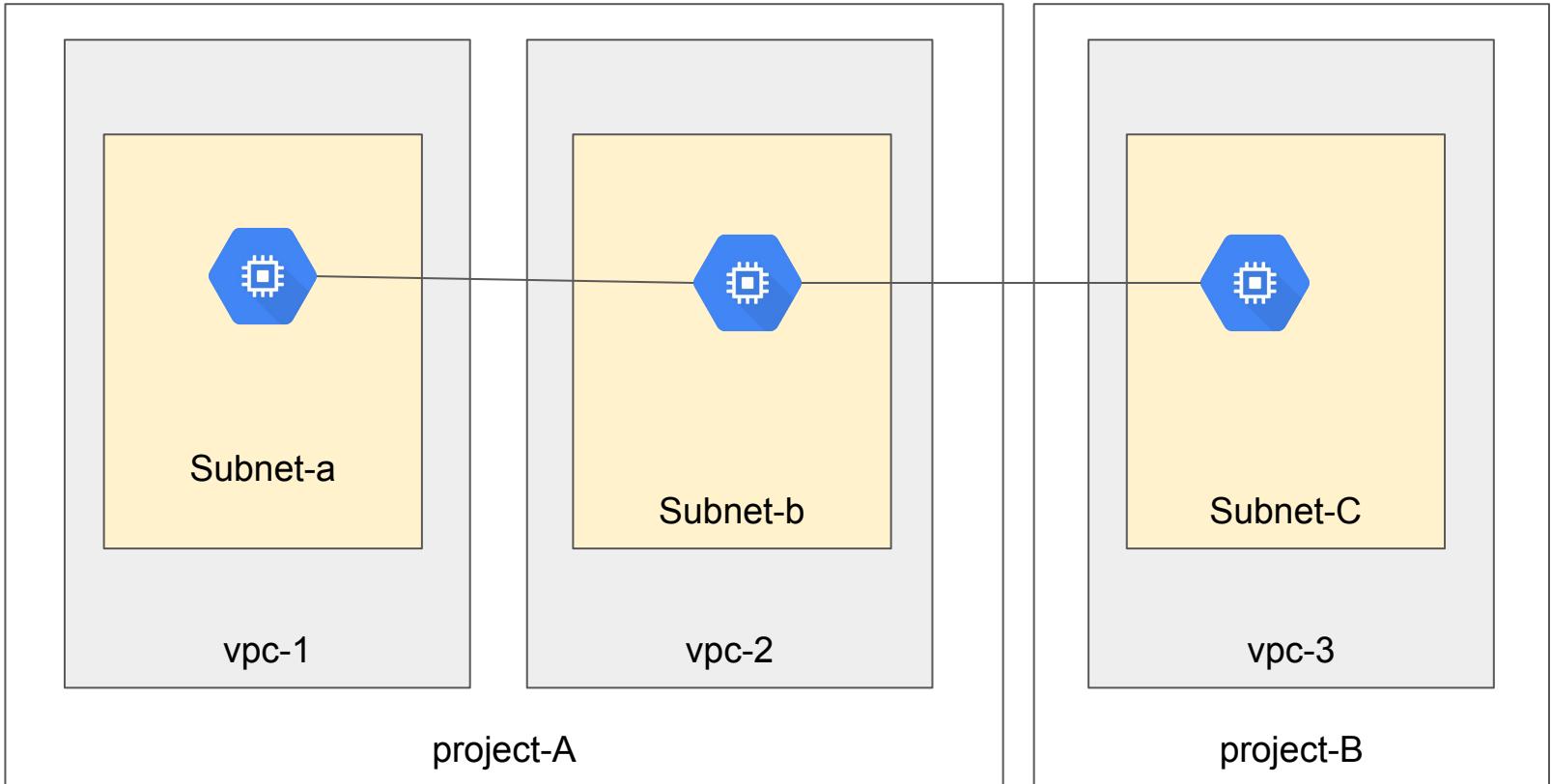
Default firewalls rules

- Allow all outgoing traffic (prio 65535)
- Deny all incoming traffic (prio 65535)
- deny outgoing 25/smtp, 465/smtp, 587/smtp
- deny non udp, tcp, icmp and pip protocols
- allow NTP, DNS, DHCP, meta-data

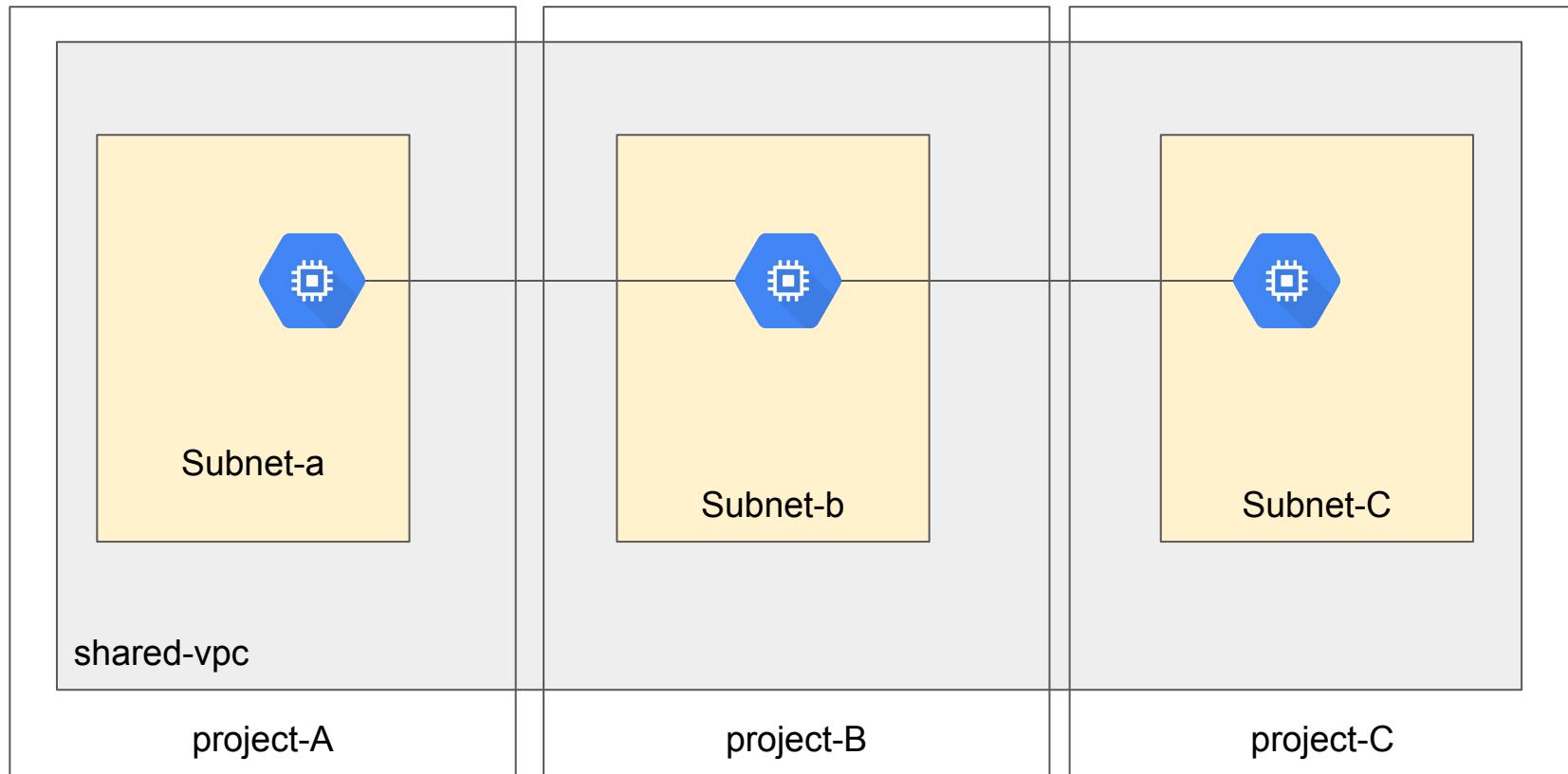
on all VPCs

VPC Firewalls

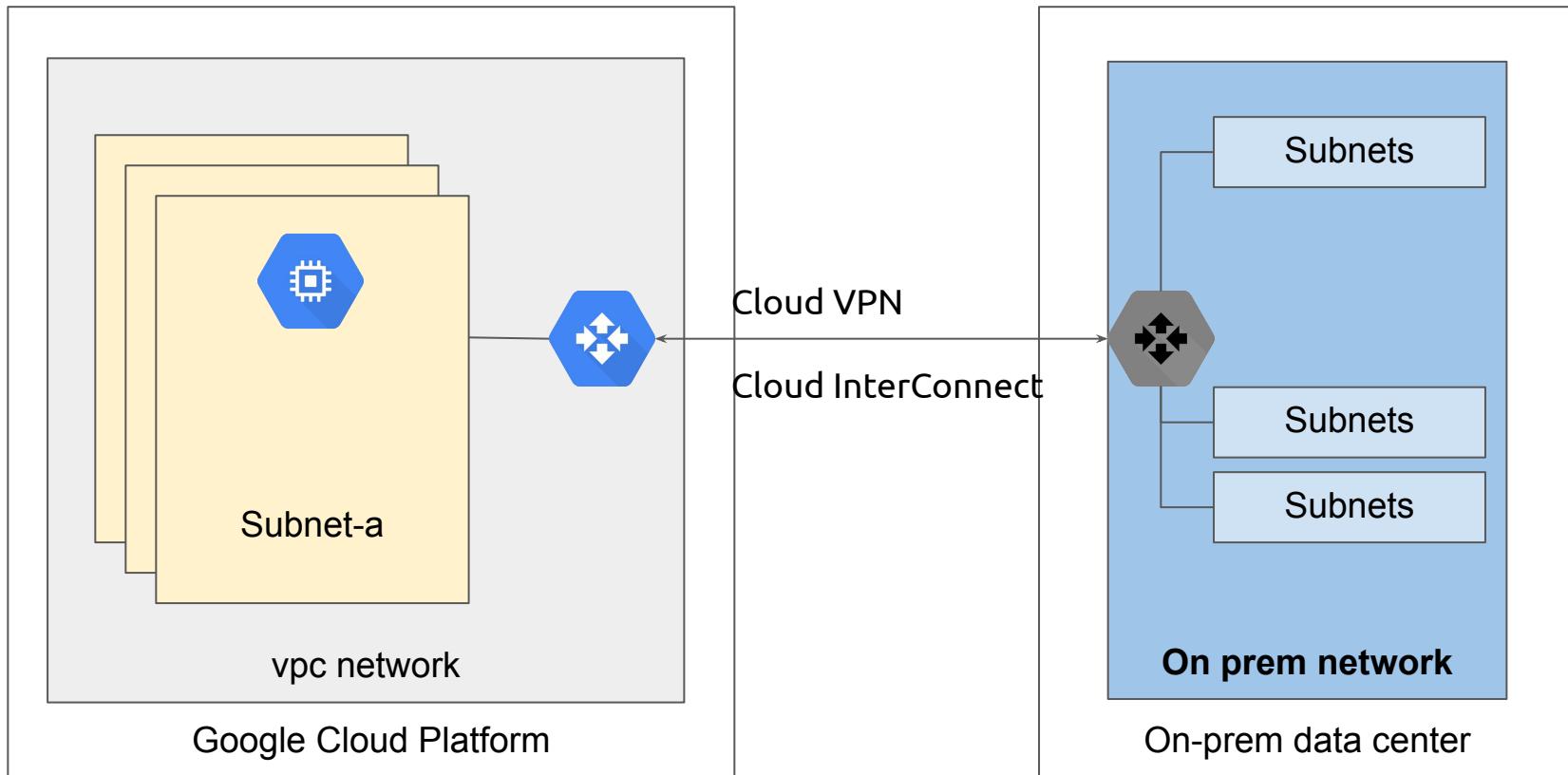
VPC Peering



Shared VPC



VPN Connections



The background of the image is a dramatic, fiery landscape. Large, billowing clouds of smoke and fire dominate the scene, with intense orange and yellow hues at the base transitioning to darker, smoky tones higher up. The clouds are thick and textured, creating a sense of depth and intensity.

Demonstration - creating a custom vpc
with firewall rules



lab - creating a custom vpc with firewall rules

Create a network called `custom` and a firewall rule which allows ssh access to all the machines in the network from anywhere on the internet.

protocol: TCP

Port : 22

Source : 0.0.0.0/0

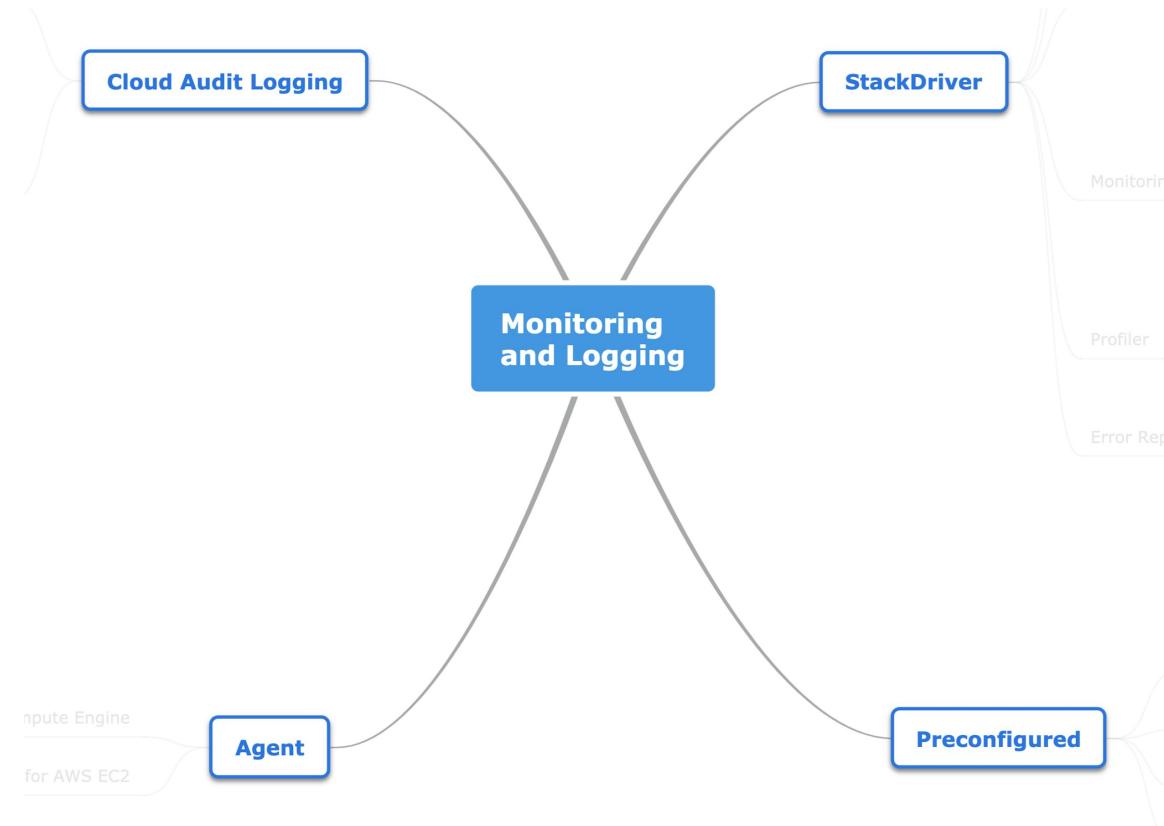
Target : all instances in network

Either via de console or CLI: gcloud compute firewall-rules create

5 minute break



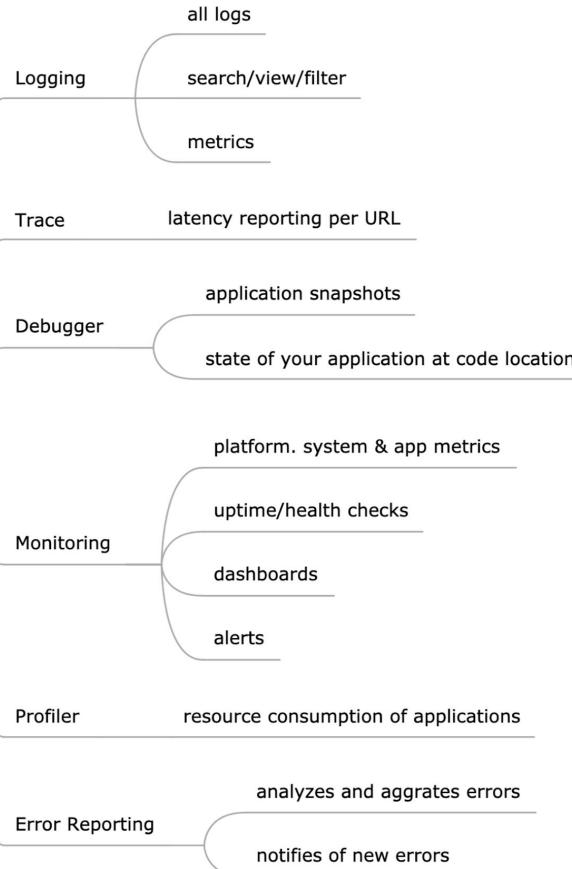
Monitoring and Logging



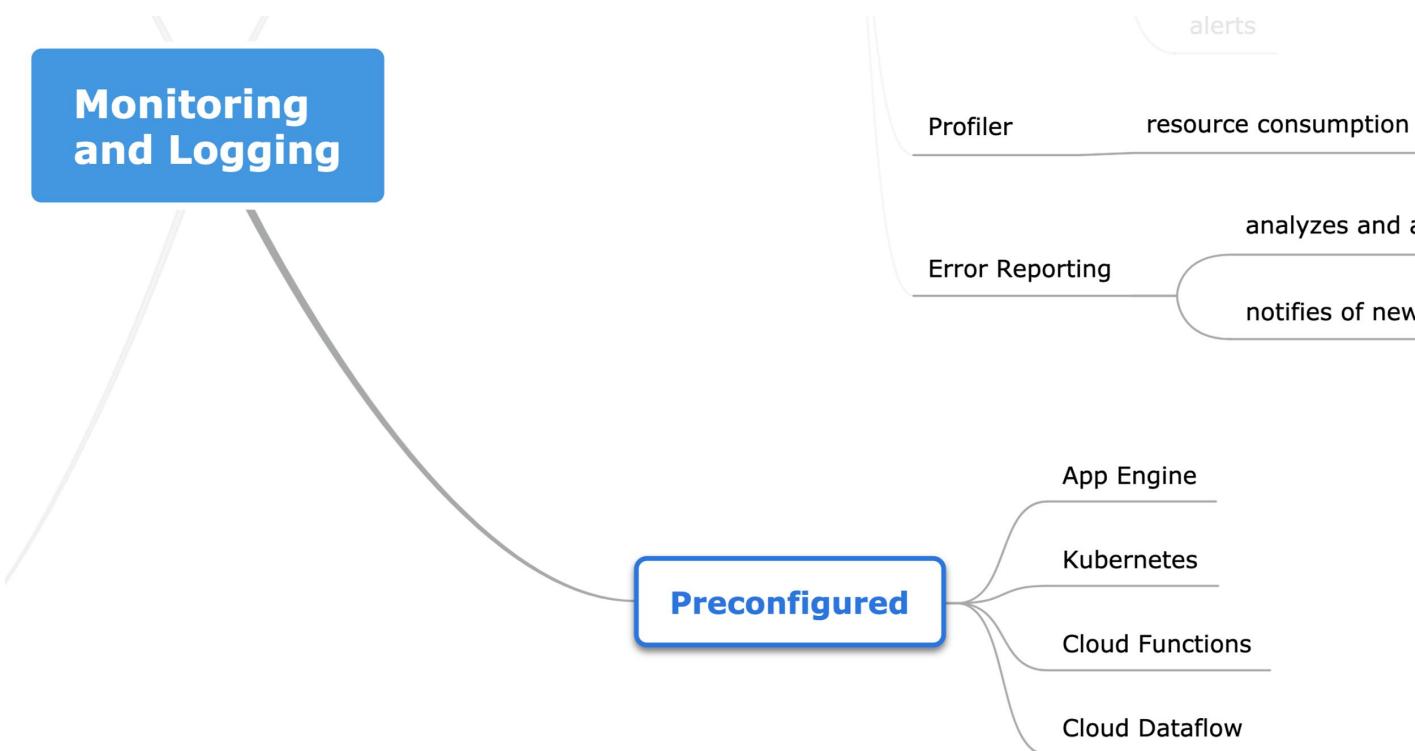
Stackdriver

Monitoring and Logging

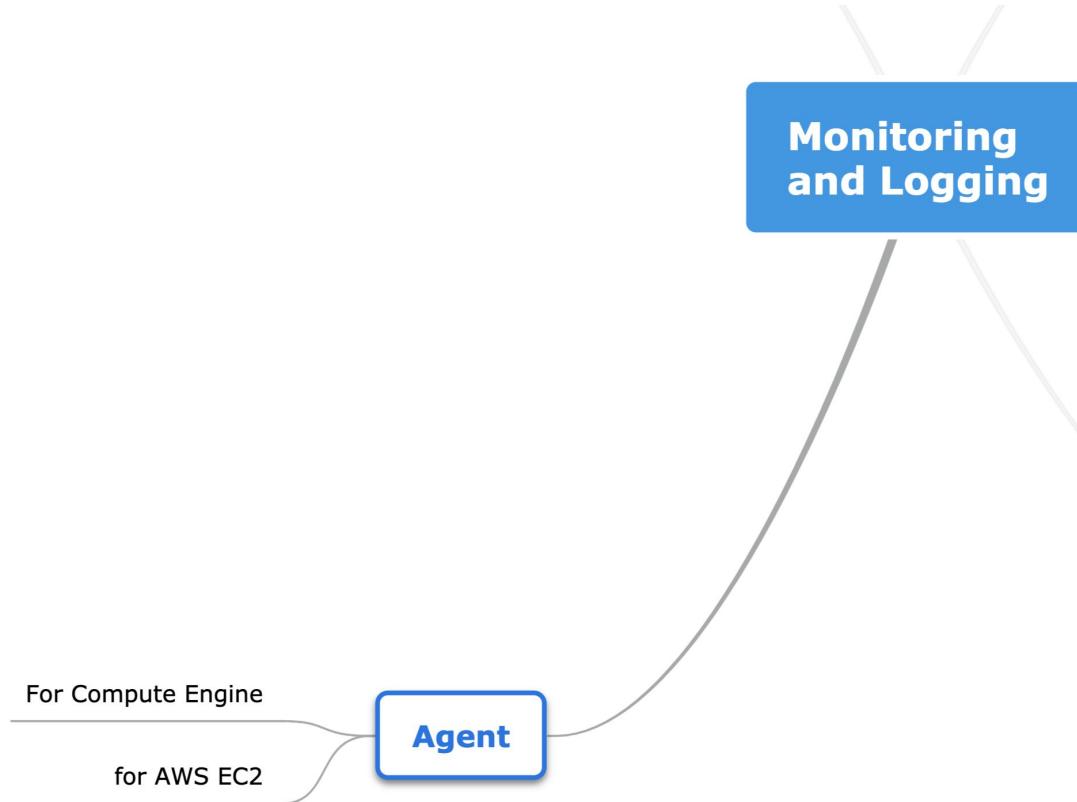
StackDriver



monitoring configuration



monitoring configuration



audit trails

default: Admin Activity (400 days)

default: System Events (400 days)

disabled: Data Access (30 days)

for each Project & Organization

Cloud Audit Logging

Cloud Pub/Sub

Cloud Storage

BigQuery

exportable to

**Monitoring
and Logging**

StackDriver Logging

The screenshot shows the Google Cloud Platform (GCP) StackDriver Logging interface. The left sidebar includes navigation links for Stackdriver Logging, Logs-based metrics, Exports, and Logs ingestion. The main area displays a list of log entries under the heading "GCE VM Instance". The logs are filtered to show "All logs" from the "Any log level" dropdown. A "Last hour" button is present, along with a "Jump to now" button. The log entries are timestamped and include details such as container names, exec IDs, and log levels. The interface also features "Download logs" and "View options" buttons at the top right of the log list.

Timestamp	Log Details
9-06-21T14:12:49.761563625Z	container exec_die 015bbbfbde53804f593de9a2560dee2ea1738835c7f36e943178c68caf16438d (execID=65fe4841158715b40a34d216...)
9-06-21T14:13:19.7674743471Z	container exec_create: /paas-monitor -check 015bbbfbde53804f593de9a2560dee2ea1738835c7f36e943178c68caf16438d (execID=...
9-06-21T14:13:19.767504441Z	container exec_start: /paas-monitor -check 015bbbfbde53804f593de9a2560dee2ea1738835c7f36e943178c68caf16438d (execID=...
9-06-21T14:13:19.908436349Z	container exec_die 015bbbfbde53804f593de9a2560dee2ea1738835c7f36e943178c68caf16438d (execID=d579652d7fe18b77d2be25a...)
9-06-21T14:13:49.900476832Z	container exec_create: /paas-monitor -check 015bbbfbde53804f593de9a2560dee2ea1738835c7f36e943178c68caf16438d (execID=...
9-06-21T14:13:49.900474217Z	container exec_start: /paas-monitor -check 015bbbfbde53804f593de9a2560dee2ea1738835c7f36e943178c68caf16438d (execID=...
9-06-21T14:13:50.025004210Z	container exec_die 015bbbfbde53804f593de9a2560dee2ea1738835c7f36e943178c68caf16438d (execID=f66el1b6b270cd8ba8053...)
9-06-21T14:14:20.030881523Z	container exec_create: /paas-monitor -check 015bbbfbde53804f593de9a2560dee2ea1738835c7f36e943178c68caf16438d (execID=...
9-06-21T14:14:20.030910945Z	container exec_start: /paas-monitor -check 015bbbfbde53804f593de9a2560dee2ea1738835c7f36e943178c68caf16438d (execID=...
9-06-21T14:14:20.152203671Z	container exec_die 015bbbfbde53804f593de9a2560dee2ea1738835c7f36e943178c68caf16438d (execID=daffbe0f7f71d2f961bf2b25...)
9-06-21T14:14:50.157913515Z	container exec_create: /paas-monitor -check 015bbbfbde53804f593de9a2560dee2ea1738835c7f36e943178c68caf16438d (execID=...
9-06-21T14:14:50.157940578Z	container exec_start: /paas-monitor -check 015bbbfbde53804f593de9a2560dee2ea1738835c7f36e943178c68caf16438d (execID=...
9-06-21T14:14:50.279052739Z	container exec_create: /paas-monitor -check 015bbbfbde53804f593de9a2560dee2ea1738835c7f36e943178c68caf16438d (execID=...
9-06-21T14:15:20.285451666Z	container exec_start: /paas-monitor -check 015bbbfbde53804f593de9a2560dee2ea1738835c7f36e943178c68caf16438d (execID=...
9-06-21T14:15:20.285478455Z	container exec_start: /paas-monitor -check 015bbbfbde53804f593de9a2560dee2ea1738835c7f36e943178c68caf16438d (execID=...
9-06-21T14:15:20.413001988Z	container exec_die 015bbbfbde53804f593de9a2560dee2ea1738835c7f36e943178c68caf16438d (execID=b1ed1d8b495d98c2632fc4e3...)
9-06-21T14:15:50.418321209Z	container exec_create: /paas-monitor -check 015bbbfbde53804f593de9a2560dee2ea1738835c7f36e943178c68caf16438d (execID=...
9-06-21T14:15:50.418346341Z	container exec_start: /paas-monitor -check 015bbbfbde53804f593de9a2560dee2ea1738835c7f36e943178c68caf16438d (execID=...
9-06-21T14:15:50.455660849Z	container exec_die 015bbbfbde53804f593de9a2560dee2ea1738835c7f36e943178c68caf16438d (execID=692d604d0c93b37855044c18...)
9-06-21T14:16:20.551274750Z	container exec_create: /paas-monitor -check 015bbbfbde53804f593de9a2560dee2ea1738835c7f36e943178c68caf16438d (execID=...
9-06-21T14:16:20.665936304Z	container exec_start: /paas-monitor -check 015bbbfbde53804f593de9a2560dee2ea1738835c7f36e943178c68caf16438d (execID=c03fb64b6f5b2a8acc60...)
9-06-21T14:16:50.671520395Z	container exec_create: /paas-monitor -check 015bbbfbde53804f593de9a2560dee2ea1738835c7f36e943178c68caf16438d (execID=...
9-06-21T14:16:50.789577016Z	container exec_die 015bbbfbde53804f593de9a2560dee2ea1738835c7f36e943178c68caf16438d (execID=811c61907aaee41cae6b5...)
2019-06-21 16:17:20.796 CEST	2019-06-21T14:17:20.79546275Z container exec_create: /paas-monitor -check 015bbbfbde53804f593de9a2560dee2ea1738835c7f36e943178c68caf16438d (execID=...
2019-06-21 16:17:20.796 CEST	2019-06-21T14:17:20.795489485Z container exec_start: /paas-monitor -check 015bbbfbde53804f593de9a2560dee2ea1738835c7f36e943178c68caf16438d (execID=...
2019-06-21 16:17:20.917 CEST	2019-06-21T14:17:20.915905379Z container exec_die 015bbbfbde53804f593de9a2560dee2ea1738835c7f36e943178c68caf16438d (execID=30d71b2f760a52599dff3c4...)

StackDriver Monitoring

Stackdriver oreilly-gcp

Monitoring Overview

You are seeing the new homepage design.

DISMISS Opt Out

Resource dashboards

RESOURCE TYPE	TOTAL RESOURCES
Cloud Storage	3
Instances	2
Block Storage Volumes	2
App Engine	1
Google Cloud Load Balancers	1

Incidents

Charts

GCE VM Instance - CPU utilization
1 min interval (mean)

GCE VM Instance - Received bytes
5 min interval (rate)

GCE VM Instance - Sent bytes
1 min interval (rate)

GCE VM Instance - Disk read bytes
1 min interval (rate)

Uptime checks

Groups

Google Cloud Platform

Mark

StackDriver Trace

Google Cloud Platform oreilly-gcp

Stackdriver Trace

Trace Details

Overview

Trace list

Analysis reports

Timeline

0 5000 10000 15000 20000 25000

Show logs

/post (15,119 ms)

/post (2,136.561 ms)

/memcache.Get (4.252 ms)

/memcache.Get (1.092 ms)

/app_identity_service.GetAccessToken (6.148 ms)

/app_identity_service.GetAccessToken (4.391 ms)

/memcache.Set (35.928 ms)

/memcache.Set (3.177 ms)

/urifetch.Fetch (121.846 ms)

/urifetch.Fetch (17.21 ms) - https://storage.googleapis.com

/urifetch.Fetch (212.057 ms)

/urifetch.Fetch (163.588 ms) - https://storage.googleapis.com

/urifetch.Fetch (254.321 ms)

/urifetch.Fetch (192.992 ms) - https://storage.googleapis.com

/urifetch.Fetch (450.677 ms)

/urifetch.Fetch (437.429 ms) - https://storage.googleapis.com

/memcache.Get (2.538 ms)

/memcache.Get (0.96 ms)

/app_identity_service.GetAccessToken (17.706 ms)

/app_identity_service.GetAccessToken (13.104 ms)

/memcache.Set (5.48 ms)

@0 ms

/post

Summary

Name	RPCs	Total Duration (ms)
/app_identity_service.GetAccessToken	4	42
/logservice.Flush	2	3
/memcache.Get	4	10
/memcache.Set	4	46
/post	2	17255
/urifetch.Fetch	10	2003

Details

Timestamp	2019-06-21 (16:05:00.867)
Traced time	2,136.561 ms
Untraced time	12,982.439 ms
Log	View
HTTP status code	500
Label	Value
/component	HTTP load balancer
/http/client_protocol	HTTP2_OVER_QUIC
/http/host	oreilly-gcp.appspot.com
/http/request/size	521557

StackDriver Debugger

Google Cloud Platform oreilly-gcp

Stackdriver Debug default - 20190621t155853 (100%) oreilly-gcp.appspot.com

WHAT'S NEW

Deployed Files

```
app engine/
  > docs/img
  > lib
  > templates
CONTRIBUTING.md
LICENSE
README.md
app.yaml
appengine_config.py
index.yaml
main.py
requirements.txt
source-context.json
```

Q Type a file name

140
141 @app.route('/delete', methods=['POST'])
142 def delete():
143 filename = request.form.keys()[0]
144 photo = ndb.Key('User', 'default', 'Photo', filename).get()
145 for tag in photo.tags:
146 entity = ndb.Key('User', 'default', 'Tags', tag).get()
147 if entity:
148 entity.count -= 1
149 if entity.count == 0:
150 entity.key.delete()
151 else:
152 entity.put()
153 photo.key.delete()
154 gcs.delete('/%s/%s' % (bucket_name, filename))
155 return redirect(url_for('photos'))
156
157
158 @app.route('/post', methods=['POST'])
159 def post():
160 form = PhotoForm(CombinedMultiDict((request.files, request.form)))
161 if request.method == 'POST' and form.validate():
162 filename = '%s.%s' % (str(uuid.uuid4()),
163 secure_filename(form.input_photo.data.filename))
164 content_type = content_types[filename.split('.')[1]]
165 write_retry_params = gcs.RetryParams(backoff_factor=1.1)
166 gcs_file = gcs.open('/%s/%s' % (bucket_name, filename), 'w',
167 retry_params=write_retry_params,
168 content_type=content_type,
169 options={'x-goog-acl': 'authenticated-read'})
170 for _ in form.input_photo.data.stream:
171 gcs_file.write(_)
172 gcs_file.close()
173
174 labels = get_labels(filename)
175 tags = [translate_text(label.description) for label in labels]
176 entity = Photo(id=filename, tags=tags,
177 parent=ndb.Key('User', 'default'))
178 entity.put()
179
180 for tag in tags:
181 entity = ndb.Key('User', 'default', 'Tags', tag).get()
182 if entity:
183 entity.count += 1
184 else:
185 entity = Tags(count=1, id=tag,
186 parent=ndb.Key('User', 'default'))
187 entity.put()
188 return render_template('post.html', storage_path=storage_path,

Snapshot Logpoint

main.py:160

Condition: (Optional)

Type a condition

Expressions: (Optional)

Type an expression

Waiting for snapshot to hit. The running application will not stop. ***

Logs Snapshot History Logpoint History

StackDriver Error Reporting

Google Cloud Platform oreilly-gcp ▾

Stackdriver Error Reporting All services ▾ All versions ▾ Open, Acknowledged ▾ AUTO-RELOAD

Filter errors

1 hour 6 hours 1 day 7 days 30 days

Errors in the last hour

Resolution Status	Occurrences	Users	Error	Seen in	First seen	Last seen	Response Code
Open	30	1	NEW Traceback (most recent call last): LoadObject (/base/alloc/tmpfs/dynamic_runtimes/python27g/6a5167f0cae8960d/python27/python27_lib/ve	20190621t162636	10 minutes ago	3 minutes ago	500
Acknowledged							
Resolved							
Muted							



Demonstration - stackdriver monitoring and logging on VMs



lab - create an alert for excessive cpu usage

In Stackdriver monitoring:

- create an alert to send yourself an email if the average CPU utilization for your managed instance group instances exceeds 20%

Bonus

- create a dashboard which shows the CPU utilization for your managed instance group instances.

Introduction to Google Cloud Platform

Mark van Holsteijn