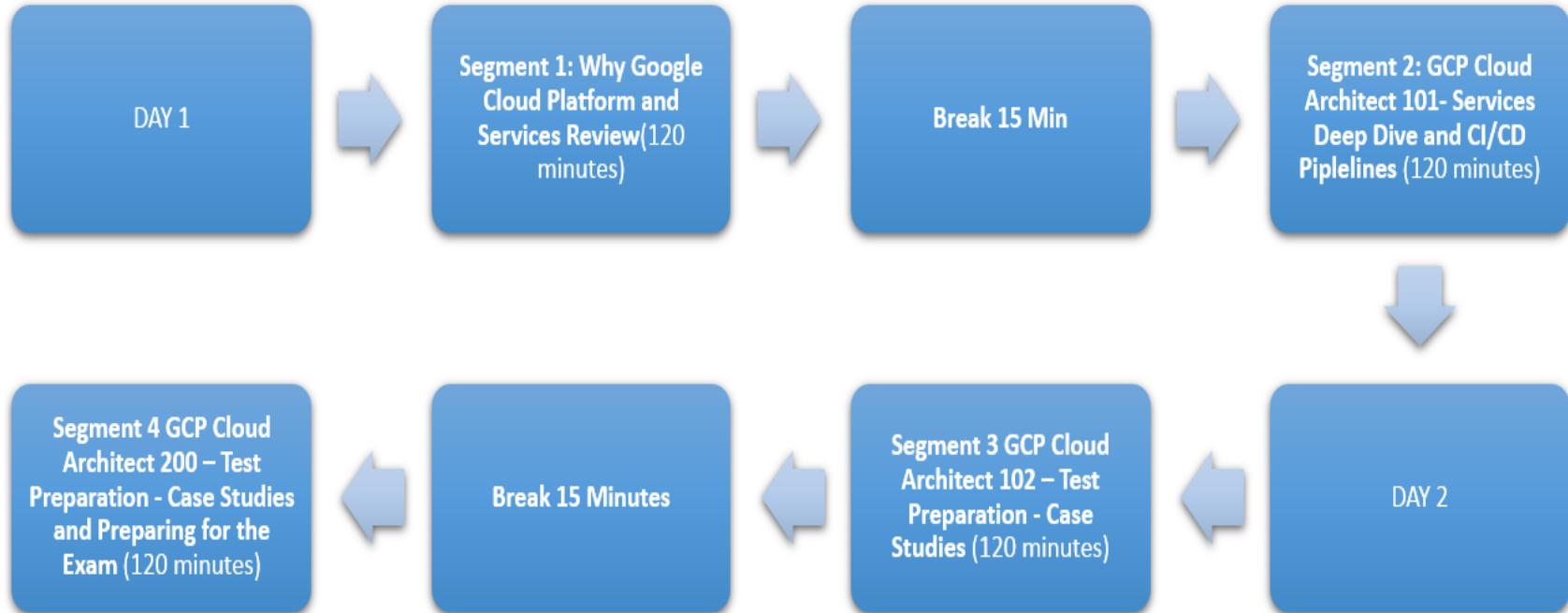




GCP Cloud Architect

GCP Cloud Architect
Certification Crash Course
Pearson Safari
Revised 02/2018

GCP Cloud Architect Overview



GCP Cloud Architect Overview

Prerequisites to be successful for course and exam

- Basic Knowledge of Cloud Technology
- Basic Knowledge of Google Cloud – 3 Months
- Basic networking experience, which you can find by viewing CompTIA Network+ Part I: Fundamental Networking Concepts
- Getting Started with Google Cloud Platform LiveLessons which you can find by viewing
- <https://www.safaribooksonline.com/videos/getting-started-with/9780135181522>

GCP Cloud Architect Overview

Free Tier and Credits

GCP Cloud Architect Overview

Free Cloud Usage Tier.

GCP Free Tier or Trial

\$300 Dollar credit may be available.

***Note that this may different bases on your country.

***Typically countries that have VAT taxes and or embargos may not be eligible.

GCP Cloud Architect Overview

The GCP Free Tier gives you the opportunity to learn about GCP and the services they offer.

The Free Tier should be used as an introduction to GCP, therefore only new accounts are eligible to access the benefits. You also need to provide a credit card or bank account information so GCP can verify your identity. You will not be charged or billed during your free trial.

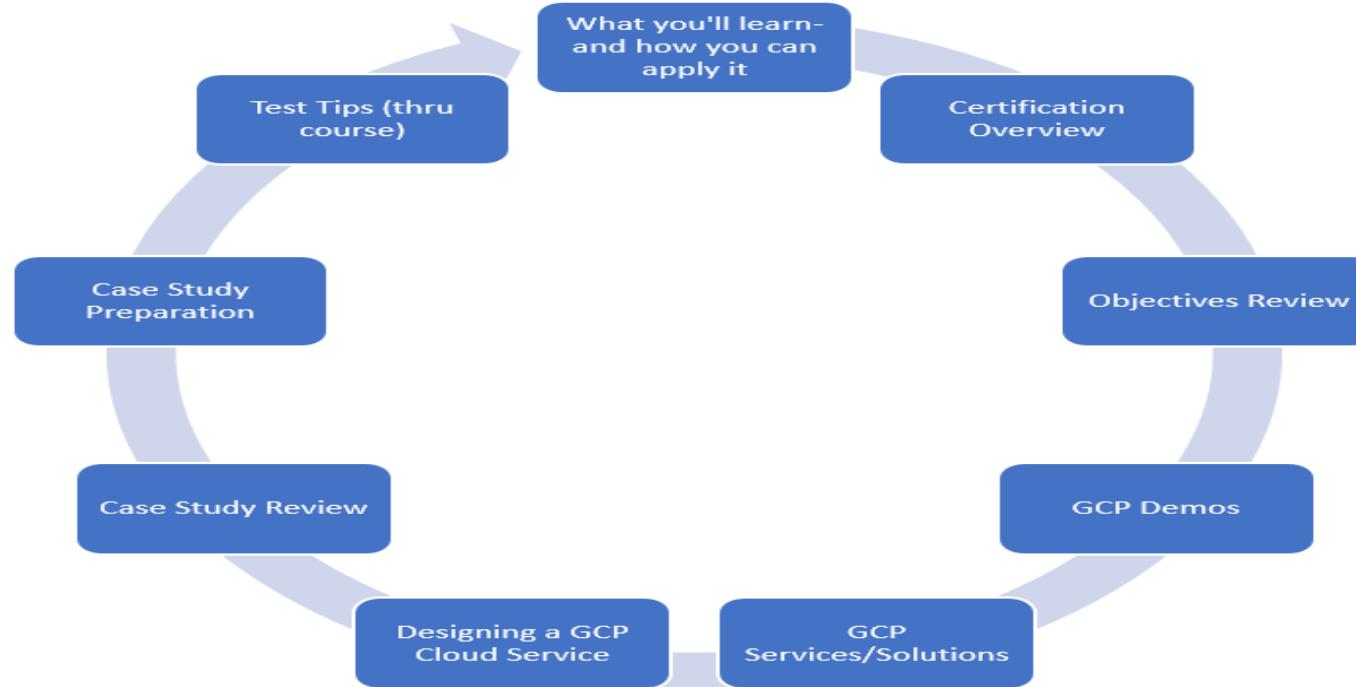
Find out more about the GCP free trial and its benefits/limitations here.

<https://cloud.google.com/free/docs/frequently-asked-questions>

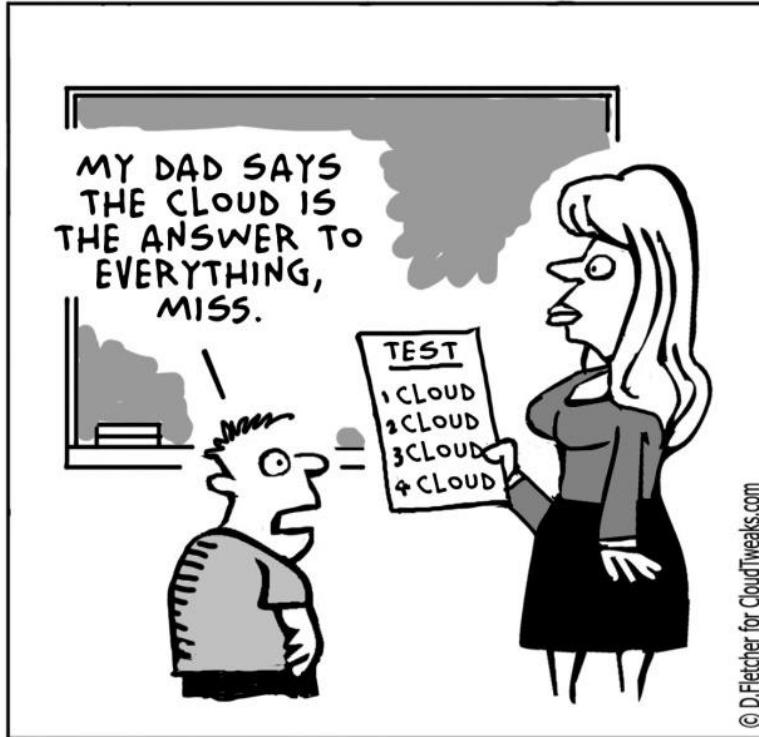
GCP Cloud Architect Overview

What we will learn

GCP Cloud Architect Overview



GCP Cloud Architect Overview

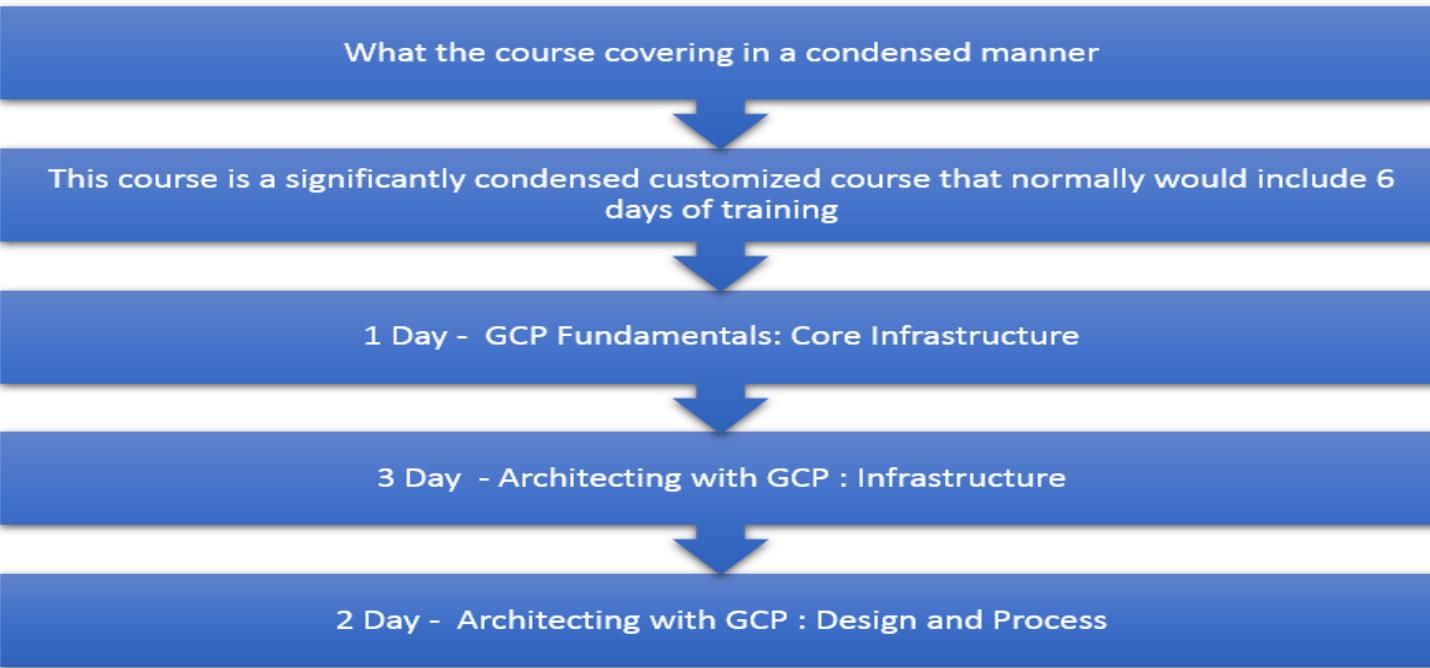


GCP Cloud Architect Overview

What you'll learn-and how you can apply it

- This training is focused on preparing IT professionals in GCP who want to achieve their GCP Cloud Architect Certification.
- Review of GCP Cloud Fundamentals
- Cloud Architecture with GCP
- How to prepare for the GCP Cloud Architect Exam
- Case Study Testing approach
- Resources to help prepare for the exam

GCP Cloud Architect Overview



<https://cloud.google.com/training/cloud-infrastructure>

GCP Cloud Architect Overview

What is a Cloud Architect according to Google Cloud?



A Professional Cloud Architect enables organizations to leverage Google Cloud technologies. With a thorough understanding of cloud architecture and Google Cloud Platform, this individual can design, develop, and manage robust, secure, scalable, highly available, and dynamic solutions to drive business objectives.

<https://cloud.google.com/certification/cloud-architect>

GCP Cloud Architect Overview

GCP	AWS
Associate GCP Cloud Architect Overview	AWS SysOps Associate
Professional Cloud Architect	AWS Solutions Architect – Professional & Security Specialty
Professional Data Engineer	AWS DevOps Engineer – Professional AWS Big Data Specialty
Professional Cloud Developer	AWS Developer Associate AWS DevOps Professional
How does GCP Certifications Map to AWS Certifications?	

GCP Cloud Architect Overview

Please don't Text and take this course. It's a matter of passing or not!



GCP Cloud Architect Overview



GCP Cloud Architect Overview

Survey Question

Who currently is or is planning on using GCP services in their enterprise environments?

- Yes
- No plans to at this time
- Will be in 3 Months
- Will be in 6 Months or more

GCP Cloud Architect Overview

Survey Question (Multiple Choice)

What Services are you using in your production environment?

- Cloud Storage
- Cloud SQL
- App Engine
- Compute Engine
- BigQuery
- Cloud ML
- Other GCP Services

GCP Cloud Architect Overview

Survey Question (Multiple Choice)

What Services are you using in your Dev/Test environments?

- Cloud Storage
- Cloud SQL
- App Engine
- Compute Engine
- BigQuery
- Cloud ML
- Other GCP Services

GCP Cloud Architect Overview

Survey Question (Multiple Choice)

What Cloud Providers are you currently using for your cloud IaaS/PaaS services in your enterprise?

- AWS
- GCP
- Bluemix
- Azure
- Rackspace
- Cloud Foundry
- Other Services

GCP Cloud Architect Overview

Survey Question (Multiple Choice)

What vendor Cloud Computing Certifications do you hold?

- AWS
- GCP
- Azure
- IBM
- Cloud Foundry
- VMware/EMC/Dell
- Cisco

GCP Cloud Architect Overview

Survey Question

What other Google Cloud Certifications are of interest to you?

- GCP Cloud Architect Overview
- Data Engineer
- Cloud Developer
- GSuite

GCP Cloud Architect Overview

Survey Question

In my current role my job role and duties are similar to what role?

- GCP Cloud Architect Overview
- Cloud Developer
- Cloud Architect
- Data Engineering/Big Data Architect
- GSuite Administrator
- Enterprise Architect
- Application Admin
- Other role not listed

GCP Cloud Architect Overview

Survey Question

What is the industry/vertical your working in?

- Consulting/VAR/Vendor or Integrators
- Financials (Banking/Insurance/Investments)
- Manufacturing
- Government (Federal/State/Local)
- Telcom/Internet/Social Media
- Healthcare and Pharma
- Retail/Online Commerce
- Logistics
- Education
- Others not listed

GCP Cloud Architect Overview

Lets Get Started

GCP Cloud Architect Overview



Why GCP? Lets Discuss



Google has the most powerful infrastructure and owns most of it.



Datacenters



Fiber Backbones

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



Submarine lines



Points of Presence

GCP Cloud Architect Overview



GOOGLE CLOUD PLATFORM ENABLES DEVELOPERS TO
BUILD, TEST AND DEPLOY APPLICATIONS ON GOOGLE'S
HIGHLY-SCALABLE, SECURE, AND RELIABLE
INFRASTRUCTURE.



CHOOSE FROM COMPUTING, STORAGE, BIG
DATA/MACHINE LEARNING, AND APPLICATION SERVICES
FOR YOUR WEB, MOBILE, ANALYTICS, AND BACKEND
SOLUTIONS.



GCP Cloud Architect Overview



Google provides interoperability at multiple layers of the stack.



Kubernetes Engine give customers the ability to mix and match microservices running across different clouds



Leverage multiple providers .



Open API's

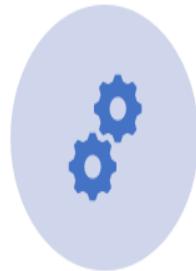
GCP Cloud Architect Overview



SUB MINUTE BILLING



SUSTAINED USED DISCOUNTS



AUTOMATICALLY REWARD USERS
WHO RUN VIRTUAL MACHINES FOR
OVER 25% OF ANY CALENDAR
MONTH COMPUTE ENGINE
CUSTOM MACHINES TYPES



PAY ONLY FOR THE RESOURCES YOU
NEED FOR YOUR APPLICATION

GCP Cloud Architect Overview

Cloud Scale Services and Comparing to AWS VM Networking

GCP offers global networks

GCP offers regional subnetting

GCP offers a default internet gateway which does not require peering.

GCP VMS in Compute Engine are more global.

AWS VMS in EC2 are more isolated.

GCP Cloud Architect Overview



Your choice managed or unmanaged services.



Flexibility



Cost effective



High performance

GCP Cloud Architect Overview



Rock Solid Infrastructure



Top Tier Data Analytics



Serverless leadership



Innovative Pricing



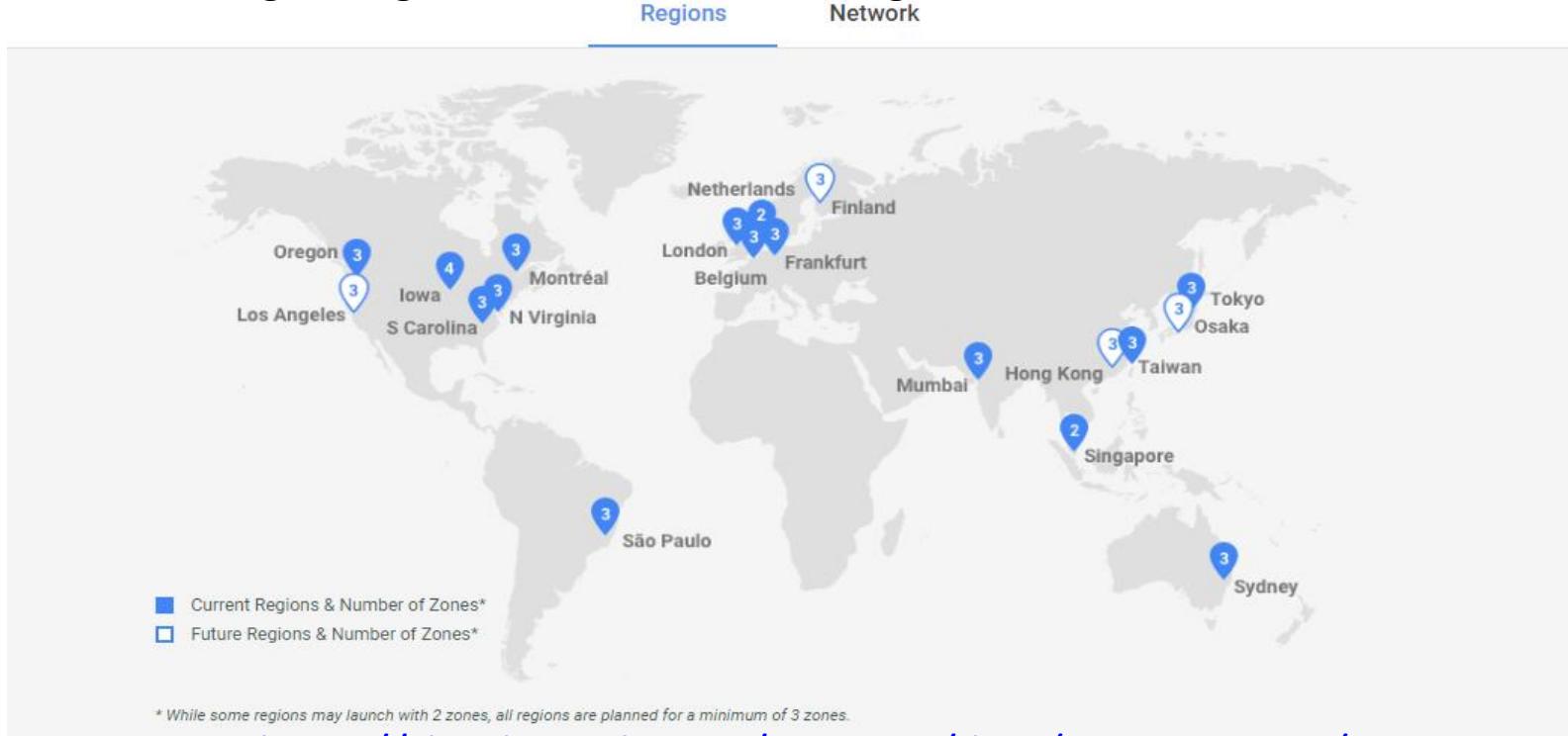
Security @ Scale



Superior Machine
Learning and Automated
Intelligence Services

GCP Cloud Architect Overview

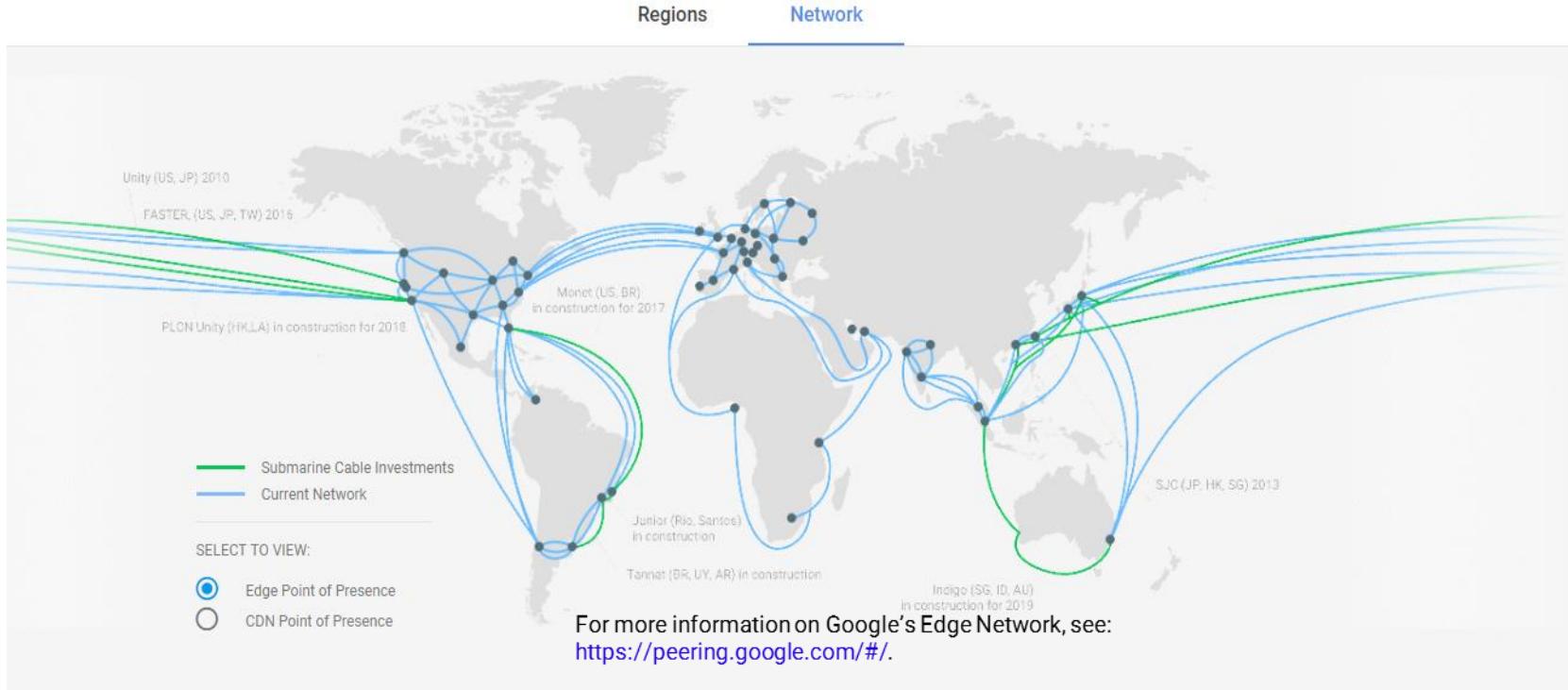
GCP Has a growing number of zones and regions.



<https://cloud.google.com/compute/docs/regions-zones/>

GCP Cloud Architect Overview

GCP Has an ever expanding infrastructure.



GCP Cloud Architect Overview

Regions and Zones

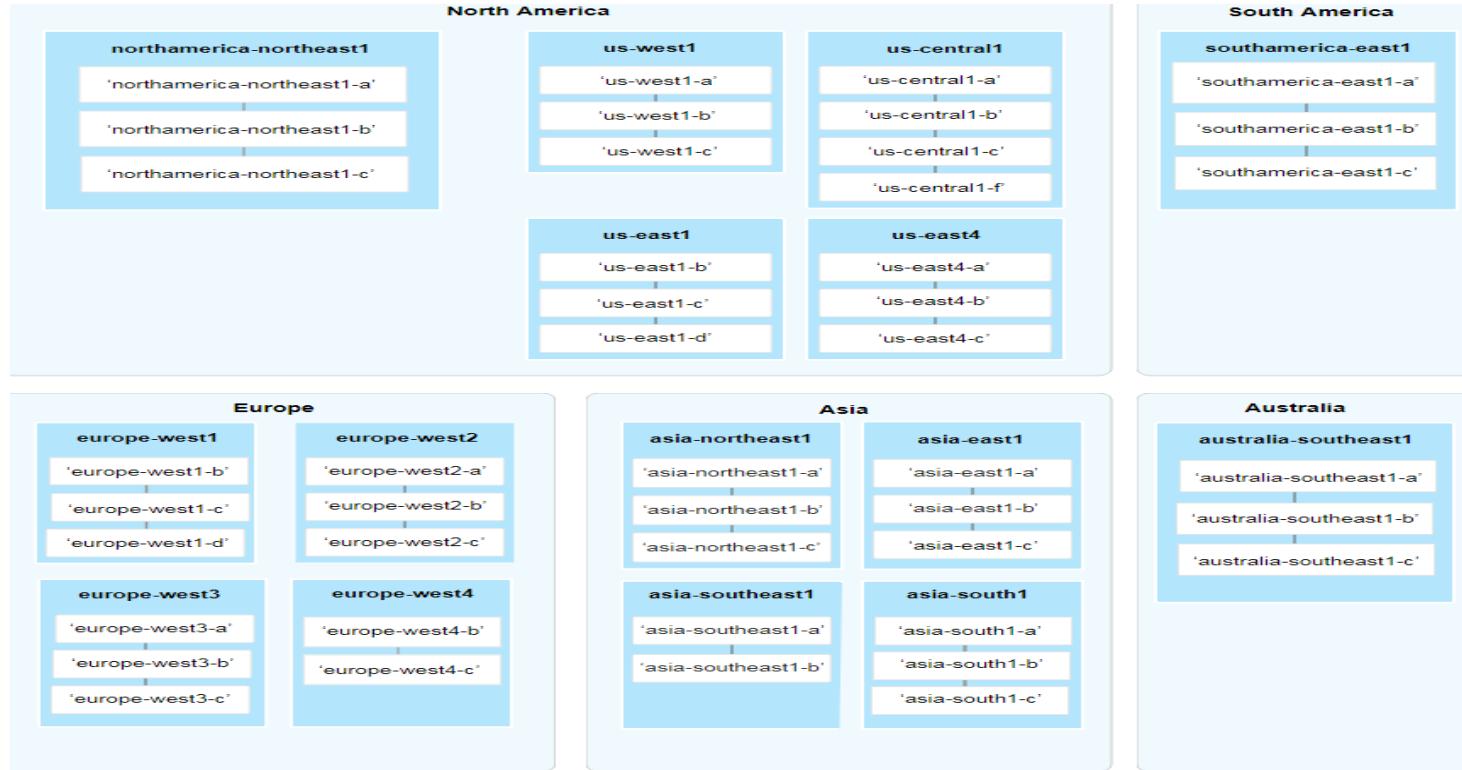
Zones have high-bandwidth, low-latency network connections to other zones in the same region.

Note that there could be bandwidth costs between regions and zones.

Google recommends deploying applications across multiple zones and multiple regions.
MZ + MR

GCP Cloud Architect Overview

Regions and Zones



GCP Cloud Architect Overview

Projects and Hierarchy

GCP Cloud Architect Overview



A Project facilitates organization of services and objects and also use this method of segmentation for billing and accounting.



Each Google Cloud Platform project has:



A project name, which you provide.



A project ID, which you can provide or GCP can provide for you.(It is your App ID)



A project number, which GCP provides.

GCP Cloud Architect Overview

Use	Use a project to:
Track	Track resource and quota usage.
Billing	Enable billing.
Manage	Manage permissions and credentials.
Enable	Enable services and APIs

GCP Cloud Architect Overview



Project info

Project name

My Python Hello World

Project ID

my-python-hello-world-191118

Project number

452326268329

Projects

A Project facilitates organization of services and objects and also use this method of segmentation for billing and accounting.



[Go to project settings](#)

GCP Cloud Architect Overview



Folders are also introduced when you use Cloud IAM.



The Cloud IAM Folders feature lets you assign policies to resources at a level of granularity you choose.



The resources in a folder can share IAM policies



Google Cloud IAM is comparable to AWS Directory Service

Projects and Hierarchy

GCP Has the following Hierarchy.

Organizations

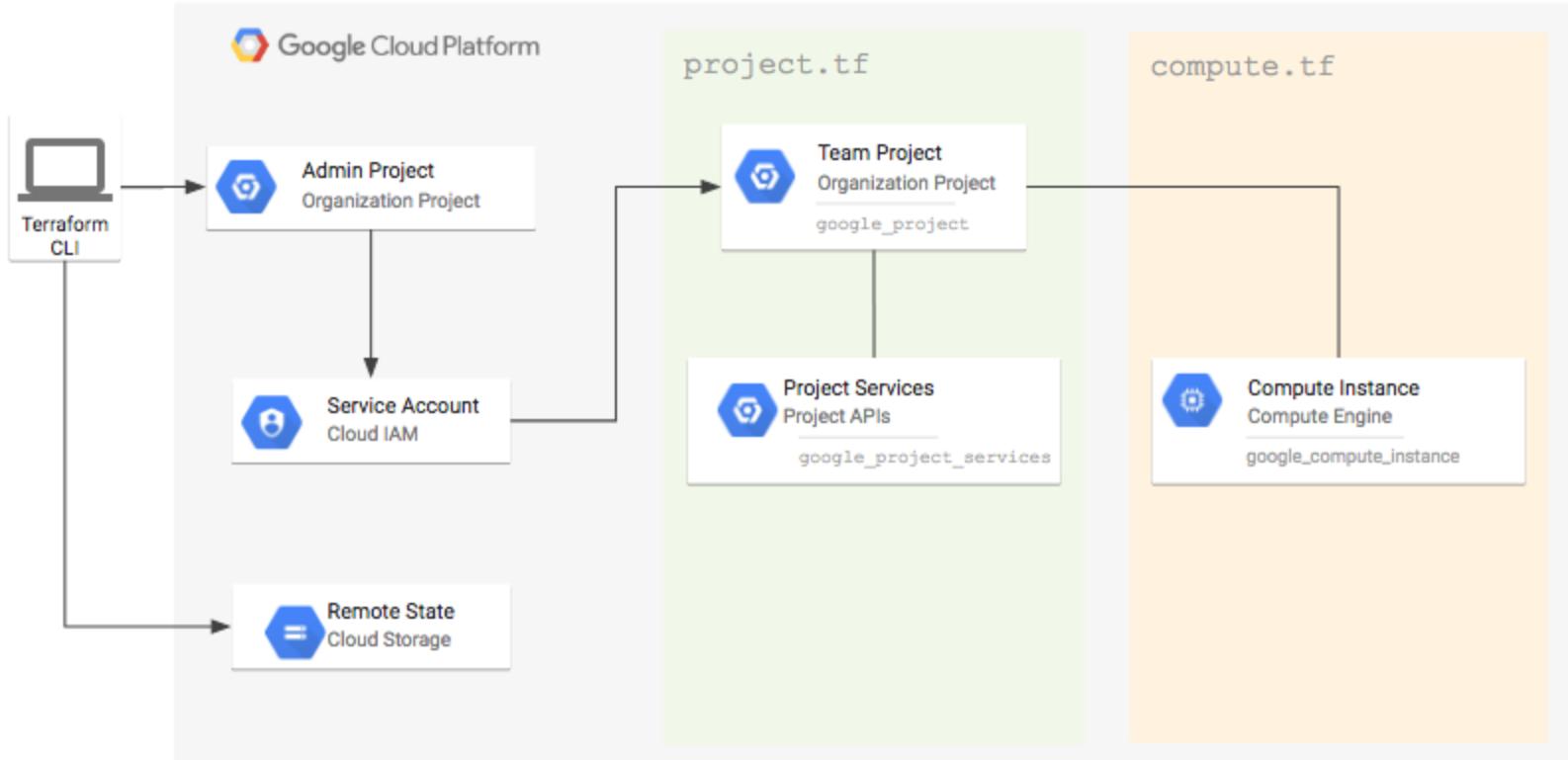
Folders

Projects

Resources



Projects and Hierarchy



Projects and Hierarchy

An Organization resource is available for G Suite and Cloud Identity customers.

Link your org domain to GCP.

Think of an Organization as a hierarchy.

Set access control and configuration settings at the organization or project level

Billing accounts, projects, and resources are not deleted when an employee leaves the company.
Follows corporate lifecycle.

Projects and Hierarchy

GCP accounts can be associated to a G Suite domain or Gmail user account.

This is useful since it can follow a lifecycle with Gmail. If you delete the user, all billing accounts, projects and resources are deleted. (Follow the user)

With GSuite this works different. Billing accounts, projects, and resources follow the company life cycle. (Follow the company organization)

GCP Cloud Architect Overview



AN ORGANIZATION RESOURCE IS AVAILABLE FOR G SUITE AND CLOUD IDENTITY CUSTOMERS.



LINK YOUR ORG DOMAIN TO GCP.



THINK OF AN ORGANIZATION AS A HIERARCHY.



SET ACCESS CONTROL AND CONFIGURATION SETTINGS AT THE ORGANIZATION OR PROJECT LEVEL



BILLING ACCOUNTS, PROJECTS, AND RESOURCES ARE NOT DELETED WHEN AN EMPLOYEE LEAVES THE COMPANY. FOLLOWS CORPORATE LIFECYCLE.

GCP Cloud Architect Overview

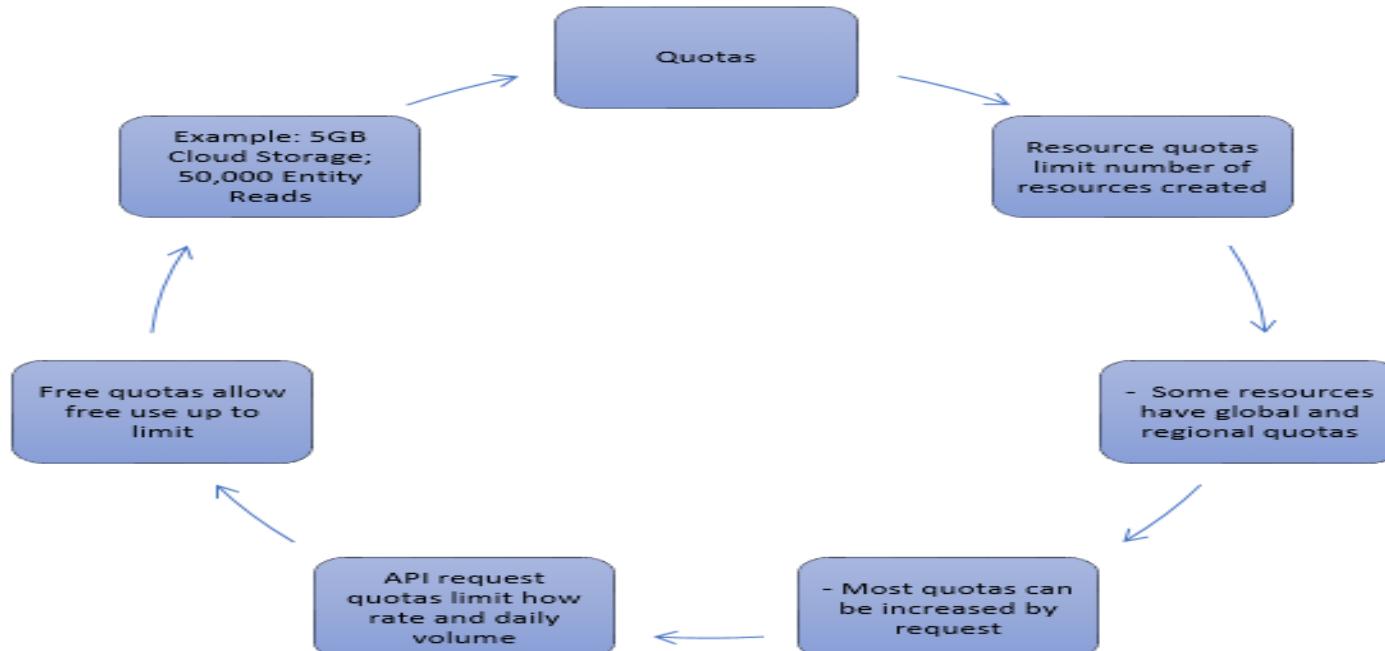
Projects – Notes

- Google Cloud Platform APIs interact with project-based resources
- Example: disk resources act as data storage for a server
- Resources are either global, regional, or zone-based
 - - Global resources can be used by any other resource, in any region/zone, in the same project
 - - Regional resources can only be used resources in the same region
 - - Zonal resources can only be used resources in the same zone

GCP Cloud Architect Overview

- - In GCP all you have to do to allow an outside user is to add their Gmail or Gsuite user account to a project
- Add a Gsuite domain as a user and create what is really an admin domain.
- The organization is linked to your G Suite domain.
- - All billing accounts, projects, and resources created by domain members belong to the organization instead of users who create them.

GCP Cloud Architect Overview



Test Tip



Projects

- Its critical to understand the “Hierarchy” of GCP. Exam will validate you understand Projects vs Organizations. Use Cases have a few challenges as well.

GCP Cloud Architect Overview

GCP Services Overview – Virtual Networking

GCP Cloud Architect Overview

IP Networking/DNS

GCP Cloud Architect Overview



Network Investments by GCP are impressive



Google Network speed up to 10Tbps of the cable's total 60Tbps bandwidth. JPN – USA



Over Googles private network and not the internet!!!

GCP Cloud Architect Overview

Network
Latency is a big
deal. It could
MS or Seconds
in difference.

Cloudping.info

Use Latency
Check from
Cloudharmony

GCPING

GCP Cloud Architect Overview



Google launched the first of any cloud providers network tier service.



Standard Tier - It delivers outbound traffic from GCP to the internet over transit (ISP) networks



Premium Tier - served over Googles low latency and reliable network.
(N+2)

GCP Cloud Architect Overview

Cloud Scale Services and Comparing to AWS VM Networking

GCP offers global networks

GCP offers regional subnetting

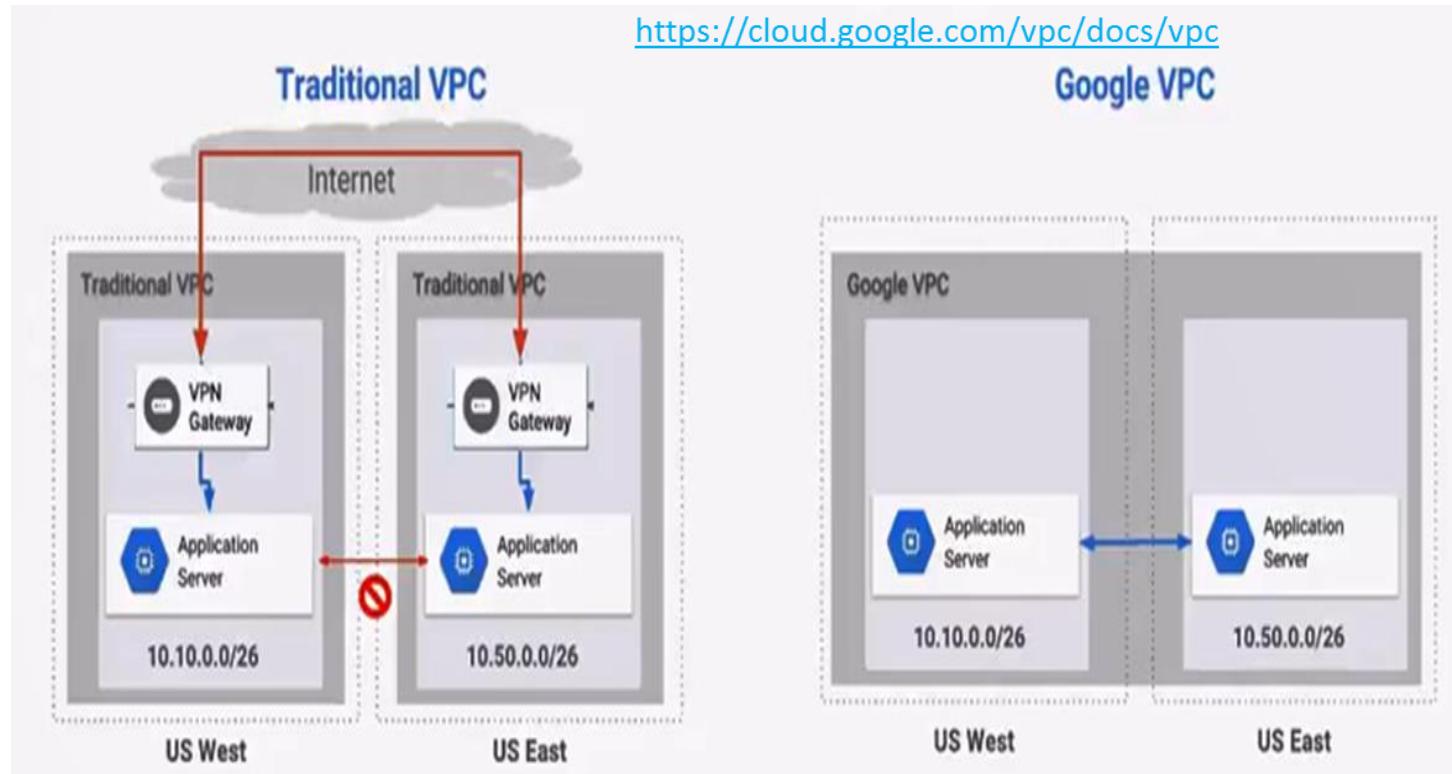
GCP offers a default internet gateway which does not require peering.

GCP VMS in Compute Engine are more global.

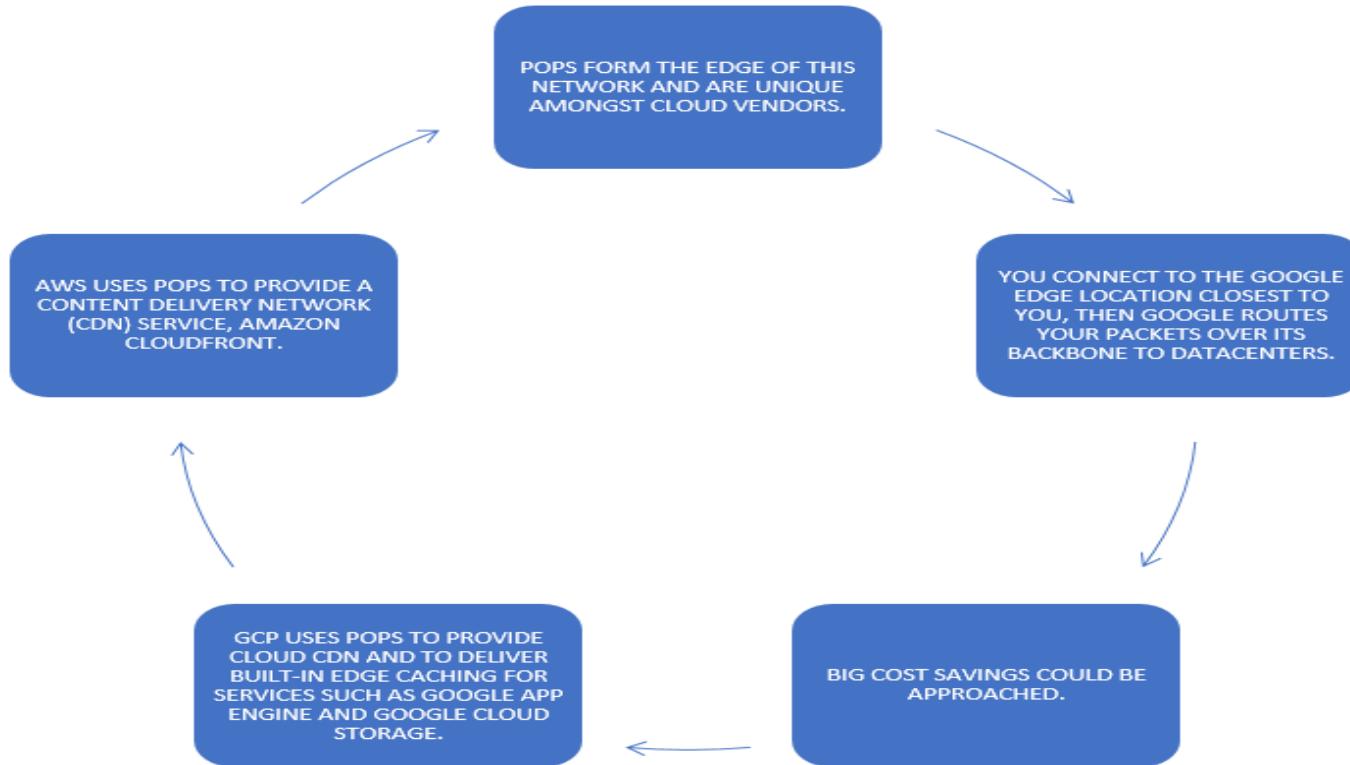
AWS VMS in EC2 are more isolated.

GCP Cloud Architect Overview

<https://cloud.google.com/vpc/docs/vpc>



GCP Cloud Architect Overview



GCP Cloud Architect Overview

IP Networking

GCP Cloud Architect Overview

Networking is Global in GCP

Three Types of Networks

1. Default

2. Custom

3. Auto

Below are Important Notes about networking

Has no IP Range, global and spans regions

Contains Subnetworks

Use networks to isolate systems.

GCP Cloud Architect Overview

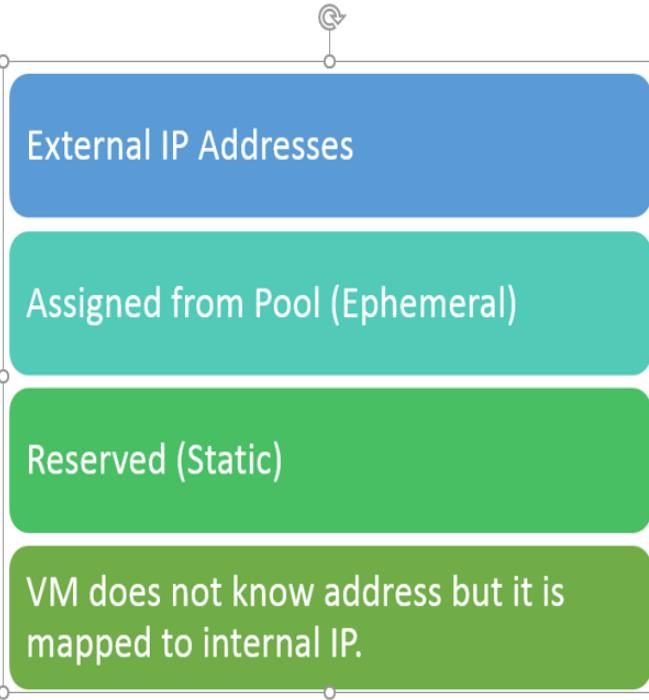
Networking Services – IP Addressing

Internal IP Addresses

Attached from subnet range to VMS by DHCP

Renewed every 24HRs

VM Name and the IP is registered with DNS



GCP Cloud Architect Overview

Internal IP Addresses DNS Resolution

DNS Notes

Each instance has a hostname that can be resolved to an internal IP address

- Hostname is the same as the instance name

- FQDN is [hostname].c.[project-id].internal

- Example: guestbook-test.c.guestbook-151617.internal

Name resolution is handled by internal DNS resolver

GCP Cloud Architect Overview

Virtual Private Networks (VPNS)

GCP Cloud Architect Overview



Virtual Private Network (VPN)

<https://cloud.google.com/vpn/docs/concepts/overview>



Google Cloud VPN securely connects your on-premises network to your Google Cloud Platform (GCP) Virtual Private Cloud (VPC) network through an IPsec VPN connection.



Traffic traveling between the two networks is encrypted by one VPN gateway, then decrypted by the other VPN gateway.



Protects your data as it travels over the Internet.



Cloud VPN only supports IPsec gateway-to-gateway scenarios. You must have a dedicated physical or virtual IPsec VPN gateway on the client side.

GCP Cloud Architect Overview



Cloud VPN Features



High throughput, high reliability, managed service



High throughput IPsec tunnels



- IKE v1 and v2 supported



- Can run over Cloud Interconnect

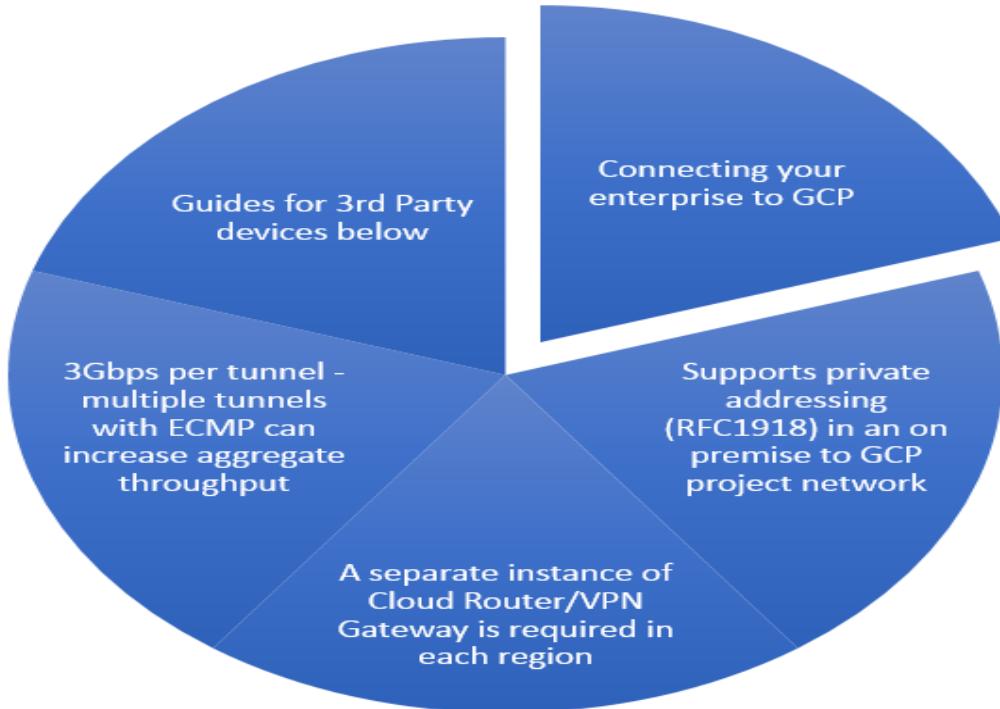


ECMP over multiple VPN tunnels to achieve greater overall throughput



Leverages Google's Edge locations across the globe to minimize latency

GCP Cloud Architect Overview



<https://cloud.google.com/compute/docs/vpn/interop-guides>

GCP Cloud Architect Overview



Connecting to GCP Static Routes



With static routing, updating the tunnel requires the addition of static routes to Google Cloud Platform and restarting the VPN tunnel to include the new subnet.



Some points to know for Exam..



Public IP on both peers



Global or Regional



1.5 Gbps throughput



Secret password



Scale horizontally through parallel tunnels

GCP Cloud Architect Overview

VPC and VPNs - Connecting

Depending on your VPC network and how many regions you want to connect, the initial procedure is somewhat different.

Several Options to consider

1. Simple setup

2. Auto mode VPC network using only the gateway subnet

3. Auto mode VPC network using more than one subnet

4. Custom Network VPN

5. Legacy Networks

https://cloud.google.com/vpn/docs/concepts/overview#vpn_diagram

GCP Cloud Architect Overview

Virtual Private Cloud (VPC)

GCP Cloud Architect Overview

What is a VPC

A Virtual Private Cloud (VPC) is a GLOBAL private isolated virtual network partition that provides managed networking functionality for your Google Cloud Platform (GCP) resources

Sandbox

GCP Cloud Architect Overview

The screenshot shows the Google Cloud Platform interface for managing VPC networks. The left sidebar is titled "VPC network" and includes links for "VPC networks", "External IP addresses", "Firewall rules", "Routes", "VPC network peering", and "Shared VPC". The main content area is titled "VPC networks" and features a table with the following data:

Name	Region	Subnets	Mode	IP addresses ranges	Gateways	Firewall Rules	Global dynamic routing
default	us-central1	15	Auto	10.128.0.0/20	10.128.0.1	6	Off
	europe-west1	default		10.132.0.0/20	10.132.0.1		
	us-west1	default		10.138.0.0/20	10.138.0.1		
	asia-east1	default		10.140.0.0/20	10.140.0.1		
	us-east1	default		10.142.0.0/20	10.142.0.1		
	asia-northeast1	default		10.146.0.0/20	10.146.0.1		
	asia-southeast1	default		10.148.0.0/20	10.148.0.1		
	us-east4	default		10.150.0.0/20	10.150.0.1		
	australia-southeast1	default		10.152.0.0/20	10.152.0.1		
	europe-west2	default		10.154.0.0/20	10.154.0.1		
	europe-west3	default		10.156.0.0/20	10.156.0.1		
	southamerica-east1	default		10.158.0.0/20	10.158.0.1		
	asia-south1	default		10.160.0.0/20	10.160.0.1		
	northamerica-northeast1	default		10.162.0.0/20	10.162.0.1		
	europe-west4	default		10.164.0.0/20	10.164.0.1		

GCP Cloud Architect Overview

A VPC supports
your enterprise
with

Global
Communications
Space

Compute or GCP
Services

Shared VPC

Hybrid Support

Private Peering

Two Types (Auto
& Custom)

GCP Cloud Architect Overview

VPC Features



Global Communications Space



Thru the Google backbone directly..



(This is a big differentiator between other clouds)

<https://cloud.google.com/vpc/docs/vpc>

GCP Cloud Architect Overview

VPC Modes

Auto Mode

- VPC Network is created with one subnet from each region is automatically created within it
- Uses predefine IP Range
- Adds new regions automatically with subnets
- Can add manually

Custom Mode

- Custom Config
- VPC Network is created (no subnets are created automatically)
- Uses your custom IP Range
- You have control and add subnets as required.

GCP Cloud Architect Overview



VPC Peering



Can add manually Google Cloud Platform (GCP)
Virtual Private Cloud (VPC)



Network Peering allows
private RFC1918 connectivity across two VPC
networks regardless of whether or not they
belong to the same project or the same
organization

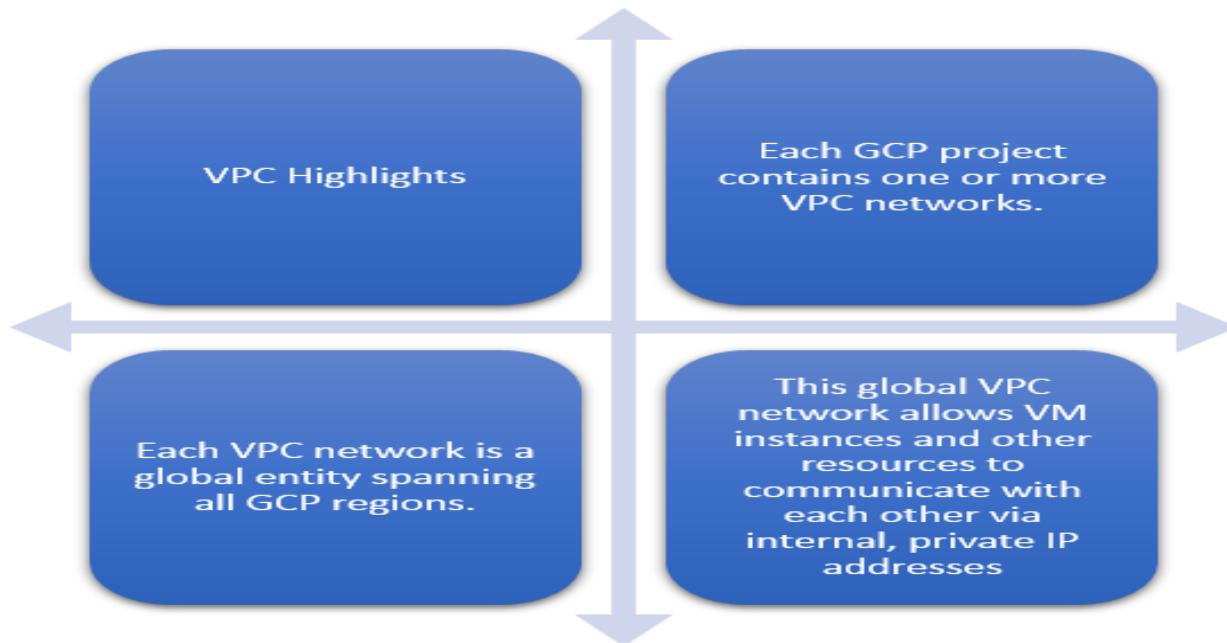
GCP Cloud Architect Overview

VPC Peering Use Cases

Organizations with several network administrative domains.

Organizations that want to peer with other organizations.

GCP Cloud Architect Overview



GCP Cloud Architect Overview

Global, regional, and zonal resources



- Global resources include preconfigured disk images, disk snapshots and networks.



- Regional resources include static external IP addresses.



- Zonal resources include VM instances, their types, and disks.

GCP Cloud Architect Overview

Cloud Interconnect

GCP Cloud Architect Overview



Cloud Interconnect



GCP has a interconnect ([AWS Directconnect](#)) called Cloud Interconnect to extend your data center network into your Google Cloud projects.



IPSec VPN



Direct access to RFC1918 IPs in your VPC (SLA)



Partner Interconnect



GCP Cloud Architect Overview

VM Networking Protocols

Supported Protocols

- TCP
- UDP
- ICMP

Note – Supports Ipv4 only

Every VM Instances belongs to a network.

Default network is used if none selected...

Legacy and Subnets....

GCP Cloud Architect Overview

Subnetworks Benefits

Subnets are ways to group similar or related resources

- If you have a VPN this allows you to target the VPN tunnels To a specific region for better control and performance.
- Benefit where you don't need to know much networking nor layout a network right away.
- Define IP ranges in two ways.
 - ---Auto
 - ---Custom

GCP Cloud Architect Overview

Routing

Routing is of course obvious important to route traffic.

- Control flow of data and direct traffic where you want it
- Default Routes work in most case but if you need a custom route that you can do as well

GCP Cloud Architect Overview

Firewalls (TAGS)

- Tags are needed to know for exam
- Used to identify routes and firewall rules for VMs.
- Tags are user defined
- Not limited to topology like an IP address.
- 64 tags to an instance
- Console, gcloud and API
- gcloud compute instances add-tags Instance1 --tag1 tag2
- <https://cloud.google.com/vpc/docs/add-remove-network-tags>

GCP Cloud Architect Overview

Subnet Notes for exam

- E.G - if you want to keep instances in your testing and production systems from talking to one another except through external IPs, you can put the instances in different networks.
- Instances in different networks are completely isolated and can have overlapping address ranges. (Comms across networks is only possible through external public IP space)
- Comms over external IP space requires security investments but also can incur additional costing (Egress)

GCP Cloud Architect Overview

Subnet Notes Continued

- Each instance created within a subnetwork gets assigned an IPv4 address from that subnetwork's range.
- Google App Engine Flexible Environment: Supported only on auto subnetwork networks. Cannot be deployed in a custom subnet networks.

GCP Cloud Architect Overview

Firewalls as a Resource

- Global Resource
- Control traffic incoming (Priority as well)
- Default allows ingress (Allow Only)

Matches dest. IP CIDR ranges, protocols, ports & target Tags

- ICMP
- SSH
- RDP

Supports Allows for ingress not Denies (Remember this)

GCP Cloud Architect Overview

Firewalls as a VPC Resource

VPC networks has two implied firewall rules. Note that these “implied” rules CAN NOT be removed..

- **implied allow egress rule (65535 Priority)**
- **implied deny ingress rule (65535 Priority)**

<https://cloud.google.com/vpc/docs/firewalls>

GCP Cloud Architect Overview

Firewalls as a VPC Resource

Always-blocked traffic - GCP always blocks the following traffic.

<https://cloud.google.com/vpc/docs/firewalls>

Firewall rules **cannot** be used to un-block traffic that is always blocked.

Rules are evaluated for priority. 0-65535 Default is 1000

GCP Cloud Architect Overview

Connecting with an External IP --- Bastion Hosts

Why..

- Perhaps you need to scale with SSH(Limit by SSH and CIDR)
- You could also connect with a Site to Site VPN
- You could also use a NAT Gateway...
- Bastion hosts have an External IP and an Internal IP.

Bastion hosts you may see on your exam.....Hint.....

Test Tip



Bastion Host

- Know the use case for a bastion host.
- Generally think of using a “bastion” host for “ingress traffic and NAT for traffic egress”

GCP Cloud Architect Overview

REFRESH TIME....

1. What are the three Ports allowed by default thru the GCP Firewall.
(Select Three)
 - a. DHCP
 - b. SSH
 - c. ICMP
 - d. RDP
 - e. Kerberos
 - f. PKI

GCP Cloud Architect Overview

REFRESH TIME....

2. What are the three characteristics of a GCP Project (Select three)
 - a. A project name, which you provide.
 - b. A project name, which GCP will provide.
 - c. A project ID, which you can provide or Cloud Platform can provide for you.
 - d. A project ID, which your procurement department must provide.
 - e. A project number, which GCP provides.
 - f. A project number, which the customer will provide.

GCP Cloud Architect Overview

Compute Options

GCP Cloud Architect Overview



Compute Engine– These VMs are focused on your enterprise IaaS services. (Compute Engine instances can run Linux or Windows Server)



Cloud Functions -is geared towards a serverless approach and focused on microservices



App Engine - is focused on PaaS and can be delivered in two different solutions (Standard or Flexible)



Kubernetes Engine - Awesome solution for developers wanting a simple and lightweight container.

GCP Cloud Architect Overview



Virtual Machines - Compute Engine



IaaS – Infrastructure as a Service (AWS its called EC2)



Can be predefined (templates or custom)



Cloud Launcher(Market Place)



vCPU and Memory



Networking



OS (Linux or Window)

GCP Cloud Architect Overview

VM Supported Protocols

- TCP
- UDP
- ICMP
- Note – Supports Ipv4 only
- Every VM Instances belongs to a network.

GCP Cloud Architect Overview



Storage on VMS



Standard, SSD (Can Scale PDs) or
local SSD



Can resize disks and migrate with
no downtime



<https://cloud.google.com/compute/docs/disks/performance>

GCP Cloud Architect Overview



Networking in VMS



Networking Features



Default and Custom
Networks



Inbound/Outbound
Firewalls



Regional load balancing
and Network Load
balancing



Global and
multiregional
Subnetworks

GCP Cloud Architect Overview



Global, regional, and
zonal resources



Global resources
include
preconfigured



disk images, disk
snapshots and
networks.



Regional resources
include static
external



IP addresses.

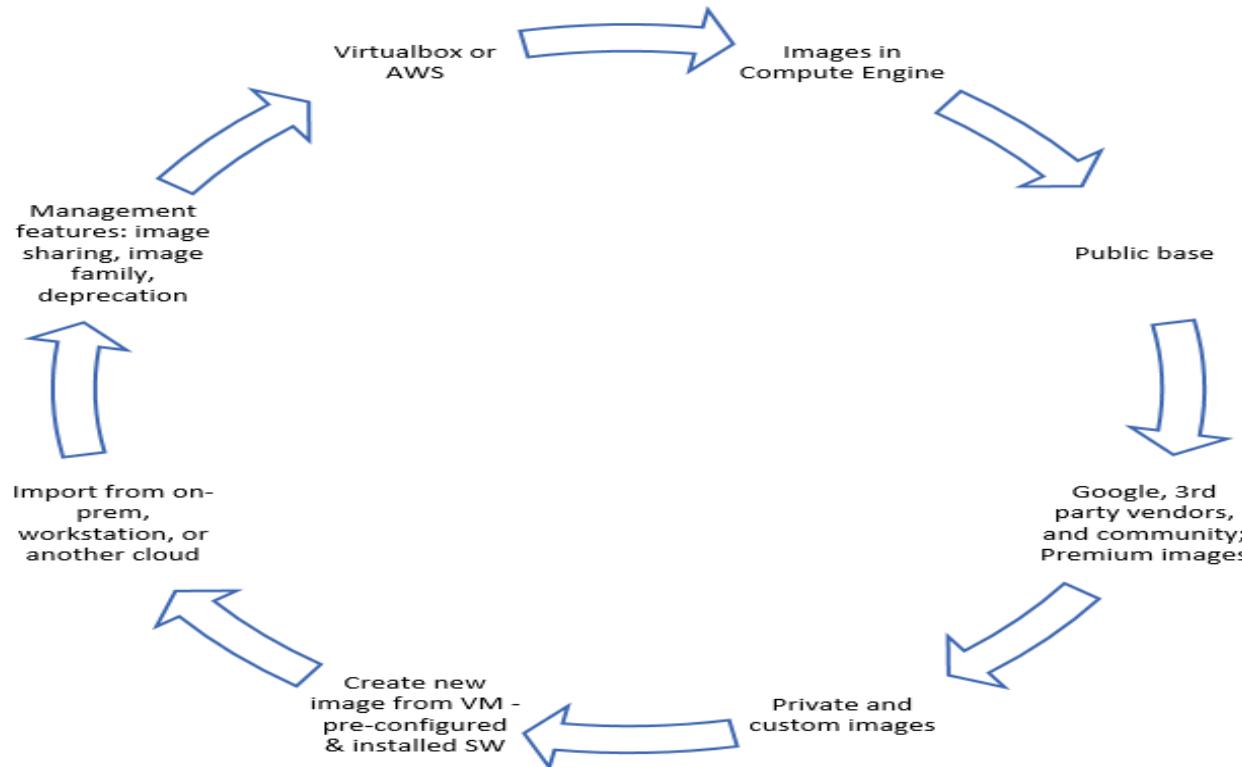


Zonal resources
include VM
instances,



their types, and
disks.

GCP Cloud Architect Overview



GCP Cloud Architect Overview

- Disk Options in Compute Engine
- Compute Engine VM comes with a single root persistent disk
- Image is loaded onto root disk during boot process
- Bootable - you can attach to a VM and boot from it
- Snapshots - incremental backups
- Durable -- can survive VM terminate
- Some SW is installed and OS is configured by GCE
- Each persistent disk can be up to 64 TB in size
- Each instance can attach only a limited amount of total persistent disk space and a limited number of individual persistent disks.



GCP Cloud Architect Overview



Disk Options in Compute Engine



Each Compute Engine instance has a single root persistent disk that contains the operating system.



Add one or more additional storage options to your instance.



Scope of access – Local, Zonal or Global



Max Sustained IOPS. Review



A single file system gives the best performance on Persistent disk



Local SSDs = High IOPS and low latency.



Review options here <https://cloud.google.com/compute/docs/disks/>

GCP Cloud Architect Overview



Two ways to move VMs



Manual



Automatic



Don't use on a VM with a local SSD. The local SSD data cannot be backed up and will just be discarded.



Persistent disks have to be attached to only the VM you are going to move. (Multiple not supported)



Sufficient quota must exist for all the resources copied during duplication, or the process will fail.

GCP Cloud Architect Overview

Snapshots VMS

Snapshot is not available for local SSD

Creates an incremental backup to GCS

Snapshots can be restored to a new persistent disk

Don't use for database migration across zones

Cant be shared among projects

GCP Cloud Architect Overview

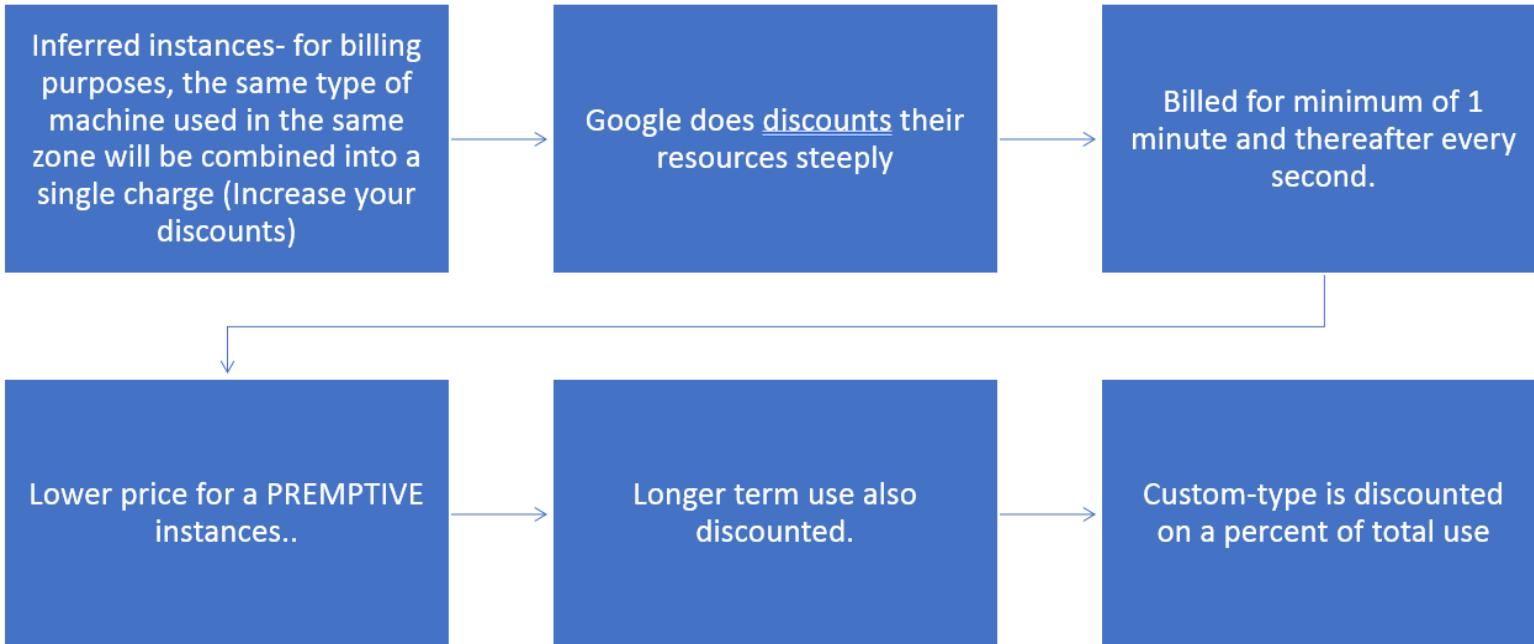
Virtual Machines Billing

GCP Cloud Architect Overview

Billing and Pricing VMS.. Lets Compare

	AWS	GCP
Per Second	Yes	Yes
Discounts (Instances)	Spot (Regular/Block)	Preemptable (24 hrs)
Discounts	Reserved	Committed Use
Savings	Prepay and discount	Up to 80% and no Prepaid contract

GCP Cloud Architect Overview



GCP Cloud Architect Overview

Per-second billing, sustained use discounts

1 minute minimum and 1 sec increments

Preemptible instances

Live at most 24 hours

Can be pre-empted with a 30 second notification via API

Discounted significantly

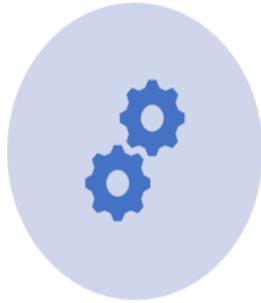
Custom machine types <https://cloud.google.com/custom-machine-types/>

Customize amount of memory and CPU

Built in Recommendation Engine
<https://cloud.google.com/compute/docs/instances/preemptible>

Notifies you of under utilized instances

GCP Cloud Architect Overview



COMPUTE ENGINE PROVIDES MACHINE TYPE
RECOMMENDATIONS TO HELP YOU OPTIMIZE THE
RESOURCE UTILIZATION OF YOUR VIRTUAL MACHINE
INSTANCES.



THESE RECOMMENDATIONS ARE GENERATED
AUTOMATICALLY BASED ON SYSTEM METRICS
GATHERED BY THE GOOGLE STACKDRIVER
MONITORING SERVICE OVER THE PREVIOUS 8 DAYS.



THIS FEATURE IS ALSO KNOWN AS RIGHTSIZING
RECOMMENDATIONS.

GCP Cloud Architect Overview

VM instances

CREATE INSTANCE ▾ IMPORT VM REFRESH START STOP RESET DELETE

Instance "instance-1" is underutilized. You can save an estimated \$16 per month by switching to the machine type: g1-small (1 vCPU, 1.7 GB memory). [Learn more](#)

Filter VM instances Columns ▾

<input type="checkbox"/> Name ^	Zone	Recommendation	Internal IP	External IP	Connect
<input type="checkbox"/> instance-1	us-east1-b	Save \$16 / mo	10.142.0.2	104.196.67.239	SSH ▾
<input type="checkbox"/> wordpress-1-vm	us-central1-f		10.128.0.3	35.224.157.136	SSH ▾

Recommendation Engine

GCP Cloud Architect Overview

Migrate VMS to GCP

GCP Cloud Architect Overview

Know about migrating a large number of Virtual Machines,
From On Prem

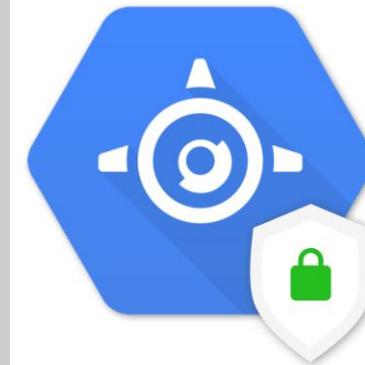
- From other Cloud Provider
- Velostrata or CloudEndure?

Reference this page before taking exam.

- <https://cloud.google.com/compute/docs/vm-migration/>

GCP Cloud Architect Overview

APP ENGINE



GCP Cloud Architect Overview

App Engine SDK

Cloud Client Libraries

Go, Java, Python, Node.js, PHP, Ruby, C#

Installation Process

Download: <https://cloud.google.com/sdk/downloads>

Extract file

Setup paths/reporting: ./google-cloud-sdk/install.sh (or .bat)

Initialize the SDK: gcloud init

Authorization

gcloud auth activate-service-account --key-file [KEY_FILE]



GCP Cloud Architect Overview



App Engine PaaS



Fully Managed, just worry about your code.



Hosted on Google's infrastructure and networks



Supports source code that is written in a version of any of the supported programming languages:
Python, Java, Node.js, Go, Ruby, PHP, or .NET



Standard or Flexible Environments



SDK Kits (Develop locally)

<https://cloud.google.com/appengine/>

GCP Cloud Architect Overview



App Engine PaaS Overview



App Engine is regional, which means the infrastructure that runs your apps is located in a specific region and is managed by Google to be redundantly available across all zones in that region.



You cannot change an app's region after you set it.



Free and Paid resources available.



Supports Spring Framework



Supports MemCache



Support and SLA

GCP Cloud Architect Overview

App Engine PaaS

Instances are health-checked, healed as necessary, and co-located with other services within the project.

Critical, backwards compatible updates are automatically applied to the underlying operating system.

VM instances are automatically located by geographical region according to the settings in your project.

VM instances are restarted on a weekly basis and GCP will apply any necessary operating system and security updates.

Root access to Compute Engine VM instances.

SSH to VM instances in the flex env is disabled by default.



GCP Cloud Architect Overview

App Engine Standard Language Versions

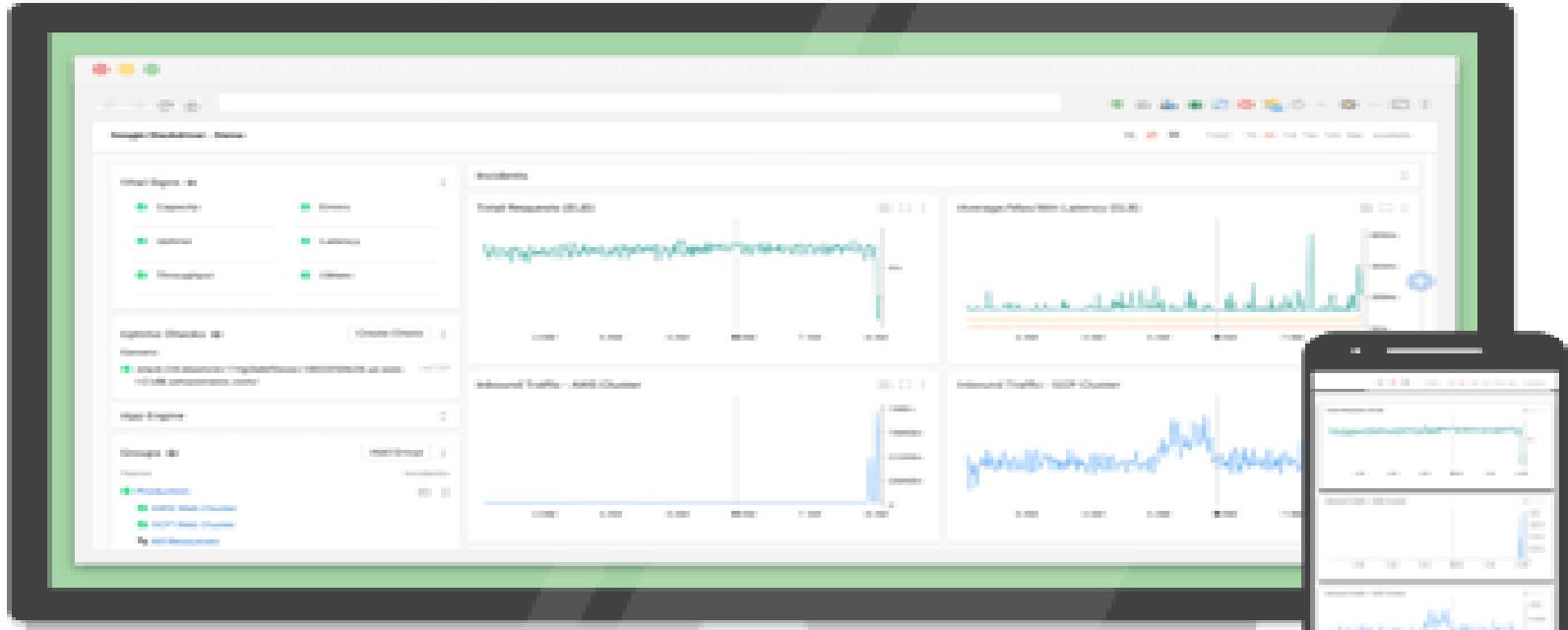
Python 2.7, Python 3.7 (beta)

Java 8, Java 7

Node.js 8 (beta)

PHP 5.5, PHP 7.2 (beta)

Go 1.6, 1.8, 1.9, and Go 1.11 (beta)



In App Engine Cloud Security Scanner can help you find security problems in your app so you can head off potential attackers.

GCP Cloud Architect Overview

Kubernetes Engine

GCP Cloud Architect Overview

Kubernetes Engine

Containers are

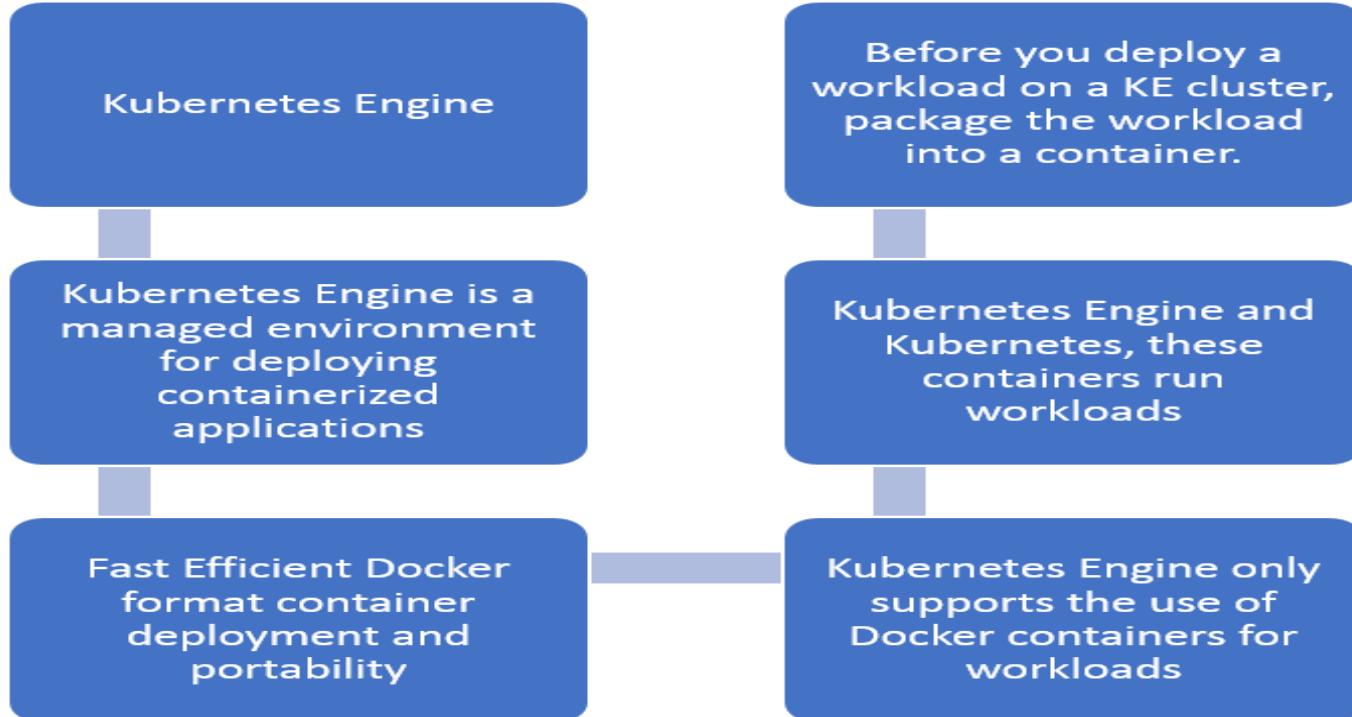
Virtualization at OS Layer

Separates operating system from app code and dependencies

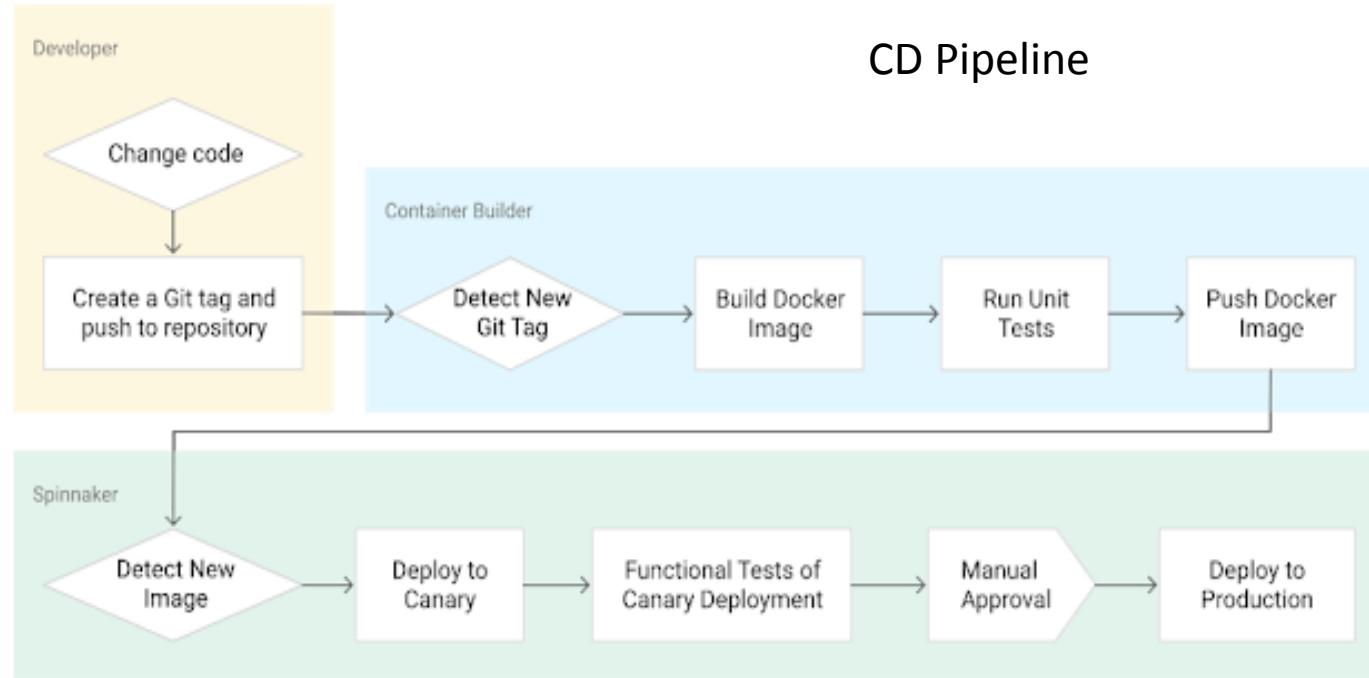
Isolates individual processes

Docker and Kubernetes

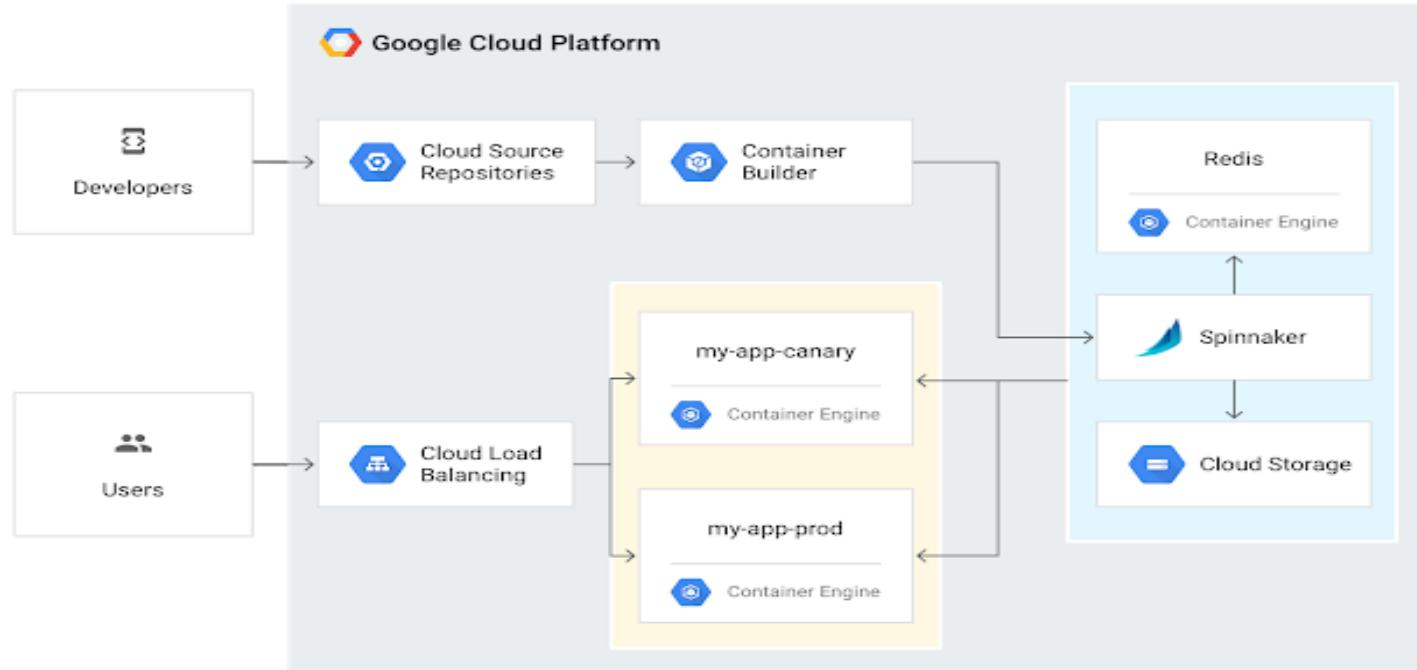
GCP Cloud Architect Overview



GCP Cloud Architect Overview



GCP Cloud Architect Overview



Google Cloud

GCP Cloud Architect Overview

Cloud Functions

GCP Cloud Architect Overview

Cloud Functions -Event-based microservices

Fully managed, serverless, secure

Triggers - Cloud Pub/Sub, HTTP, Cloud Storage

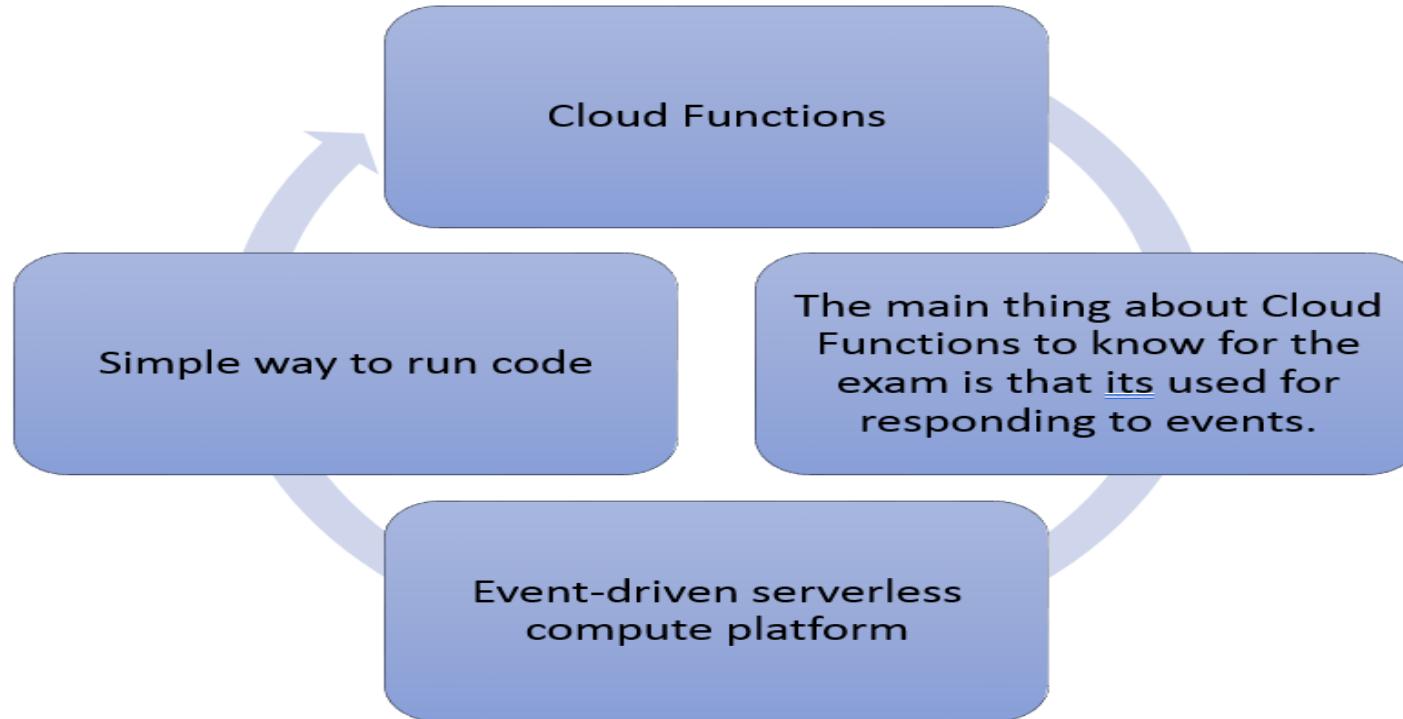
Code Deploy functions from a Cloud Storage bucket, Github or Bitbucket repository

Written in Javascript and runs in Node.js

Stackdriver integration

Cloud Functions come in two distinct variants: foreground (HTTP) and background

GCP Cloud Architect Overview



Test Tip



Custom VMs

Customize Templates in GCP

- CPUs
- Memory

Test Tip



Compute Options

- For the GCP Cloud Architect Exam its very important to distinguish what type of compute options should be selected.
- Be able to specify: Compute Engine, App Engine, Cloud Functions or Kubernetes Engine

Test Tip



Compute Options

App Engine has two environments.

- Standard
- Flexible

App Engine on the exam the main objectives focus on Deploying and implementing App Engine and understanding scaling, what version to deploy and traffic flow.
(Case Study)

GCP Cloud Architect Overview

Service	Why Use
Google Container Registry	Easy to store and access your private Docker images in GCP. Push and Pull images.
Google Cloud Build (Container Builder)	Deploy your containers on Kubernetes Engine without needing to setup authentication.
Google Source Repositories	A single place for your team to store, manage, and track code. Private Github
Kubernetes Engine Container Services Complimentary Services	

GCP Cloud Architect Overview

	Kubernetes Engine	App Engine Std	App Engine Flex
Language	Any	Java, Python, Go, PHP, Node.js	Any
Service Model	Hybrid	PaaS	PaaS
Use Case	Containers	Web & Mobile	Web and Mobile container based.
So What do I choose. App Engine or Kubernetes Engine?			

Test Tip



Kubernetes Engine.

- Kubernetes clusters can be spread across zones within a region for high availability.
They integrate with the required enterprise features like Cloud IAM (Identity Access Management) and VPCs (Virtual Private Clouds) for security purposes.
- Know Complimentary Services for Case Studies

GCP Cloud Architect Overview

Review Questions

GCP Cloud Architect Overview

Review Question 1

What would be the proper IP schema based on the following scenario.

You have been contacted by a major railroad that would like to setup their applications and VMs in the GCP cloud. Customer is asking that there services are setup with an ephemeral IP address range that is dedicated to their services. They don't expect this to be the lowest cost option and would prefer a static solution. What type of IP would you recommend in the GCP Cloud? (Select one)

- a. Internal
- b. Dedicated
- c. Static
- d. External

GCP Cloud Architect Overview

Review Question 2

You have been contacted by a customer to discuss a GCP solution for their events and messaging application. Customer is currently on another provider and using their application on microservices platform. What virtual machine service on GCP is geared towards a serverless approach and focused on microservices?

- a. Container Engine
- b. **Cloud Functions**
- c. App Engine
- d. Compute Engine

GCP Cloud Architect Overview

Review Question 3

You are currently looking at segmenting specific VM resources into a logical manner for ease of management. What are the two types of subnets in GCP? (Choose two)

- a. Auto
- b. Custom
- c. Customized
- d. Autonomous

GCP Cloud Architect Overview

Review Question 4

Google Cloud Functions is a lightweight compute solution for developers to create single-purpose, stand-alone functions that respond to cloud events without the need to manage a server or runtime environment. Cloud Functions runs javascript in node.js supporting both frontend HTTP and background functions. Cloud Functions is useful in a microservices design.

What are some of the drawbacks/limitations of Cloud Functions that you as an Cloud Guru should be aware of? (Select Two)

[On next page](#)

GCP Cloud Architect Overview

Question 4 continued

- a. Cloud functions is not a low latency service
- b. Serverless, there are less resources that can be adjusted for price/performance tradeoffs
- c. Serverless, there are more resources that can be adjusted for price/performance tradeoffs
- d. Cloud functions is a low latency service

GCP Cloud Architect Overview

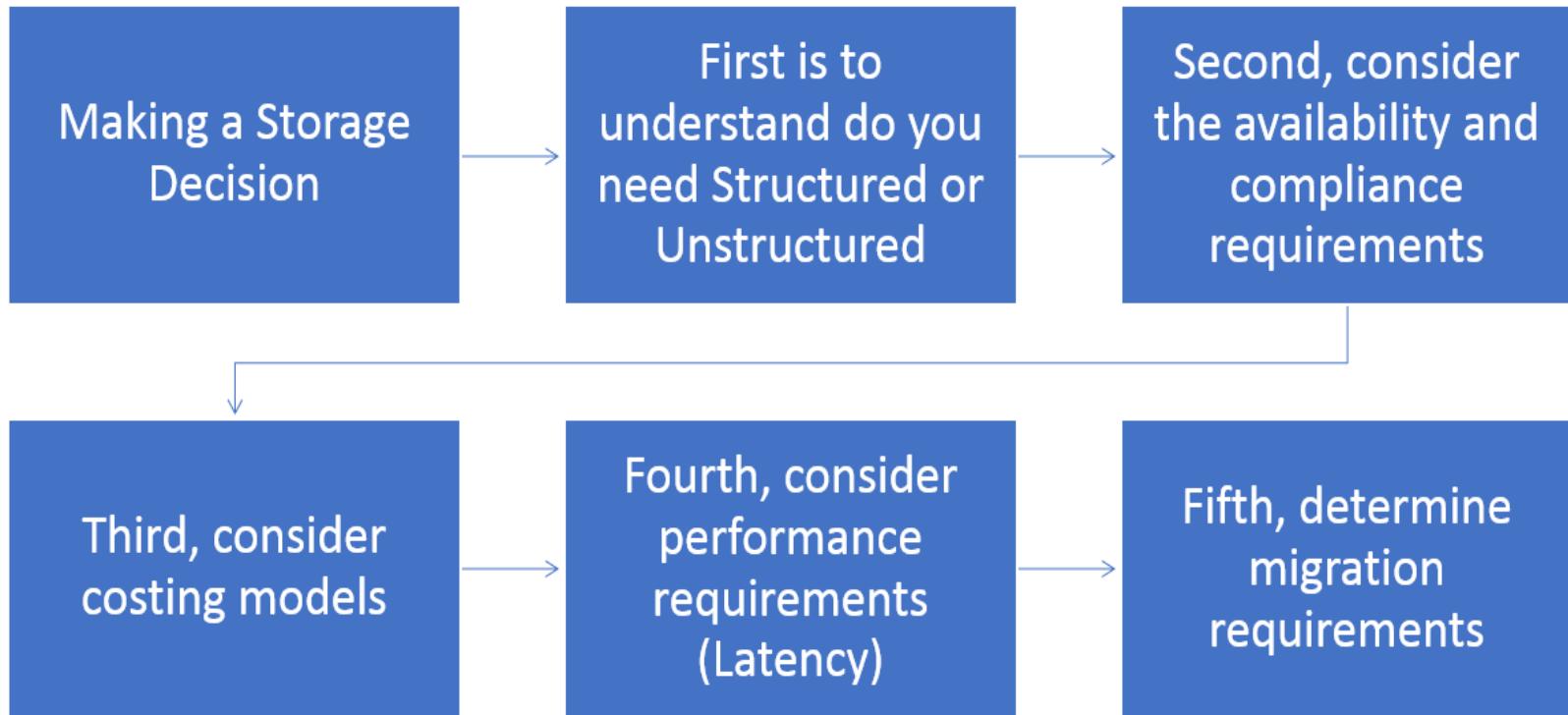
Review Question 5 App Engine has been deployed in a customers GCP services subscription. They would like to know more about the benefits of App Engine Flexible. Please advise them on the benefits. (Select Two)

- a. Supports Autoscaling
- b. Supports Node.js
- c. Runs microservices
- d. Runs in a sandbox

GCP Cloud Architect Overview

GCP Storage and Data Services

GCP Cloud Architect Overview



GCP Cloud Architect Overview

Structure Data Services	Unstructured Data Services
Cloud SQL	Cloud Storage (Blob)
Cloud BigTable	Cloud Filestore (NAS) (not seen on exam objectives)
Cloud BigQuery (Warehouse)	
Cloud Datastore	
Cloud Spanner	

GCP Cloud Architect Overview

Choose a Storage Option

<https://cloud.google.com/storage-options/>

Cloud Storage

Cloud Filestore

Cloud BigTable

Cloud SQL

Cloud Spanner

Cloud Datastore

Persistent Disk



GCP Cloud Architect Overview

<https://cloud.google.com/storage-options/>

	Cloud Storage	Cloud Datastore	Cloud SQL	Bigtable
Storage Type	Object Store	NoSQL, document	Relational SQL	NoSQL, wide Column
Capacity	Petabytes	Terabytes	up to 500GB	Petabytes
Unit Size	5TB per object	1MB/Entity	MySQL Limits	10MB Cell/100MB row
Transactions	No	Yes	Yes	No
Complex Queries	No	No	Yes	No
Good For	Structured or Unstructured	App Engine apps	Web Frameworks	Flat Data, events, analytics
Use Case	Images, media, backups	User profiles	User Credentials	Adtech
		Catalogs	Customer Orders	Financial
				IoT

GCP Cloud Architect Overview

Data Storage - Unstructured data

Unstructured data is data that does not have a pre determined sequence, data model or schema.

Can be human generated or machine generated

Examples are Email, documents, social media, mobile, sensor data, satellite images, etc

On GCP Cloud Storage is the only service built for managing and maintaining your Unstructured Data

GCP Cloud Architect Overview

Data Storage - Structured data

- Structured data is data that does have a pre determined sequence, data model or schema. Generally a database (RDBMS)
- Can be human generated or machine generated
- Examples are SQL.



GCP Cloud Architect Overview



Data Storage - Semi-Structured data



Semi-Structured data is data that contains semantic tags, but does not conform to the structure associated with typical relational databases.

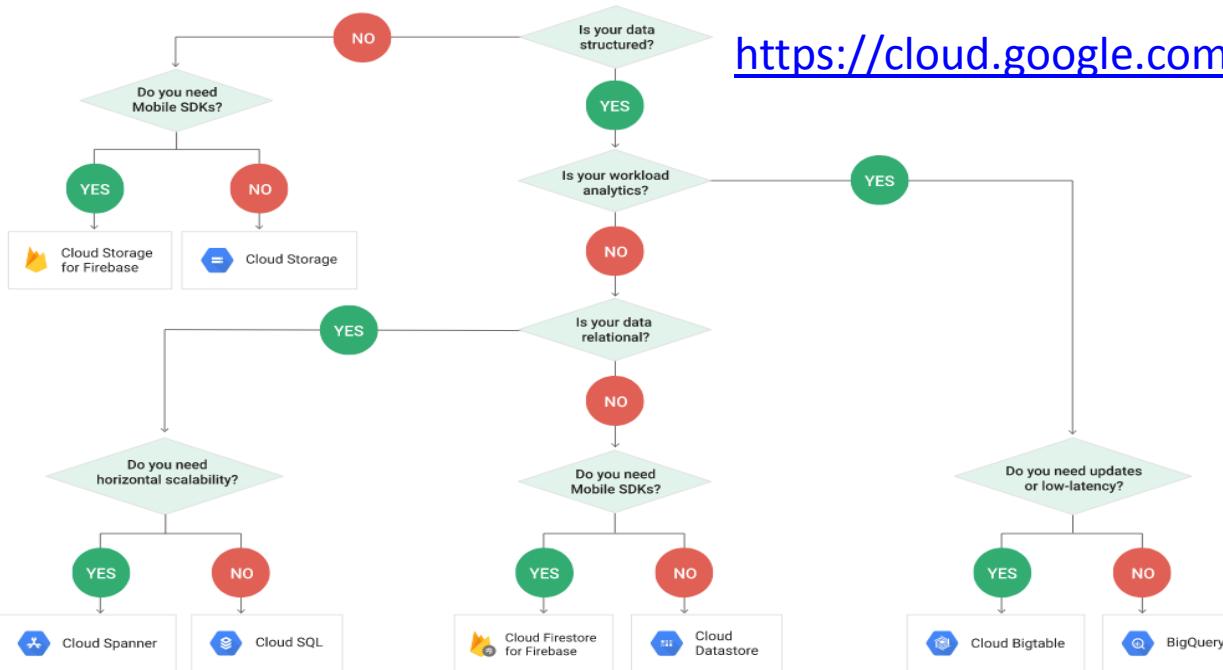


Can be human generated or machine generated



Examples are XML, JSON and NoSQL

GCP Cloud Architect Overview



<https://cloud.google.com/storage-options/>

GCP Cloud Architect Overview

Cloud Storage

GCP Cloud Architect Overview

Google Cloud Storage offers four storage classes.

Customers can associate each of their buckets with the storage class most appropriate for their use cases.

All of the storage classes are accessed in using the Cloud Storage API, and all offer millisecond access times.

All storage classes incur a cost per gigabyte of data stored per month, and egress and data transfer charges may apply.

In addition to those charges, Nearline storage also incurs an access fee per gigabyte of data read, and Coldline storage incurs a higher fee per gigabyte (reads)

GCP Cloud Architect Overview

Cloud Storage is Not a file system. Though Cloud Storage is not a file system, it can be accessed as one using third party tools such as Cloud Storage Fuse.

-Simple administration and does not require capacity management

- Accessed through REST APIs

- Client libraries

- REST APIs

- gsutil (CLI)

GCP Cloud Architect Overview



Cloud Storage Traffic Costs



Supports Online or offline imports



All storage classes accessed through the same APIs



Simple pricing model



- Network ingress, and data transfer within a region is free



- Network egress charges apply and vary by destination

GCP Cloud Architect Overview

Cloud Storage Terminology

All data in Cloud Storage belongs inside a project.

A project consists of a set of users, a set of APIs, and billing, authentication, and monitoring settings for those APIs.

Buckets are the basic containers that hold your data. Everything that you store in Cloud Storage must be contained in a bucket.

Objects are the individual pieces of data that you store in Cloud Storage.

GCP Cloud Architect Overview

Objects have two components:

object data and object metadata.

Object data is typically a file that you want to store in Cloud Storage.

Object metadata is a collection of name-value pairs that describe various object qualities.

GCP Cloud Architect Overview



Cloud Storage uses a flat namespace to store objects.



There is only one Cloud Storage namespace, which means every bucket must have a unique name across the entire Cloud Storage namespace.



Object names must be unique only within a given bucket.

GCP Cloud Architect Overview

Google Cloud Storage has four specific classes that you should be aware since this will affect durability and costing significantly.

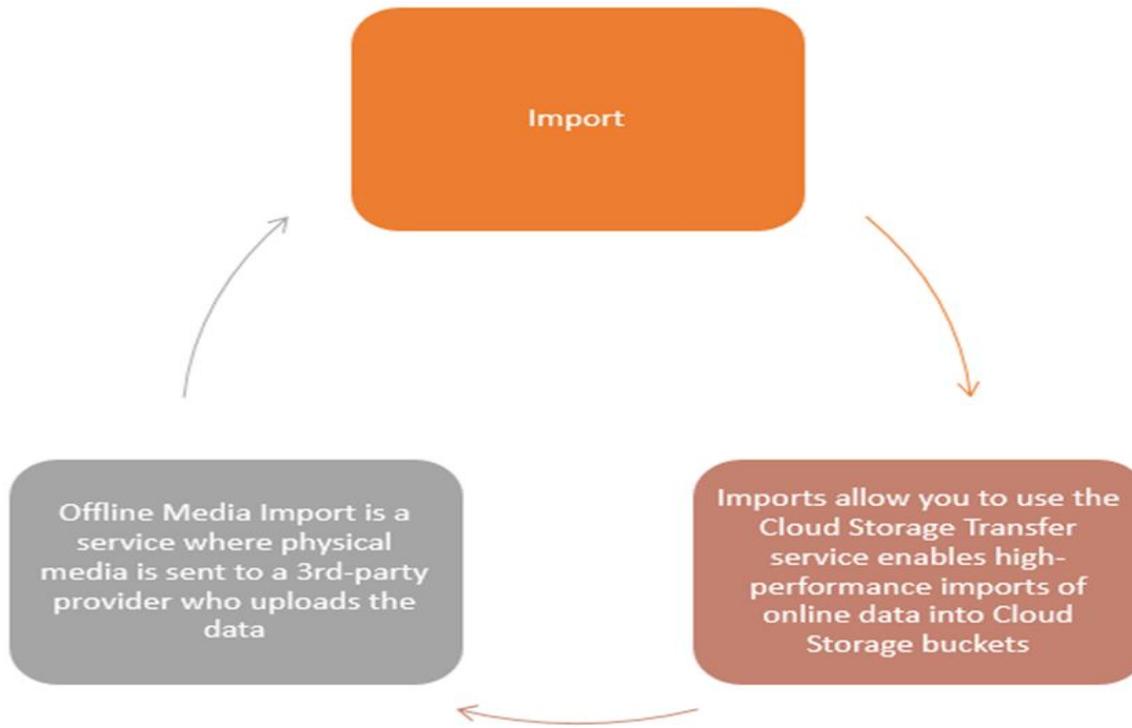
Multi-Regional

Regional

Nearline

Coldline

GCP Cloud Architect Overview



GCP Cloud Architect Overview

Data Services

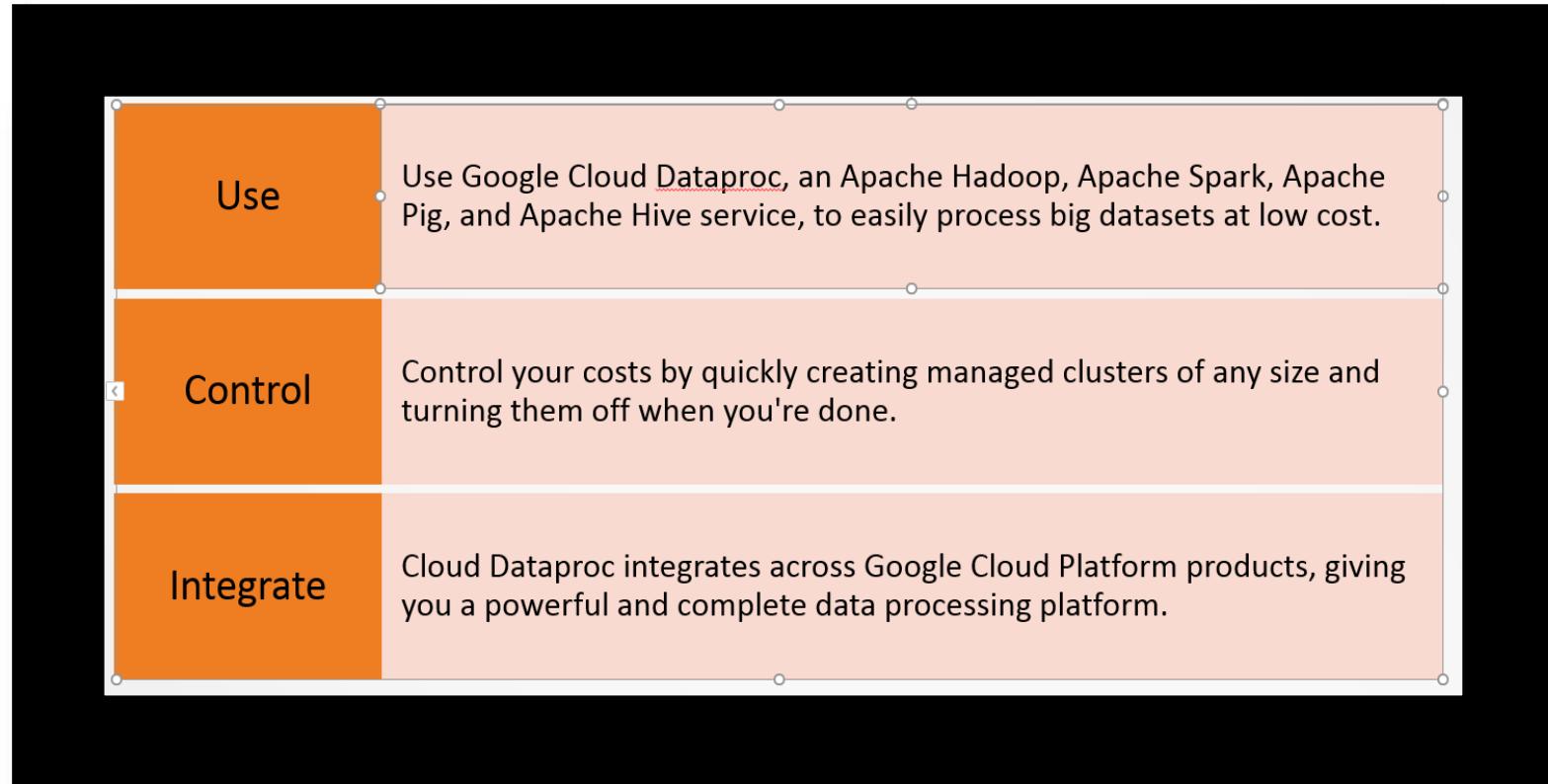
GCP Cloud Architect Overview



GCP Cloud Architect Overview

DataProc

GCP Cloud Architect Overview



Test Tip



DataProc

- Know that you can use DataProc in a geo distributed cluster for storing user profiles.
- *Apache Spark and Hadoop on exam,,, This is likely the answer*
- Don't confuse DataProc and DataFlow.

GCP Cloud Architect Overview

Review Question 1

Your enterprise is forecasting a steep increase in the number and size of Apache Spark and Hadoop jobs in your datacenter.

You want to utilize GCP to help you scale this upcoming demand with the least amount of operations, effort and development.

What GCP Solution should you select?

- a. Cloud DataFlow
- b. **Cloud DataProc**
- c. BigTable
- d. BigQuery

Cloud DataProc Vs Cloud DataFlow

- Cloud Analytics
- Cloud DataProc is used for processing large Apache datasets and provides you with a Hadoop cluster for access to Hadoop-ecosystem tools (e.g. Apache Pig, Hive, and Spark)
- Cloud Dataflow is for processing both the Batch and Stream data and provides you with a place to run Apache Beam based process on GCP. (Analyze real time data streams)

GCP Cloud Architect Overview

Cloud SQL

GCP Cloud Architect Overview

Cloud SQL is a fully-managed MySQL and PostgreSQL database service.

Fully managed instances

Patches and updates automatically applied

You still have to administer MySQL users

Cloud SQL supports many clients

GCP Cloud Architect Overview



Cloud SQL is a fully-managed MySQL and PostgreSQL database service.



Pay per use model

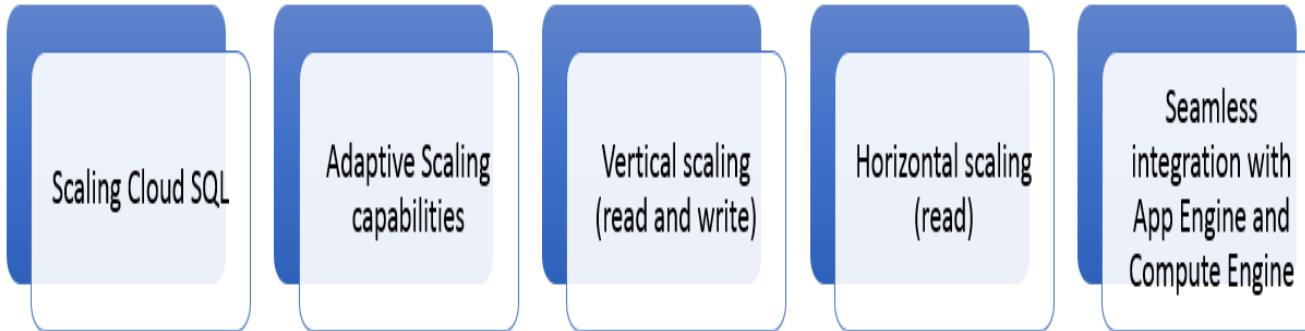


Rest API



Affordable and high performance

GCP Cloud Architect Overview



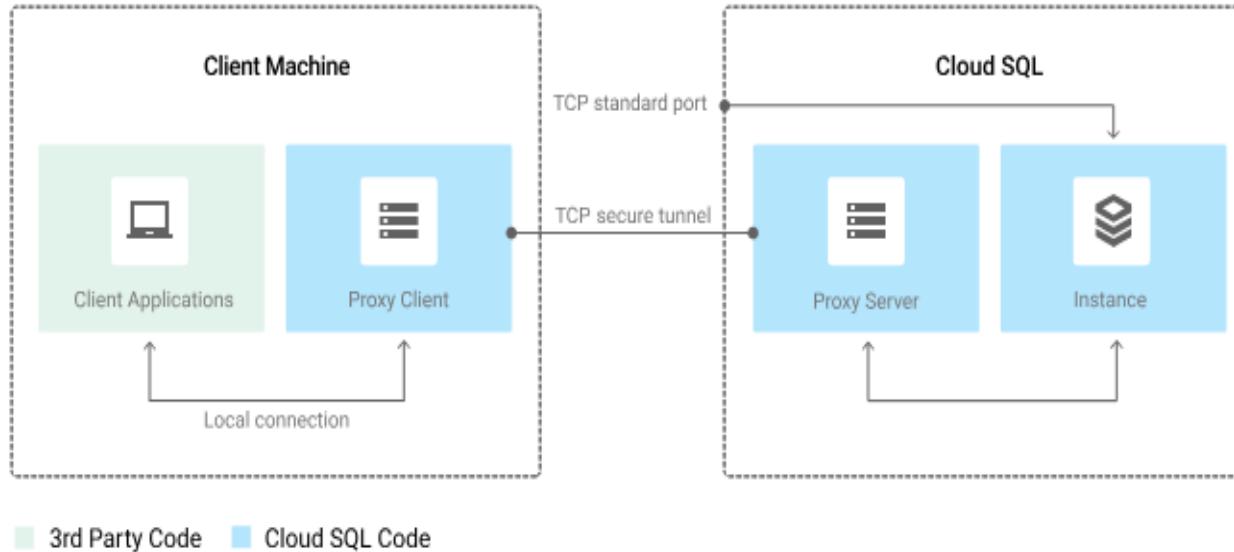
Cloud SQL
Cloud SQL Instances

Cloud SQL instances are fully managed, relational MySQL and PostgreSQL databases. Google handles replication, patch management and database management to ensure availability and performance. [Learn more](#)

To get started with Cloud SQL, you can create a new instance or use Cloud SQL to migrate your MySQL database to Google Cloud.

[Create instance](#) or [Migrate data](#)

GCP Cloud Architect Overview



GCP Cloud Architect Overview



GCP Cloud Architect Overview



SQL Features Supported



Cloud SQL supports: Stored procedures, Triggers, and Views



Cloud SQL does not support: User-defined functions, Internal MySQL replication, statements and functions related to files and plugins



Go to this page for current supported and unsupported capabilities

<https://cloud.google.com/sql/docs/features>

GCP Cloud Architect Overview



Instances Supported

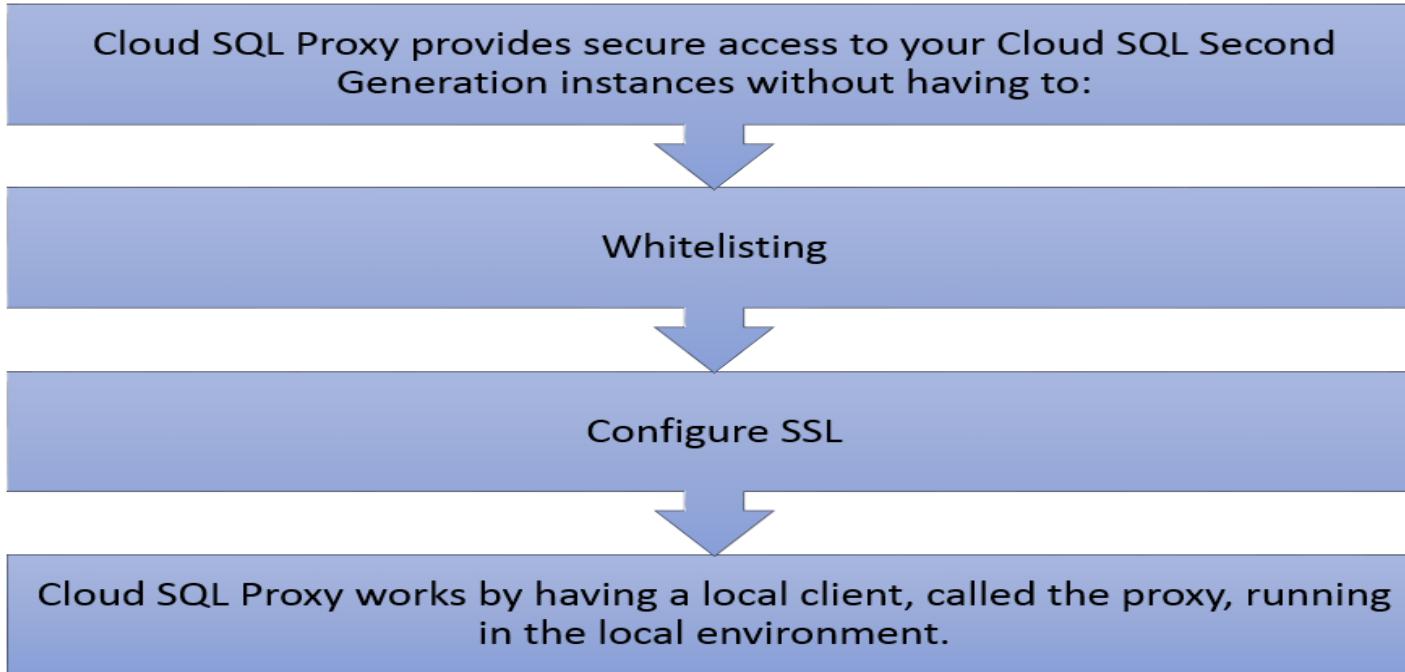


Second Generation instances support MySQL 5.6 or [5.7](#), and provide up to 208 GB of RAM and 10 TB data storage, with the option to automatically increase the storage size as needed.



First Generation instances support MySQL 5.5 or [5.6](#), and provide up to 16 GB of RAM and 500 GB data storage.

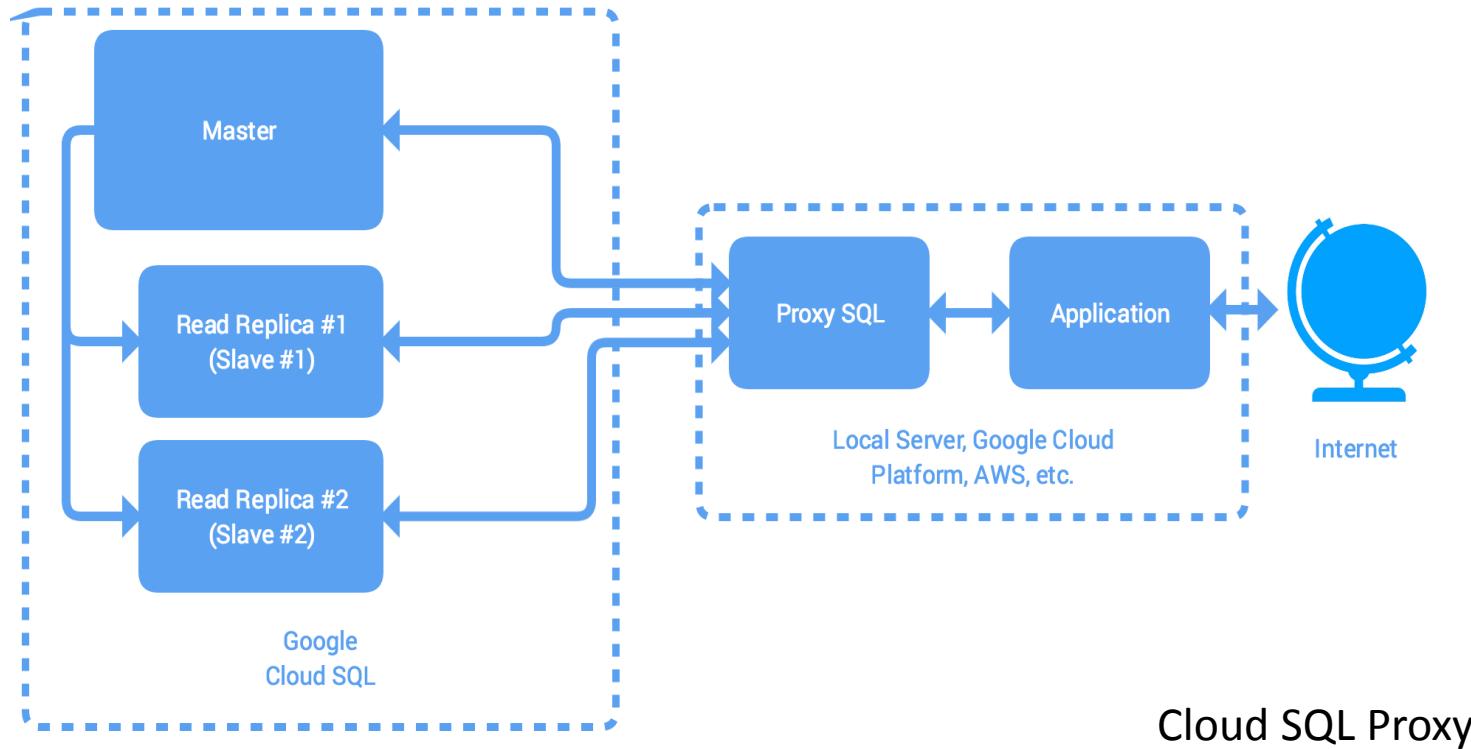
GCP Cloud Architect Overview



GCP Cloud Architect Overview



GCP Cloud Architect Oveview



GCP Cloud Architect Overview

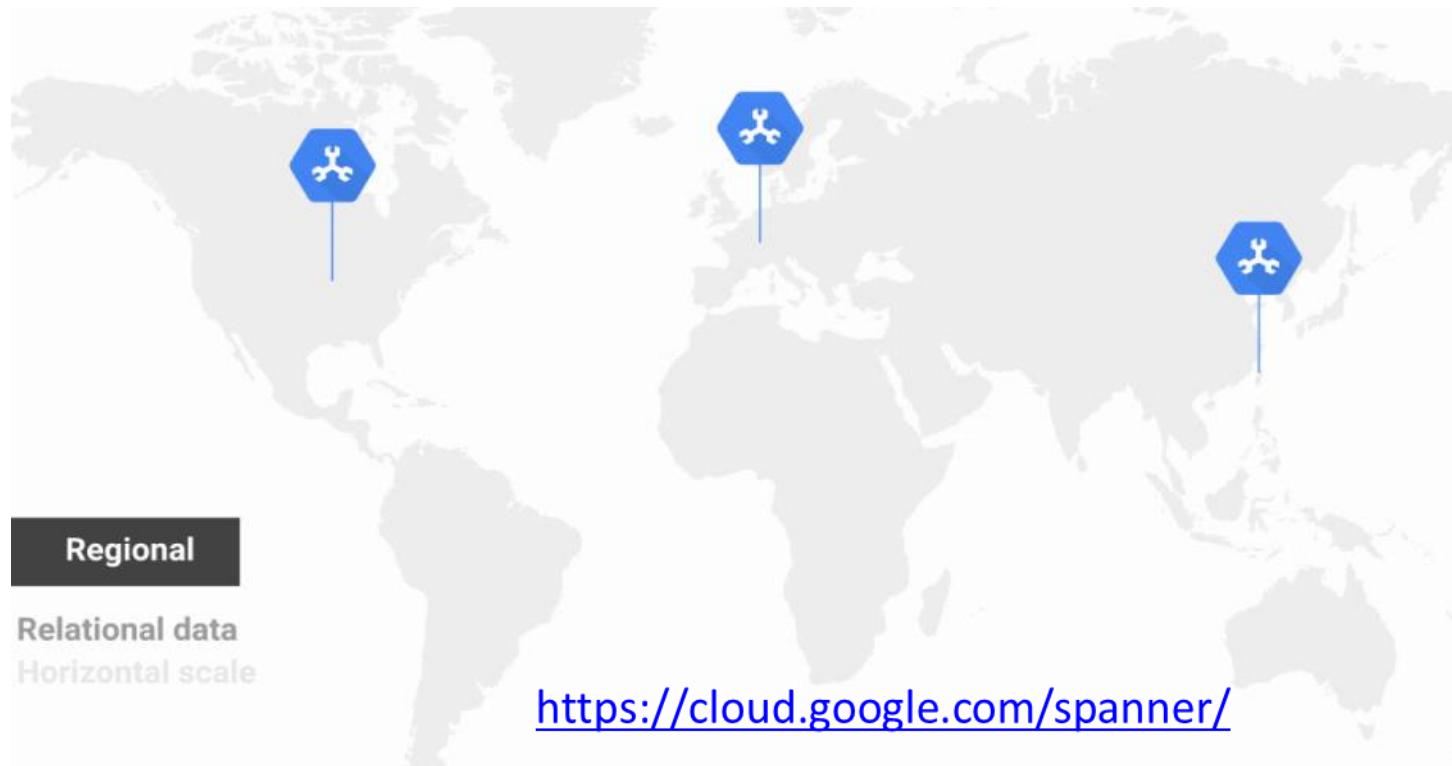
Cloud Spanner

GCP Cloud Architect Overview

Cloud Spanner is the only enterprise-grade, globally-distributed, and strongly consistent database service built for the cloud specifically to combine the benefits of relational database structure with non-relational horizontal scale.

Cloud SQL is Regional so consider Spanner with your Geo disbursed requirements

GCP Cloud Architect Overview



GCP Cloud Architect Overview



Cloud Spanner
Overview.



Strong
Consistency



SQL Support



Managed Service



Strong global
consistency



Secure global
transactions



Horizontal
scalability



Managed by
Googles SRE team

GCP Cloud Architect Overview

Cloud Spanner Notes for Exam

Cloud Spanner has regional and multi-region instance configurations.

Cloud Spanner database can contain one or more tables.

Data in Cloud Spanner is strongly typed (Strong Schema)

GCP Cloud Architect Overview

	CLOUD SPANNER	TRADITIONAL RELATIONAL	TRADITIONAL NON-RELATIONAL
Schema	✓ Yes	✓ Yes	✗ No
SQL	✓ Yes	✓ Yes	✗ No
Consistency	✓ Strong	✓ Strong	✗ Eventual
Availability	✓ High	✗ Failover	✓ High
Scalability	✓ Horizontal	✗ Vertical	✓ Horizontal
Replication	✓ Automatic	🟡 Configurable	🟡 Configurable

<https://cloud.google.com/spanner/>

GCP Cloud Architect Overview



Cloud Spanner transaction modes:



Locking read-write. This type of transaction is the only transaction type that supports writing data into Cloud Spanner.



Read-only. This transaction type provides guaranteed consistency across several reads, but does not allow writes.

GCP Cloud Architect Overview

Cloud Datastore

GCP Cloud Architect Overview



Cloud Datastore is a highly-scalable NoSQL database for your applications. Cloud Datastore automatically handles sharding and replication, a highly available and durable database that scales automatically



Strong Consistency



Global Scalability



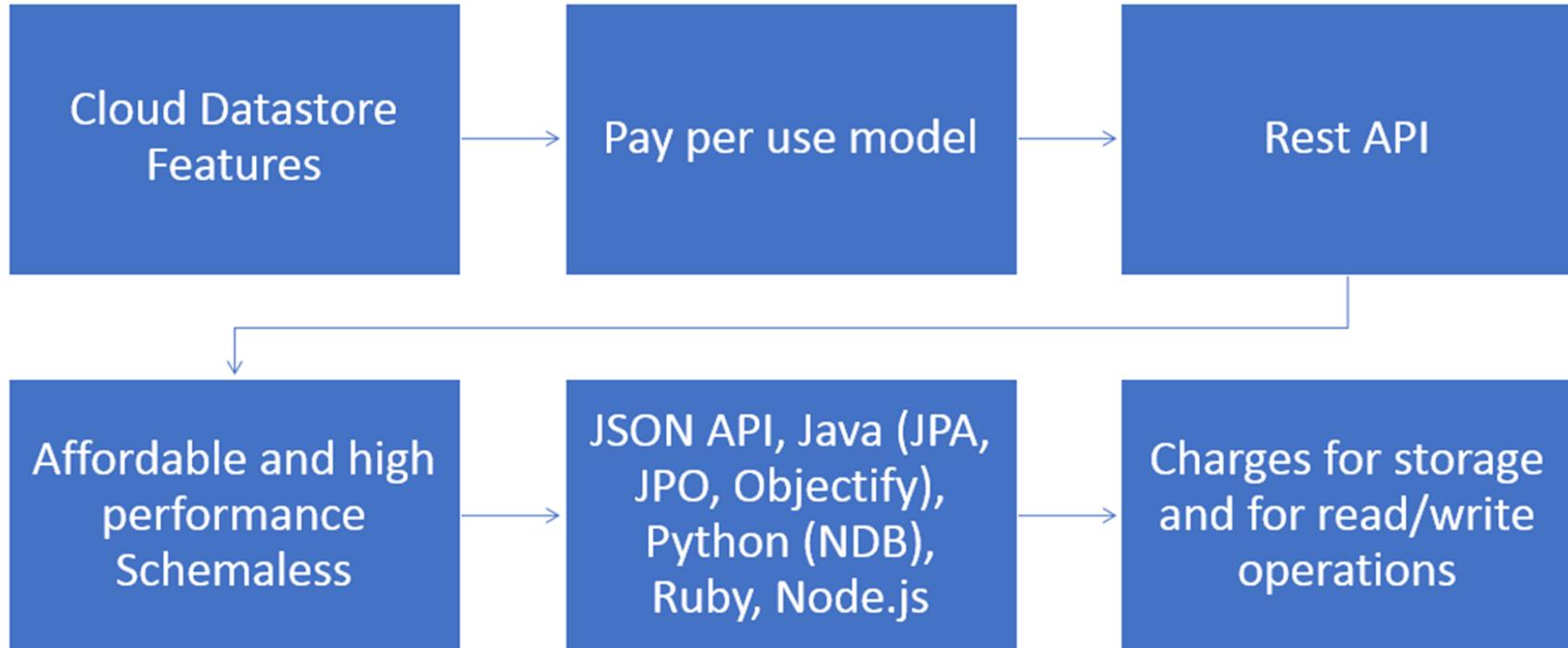
Managed Instances



SQL Support ANSI 2011



GCP Cloud Architect Overview



GCP Cloud Architect Overview



CLOUD DATASTORE
REPLICATION



MULTIPLE LOCATIONS



MULTI-REGIONAL



MULTI-REGION
REDUNDANCY, HIGHER
AVAILABILITY



REGIONAL LOCATIONS

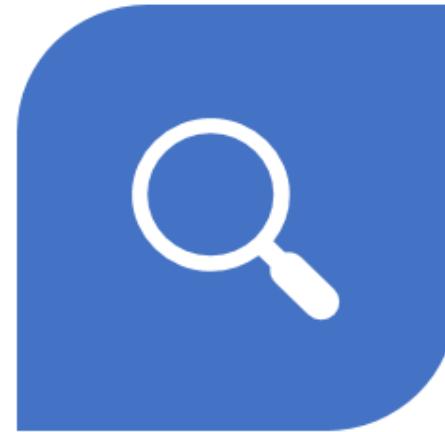


LOWER WRITE LATENCY, CO-
LOCATION WITH OTHER
RESOURCES



GLOBAL POINTS OF
PRESENCE - LOWER
LATENCY FOR THE END USER

GCP Cloud Architect Overview



GOOGLE CLOUD DATASTORE IS A SCHEMALESS DATABASE, WHICH ALLOWS YOU TO WORRY LESS ABOUT MAKING CHANGES TO YOUR UNDERLYING DATA STRUCTURE AS YOUR APPLICATION EVOLVES.

DATASTORE PROVIDES A POWERFUL QUERY ENGINE THAT ALLOWS YOU TO SEARCH FOR DATA ACROSS MULTIPLE PROPERTIES AND SORT AS NEEDED.

GCP Cloud Architect Overview

Cloud Bigtable

GCP Cloud Architect Overview

Cloud Bigtable Overview.

Fully-managed NoSQL database

Petabyte-scale with very low latency

Seamless scalability for throughput

Learns and adjusts to access patterns

Cloud Bigtable utilizes a low-latency storage stack

Redundant Autoscaling Storage

Seamless Cluster Resizing



GCP Cloud Architect Overview

GCP Big Table

Integrates easily with popular Big Data tools like Hadoop, as well as Google Cloud Platform products like Cloud Dataflow and Dataproc.

Bigtable supports the open-source, industry-standard HBase API

GCP Cloud Architect Overview

<https://cloud.google.com/storage-options/>

	Cloud Storage	Cloud Datastore	Cloud SQL	Bigtable
Storage Type	Object Store	NoSQL, document	Relational SQL	NoSQL, wide Column
Capacity	Petabytes	Terabytes	up to 500GB	Petabytes
Unit Size	5TB per object	1MB/Entity	MySQL Limits	10MB Cell/100MB row
Transactions	No	Yes	Yes	No
Complex Queries	No	No	Yes	No
Good For	Structured or Unstructured	App Engine apps	Web Frameworks	Flat Data, events, analytics
Use Case	Images, media, backups	User profiles	User Credentials	Adtech
		Catalogs	Customer Orders	Financial
				IoT

GCP Cloud Architect Overview

Data Storage - Unstructured data

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Can be human generated or machine generated

Examples are Email, documents, social media, mobile, sensor data, satellite images, etc

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GCP Cloud Architect Overview

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- Structured data is data that does have a pre determined sequence, data model or schema. Generally a database (RDBMS)
- Can be human generated or machine generated
- Examples are SQL.



GCP Cloud Architect Overview



Data Storage - Semi-Structured data



Semi-Structured data is data that contains semantic tags, but does not conform to the structure associated with typical relational databases.



Can be human generated or machine generated



Examples are XML, JSON and NoSQL

GCP Cloud Architect Overview



GOOGLE CLOUD STORAGE IS UNIFIED OBJECT STORAGE FOR DEVELOPERS AND ENTERPRISES, FROM LIVE DATA SERVING TO DATA ANALYTICS/ML TO DATA ARCHIVING.



HIGH PERFORMANCE, INTERNET-SCALE, IMMUTABLE BLOB (BINARY LARGE OBJECT) STORAGE



SIMPLE ABSTRACTION STORAGE BUCKETS, IMMUTABLE OBJECTS WITH MUTABLE METADATA AND GLOBALLY UNIQUE URI IDENTIFIERS FOR BUCKETS, OBJECTS



COMMON STORAGE FOR GOOGLE CLOUD PLATFORM SERVICES

GCP Cloud Architect Overview



Some important Cloud Storage
Notes



Cloud Storage uses a flat
namespace to store objects.

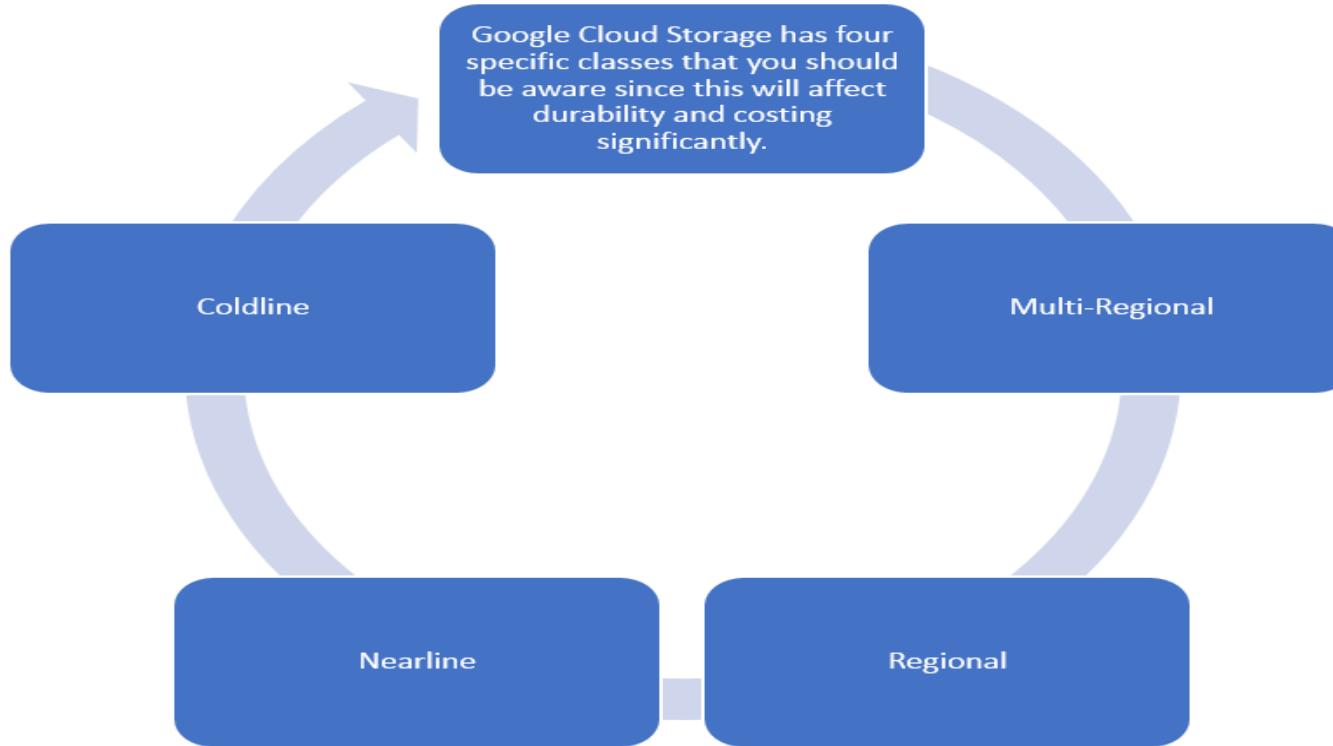


There is only one Cloud Storage
namespace, which means every
bucket must have a unique name
across the entire Cloud Storage
namespace.

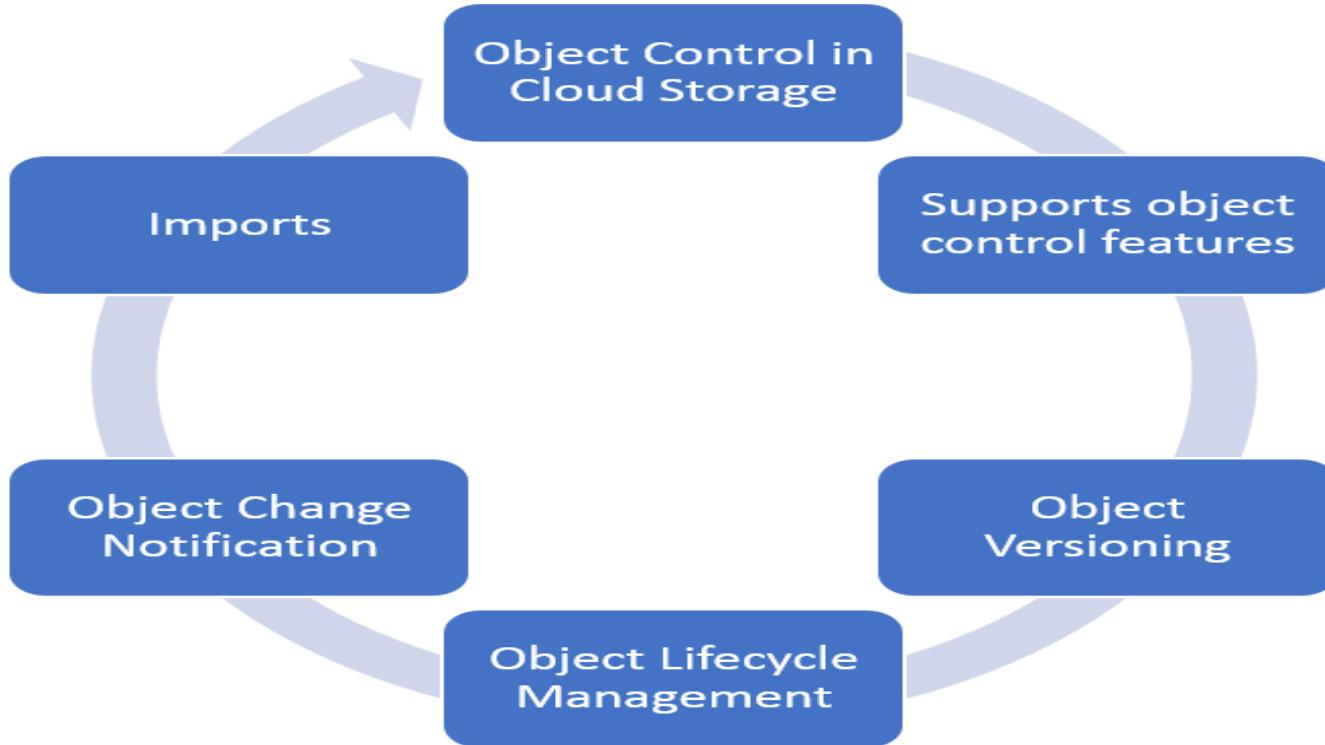


Object names must be unique only
within a given bucket.

GCP Cloud Architect Overview



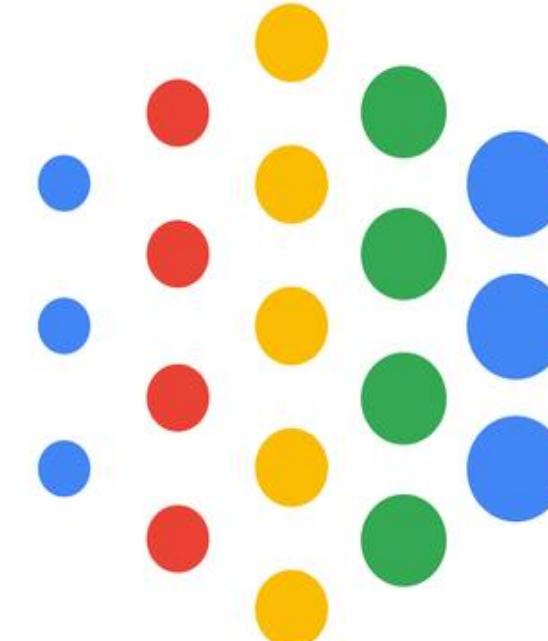
GCP Cloud Architect Overview



GCP Cloud Architect Overview

Object Lifecycle Management

- Object Lifecycle management policies specify actions to be performed on objects that meet certain rules sets.
- Changes to configurations can take 24 hours to apply
- Object inspection occurs asynchronous batches



GCP Cloud Architect Overview

Object Change Notification

- Uses Webhooks
- Object change notification watches a bucket and send notifications to external applications when objects change

<https://cloud.google.com/storage/docs/object-change-notification>



GCP Cloud Architect Overview

Import

- Imports allow you to use The Cloud Storage Transfer service enables high-performance imports of online data into Cloud Storage buckets
- Offline Media Import is a service where physical media is sent to a 3rd-party provider who uploads the data

Availability and Third Party Service Providers

<https://cloud.google.com/storage/docs/offline-media-import-export>

GCP Cloud Architect Overview

Import

- Imports allow you to use The Cloud Storage Transfer service enables high-performance imports of online data into Cloud Storage buckets
- Offline Media Import is a service where physical media is sent to a 3rd-party provider who uploads the data

Availability and Third Party Service Providers

<https://cloud.google.com/storage/docs/offline-media-import-export>

Test Tip



Cloud Storage

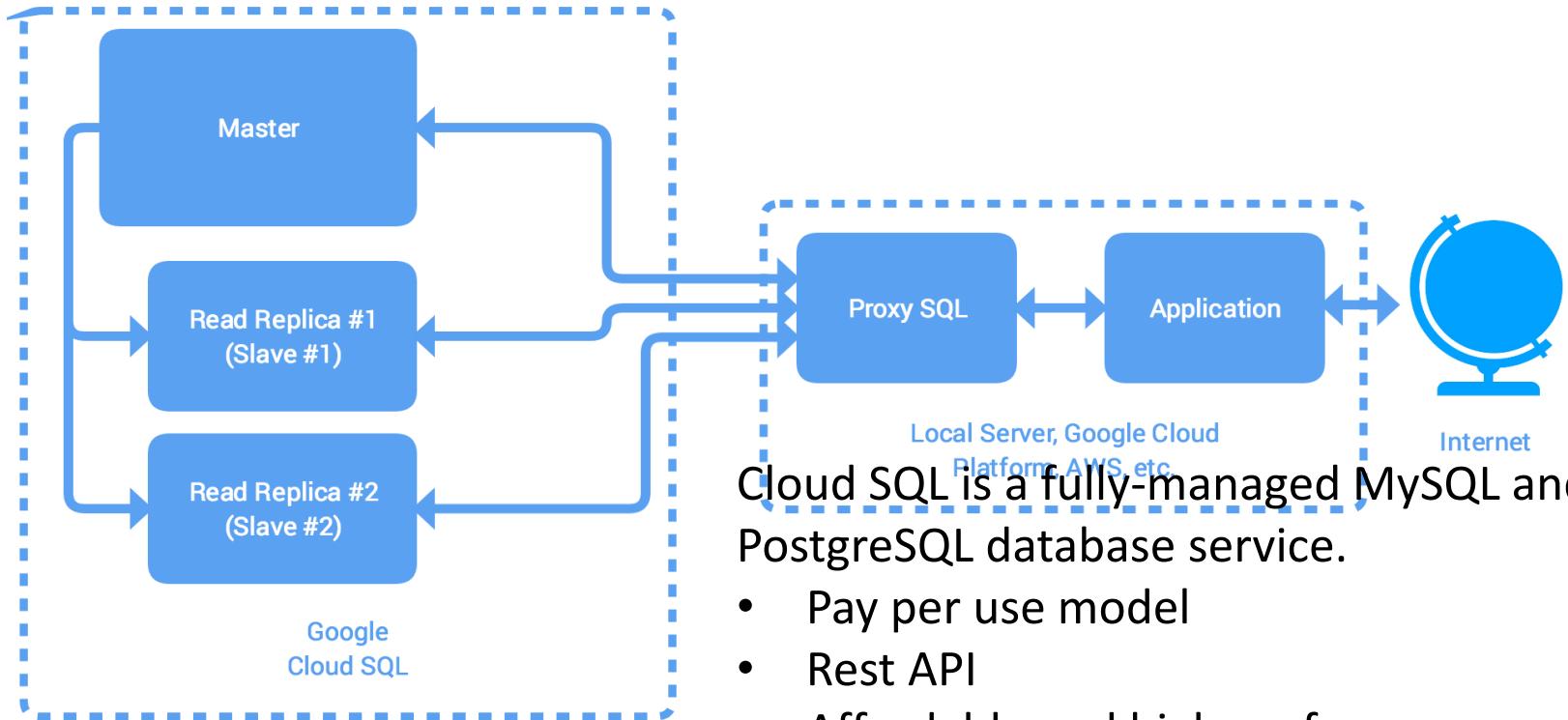
- Know your Cloud Storage Options and Classes or you may be this guy😊
- 30 days or less- keep on Multi-regional or regional.
- 30 -90 days = Nearline
- 90 or more days = Coldline



GCP Cloud Architect Overview

Cloud SQL

GCP Cloud Architect Overview



GCP Cloud Architect Overview

Scaling Cloud SQL

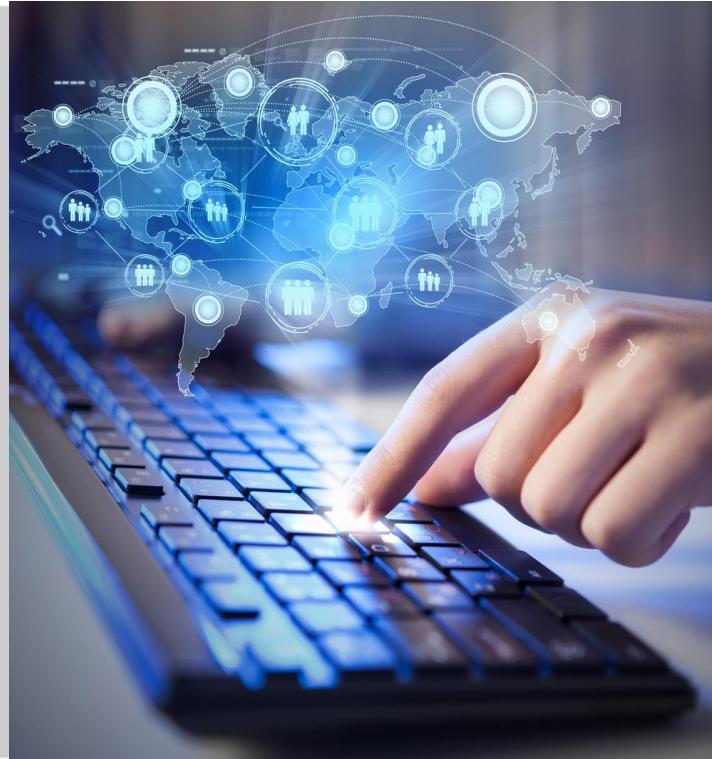
- Adaptive Scaling capabilities
- Vertical scaling (read and write)
- Horizontal scaling (read)
- Seamless integration with App Engine and Compute Engine



GCP Cloud Architect Overview

Scaling Cloud SQL

- Adaptive Scaling capabilities
- Vertical scaling (read and write)
- Horizontal scaling (read)
- Seamless integration with App Engine and Compute Engine



GCP Cloud Architect Overview

SQL Features Supported

- Cloud SQL supports: Stored procedures, Triggers, and Views
- Cloud SQL does not support: User-defined functions, Internal MySQL replication, statements and functions related to files and plugins
- Go to this page for current supported and unsupported capabilities

<https://cloud.google.com/sql/docs/features>

GCP Cloud Architect Overview

Instances Supported

- Second Generation instances support MySQL 5.6 or 5.7, and provide up to 208 GB of RAM and 10 TB data storage, with the option to automatically increase the storage size as needed.
- First Generation instances support MySQL 5.5 or 5.6, and provide up to 16 GB of RAM and 500 GB data storage.

Test Tip



Cloud SQL

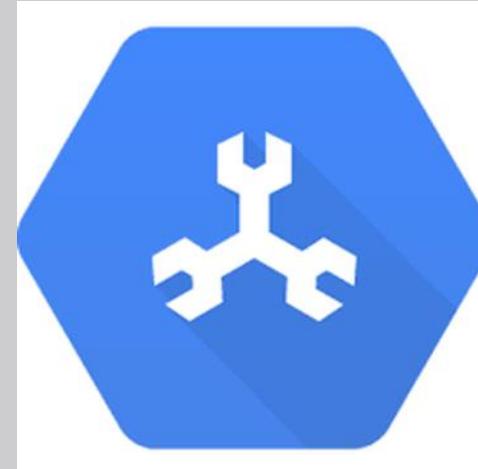
- Cloud SQL is mainly tested in Case Studies.
- Understand that it scales **Regionally not Globally**.
- Specify Cloud Spanner over Cloud SQL if there is a Cross Regional requirement.
- Horizontal vs Vertical Scaling

GCP Cloud Architect Overview

Cloud Spanner

GCP Cloud Architect Overview

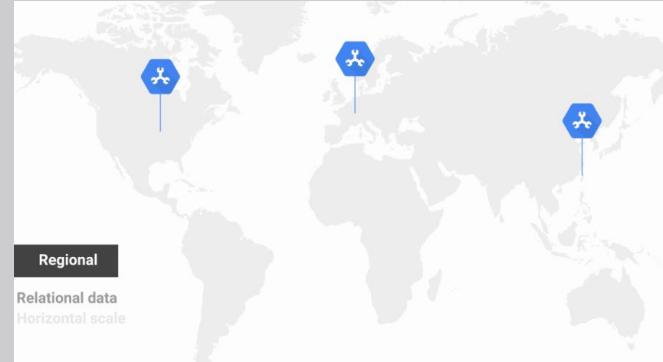
Cloud Spanner is the only enterprise-grade, globally-distributed, and strongly consistent database service built for the cloud specifically to combine the benefits of relational database structure with non-relational horizontal scale.



GCP Cloud Architect Overview

Cloud Spanner Overview.

- Strong Consistency
- SQL Support
- Managed Service
- Strong global consistency
- Secure global transactions
- Horizontal scalability
- Managed by Googles SRE team



<https://cloud.google.com/spanner/>

GCP Cloud Architect Overview

Cloud Spanner Notes for Exam

- Cloud Spanner has **regional and multi-region** instance configurations.
- Cloud Spanner database can contain **one or more tables**.
- Data in Cloud Spanner is strongly typed (**Strong Schema**)

	CLOUD SPANNER	TRADITIONAL RELATIONAL	TRADITIONAL NON-RELATIONAL
Schema	✓ Yes	✓ Yes	✗ No
SQL	✓ Yes	✓ Yes	✗ No
Consistency	✓ Strong	✓ Strong	✗ Eventual
Availability	✓ High	✗ Failover	✓ High
Scalability	✓ Horizontal	✗ Vertical	✓ Horizontal
Replication	✓ Automatic	⟳ Configurable	⟳ Configurable

GCP Cloud Architect Overview

Cloud Spanner transaction modes:

- **Locking read-write.** This type of transaction is the only transaction type that supports writing data into Cloud Spanner.
- **Read-only.** This transaction type provides guaranteed consistency across several reads, but does not allow writes.

<https://cloud.google.com/spanner/docs/transactions>

GCP Cloud Architect Overview

CloudSQL Vs Cloud Spanner

Regional(Vertical) vs Global (Horizontal)

- CloudSQL is fully relational database for supporting customized table views, stored procedures, tons of indexes and ACID compliance. It supports MySQL and PostGreSQL (Vertical)
- Cloud Spanner is the first and only Global Scale relational database service that is both strongly consistent and horizontally scalable.
 - Cloud Spanner is a tool really for scaling globally (Horizontally).
 - Cloud SQL is your standard SQL databases and scales like. You can select machine type, hard disk type and size, region and zone.

GCP Cloud Architect Overview

CloudSQL Vs Cloud Spanner

- Main issue on exam will be scaling for use cases.
- Don't get caught off guard and be a “deer with the headlights on it”



GCP Cloud Architect Overview

Cloud Datastore

GCP Cloud Architect Overview



Cloud Datastore is a highly-scalable NoSQL database for your applications. Cloud Datastore automatically handles sharding and replication, a highly available and durable database that scales automatically



Strong Consistency



Global Scalability



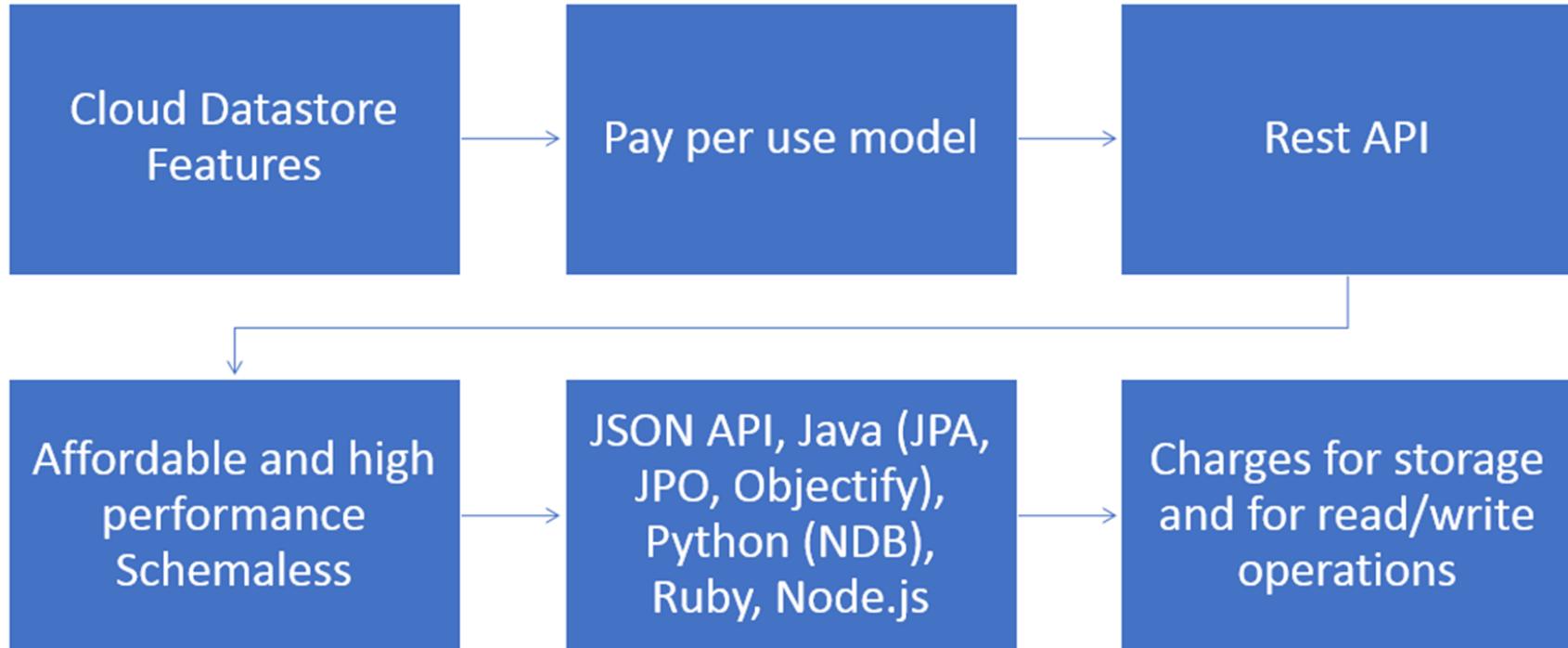
Managed Instances



SQL Support ANSI 2011



GCP Cloud Architect Overview



GCP Cloud Architect Overview



CLOUD DATASTORE
REPLICATION



MULTIPLE LOCATIONS



MULTI-REGIONAL



MULTI-REGION
REDUNDANCY, HIGHER
AVAILABILITY



REGIONAL LOCATIONS

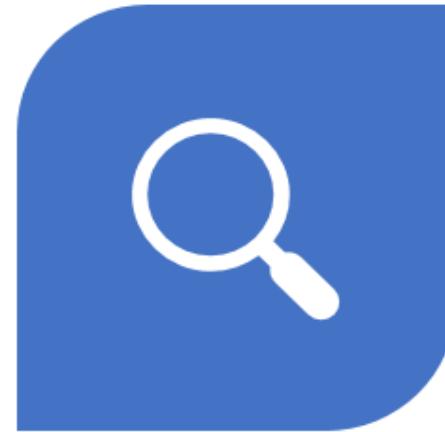


LOWER WRITE LATENCY, CO-
LOCATION WITH OTHER
RESOURCES



GLOBAL POINTS OF
PRESENCE - LOWER
LATENCY FOR THE END USER

GCP Cloud Architect Overview



GOOGLE CLOUD DATASTORE IS A SCHEMALESS DATABASE, WHICH ALLOWS YOU TO WORRY LESS ABOUT MAKING CHANGES TO YOUR UNDERLYING DATA STRUCTURE AS YOUR APPLICATION EVOLVES.

DATASTORE PROVIDES A POWERFUL QUERY ENGINE THAT ALLOWS YOU TO SEARCH FOR DATA ACROSS MULTIPLE PROPERTIES AND SORT AS NEEDED.

Test Tip



Cloud Datastore is a **schemaless database**, which allows you to worry less about making changes to your underlying data structure as your application evolves.

- Datastore provides a powerful query engine that allows you to search for data across multiple properties and sort as needed.
- Product Catalogs, Use Profiles.

GCP Cloud Architect Overview

Cloud Filestore

GCP Cloud Architect Overview



Cloud Filestore is a managed file storage service for applications that require a filesystem interface and a shared filesystem for data. Filestore gives users a simple, native experience for standing up managed Network Attached Storage (NAS) with their Google Compute Engine and Kubernetes Engine instances

GCP Cloud Architect Overview



Cloud Filestore Benefits



Cloud Filestore offers low latency for file operations.



Filestore provides high IOPS with minimal variability in performance.



Users independently pick the IOPS and the storage capacity you need with Filestore.



Cloud Filestore is a fully managed, NoOps service that is integrated with the rest of the Google Cloud portfolio

GCP Cloud Architect Overview

Cloud Bigtable

GCP Cloud Architect Overview

Cloud Bigtable Overview.

Fully-managed NoSQL database

Petabyte-scale with very low latency

Seamless scalability for throughput

Learns and adjusts to access patterns

Cloud Bigtable utilizes a low-latency storage stack

Redundant Autoscaling Storage

Seamless Cluster Resizing



GCP Cloud Architect Overview

GCP Big Table

Integrates easily with popular Big Data tools like Hadoop, as well as Google Cloud Platform products like Cloud Dataflow and Dataproc.

Bigtable supports the open-source, industry-standard HBase API

GCP Cloud Architect Overview

Big Table Use Case

Integrates easily with popular Big Data tools like Hadoop, as well as Google Cloud Platform products like Cloud Dataflow and Dataproc.

Bigtable supports the open-source, industry-standard HBase API

Ideal for applications that need very high throughput and scalability for non-structured key/value data, where each value is typically no larger than 10 MB.

Use Case – MapReduce operations, ML Apps and streams.

GCP Cloud Architect Overview

Cloud Bigquery

GCP Cloud Architect Overview



FULLY-MANAGED
NOSQL DATABASE



PETABYTE-SCALE
WITH VERY LOW
LATENCY



SEAMLESS
SCALABILITY FOR
THROUGHPUT



LEARNS AND ADJUSTS
TO ACCESS PATTERNS



CLOUD BIGTABLE
UTILIZES A LOW-
LATENCY STORAGE
STACK



REDUNDANT
AUTOSCALING
STORAGE



SEAMLESS CLUSTER
RESIZING

Test Tip



Cloud Bigtable

- Name can be confused with BigQuery.
- Use BigQuery when you have collected a large amount of data, and then need to ask questions about it (Query).

BigQuery Vs BigTable

Query Service vs Data Warehouse

- **BigQuery** is what you use when you have collected a large amount of data, and need to ask questions about it. (**It's Serverless**)
- **BigTable** is a database which is designed to be the foundation for a large, scalable application.
 - Use **BigTable** when you are making any kind of app that needs to read and write data, and scale is a potential issue. (**Warehouse**)
 - Use **BigQuery** when you have collected a large amount of data, and then need to ask questions about it (**Query**).

GCP Cloud Architect Overview

BigQuery Vs BigTable

- Understand the Uses Cases and base technical features or you may be this guy on the exam.
- Memorizing differences is critical.
 - Don't get confused by similar names.

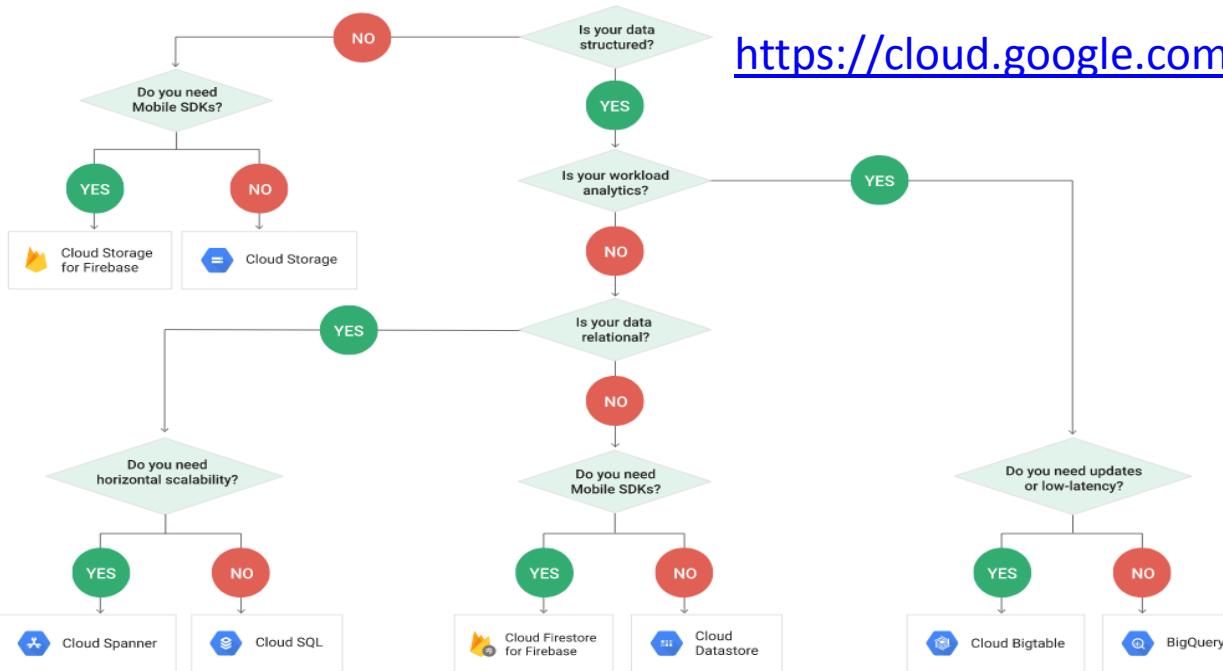


GCP Cloud Architect Overview

Spend some time here.

- Storage Options
- <https://cloud.google.com/storage-options/>

GCP Cloud Architect Overview



<https://cloud.google.com/storage-options/>

GCP Cloud Architect Overview

IAM

GCP Cloud Architect Overview

Identity and Access Management (IAM)

Cloud IAM, you grant access to members. Members can be of following types:

Google account

Service account

Google group

G Suite domain

Cloud Identity domain



GCP Cloud Architect Overview

A large number of projects can become unwieldy to manage at scale. This is why IAM includes the concept of an Organization Node.

The Organization Node sits above Projects and is your company's root node for Google Cloud resources.

Gsuite, when you enable the Organization Node, any project created by users in your domain will automatically belong to your Organization Node

The account with Organization Owner role is empowered to modify all projects within the organization.

Changes to the organization must occur through Google Sales.

GCP Cloud Architect Overview



IAM ORG NODES



USE YOUR OWN
AUTHENTICATION
MECHANISM AND MANAGE
YOUR OWN CREDENTIALS



FEDERATE YOUR IDENTITIES
TO GOOGLE CLOUD
PLATFORM



USERS DO NOT HAVE TO
LOGIN A SECOND TIME TO
ACCESS CLOUD PLATFORM
RESOURCES



REVOKE ACCESS TO CLOUD
PLATFORM USING YOUR
EXISTING CREDENTIAL
MANAGEMENT



GOOGLE APPS DIRECTORY
SYNC INTEGRATES WITH
LDAP

GCP Cloud Architect Overview



Google Cloud Directory Sync



GSuite Admin can automatically add, modify, and delete users, groups, and non employee contacts to synchronize the data in a GSuite domain with an LDAP directory server or MS Active Directory.



The data in the LDAP directory server is never modified or compromised. (one way update)



GCDS is a secure tool that help keep track of users and groups.

GCP Cloud Architect Overview

There are three types of roles in GCP Cloud IAM:

Primitive roles: The original roles available in the Google Cloud Platform Console. These are the Owner, Editor, and Viewer roles. Still assigned by default to projects. Primitive roles are quite broad.

Curated roles: Curated roles are new IAM roles that give finer-grained access control than the primitive roles

Custom Roles - provide granular access according to a user-specified list of permissions

GCP Cloud Architect Overview



GCP Service Accounts



A service account is an identity for your programs to use to authenticate and gain access to GCP APIs. (Server to Server)



Service accounts authenticate applications running on your virtual machine instances to other GCP services.



Each service account is associated with a key pair, which is managed by GCP. It is used for service-to-service authentication within GCP.



Google rotates the keys daily.

GCP Cloud Architect Overview



GCP Cloud Architect Overview

Service Accounts need to know for Exam

By default, all projects come with the Compute Engine default service account.

When you start a new instance using gcloud, the default service account is enabled on that instance.

Apart from the default service account, all projects come with a Google APIs service account, identifiable using the email:

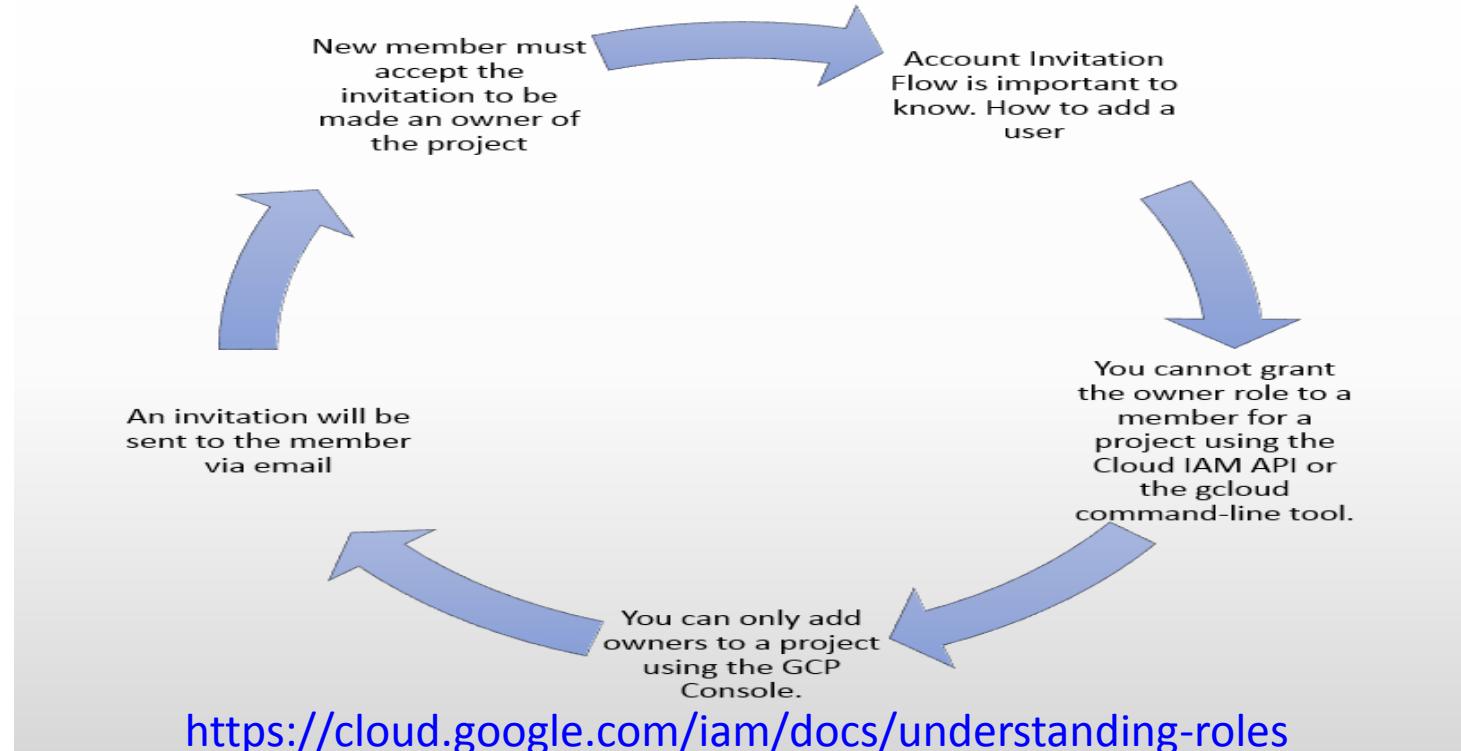
{project-number}@cloudservices.gserviceaccount.com

GCP Cloud Architect Overview

Role Name	Role Title	Description	Resource Type
roles/appengine.appAdmin	App Engine Admin	Read/Write/Modify access to all application configuration and settings.	Project
roles/appengine.serviceAdmin	App Engine Service Admin	Read-only access to all application configuration and settings. Write access to module-level and version-level settings. Cannot deploy a new version.	Project
roles/appengine.deployer	App Engine Deployer	Read-only access to all application configuration and settings. Write access only to create a new version; cannot modify existing versions other than deleting versions that are not receiving traffic.	Project
roles/appengine.appViewer	App Engine Viewer	Read-only access to all application configuration and settings.	Project
roles/appengine.codeViewer	App Engine Code Viewer	Read-only access to all application configuration, settings, and deployed source code.	Project

<https://cloud.google.com/iam/docs/understanding-roles>

GCP Cloud Architect Overview



GCP Cloud Architect Overview

- If you just want to give a user the ability to connect to a virtual machine instance using SSH, but don't want to grant them the ability to manage Compute Engine resources, add the user's public key to the project, or add a user's public key to a specific instance.
- You can avoid adding a user as a project member, while still granting them access to specific instances.

<https://cloud.google.com/compute/docs/access/>

GCP Cloud Architect Overview

- OS Login simplifies SSH access management by linking your Linux user account to your Google identity.
- Use OS Login to manage SSH access to your instances using IAM without having to create and manage individual SSH keys.
- OS Login maintains a consistent Linux user identity across VM instances and is the recommended way to manage many users across multiple instances or projects. <https://cloud.google.com/compute/docs/oslogin/>

Test Tip



IAM and Security

- Project Roles to give to Auditors such as **Org viewer, project viewer**
- Develop a Service account key-management strategy for migrating user profiles. (Key Management)
- **Auditors - Export audit logs to GCS bucket and set IAM policy**
- **Cloud Identity- IDaaS**

GCP Cloud Architect Overview

DevOps

GCP Cloud Architect Overview

DevOps

DevOps (development & operations) is an enterprise software development phrase used to mean a type of agile relationship between development and IT operations.

The goal of DevOps is to change and improve the relationship by advocating better communication and collaboration between these two business units.

GCP Cloud Architect Overview



Continuous Integration (CI) is the practice of merging all developer working copies to a shared mainline (Pipeline) several times a day.



Benefits are efficiency, reduce risk, remove manual processes



Continuous Delivery (CD) is the ability to get changes of all types—including new features, configuration changes, bug fixes and experiments—into production, or into the hands of users, safely and quickly in a sustainable way



Benefits are lower risks release, faster market time, high quality and lower costs



Continuous Deployments can be thought of as an extension of continuous integration, aiming at minimizing lead time, the time elapsed between development writing one new line of code and this new code being used by live users, in production



Benefits are lower risks, reduce lead time to market, quicker feedback and better ROI

GCP Cloud Architect Overview

In a Nutshell . (From Stackoverflow)

Continuous Integration basically just means that the developer's working copies are synchronized with a shared mainline several times a day.

Continuous Delivery is described as the logical evolution of continuous integration: Always be able to put a product into production!

Continuous Deployment is described as the logical next step after continuous delivery: Automatically deploy the product into production whenever it passes QA!

Puppet.com has a good comparison as well

GCP Cloud Architect Overview

Exam Tip know where Cloud Repositories fits into CI Pipeline

GCP Developer Resource to know

Repositories provide full Git repositories on GCP

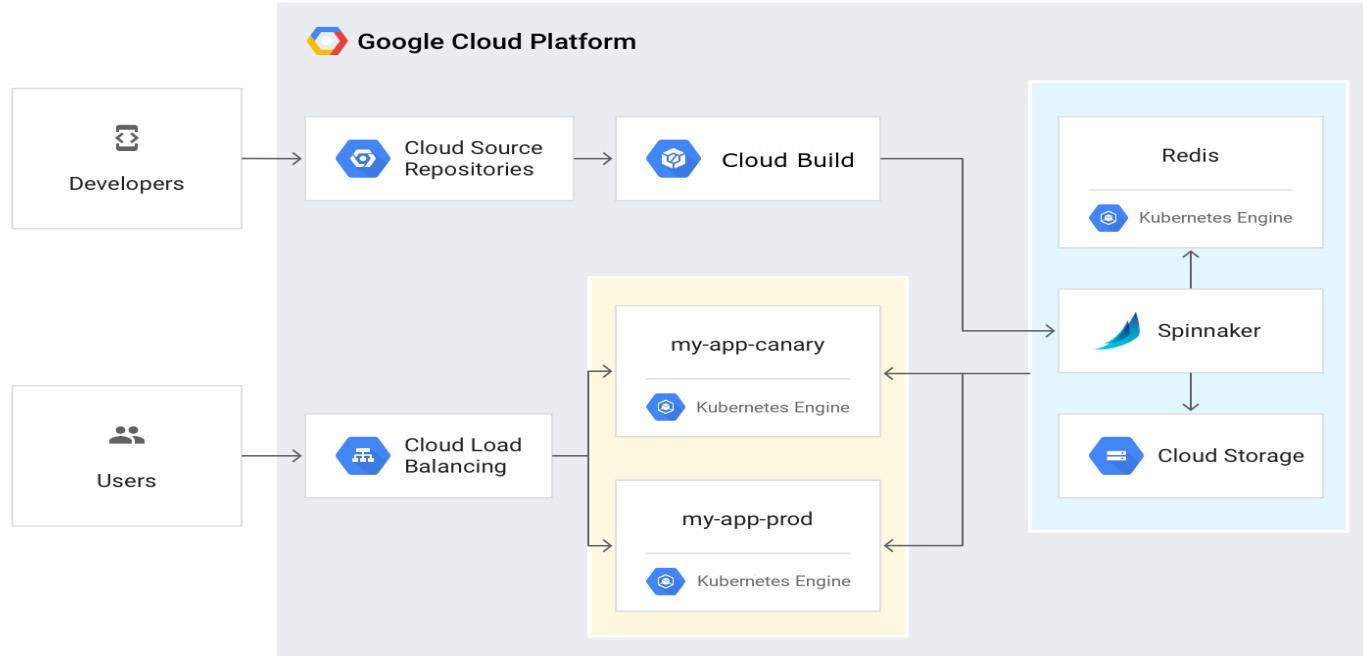
App Engine and Compute Engine

Each Project has a repository

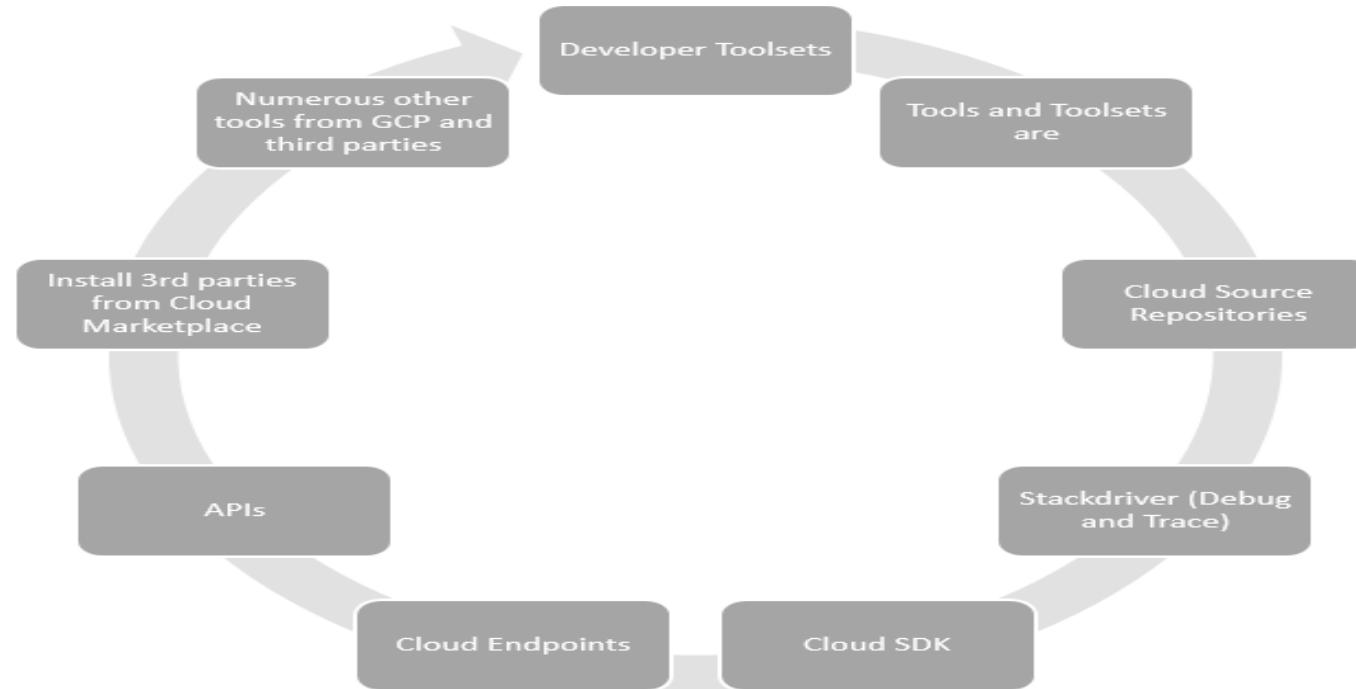
Includes a source editor.

GCP Cloud Architect Overview

Exam Tip- Put together a CI Pipeline



GCP Cloud Architect Overview



GCP Cloud Architect Overview

Cloud Endpoints

API Gateway

NGINX based proxy

Cloud Endpoints
are used to create
a web backend.

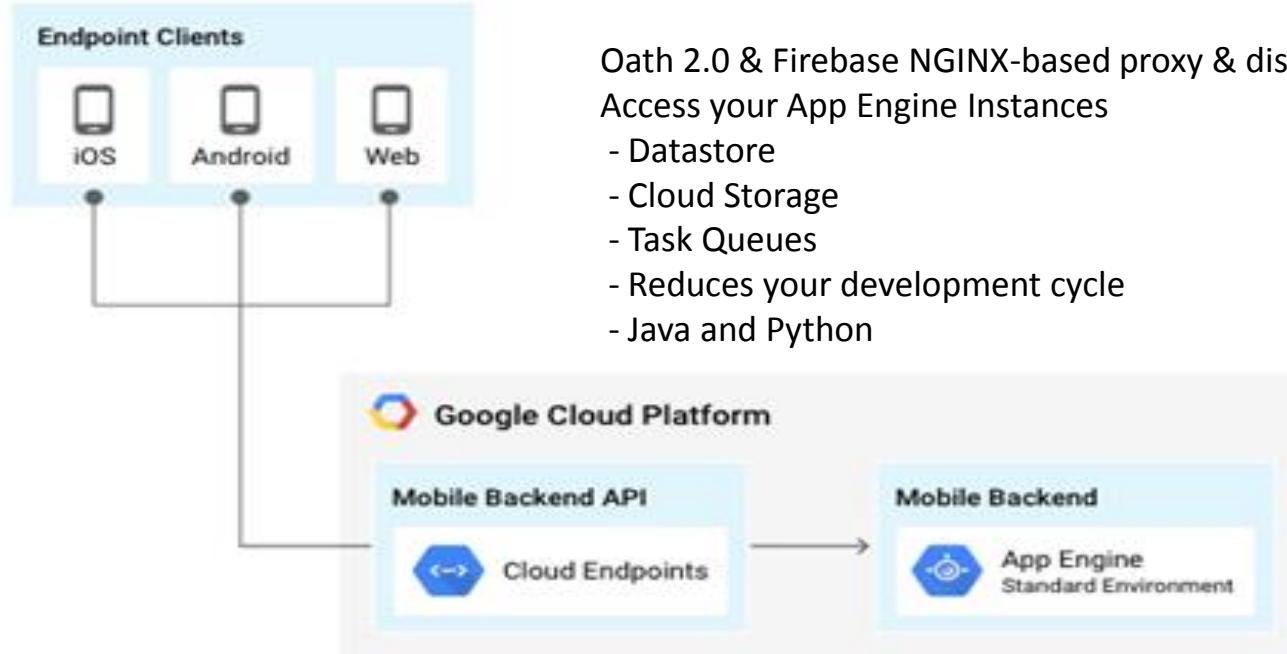
Used for web and
mobile clients

Deploy with App
Engine

Tools and Library

GCP Cloud Architect Overview

Cloud Endpoints Notes



Test Tip



DevOps/Deploy Apps

- Understand the tools and services with GCP to create a CI Pipeline

Github > Cloud Build > Dev > Prod

- Deploy Isolated Application Environments

For Example –

1. Create a project for development
2. Create another for staging and production

Test Tip



DevOps/Deploy Apps

- Blue –Green Deployment Model - How to implement for a Case Study QA Testing process.
- How to reduce the chance of security errors in a CI/CD Pipeline. (Security Scanner) App Engine

GCP Cloud Architect Overview

Review Question 1

Google Cloud DevOps Tools

Your enterprise has revised their API service in order to enable productivity for their developers. You will need to keep the old version of the API available and deployable but need to allow for new customers and testers to try out the new API services. The configuration must be the same (SSL and DNS) to serve both APIs. What is the solution?

- a. Create a new load balancing setup
- b. Route your traffic based on IP Address
- c. **Configure clients to use the new endpoint**
- d. Contact GCP Support

GCP Cloud Architect Overview

Please don't Text and take this course. It's a matter of passing or not!



GCP Cloud Architect Overview

Load Balancing

GCP Cloud Architect Overview

Load Balancing

- Types of Load Balancing
- Network Load Balancing
- HTTPS Load Balancing
- Cross-Region Load Balancing
- Content-based Load Balancing
- Cloud SSL Proxy

GCP Cloud Architect Overview

Network Load Balancing

- Network load balancing distributes incoming traffic across multiple instances
 - Supports non-HTTP(S) protocols (TCP/UDP)
 - Can be used for HTTPS traffic when you want to terminate connection on your instances (not at HTTPS load balancer)
- Supports autoscaling with managed instance groups

<https://cloud.google.com/compute/docs/load-balancing/network/>

GCP Cloud Architect Overview

Network Load Balancing

- Forwarding rules consist of...

Name

Region

IP Address (regional, not global)

IP Protocol (TCP, UDP; AH, ESP, ICMP, SCTP)

Ports

Target-pool or target-instance

GCP Cloud Architect Overview

Network Load Balancing

- Target pools consist of...

Name

Description

Region

Instances (must all be in same region as target pool)

SessionAffinity (NONE, CLIENT_IP_PROT, CLIENT_IP)

BackupPool

FailoverRatio

GCP Cloud Architect Overview

HTTP(S) Load Balancing

- HTTP(S) Load Balancing distributes HTTP(S) traffic among instance groups based on proximity to user or URL or both
- Autoscalers can be attached to HTTP(S)load balancers

<https://cloud.google.com/compute/docs/load-balancing/network/>

GCP Cloud Architect Overview

HTTP(S) Load Balancing

- HTTP(S) The following resources comprise a load balancer

Global Forwarding Rule

Target Proxy (w SSL certificate resource for HTTPS proxy)

URL map

Backend Service and Backends

Health Check

- The load balancer leverages additional resources

Global IP Address (ephemeral or static)

One or more Instance Groups

GCP Cloud Architect Overview

Global Forwarding

- A global forwarding rule provides a single global IP address for an application
- The rule routes traffic by IP address, port, and protocol to an HTTP or HTTPS target proxy
- A global forwarding rule can only forward to a single port
- Global forwarding rules can only be used by an HTTP(S) load balancer

<https://cloud.google.com/compute/docs/load-balancing/http/global-forwarding-rules>

GCP Cloud Architect Overview

Target proxies route incoming HTTP(requests) based on URL maps and backend service configurations

- HTTPS target proxy terminates client SSL session
- HTTPS target proxies require configured SSL certificate resources

<https://cloud.google.com/compute/docs/load-balancing/http/target-proxies>

GCP Cloud Architect Overview

Cloud SSL Proxy

- Cloud SSL proxy alt type of load balancing
 - non-HTTP(S) traffic
 - Performs global load balancing, routing clients to the closest instance with capacity
- Cloud SSL proxy advantages
 - Intelligent routing
 - Reduced CPI load on instances
 - Certificate management
 - Security patching

GCP Cloud Architect Overview

Cross Region Load Balancing

HTTP/HTTPS only

Cross-region using a single global IP address

Requests routed to the closest region

Automatically reroutes to next closest once capacity is reached

Eliminates need for DNS-based load balancing

GCP Cloud Architect Overview

Content Based Load Balancing

HTTP/HTTPS only

Create multiple backend services to handle content types

Add path rules to backend services

- /video for video services
- /static for static content

Configure different instance types for different content types

GCP Cloud Architect Overview

What type of load balancing?

- HTTP, HTTPS, TCP, and SSL load balancing
- Network Load Balancing

<https://cloud.google.com/compute/docs/load-balancing/optimize-app-latency>

GCP Cloud Architect Overview

Instance Groups

Manage Groups of VMs

Three Types

1. Unmanaged
2. Managed Instance Group (Zonal)
3. Managed Instance Group (Regional)

Unmanaged instance groups contain dissimilar instances and wont.

- Autoscaling
- Rolling updates
- Instance creation using instance templates

<https://cloud.google.com/compute/docs/instance-groups/creating-groups-of-managed-instances>

Test Tip



Load Balancing

- Google Cloud SSL proxy terminates user SSL (TLS) connections at the global load balancing layer/ then balances the connections across your instances via SSL or TCP.
- Cloud SSL proxy is intended for non-HTTP(S) traffic.
- For HTTP(S) traffic -HTTP(S) load balancing is used

GCP Cloud Architect Overview

Autoscaling

GCP Cloud Architect Overview

Autoscaling

- Part of the Compute Engine API
- Used to automatically scale number of instances in a managed instance group based on workload
- Create one autoscaler per managed instance group
- Autoscalers can be used with zone-based managed instance groups or regional managed instance groups
- Fast typically ~ 1 min windows

https://cloud.google.com/compute/docs/instance-groups/distributing-instances-with-regional-instance-groups#provisioning_your_autoscaler_configuration

Test Tip



Load Balancing

When the Autoscaler scales down

- It determines the number of virtual machines it needs to shut down
- Before an instance is terminated validate remaining connections, gracefully shut down any applications or application servers, uploading logs, etc.
- Shutdown Scripts....

GCP Cloud Architect Overview

Google Stackdriver

GCP Cloud Architect Overview



Stackdriver is a hybrid Monitoring, logging, and diagnostics for applications on Cloud Platform and AWS.



GCP Purchased Stackdriver and was rebranded to Google Stackdriver.



Stackdriver monitors the clouds service layers in a single SaaS solutions.



Native integration with Google Cloud data tools BigQuery, Cloud Pub/Sub, Cloud Storage, Cloud Datalab, and out-of-the-box integration with all your other application components.



Access from GCP Console



GCP Cloud Architect Overview



STACKDRIVER
BENEFITS



MONITORS MULTI
CLOUD



IDENTIFY TRENDS AND
PREVENTS ISSUES



LOWERS MONITORING
HEADACHES



FIX PROBLEMS FASTER



REDUCES
MONITORING NOISE!



AIDS WITH CLOUD
SECURITY



AIDS WITH
COMPLIANCE

GCP Cloud Architect Overview



Additional Features



Monitoring agent (AWS
EC2 and GCP VMS)



App Engine has built in
support



The Monitoring agent,
stackdriver-agent, is
based on the original
collectd system statistics
collection daemon.
stackdriver-agent



Kubernetes Engine
Support



Only specific OS's and
versions are supported

GCP Cloud Architect Overview

Major Features



Monitoring



Debugger



Logging



Trace



Error Reporting



Profiling

GCP Cloud Architect Overview

The screenshot shows the Google Cloud Monitoring Overview page. On the left, a sidebar menu lists several options: Monitoring Overview, Resources, Alerting, Uptime Checks (which is selected and highlighted in grey), Groups, Dashboards, and Debug. The main content area is titled "Uptime Checks" and includes a "Filter..." button. Below the title, there are tabs for "CHECKS", "VIRGINIA", "OREGON", "IOWA", "BELGIUM", "SINGAPORE", "SAO PAULO", "POLICIES", and "ACTIONS". A large message box states, "You don't have any uptime checks. [Learn more](#) about the uptime monitoring functionality." It also features a blue "Create an Uptime Check" button. To the right of this message, two red text boxes contain the following information:
"Uptime checks verify 8 Global locations."
"When you make a change to an uptime check delay could be 25 minutes"

GCP Cloud Architect Overview



Additional Features



Monitoring agent (AWS
EC2 and GCP VMs)



App Engine has built in
support



The Monitoring agent,
stackdriver-agent, is
based on the original
collectd system statistics
collection daemon.
stackdriver-agent



Kubernetes Engine
Support



Only specific OS's and
versions are supported

<https://cloud.google.com/monitoring/agent/>

GCP Cloud Architect Overview

Command Line for any GCP Exam

- Command Line questions around installing agents were on the exam outline.
- Command for installing the monitoring agent
- curl -sSO <https://dl.google.com/cloudagents/install-monitoring-agent.sh>
- Command for installing the logging agent
- curl -sSO <https://dl.google.com/cloudagents/install-logging-agent.sh>

Test Tip



Stackdriver

- Know how to setup an Uptime Check in Stackdriver Monitoring
- Feature to enable filters of aggregated logs down (Logging)
- Debug one piece of the application across many hosts(Debug)
- Understand API requests to microservices-based applications (Trace)

Test Tip



Stackdriver

- Know Stackdriver Monitoring default retention policy and how to export/analyze for legal purposes. (7/30/BigQuery)
- Use Stackdriver Logging and setup triggers to alert for events
- PCI Compliance - Enable Logging export to Google BigQuery, ACLs, views to scope the data shared with the auditor

GCP Cloud Architect Overview

Deployment Manager

GCP Cloud Architect Overview



Deployment Manager Must Know



Deployment Manager is an infrastructure deployment service that automates the creation and management of Google Cloud Platform resources for you.



Declarative format (Schema Files)–yaml



Python or Jinja2(Templates)

<https://cloud.google.com/deployment-manager/>

GCP Cloud Architect Overview

Pricing Calculator

Pricing Calculators



Both AWS and GCP have
pricing calculators.



Straight forward.



AWS pricing calculator is more
useful for pricing overall.

GCP Cloud Architect Overview



GCP Cloud Architect Overview

Case Study Questions

GCP Cloud Architect Overview



GCP Cloud Architect Overview



IMPORTANTE! CASE Study
Question take up nearly 50% of
exam.



For the case study questions its
important to understand the
problems, scenarios, etc that the
case study presents.

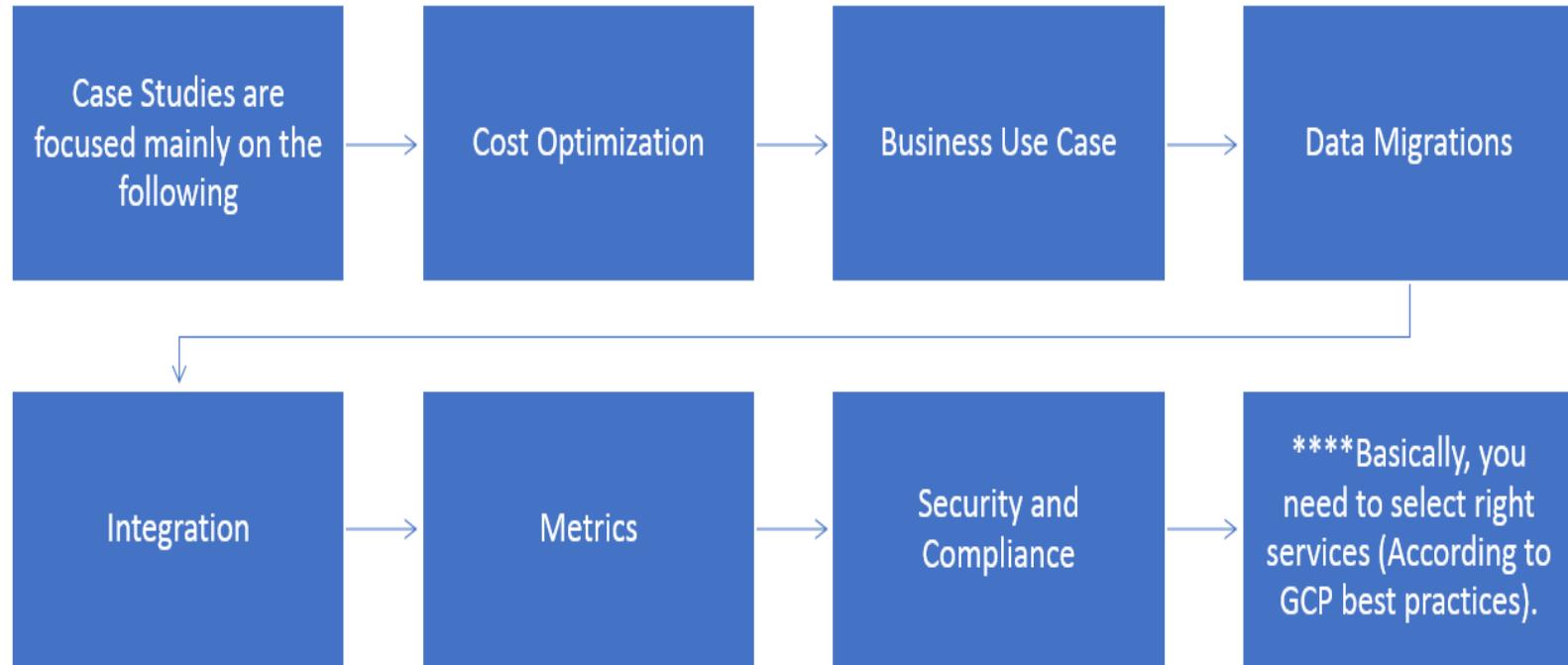


You then need to apply the
proper Google Cloud Service to
the problem.



DevOps and development
knowledge is expected.

GCP Cloud Architect Overview



GCP Cloud Architect Overview

Case Studies also have a small Site Recovery Aspect

Deployment of Applications. (CI/CA)

Quality Control

Monitoring and Management

App Design Best Practices

Basically, you need to select right data flow for recovery.

GCP Cloud Architect Overview



Yes, and there is more!



The exam questions will ask you to read the case study and then refer to either the Technical Requirements or the Business Requirements.



You then need to apply the proper GCP solution (s) to answer the question properly.

GCP Cloud Architect Overview

Root Canal or GCP Cloud Architect Exam?

- 
- The exam questions will ask you to read the case study and then refer to either the Technical Requirements or the Business Requirements.
 - You then need to apply the proper GCP solution (s) to answer the question properly.

GCP Cloud Architect Overview

Case Study Question

For this question, refer to the Mountkirk Games case study

Mountkirk Games needs to create a repeatable and configurable mechanism for deploying isolated application environments.

Developers and testers can access each other's environments and resources, but they cannot access staging or production resources. The staging environment needs access to some services from production.

What should you do to isolate development environments from staging and production?

GCP Cloud Architect Overview

Survey

- A. Create a project for development and test and another for staging and production.
- B. Create a network for development and test and another for staging and production.
- C. Create one subnetwork for development and another for staging and production.
- D. Create one project for development, a second for staging and a third for production.

GCP Cloud Architect Overview

Survey

For this question, refer to the Mountkirk Games case study.

Mountkirk Games wants you to design their new testing strategy. How should the test coverage differ from their existing backends on the other platforms?

- A. Tests should scale well beyond the prior approaches.
- B. Unit tests are no longer required, only end-to-end tests.
- C. Tests should be applied after the release is in the production environment.
- D. Tests should include directly testing the Google Cloud Platform (GCP) infrastructure

GCP Cloud Architect Overview

Case Study Question

For this question, refer to the Mountkirk Games case study.

Mountkirk Games has deployed their new backend on Google Cloud Platform (GCP).

You want to create a thorough testing process for new versions of the backend before they are released to the public. You want the testing environment to scale in an economical way. How should you design the process?

GCP Cloud Architect Overview

Survey

- A. Create a scalable environment in GCP for simulating production load.
- B. Use the existing infrastructure to test the GCP-based backend at scale.
- C. Build stress tests into each component of your application using resources internal to GCP to simulate load.
- D. Create a set of static environments in GCP to test different levels of load — for example, high, medium, and low.

GCP Cloud Architect Overview

Case Study Question

For this question, refer to the Mountkirk Games case study.

Mountkirk Games wants to set up a **continuous delivery pipeline**. Their architecture includes many small services that they want to be able to **update and roll back quickly**. Mountkirk Games has the following requirements:

- Services are deployed **redundantly across multiple regions in the US and Europe**.
- Only frontend services are exposed on the public internet.
- They can provide a single frontend IP for their fleet of services.
- Deployment artifacts **are immutable**.

Which set of products should they use?

GCP Cloud Architect Overview

Survey

- A. Google Cloud Storage, Google Cloud Dataflow, Google Compute Engine
- B. Google Cloud Storage, Google App Engine, Google Network Load Balancer
- C. Google Container Registry, Google Container Engine, Google HTTP(s) Load Balancer
- D. Google Cloud Functions, Google Cloud Pub/Sub, Google Cloud Deployment Manager

GCP Cloud Architect Overview

Survey

Refer to the JencoMart case study.

JencoMart wants to move their User Profiles database to Google Cloud Platform. Which Google Database should they use?

- A. Cloud Spanner
- B. Google BigQuery
- C. Google Cloud SQL
- D. **Google Cloud Datastore**

GCP Cloud Architect Overview

Survey

Refer to the Dress4Win case study.

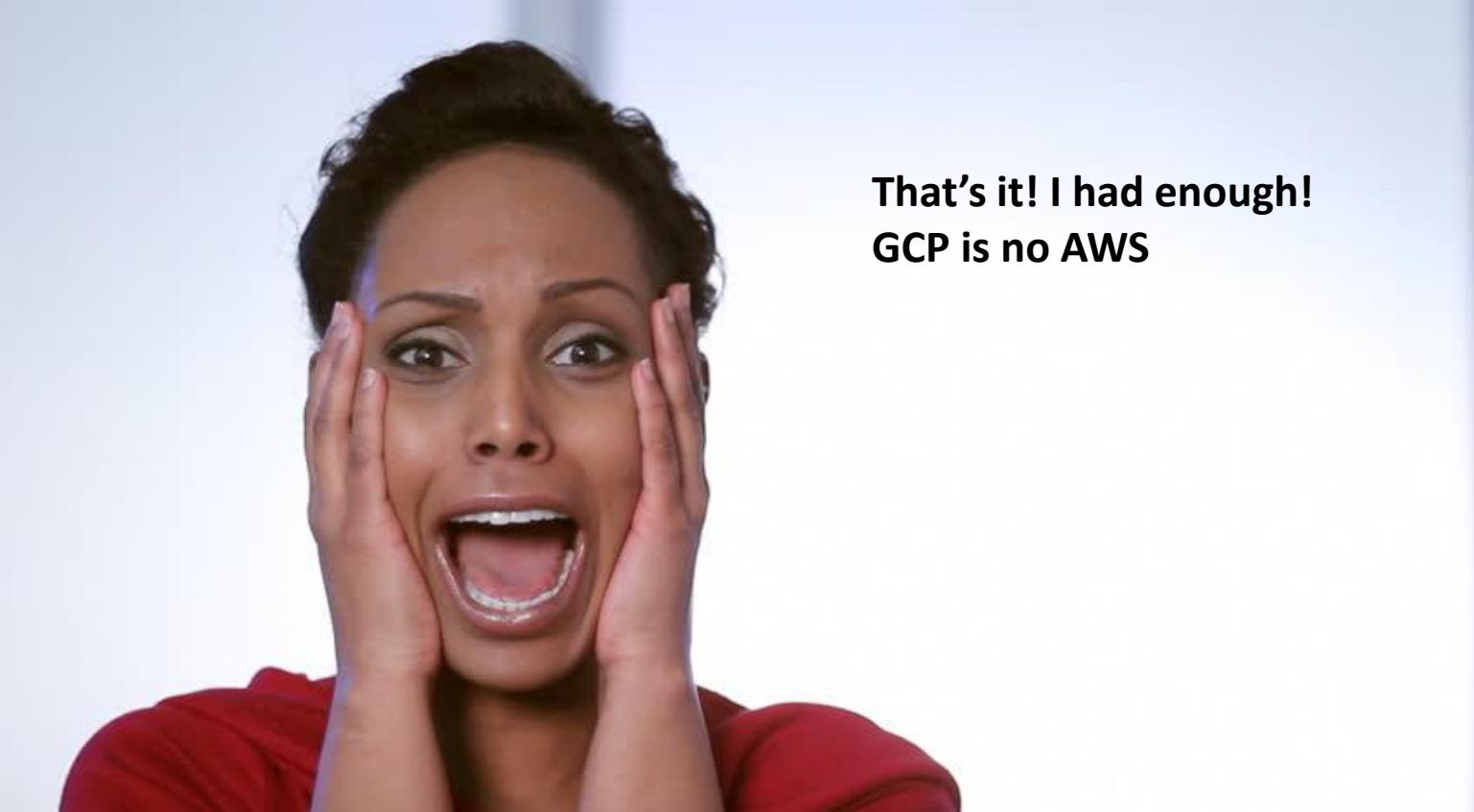
You want to ensure Dress4Win's sales and tax records remain available for infrequent viewing by auditors for at least 10 years. Cost optimization is your top priority. Which cloud services should you choose?

Continued next page

GCP Cloud Architect Overview

- A. Google Cloud Storage Coldline to store the data, and gsutil to access the data.
- B. Google Cloud Storage Nearline to store the data, and gsutil to access the data.
- C. Google SQL with US or EU as location to store the data, and gcloud to access the data.
- D. Cloud Filestore to store the data, and a web server cluster in a managed instance group to access the data.

GCP Cloud Architect Overview



**That's it! I had enough!
GCP is no AWS**

GCP Cloud Architect Overview

Exam Tips

GCP Cloud Architect Exam

Top 10 Things to Know

- Review case study questions SLOWLY...
- Know your compute options in detail. Compute Engine, App Engine, Kube Engine and Cloud Functions.
- Know about how VMs are billed (Inferred, Preemptive, discounts)
- Kubernetes deployments with CI, CD and DevOps
- Understand Load Balancing (Http, Network, SSL Proxy) and the use cases for each.

GCP Cloud Architect Exam

Top 10 Things to Know (Continued)

- Know the SQL Versions at a high level.. MySQL and PostgreSQL database service
- Storage around every aspect and needed to discern between Nearline and Coldline. Regional and Standard storage. Persistent Storage (Block)
- CI and CD Development Pipelines
- Use Cases with Big Data and ML
- GCP Design and Process

GCP Cloud Architect Exam

Exam Tips

- Study hard and routine.
- Use practice questions and review answers for gaps in knowledge.
- This is a newly revised exam and thus far not much content.
- Review the outline and fill in gaps in your knowledge
- Review all exam focused GCP documentation and best practices
- Use Codelabs, Qwiklabs or a Free account if available

GCP Cloud Architect Overview

Resources on Pearson Safari

GCP Cloud Architect Exam

Resources for Safari Subscribers

- Google Cloud Certified Associate GCP Cloud Architect Overview Crash Course
- <https://www.safaribooksonline.com/live-training/courses/google-cloud-certified-associate-cloud-engineer-crash-course/0636920222026/>

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Resources for Safari Subscribers

- [Google Cloud for AWS Professionals](#)
- <https://www.safaribooksonline.com/live-training/courses/google-cloud-platform-gcp-for-aws-professionals/0636920223047/>

GCP Cloud Architect Exam

Resources for Safari Subscribers

- Google Getting Started with Google Cloud Platform LiveLessons
- <https://www.safaribooksonline.com/videos/getting-started-with/9780135181522>

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Thank you for attending

Thank you and Good Luck!

