



Google Cloud Concepts

Introduction to GCP and the cloud

Purpose of this course (“why are we here?”)

“Where do I start my GCP learning journey?” – Right here!

Provide a high-level introduction to Google Cloud Platform

Oversimplification of concepts

Provide beginner’s frame of reference

Foundation for more advanced concepts

Minimum of terminology





What exactly is 'The Cloud'?



“Protect your files in the cloud”
“To the cloud!”



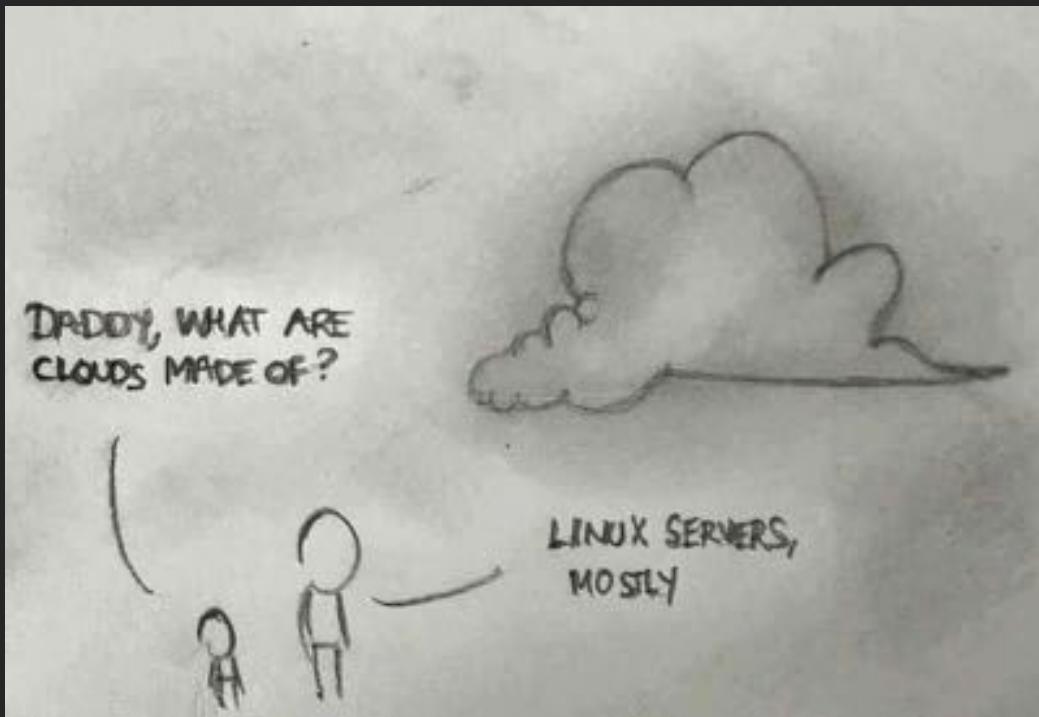
Google Drive



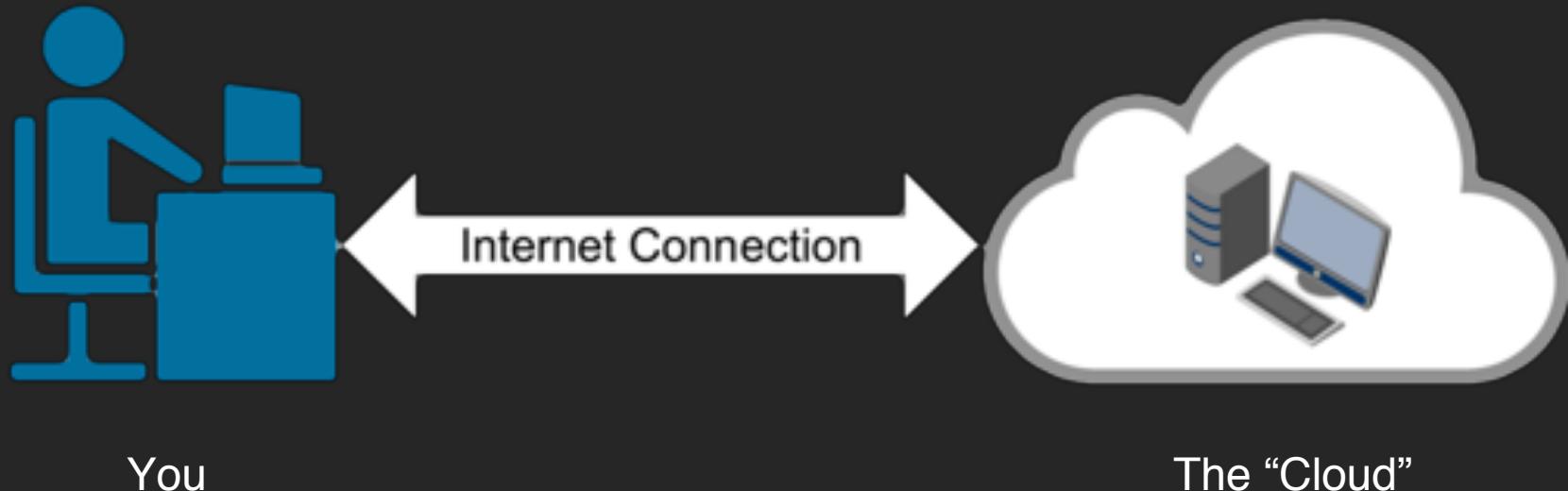
What exactly is the cloud?



Opinions vary



So what is the cloud, really?





You



Data Center

iCloud
Google Drive
Google Cloud Platform

So what is Google Cloud Platform?

Computing

Storage

Databases

Big Data

Analytics



Google Cloud Platform (GCP) is a Cloud services provider

Also known as Infrastructure as a Service/Platform as a Service (IaaS, PaaS)

Machine Learning/AI

Developer Tools

Security

So why do we care?

Why do individuals and organizations use GCP and the cloud?

What are the benefits?

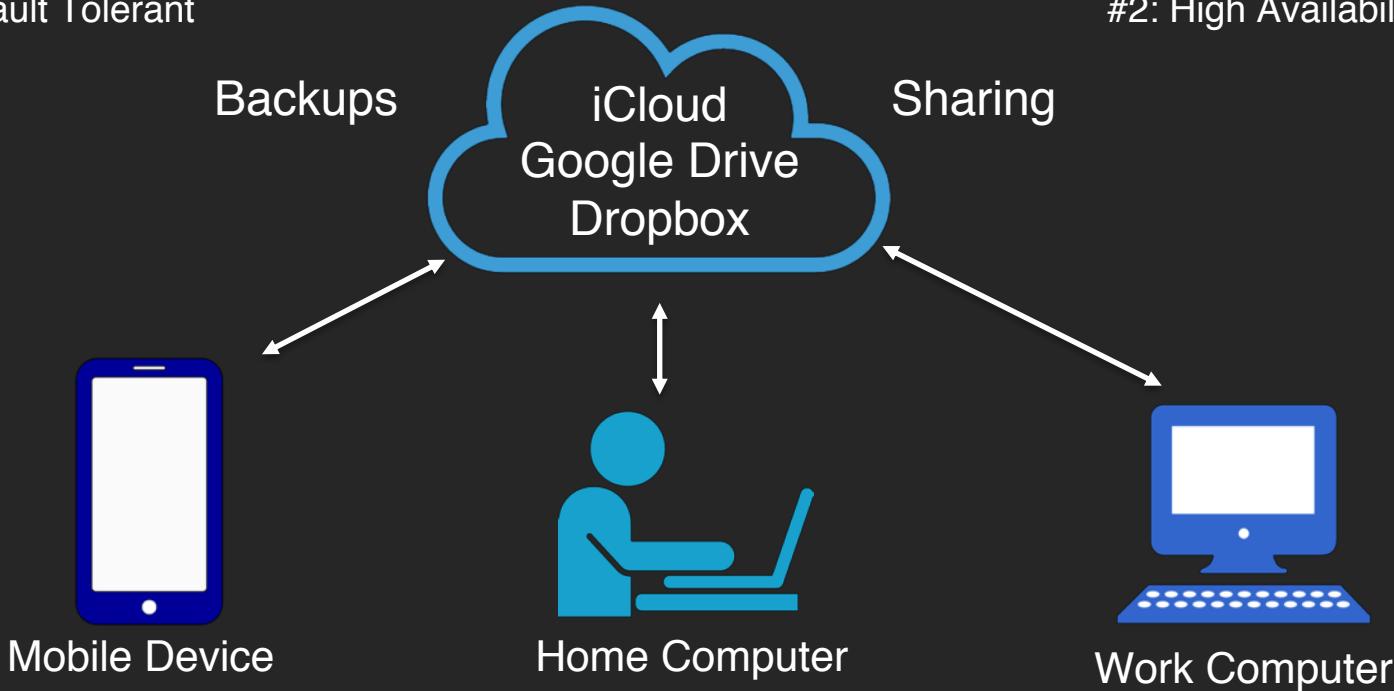
How is working with modern cloud services different than past practices?



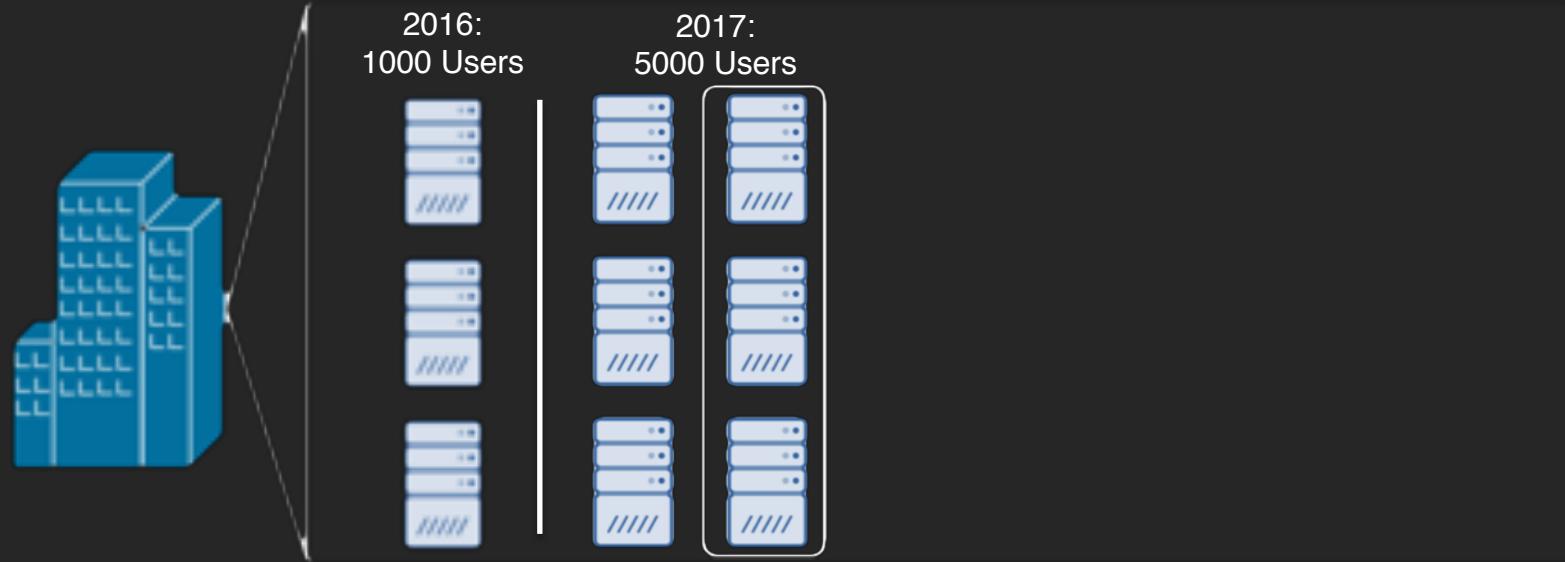
Common **personal** uses of cloud services

Cloud Terminology:
#1: Fault Tolerant

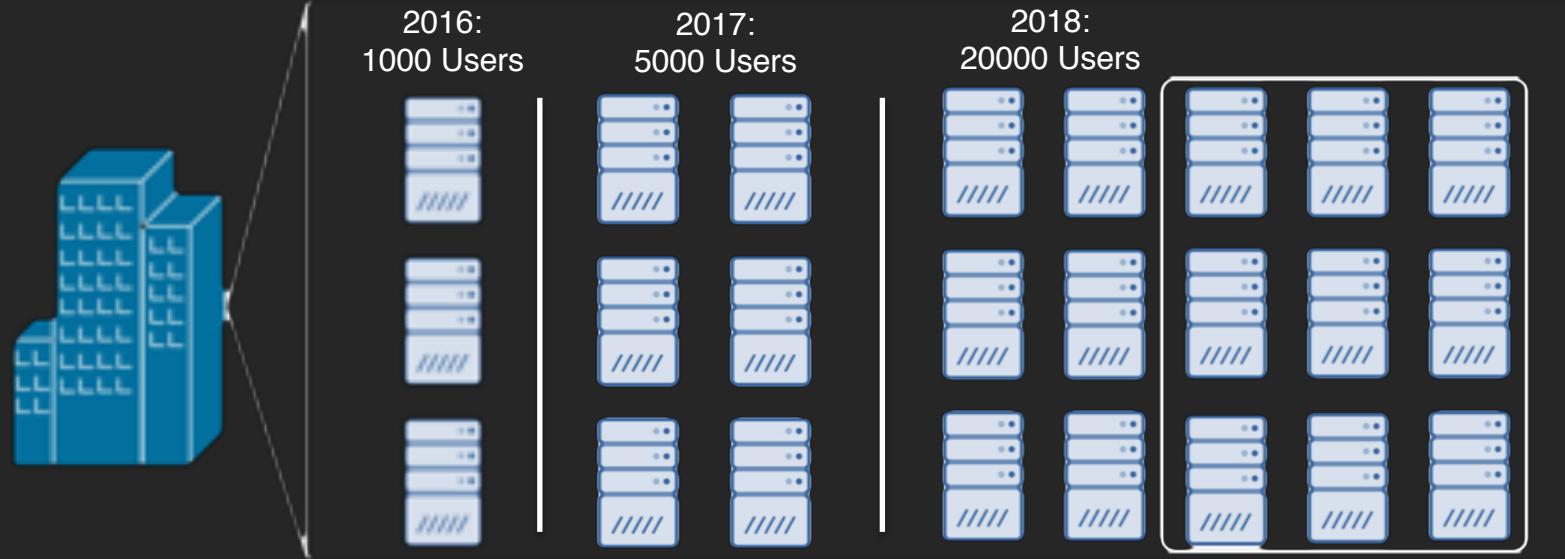
Cloud Terminology:
#2: High Availability



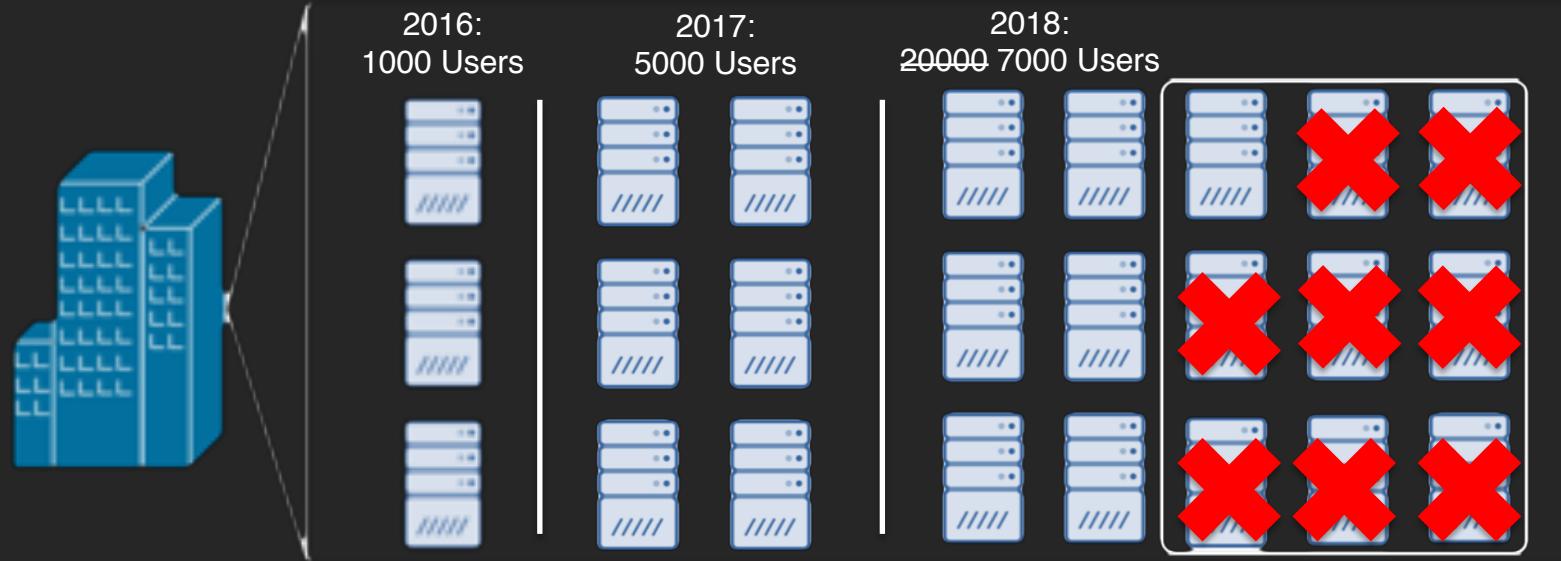
Common Enterprise Uses of Cloud Services



Common Enterprise Uses of Cloud Services



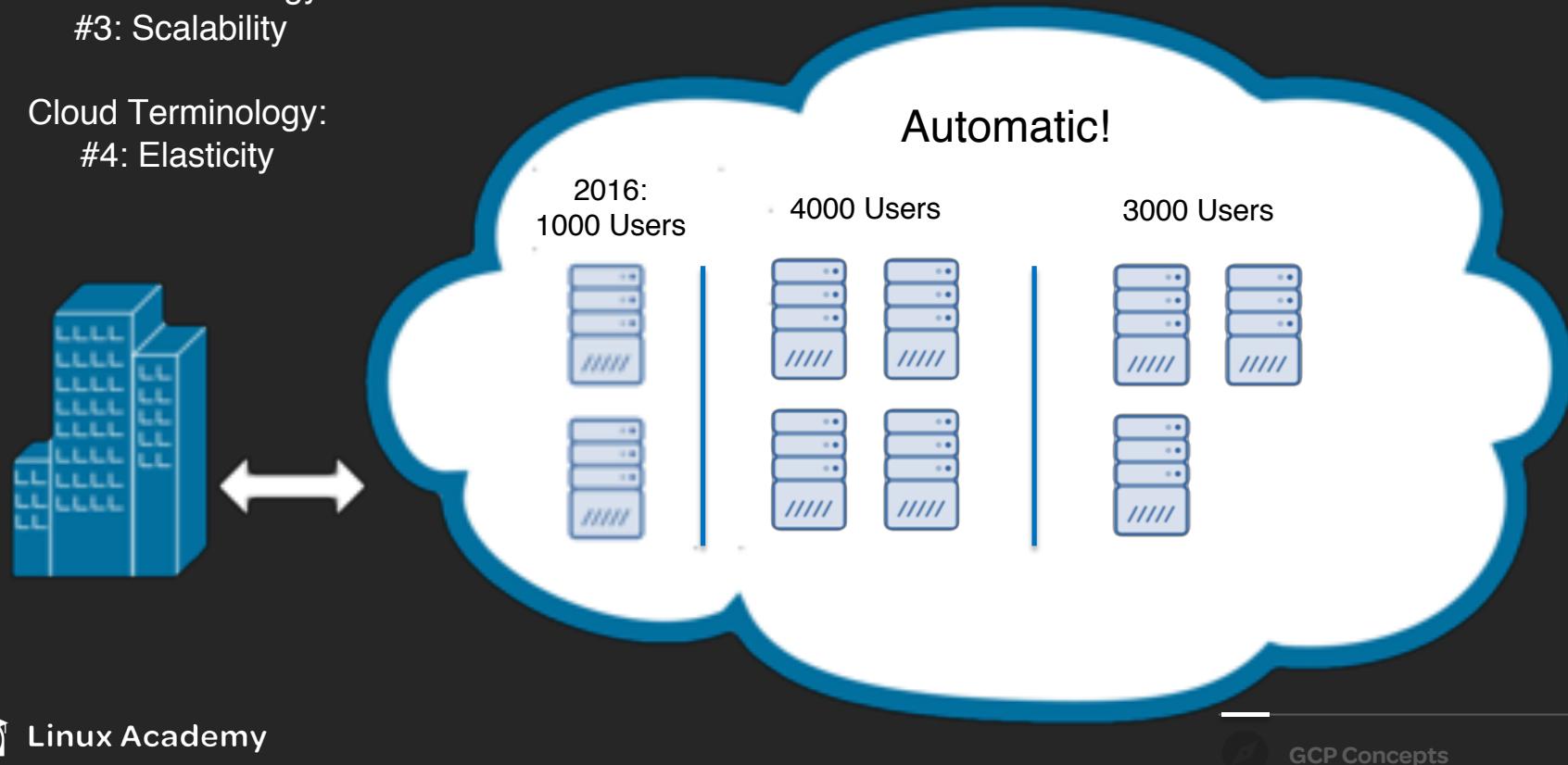
Common Enterprise Uses of Cloud Services



Common Enterprise Uses of Cloud Services

Cloud Terminology:
#3: Scalability

Cloud Terminology:
#4: Elasticity



Recap



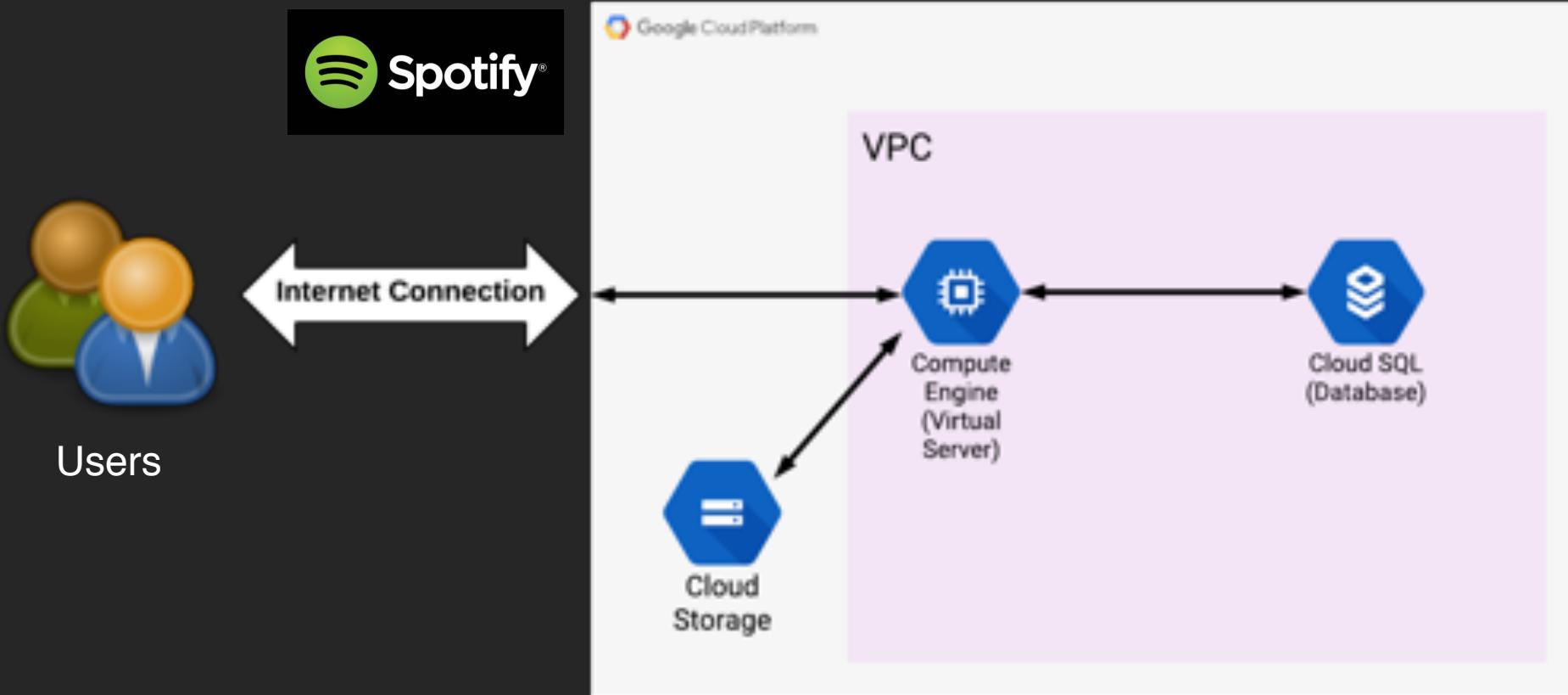
Cloud Terminology:
#1: Fault Tolerant

Cloud Terminology:
#2: High Availability

Cloud Terminology:
#3: Scalability

Cloud Terminology:
#4: Elasticity

Preview





Google Cloud Concepts

Introduction to Compute Engine

Reminder - Purpose of This Course

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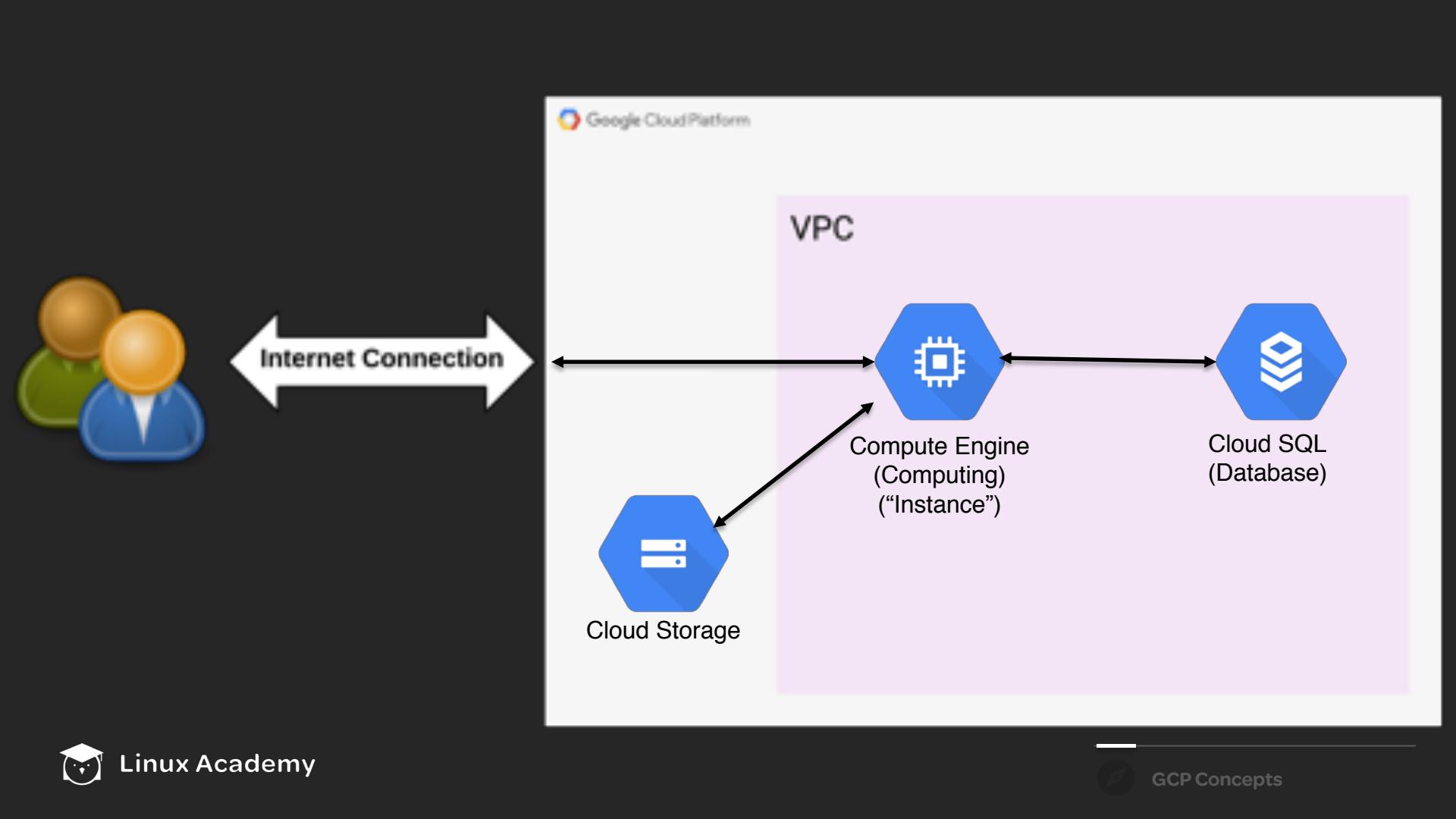
Oversimplification of concepts

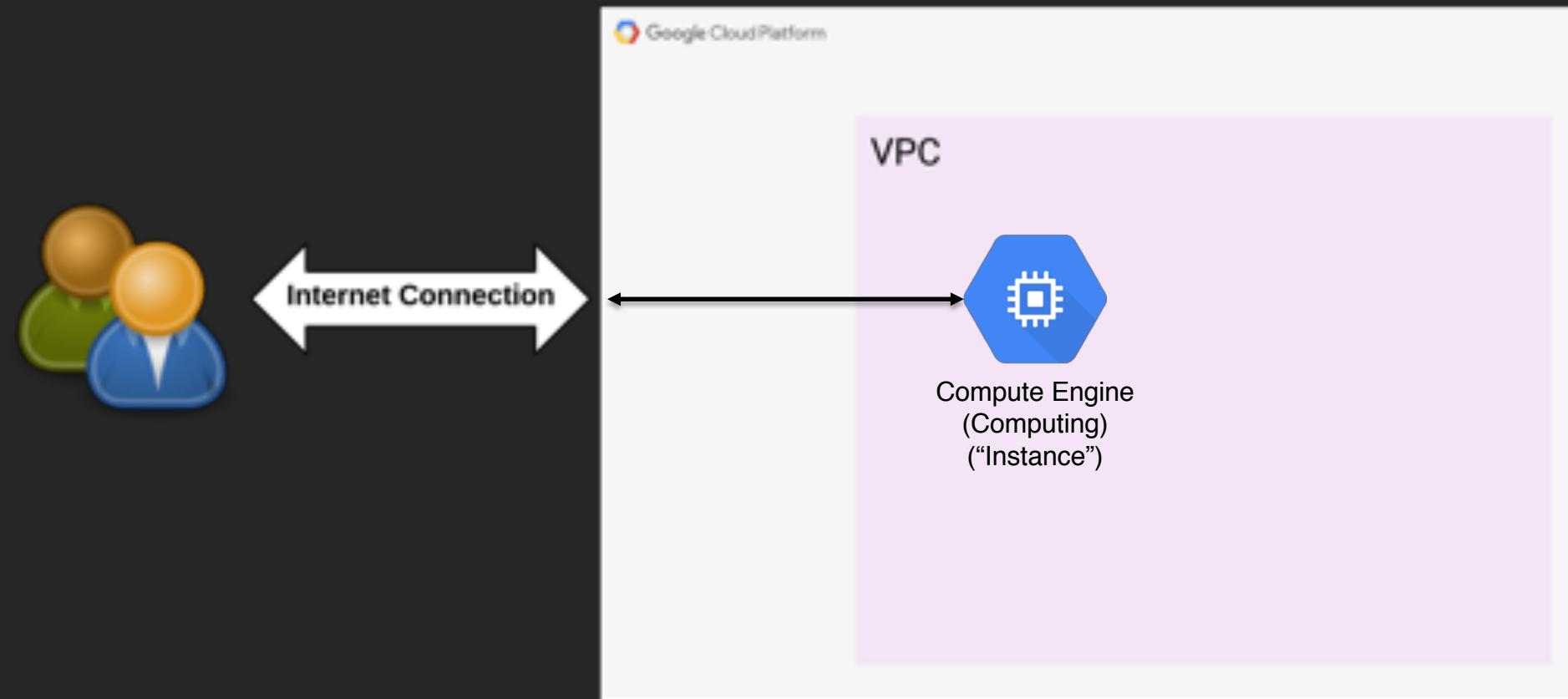
- Provide beginner's frame of reference
- Foundation for more advanced concepts
- Minimum of terminology

GCP = not just “someone else’s computer”

Google Cloud Platform







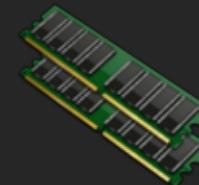
Cloud Terminology: #5: “Instance”



=



CPU



RAM



Hard Drive/Storage



Compute Engine

=



Server
(Application Hosting)

=



Network Card



Firewall
(Security)



Operating System
Windows/Linux

Applications are Hosted on Servers

Spotify

Search

Home

Your Library

RECENTLY PLAYED

Songs to Sing in the Car

PLAYLIST

Discover Weekly

PLAYLIST

Wake Up and Smell the ...

PLAYLIST

90's Alternative Rock

ALBUM

Daniel Tiger

PLAYLIST

Install App

Matthew Wilson

September Earth, Wind & Fire

Made for Matthew

Your Daily Mix 1: Daily Mix 1 - Austin Wintory, Damon Kort, Taylor Davis and more

Your Daily Mix 2: Daily Mix 2 - Wiener Philharmoniker, Berliner Philharmoniker, Wiener Symphoniker and more

Your Daily Mix 3: Daily Mix 3 - The Monkees, Del Shannon, The Dixie Brothers and more

Your Daily Mix 4: Daily Mix 4 - Hokey Polka Kids, Apresous Smeeth, Daniel Tiger's Neighborhood and more

Your Daily Mix 5: Daily Mix 5 - Chuck Berry, The Hollies, The Animals and more

Your Release Radar

Recently played

Songs to Sing in the Car

Discover Weekly

Wake Up and Smell the Coffee

90's Alternative Rock

DANIEL TIGER'S NEIGHBORHOOD

TIGER

GET VOCAL KANSAS!

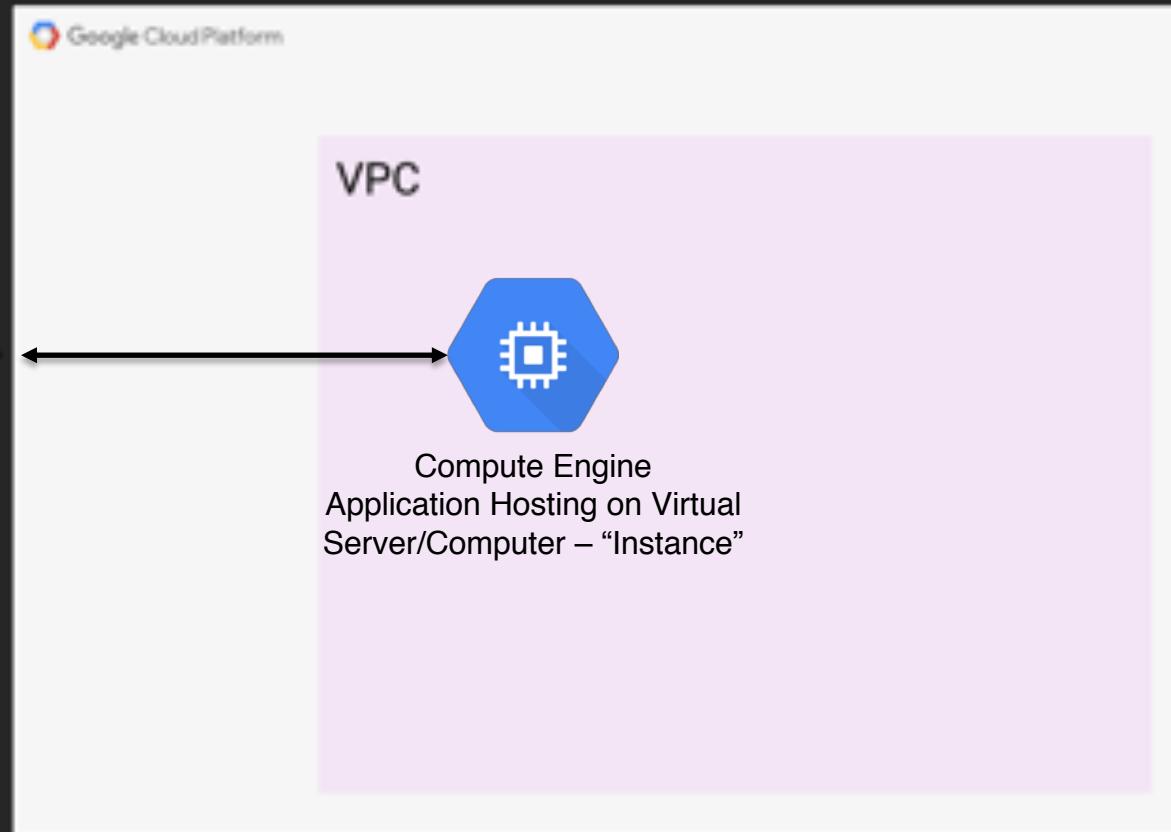
10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31



Internet Connection



Recap

- A Compute Engine **Instance** is a virtual computer/server for anything you want
- Common use = hosting applications





Google Cloud Concepts

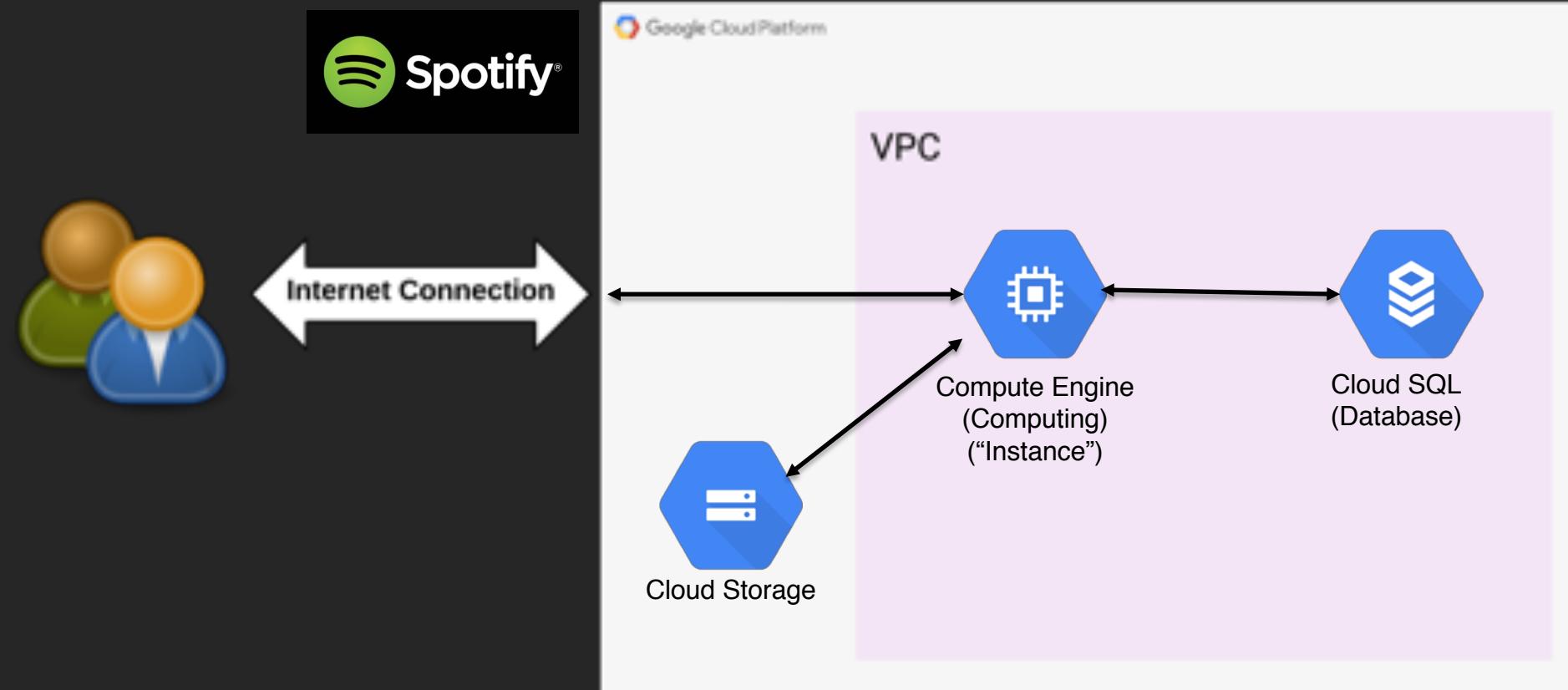
What is a Virtual Private Cloud (VPC)?

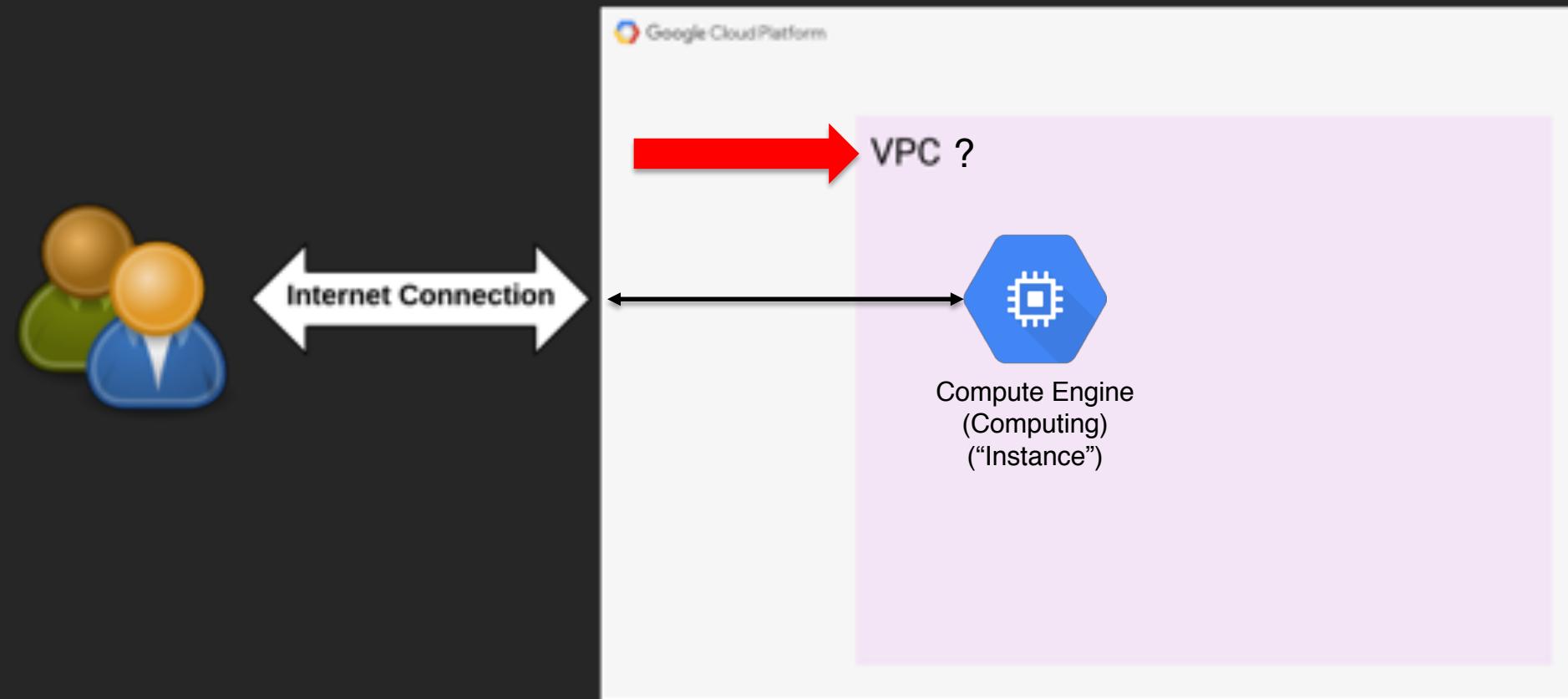
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Oversimplification of concepts

- Provide beginner's frame of reference
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Google Cloud Platform

VPC

Virtual Private Cloud (Private Network)

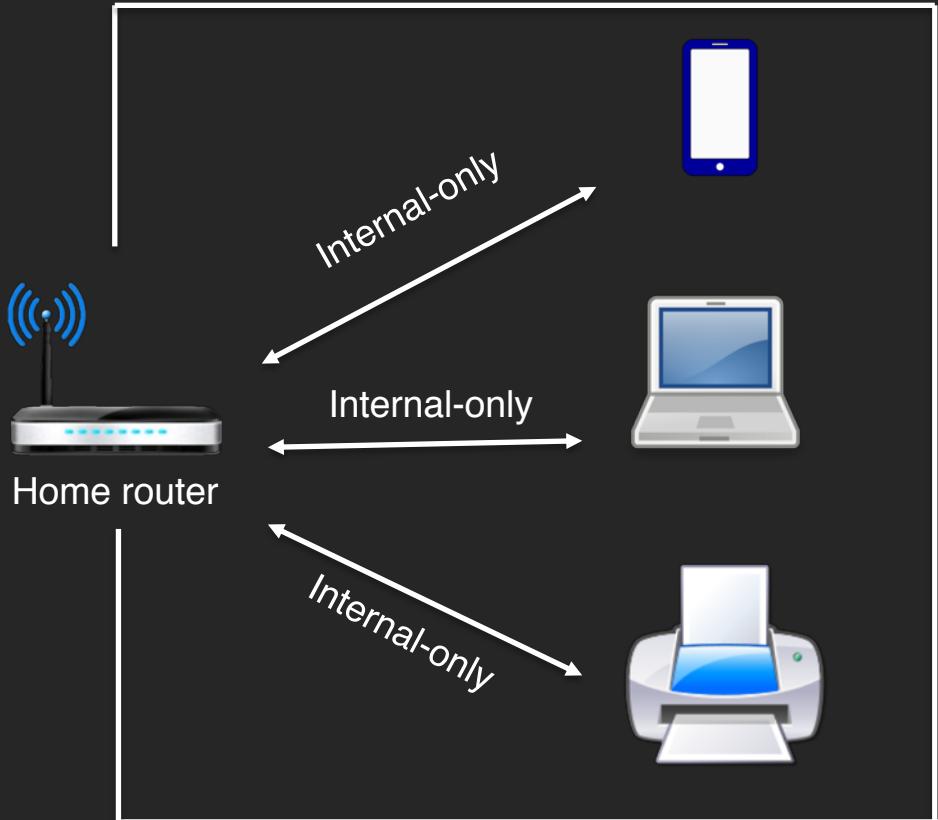
Private Network Examples



Public Internet



Private network: uses **internal IP** addresses to communicate on private networks only.



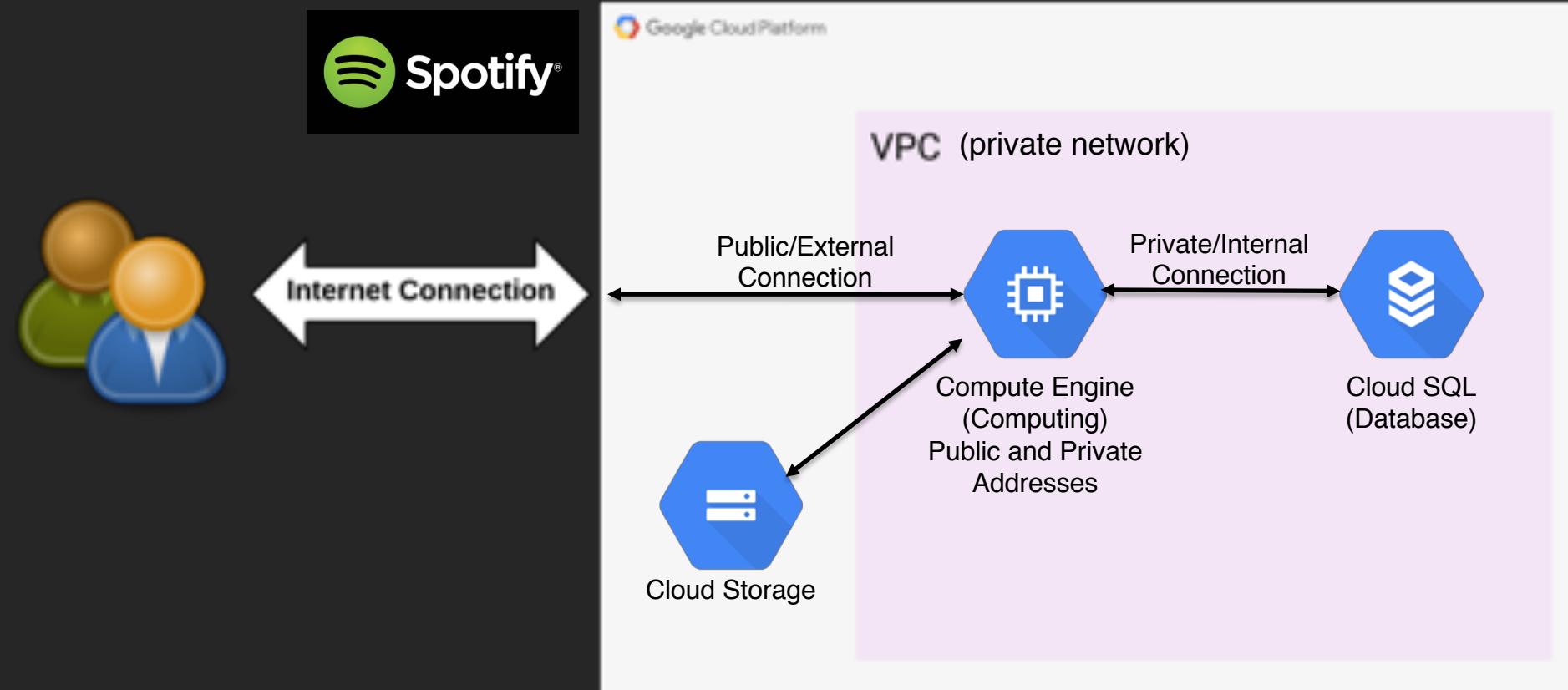


VPC

Virtual Private Cloud

“Home network” on GCP

Resources can use internal (private)
and external (public) addresses.



Recap

A **Virtual Private Cloud (VPC)** is your own private network

- Place GCP resources
- Allow/restrict access to networks



Google Cloud Concepts

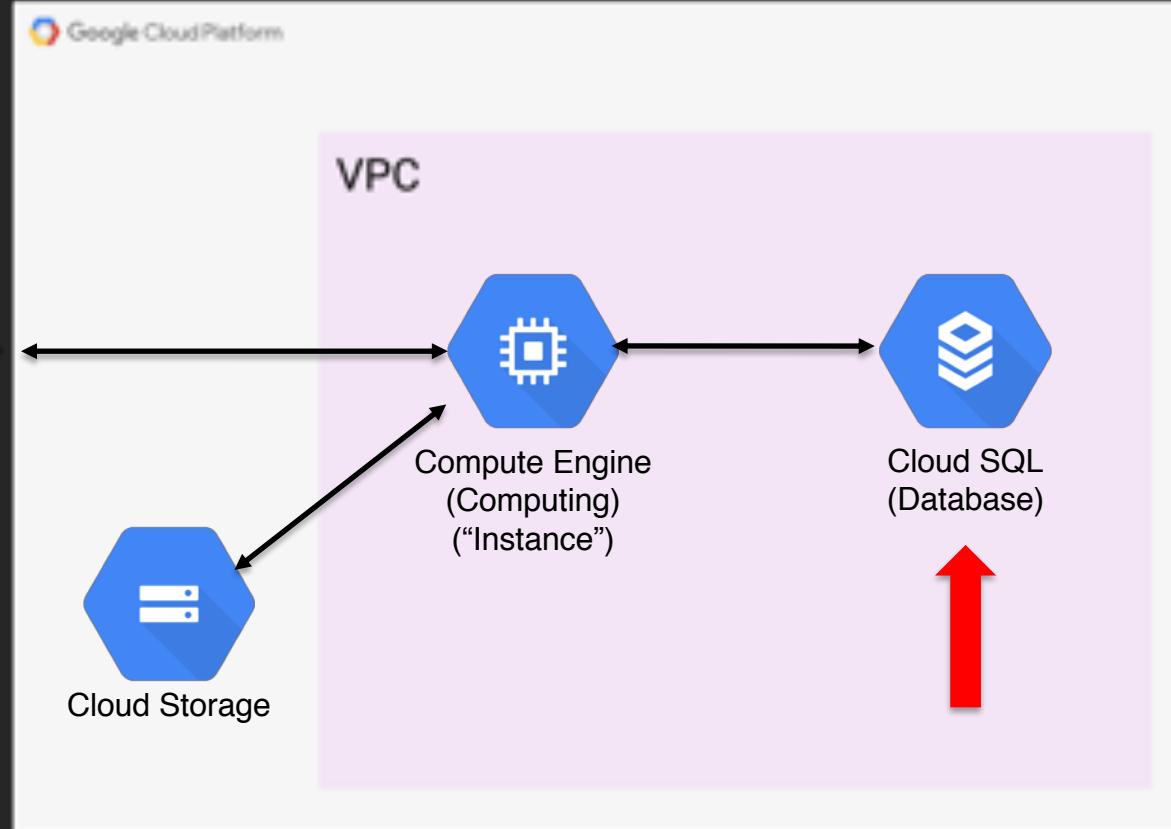
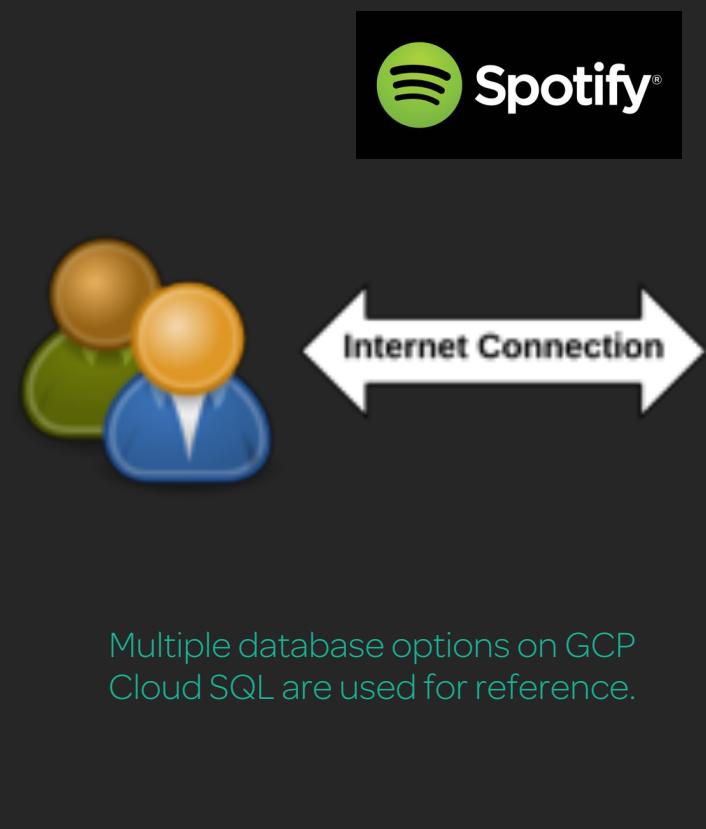
Databases on GCP

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Oversimplification of Concepts

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Why Databases?

Store structured data

- Usernames/passwords
- Song catalog
- Inventory

A	B	C	D	E	F	G
Segment	Country	Product	Discount Band	Units Sold	Manufacturing	Sale Price
2 Government	Canada	Carretera	None	1618.5	\$ 3.00	\$ 20.00
3 Government	Germany	Carretera	None	1321	\$ 3.00	\$ 20.00
4 Midmarket	France	Carretera	None	2178	\$ 3.00	\$ 15.00
5 Midmarket	Germany	Carretera	None	888	\$ 3.00	\$ 15.00
6 Midmarket	Mexico	Carretera	None	2470	\$ 3.00	\$ 15.00
7 Government	Germany	Carretera	None	1513	\$ 3.00	\$ 350.00
8 Midmarket	Germany	Montana	None	921	\$ 5.00	\$ 15.00
9 Channel Partners	Canada	Montana	None	2518	\$ 5.00	\$ 12.00
10 Government	France	Montana	None	1899	\$ 5.00	\$ 20.00
11 Channel Partners	Germany	Montana	None	1545	\$ 5.00	\$ 12.00
12 Midmarket	Mexico	Montana	None	2470	\$ 5.00	\$ 15.00
13 Enterprise	Canada	Montana	None	2665.5	\$ 5.00	\$ 125.00
14 Small Business	Mexico	Montana	None	958	\$ 5.00	\$ 300.00
15 Government	Germany	Montana	None	2146	\$ 5.00	\$ 7.00
16 Enterprise	Canada	Montana	None	345	\$ 5.00	\$ 125.00
17 Midmarket	United States of America	Montana	None	615	\$ 5.00	\$ 15.00
18 Government	Canada	Paseo	None	292	\$ 10.00	\$ 20.00
19 Midmarket	Mexico	Paseo	None	974	\$ 10.00	\$ 15.00
20 Channel Partners	Canada	Paseo	None	2518	\$ 10.00	\$ 12.00
21 Government	Germany	Paseo	None	1006	\$ 10.00	\$ 350.00
22 Channel Partners	Germany	Paseo	None	367	\$ 10.00	\$ 12.00
23 Government	Mexico	Paseo	None	883	\$ 10.00	\$ 7.00
24 Midmarket	France	Paseo	None	549	\$ 10.00	\$ 15.00
25 Small Business	Mexico	Paseo	None	788	\$ 10.00	\$ 300.00
26 Midmarket	Mexico	Paseo	None	2472	\$ 10.00	\$ 15.00
27 Government	United States of America	Paseo	None	1143	\$ 10.00	\$ 7.00
28 Government	Canada	Paseo	None	1725	\$ 10.00	\$ 350.00
29 Channel Partners	United States of America	Paseo	None	912	\$ 10.00	\$ 12.00
30 Midmarket	Canada	Paseo	None	2152	\$ 10.00	\$ 15.00
31 Government	Canada	Paseo	None	1817	\$ 10.00	\$ 20.00
32 Government	Germany	Paseo	None	1513	\$ 10.00	\$ 350.00

Why Do We Separate Out Database?

Separating out components takes advantage of the benefits of the cloud

- Fault tolerant
- Highly available
- Scalability
- Elasticity

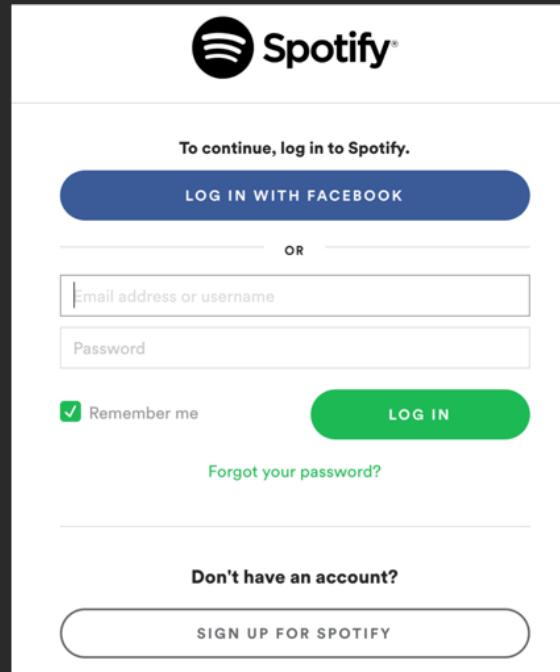
We will have a further explanation over this in the next lesson.

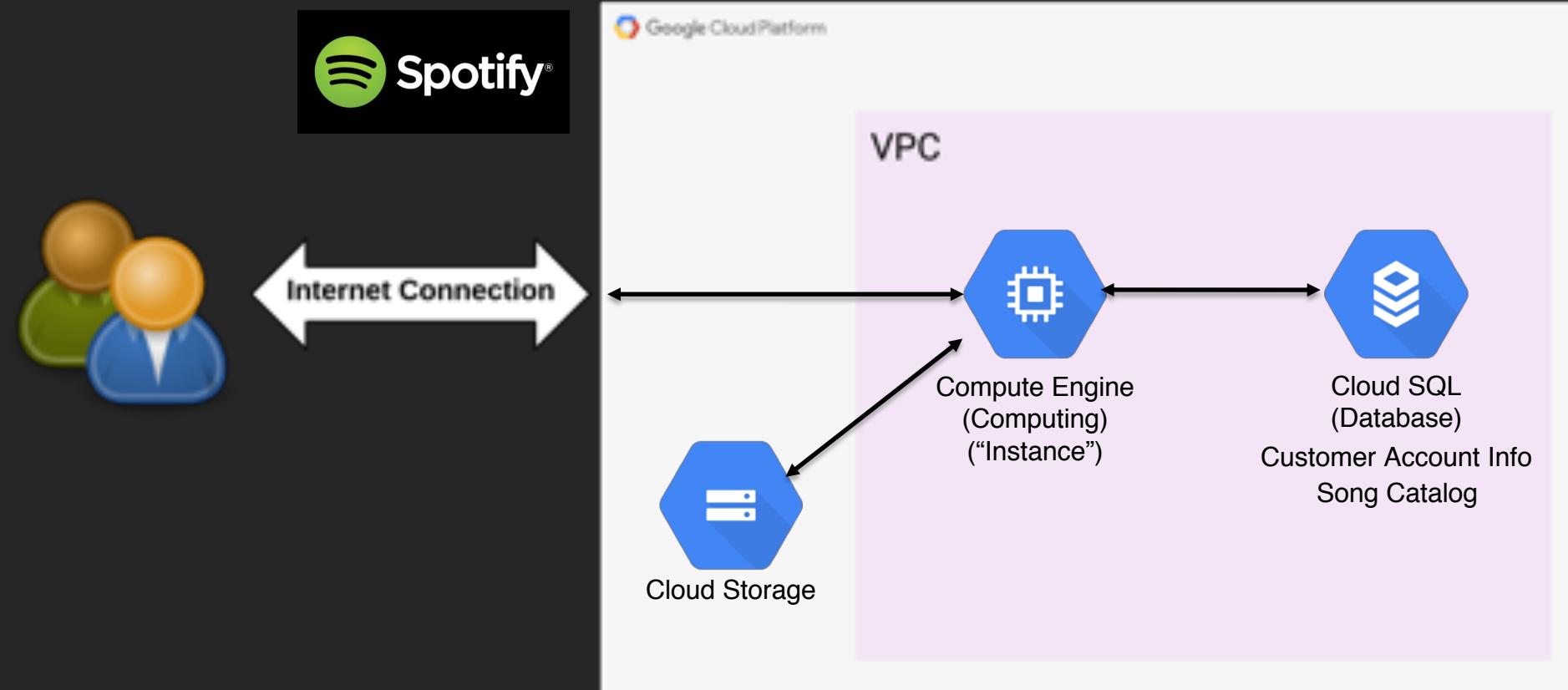


Compute Engine
Computing + Database?

Databases in Our Example

1. Log in to Spotify.
2. Find a song.





Recap

Databases on GCP

- Store structured data (think spreadsheets)
- Login information
- Song catalogs
- Inventory





Google Cloud Concepts

The Power of the Cloud

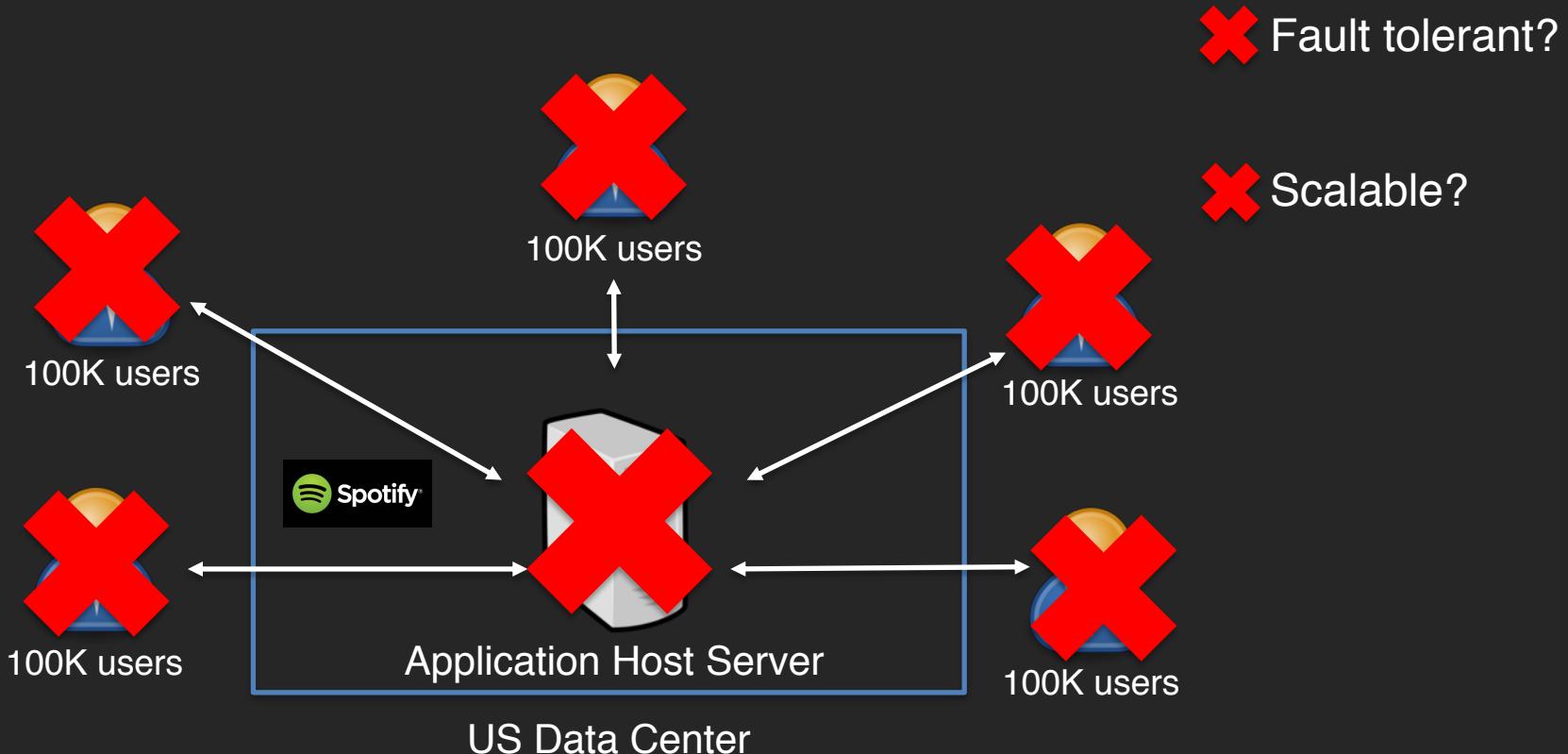
Reminder – Cloud Terminology

Cloud advantages

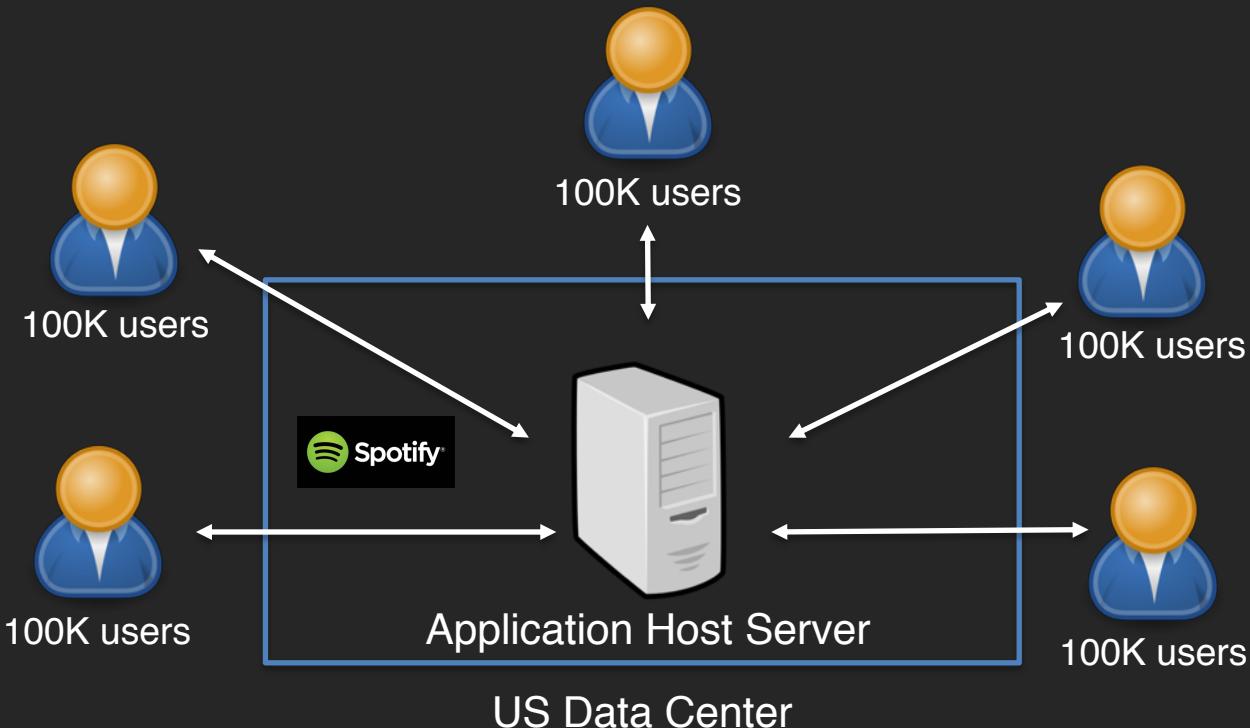
- Fault tolerant
- Highly available
- Scalability
- Elasticity

What does this look like?

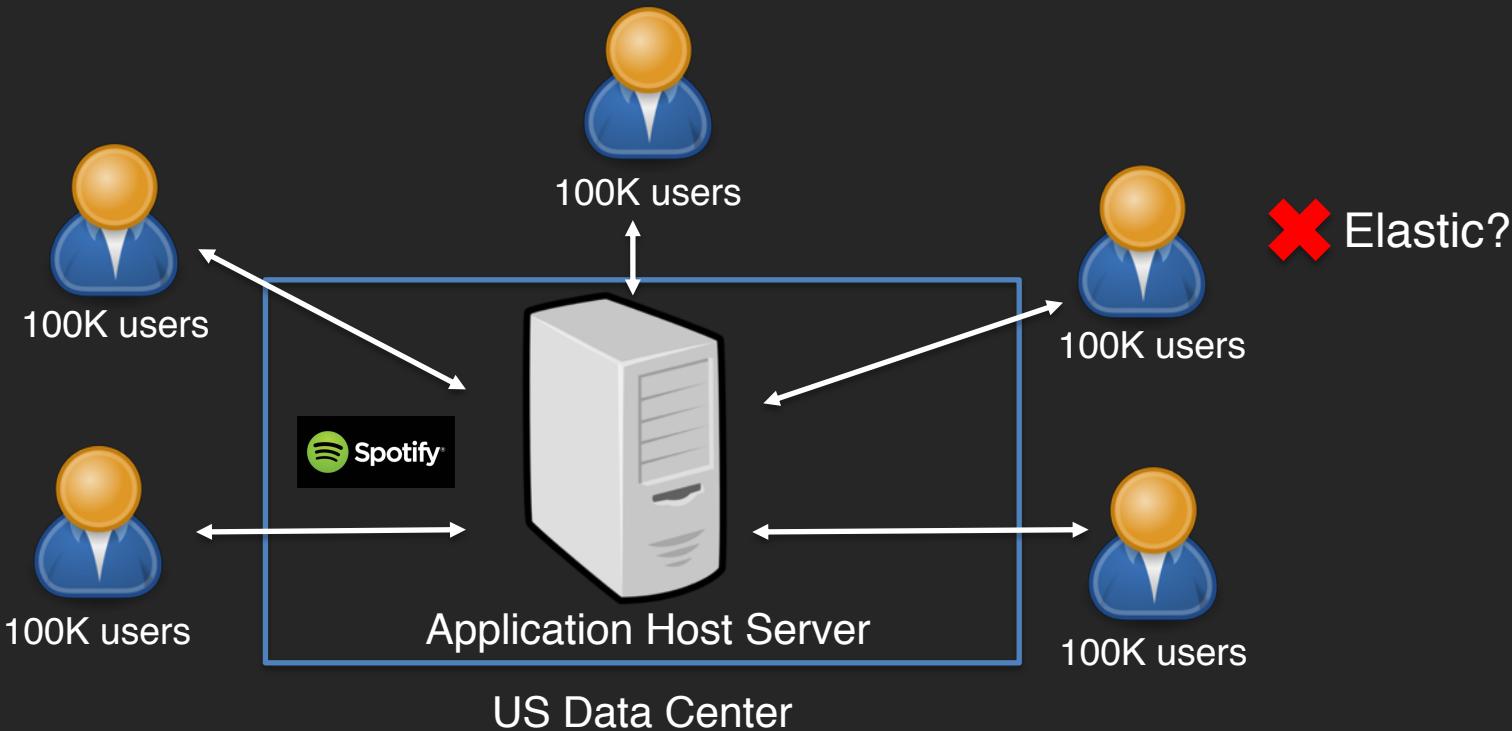
Without Cloud Advantages



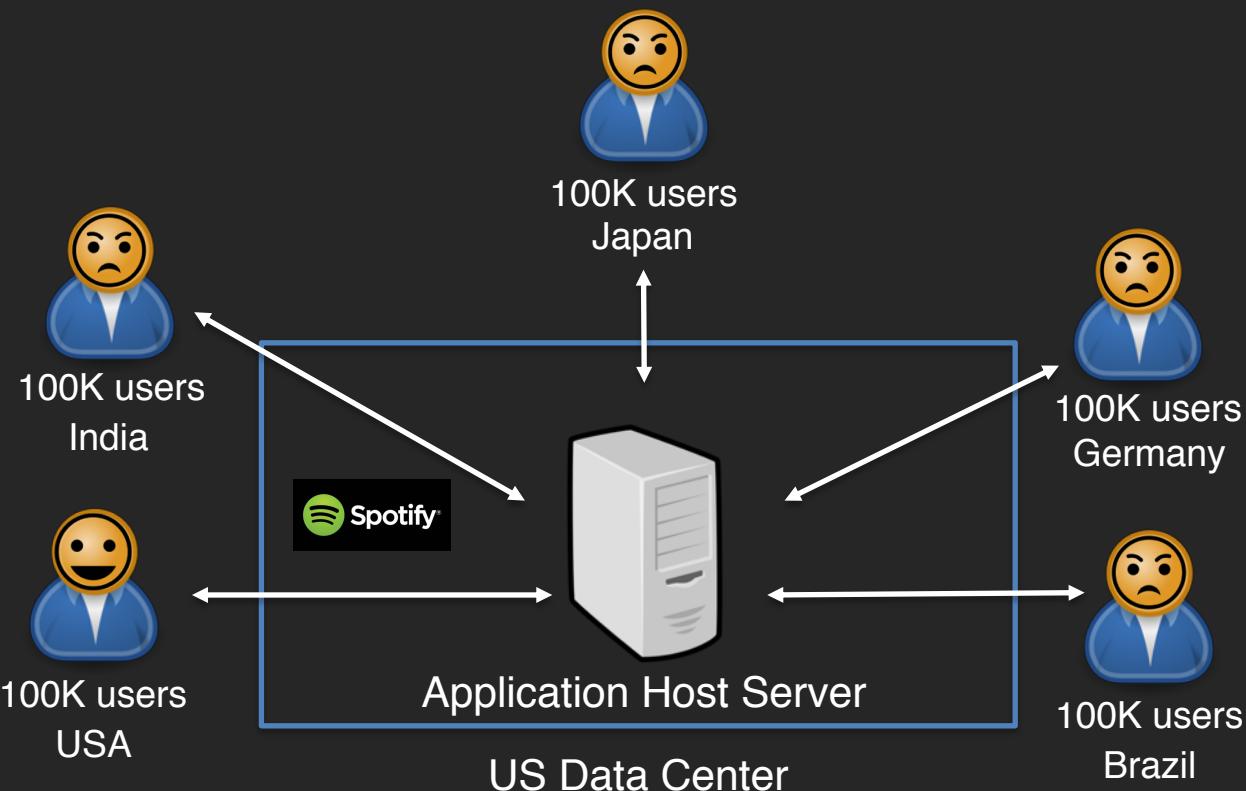
Without Cloud Advantages



Without Cloud Advantages

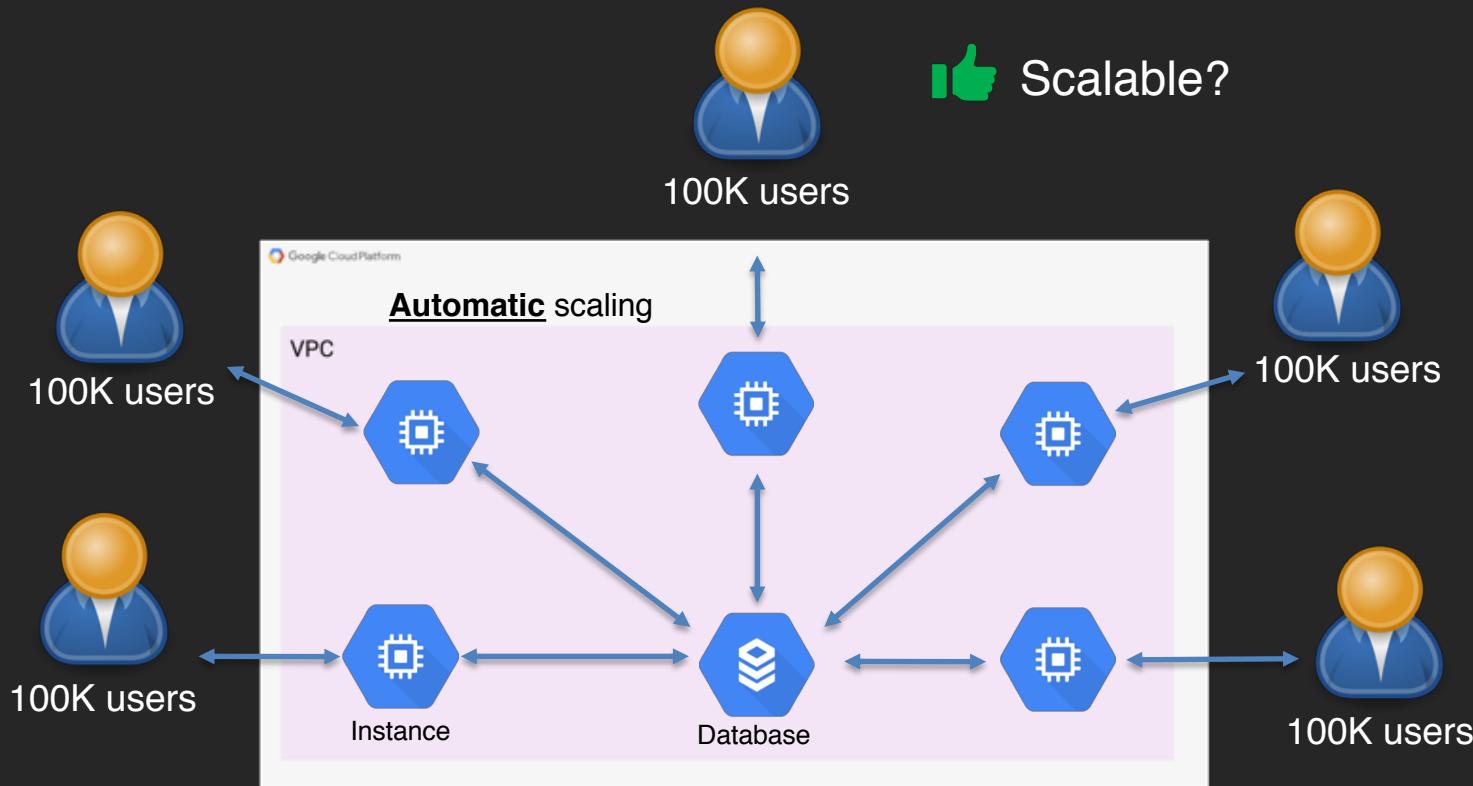


Without Cloud Advantages

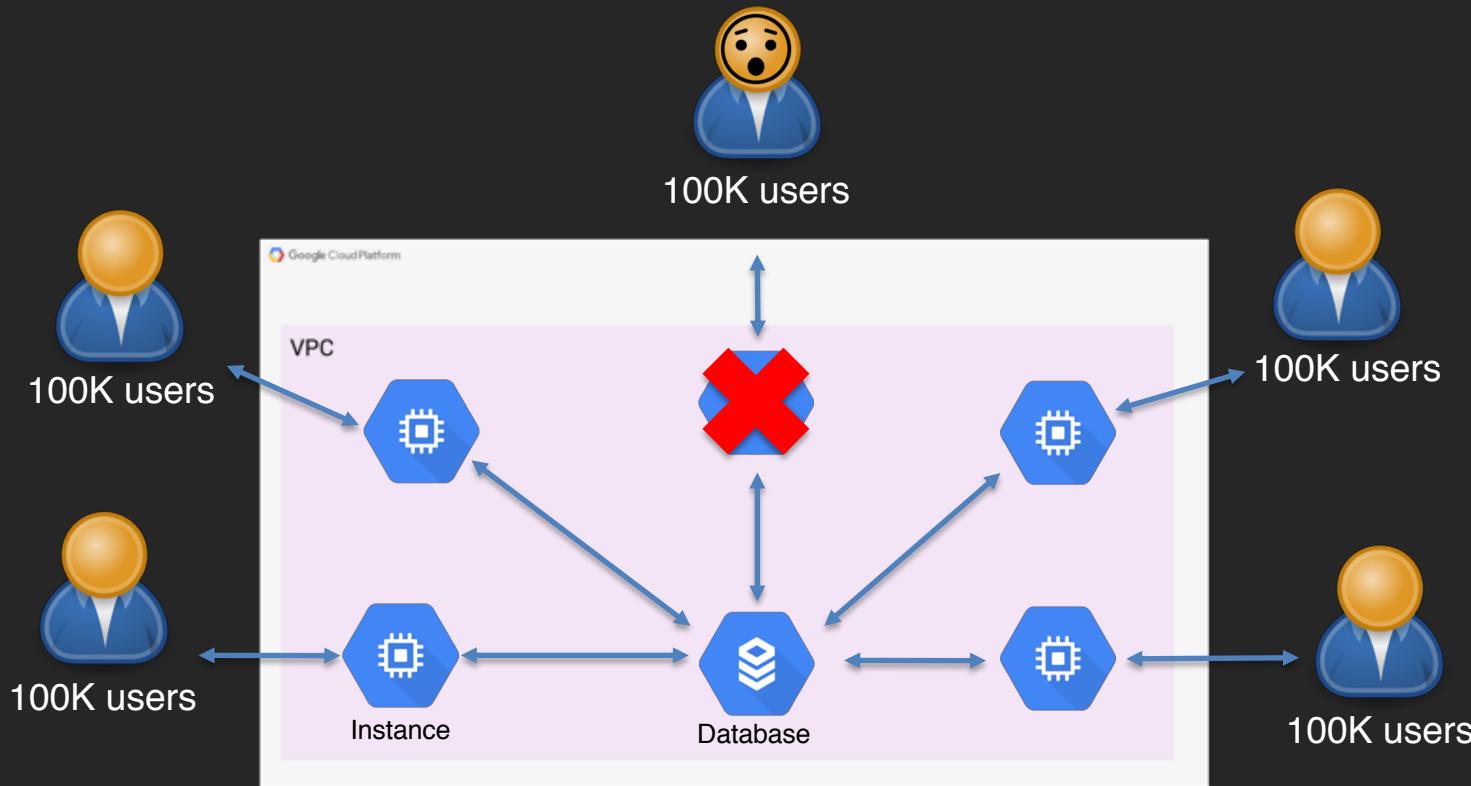


- ✗ Fault tolerant?
- ✗ Highly available?
- ✗ Scalable?
- ✗ Elastic?

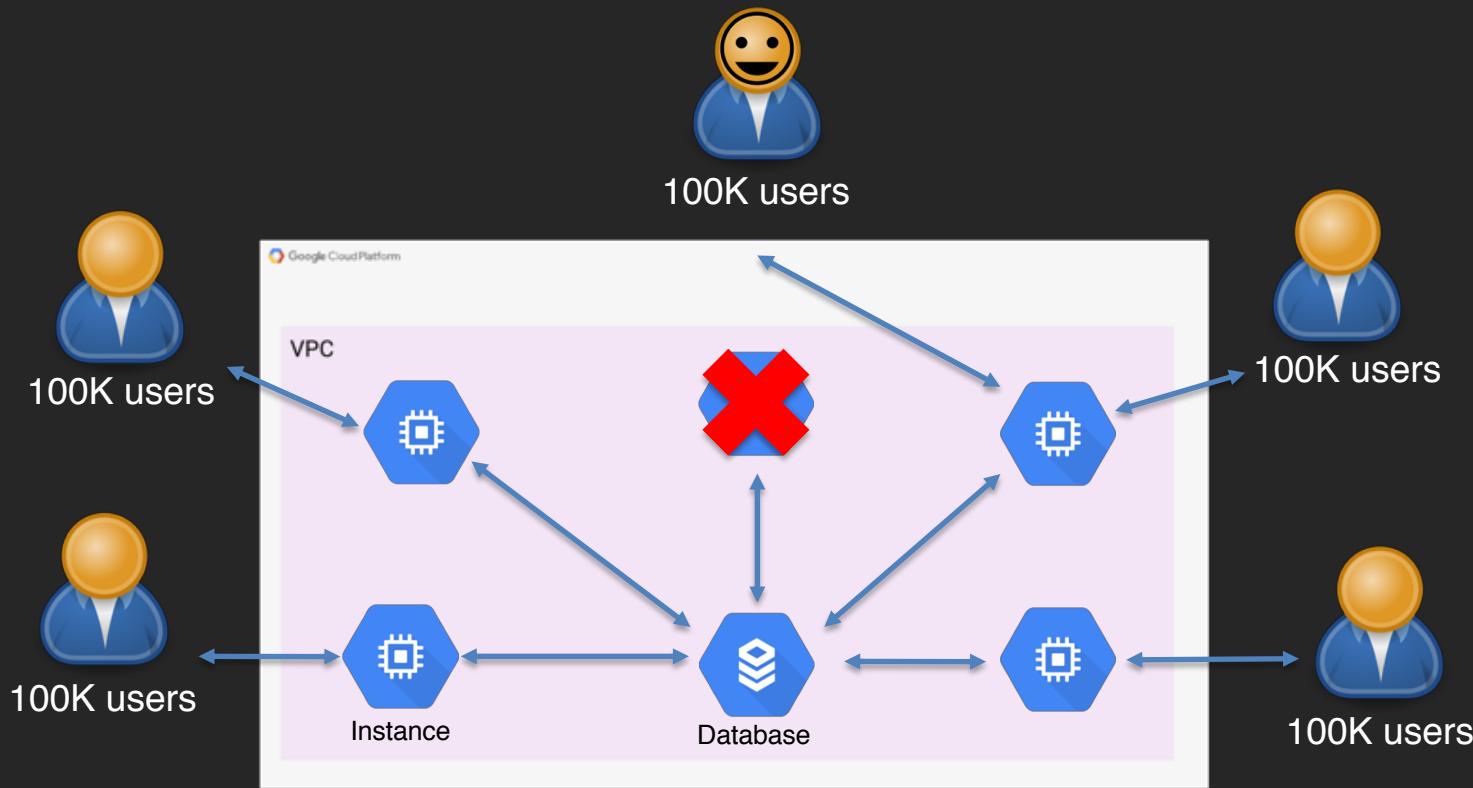
With Cloud Advantages



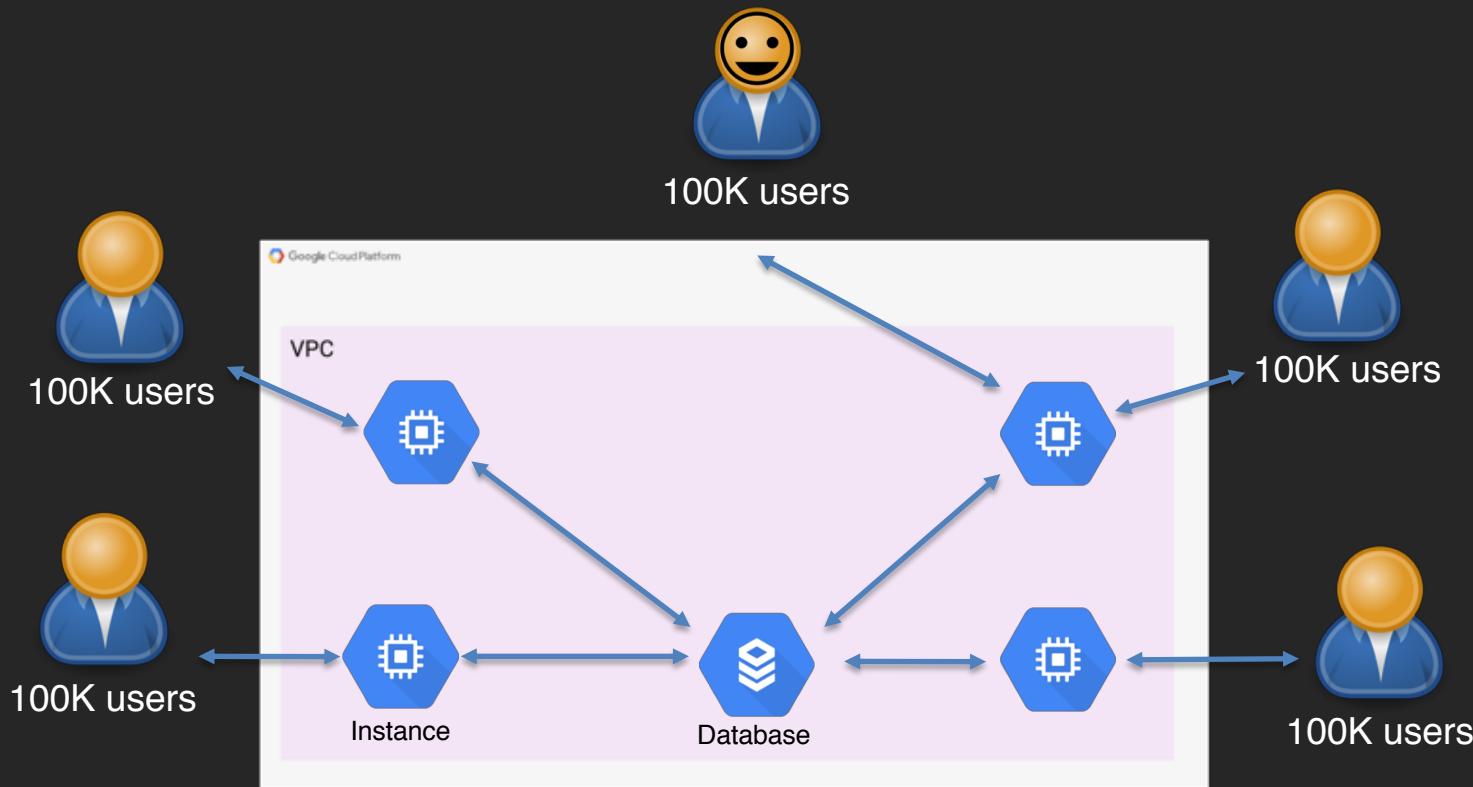
With Cloud Advantages



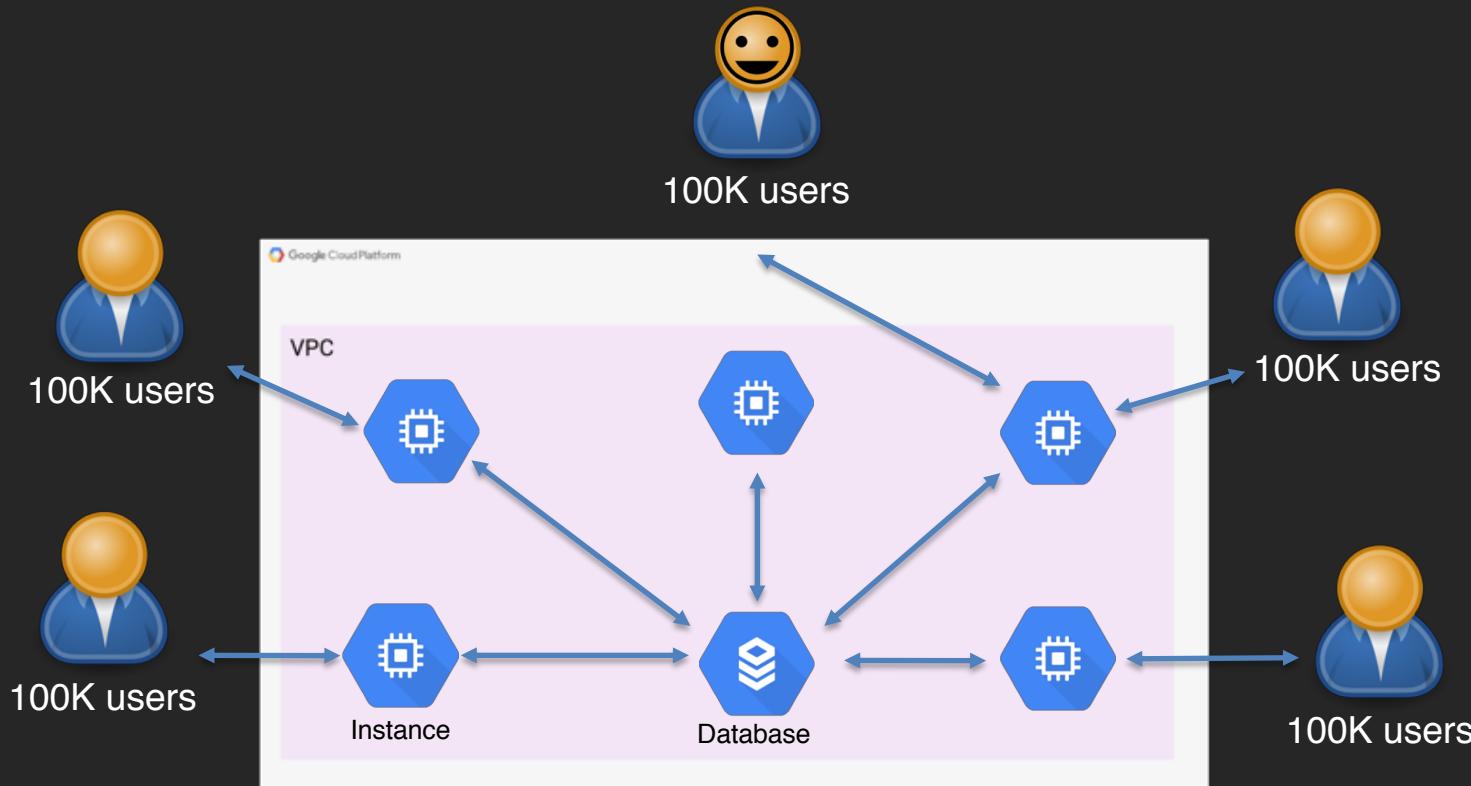
With Cloud Advantages



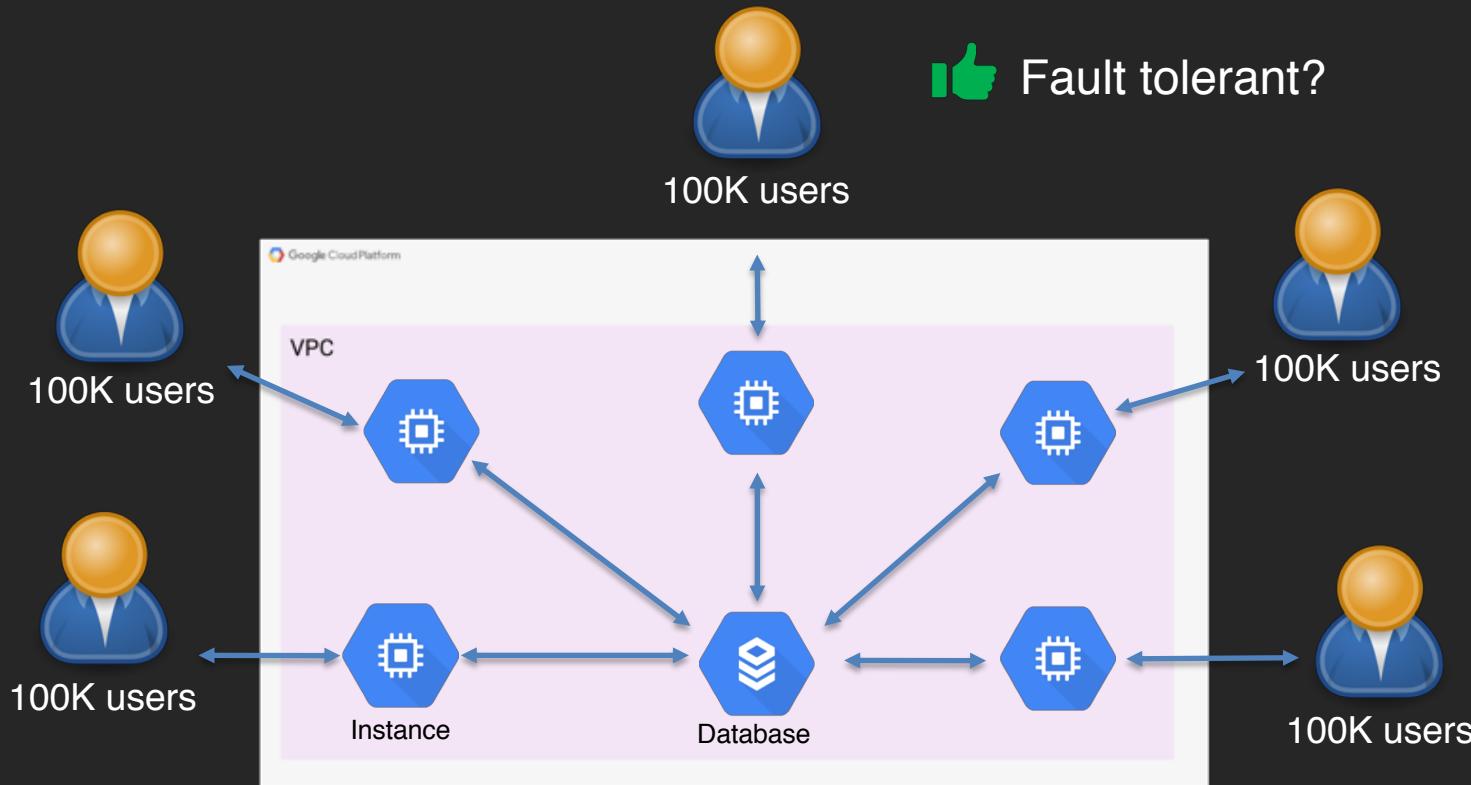
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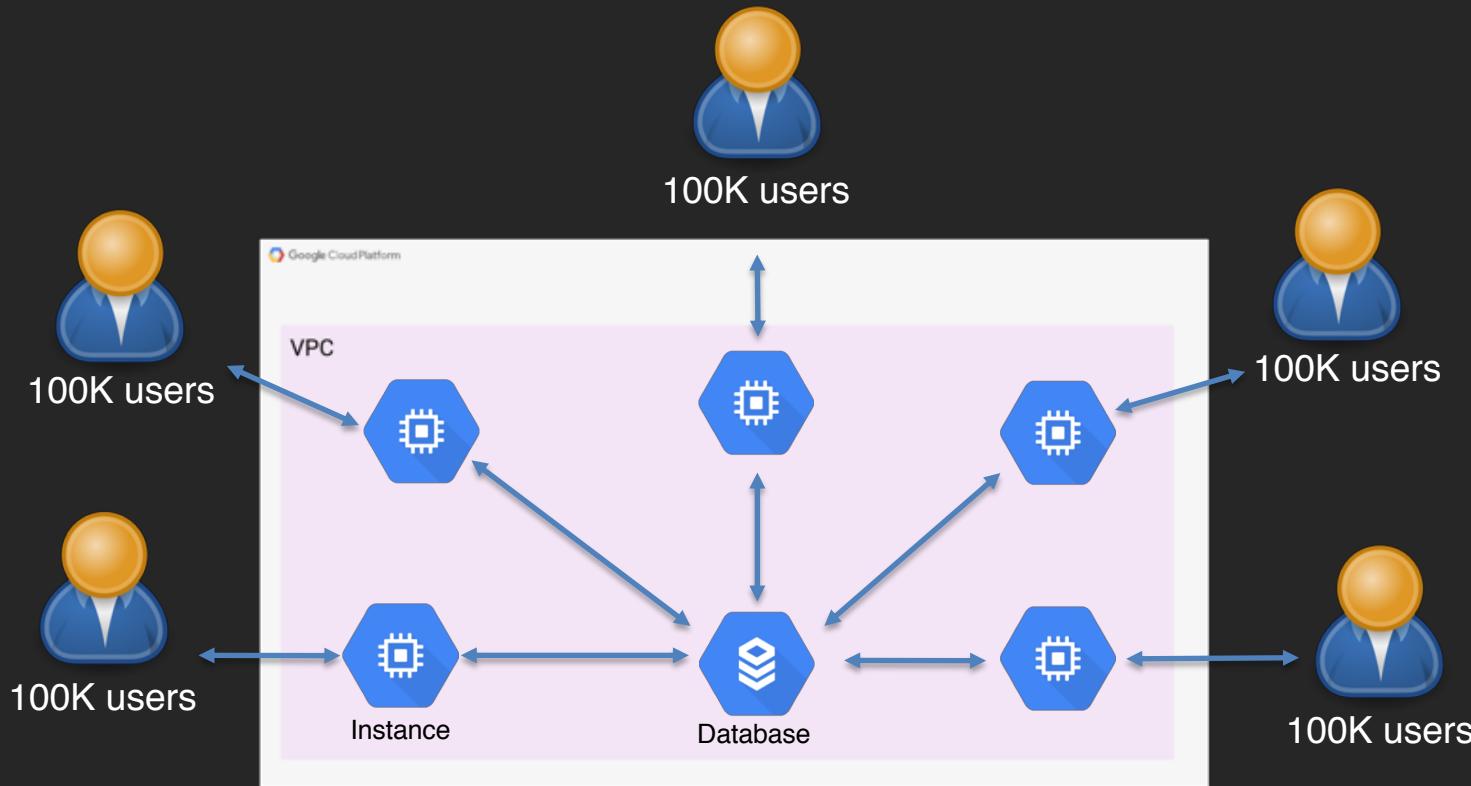
With Cloud Advantages



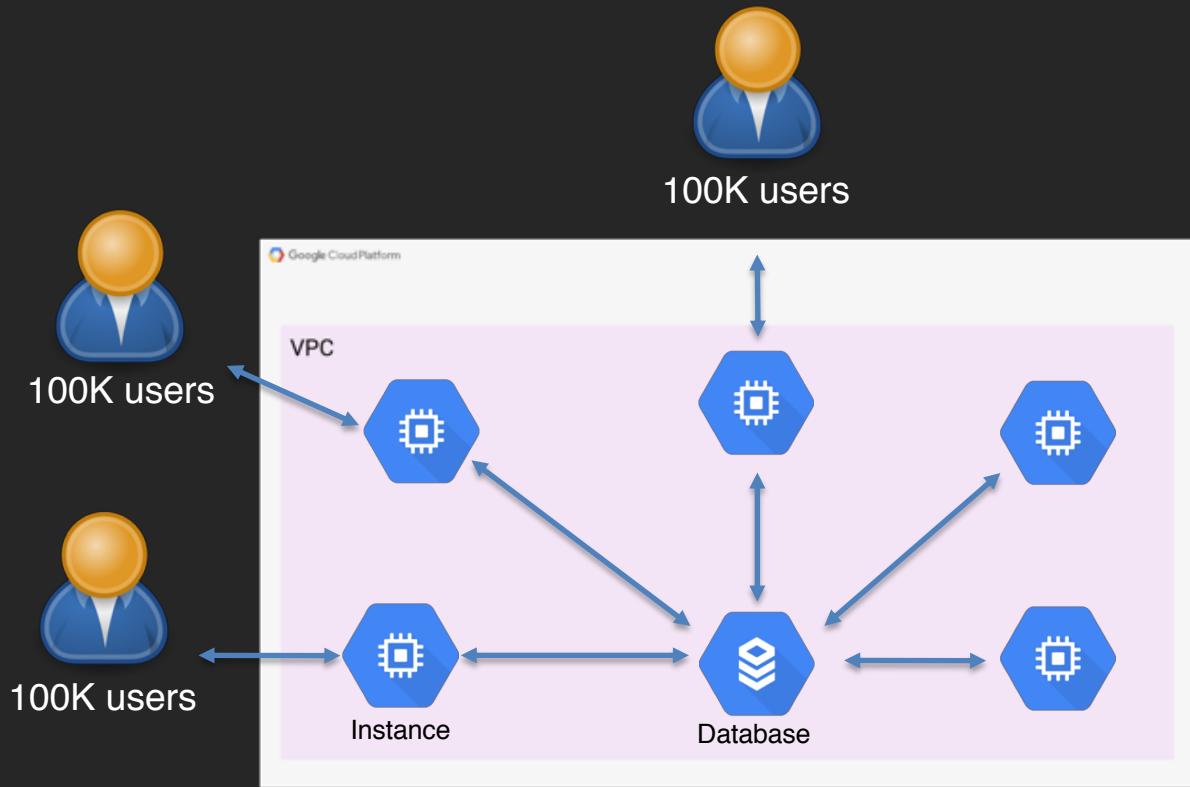
With Cloud Advantages



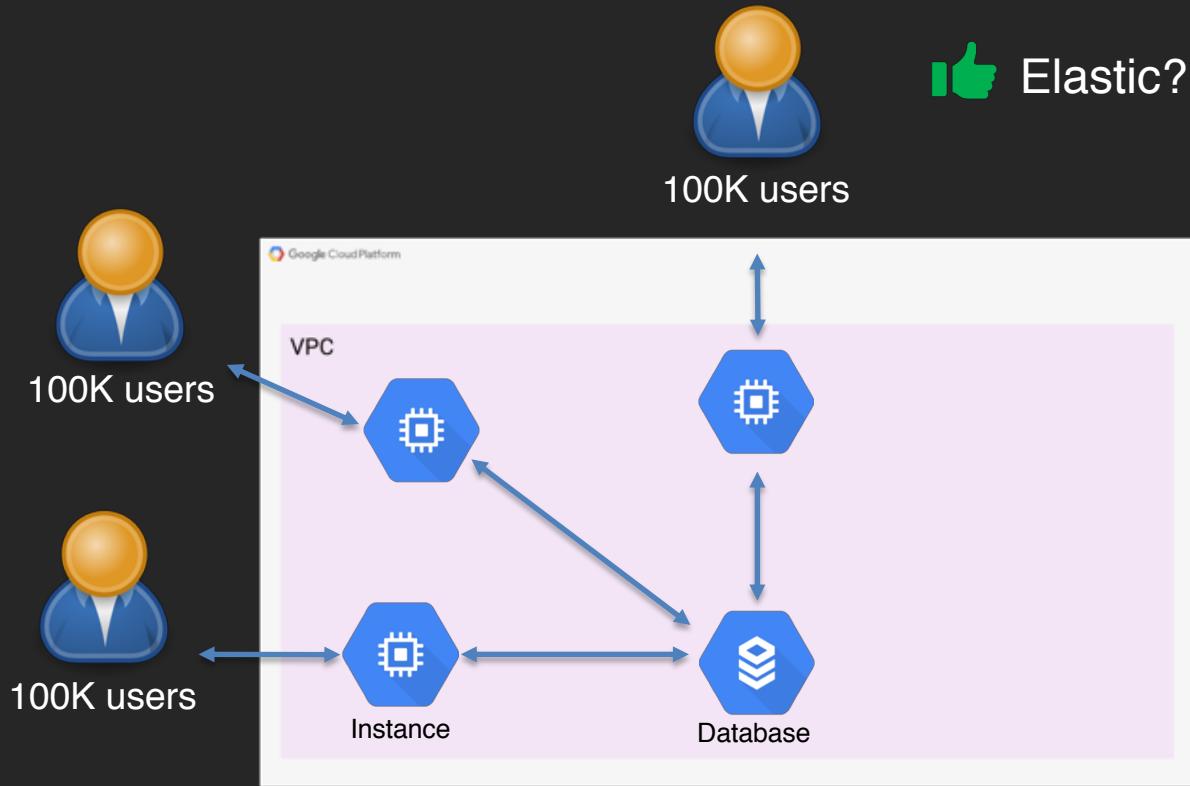
With Cloud Advantages



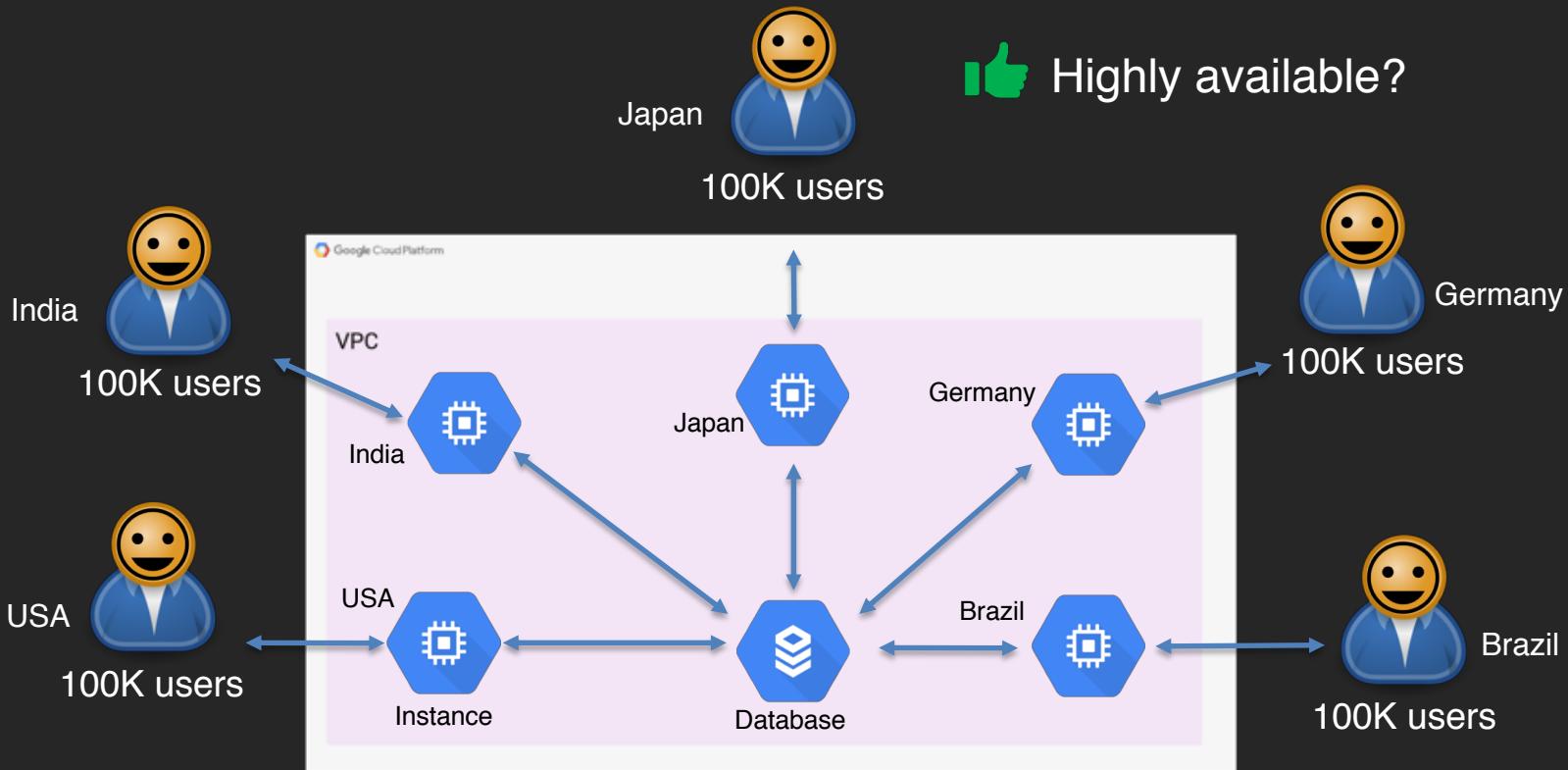
With Cloud Advantages



With Cloud Advantages



With Cloud Advantages





Google Cloud Concepts

Introduction to Cloud Storage

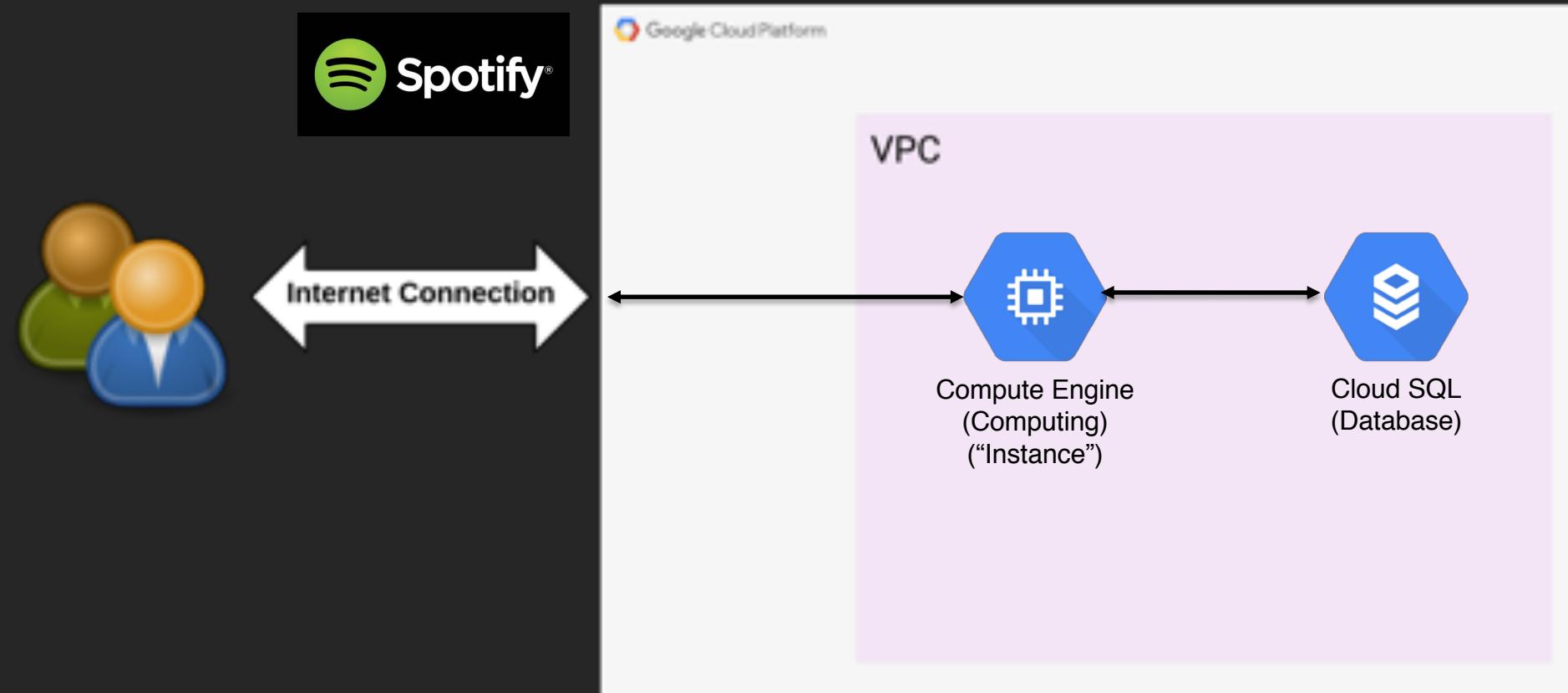
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Oversimplification of Concepts

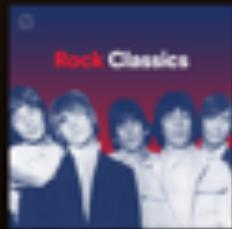
- Provide a beginner's frame of reference
- Foundation for more advanced concepts
- Minimum of terminology





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More like Songs to Sing in the Car

[Have A Great Day!](#)[Songs to Sing in the Shower](#)[All Out 70s](#)[All Out 80s](#)[Jukebox Joint](#)[Legendary](#)[Rock Classics](#)[80s Rock Anthems](#)[Jyväskylän purokka ja finnhitsit](#)[Classic Road Trip Songs](#)

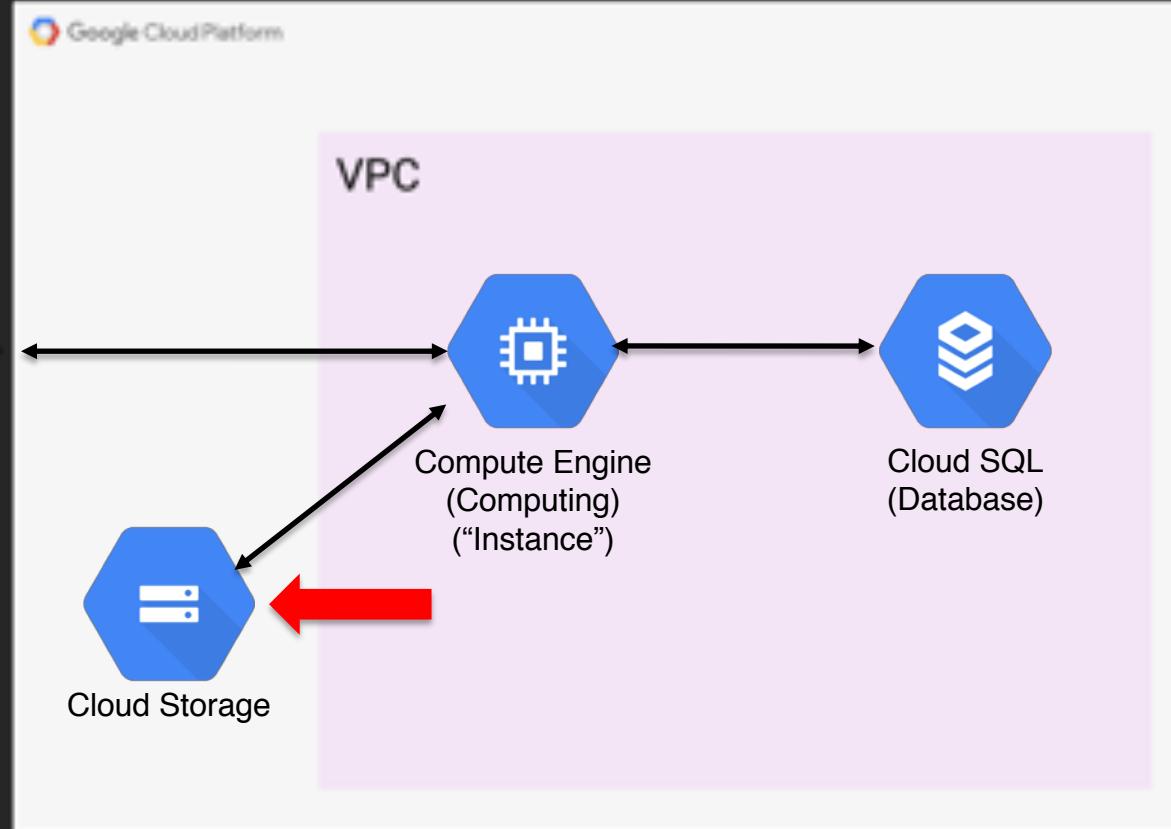
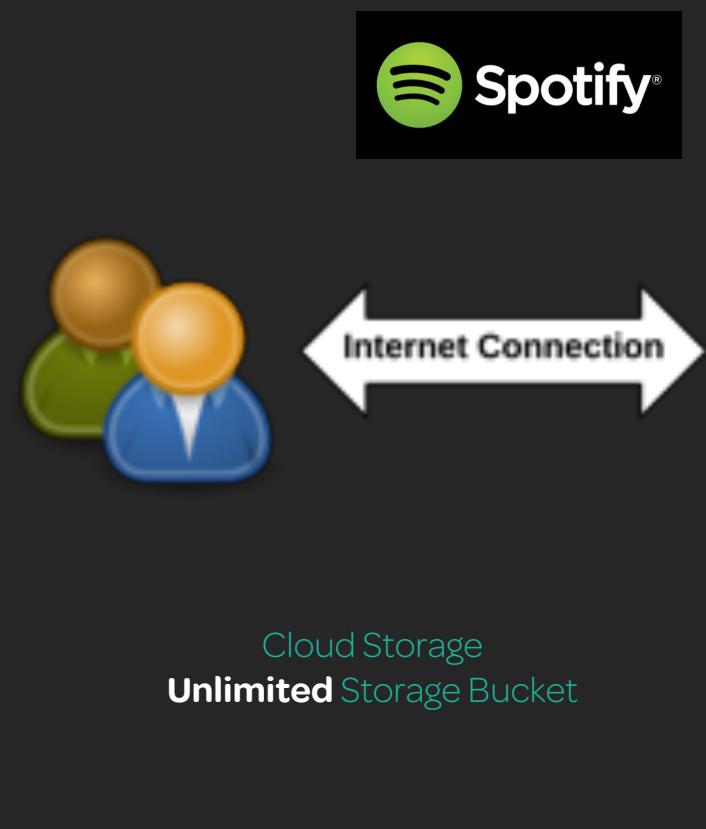
Lights out

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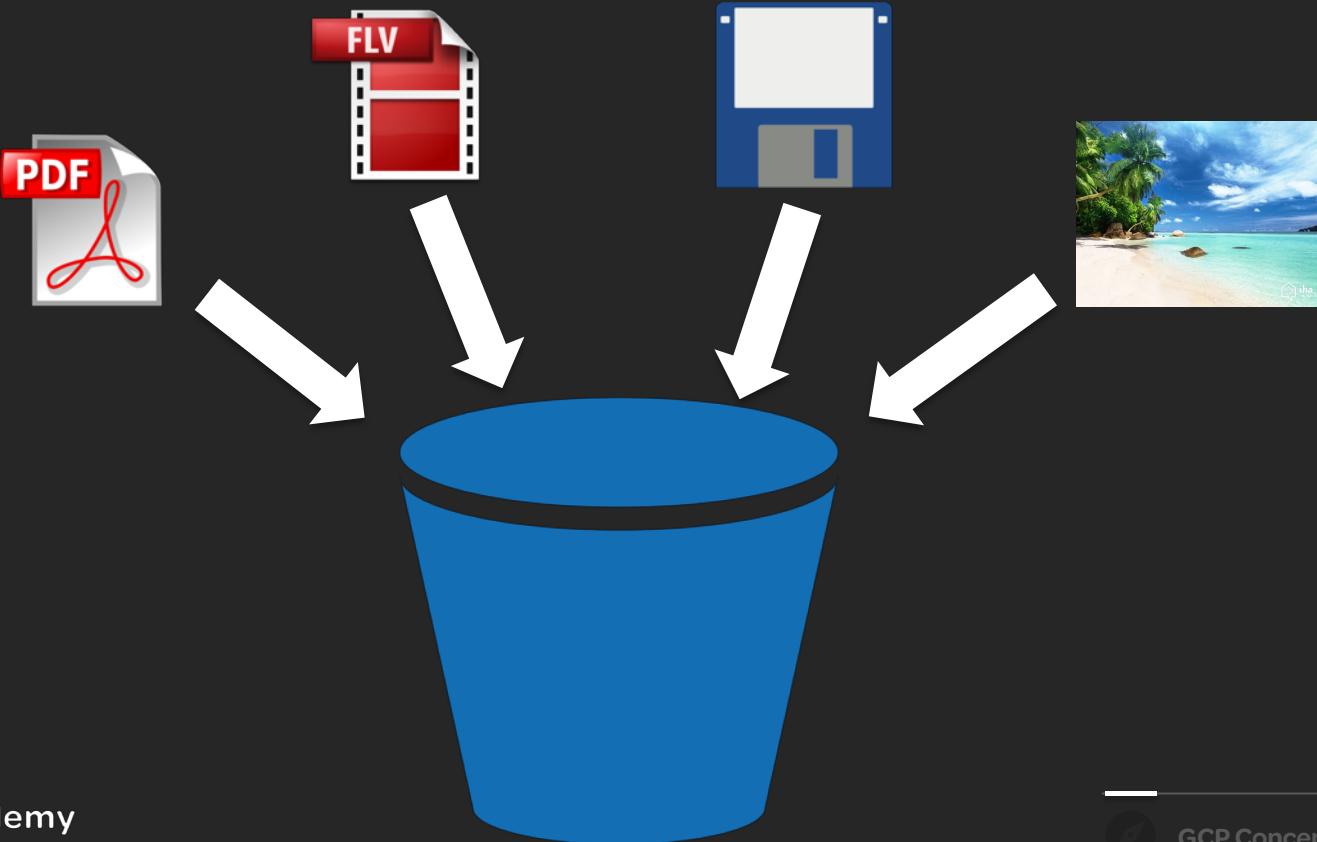
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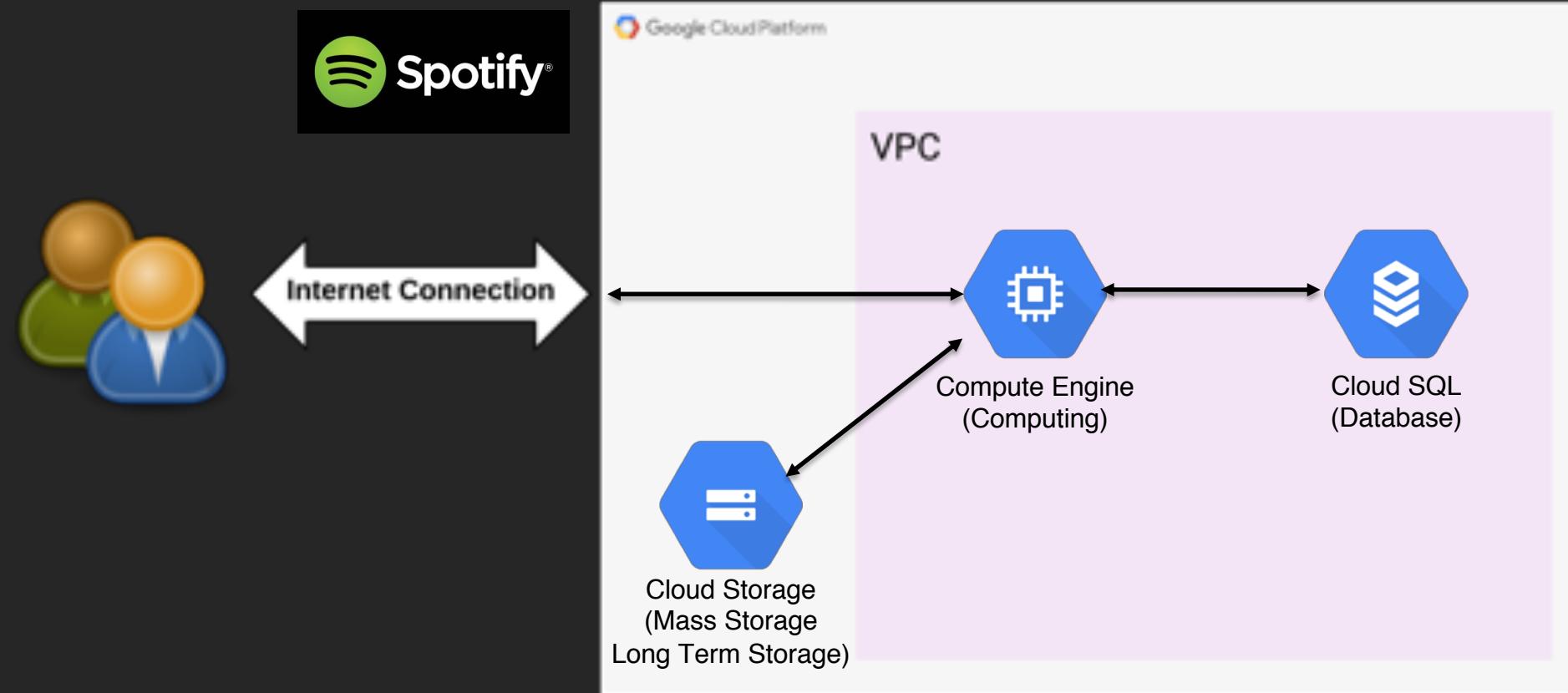


GCP Concepts



What Can Cloud Storage Hold? Everything!





Recap

Cloud Storage on GCP

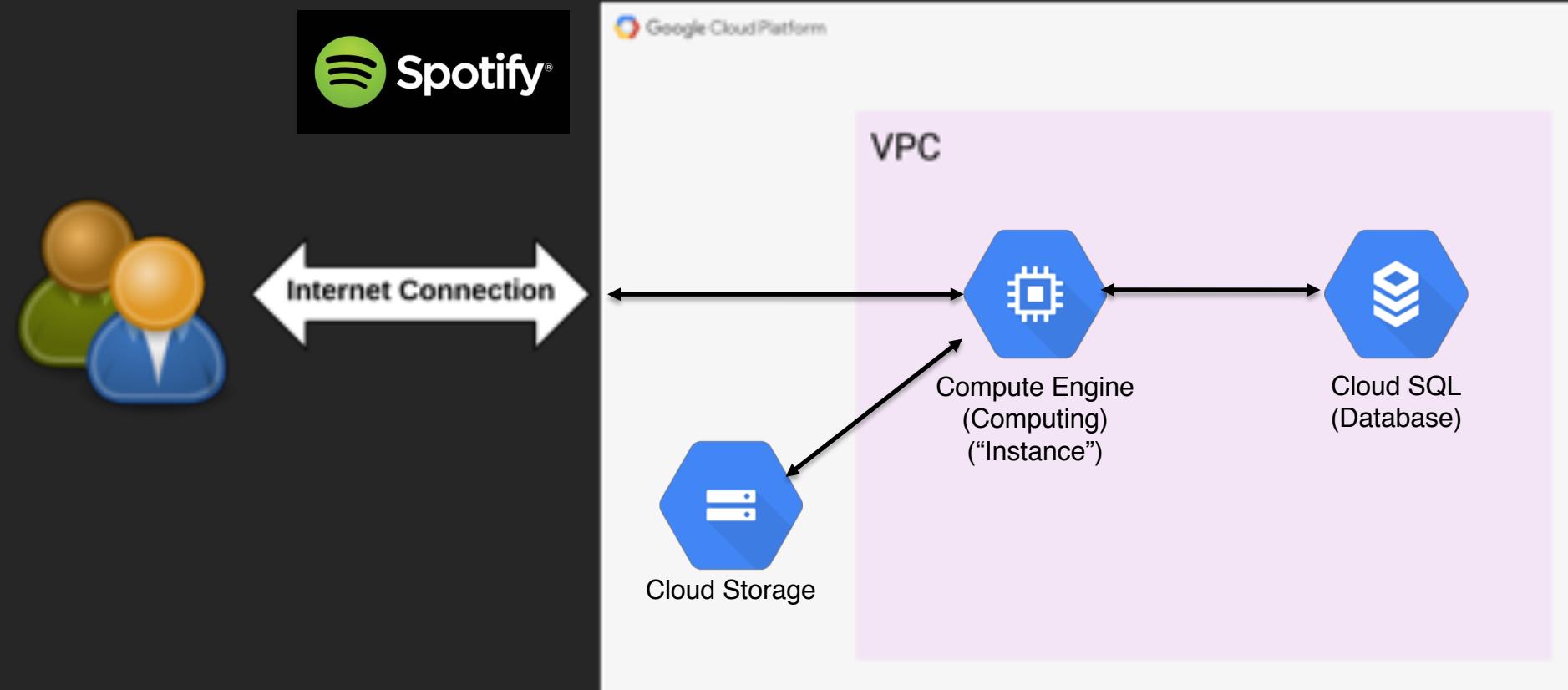
- *Massive* storage bucket
- Stores everything as long as you want:
 - Songs
 - Movies
 - Databases
 - Documents



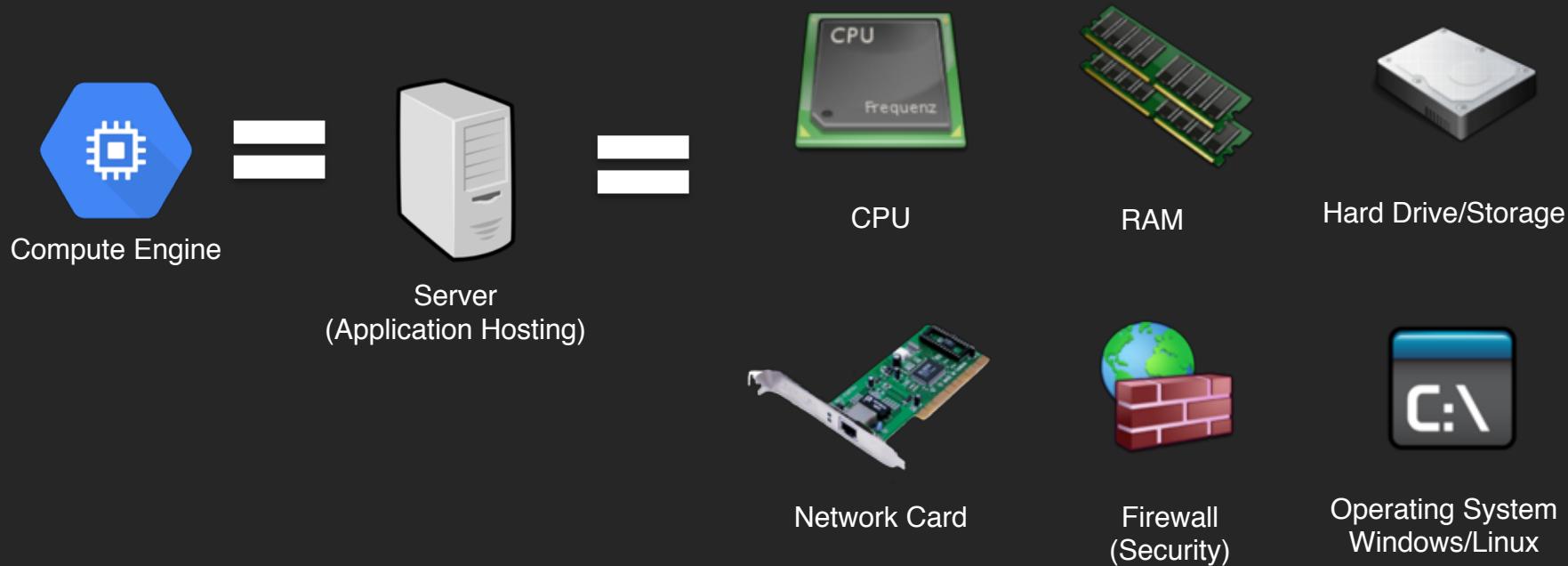


Google Cloud Concepts

What are Managed Services?



Recap – What's in a Server?

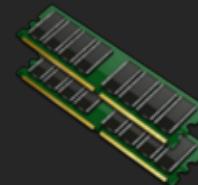


Recap – What's in a Server? (cont.)

Stuff **you** deal with



CPU



RAM



Hard Drive/Storage

Unmanaged service =
You manage the server '**stuff**'.



Network Card



Firewall
(Security)



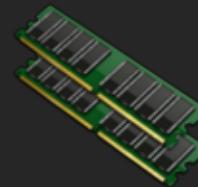
Operating System
Windows/Linux

Managed Services Offload the ‘Stuff’

Stuff **Google** deals with



CPU



RAM



Hard Drive/Storage

Managed service =
Google manages the server **‘stuff’**.
You focus on your data/code/etc.



Network Card



Firewall
(Security)



Operating System
Windows/Linux

Example Cloud SQL – Database server

Google manages

- OS installation, patches, updates
- Storage

You manage

- Loading data
- Accessing data
- Using data

Different managed services handle different stuff.

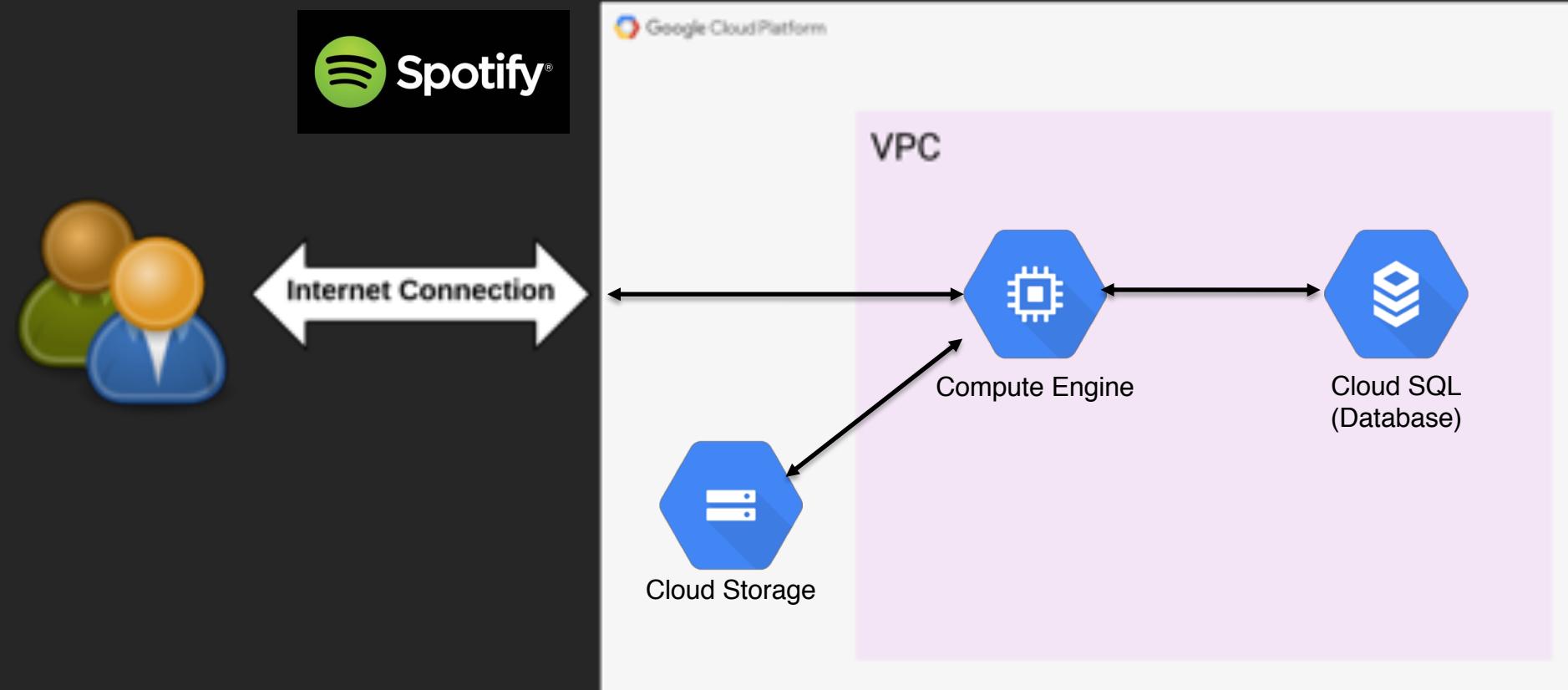
All of them are powered by the same Compute Engine instances.





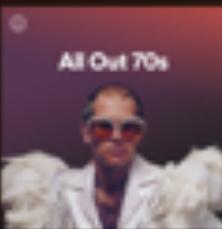
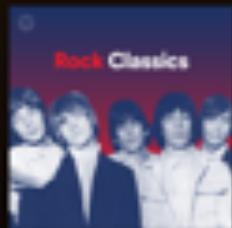
Google Cloud Concepts

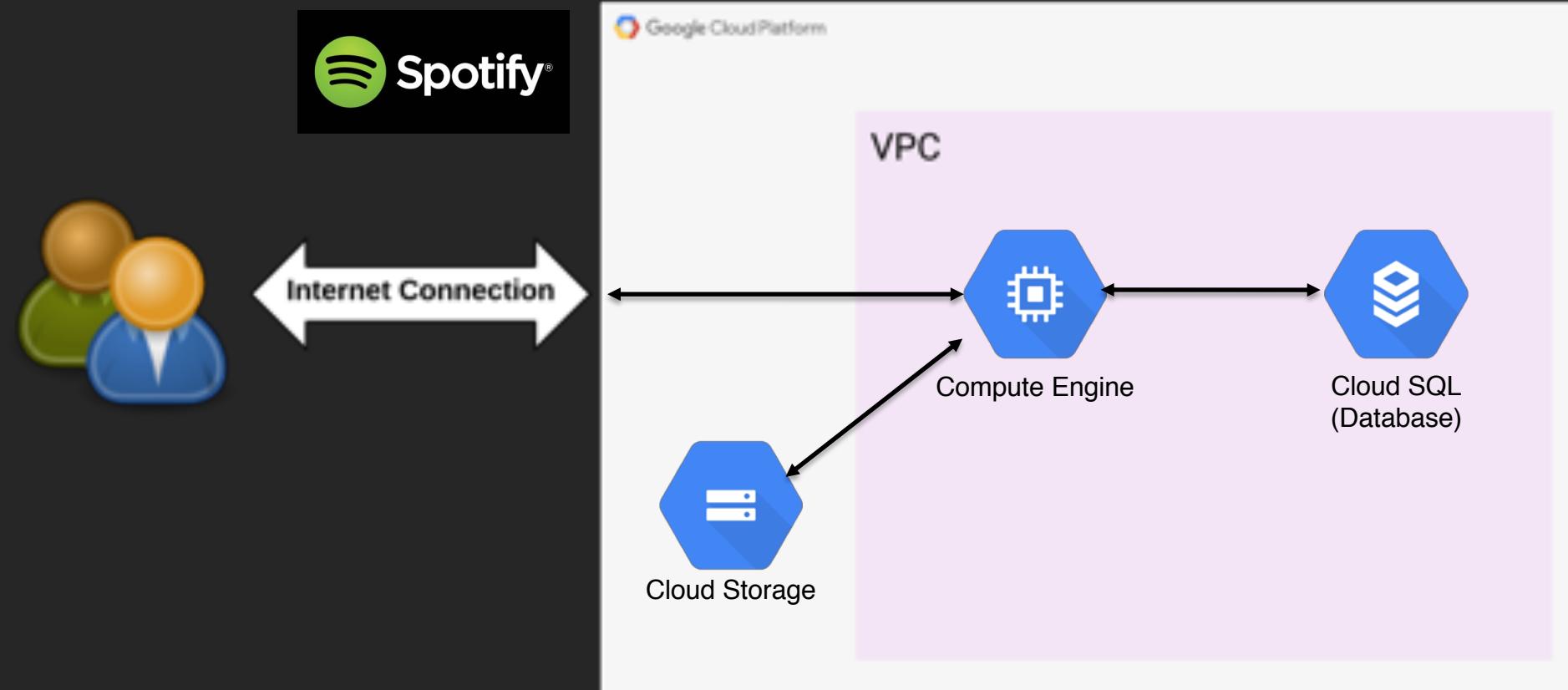
Putting the Pieces Together

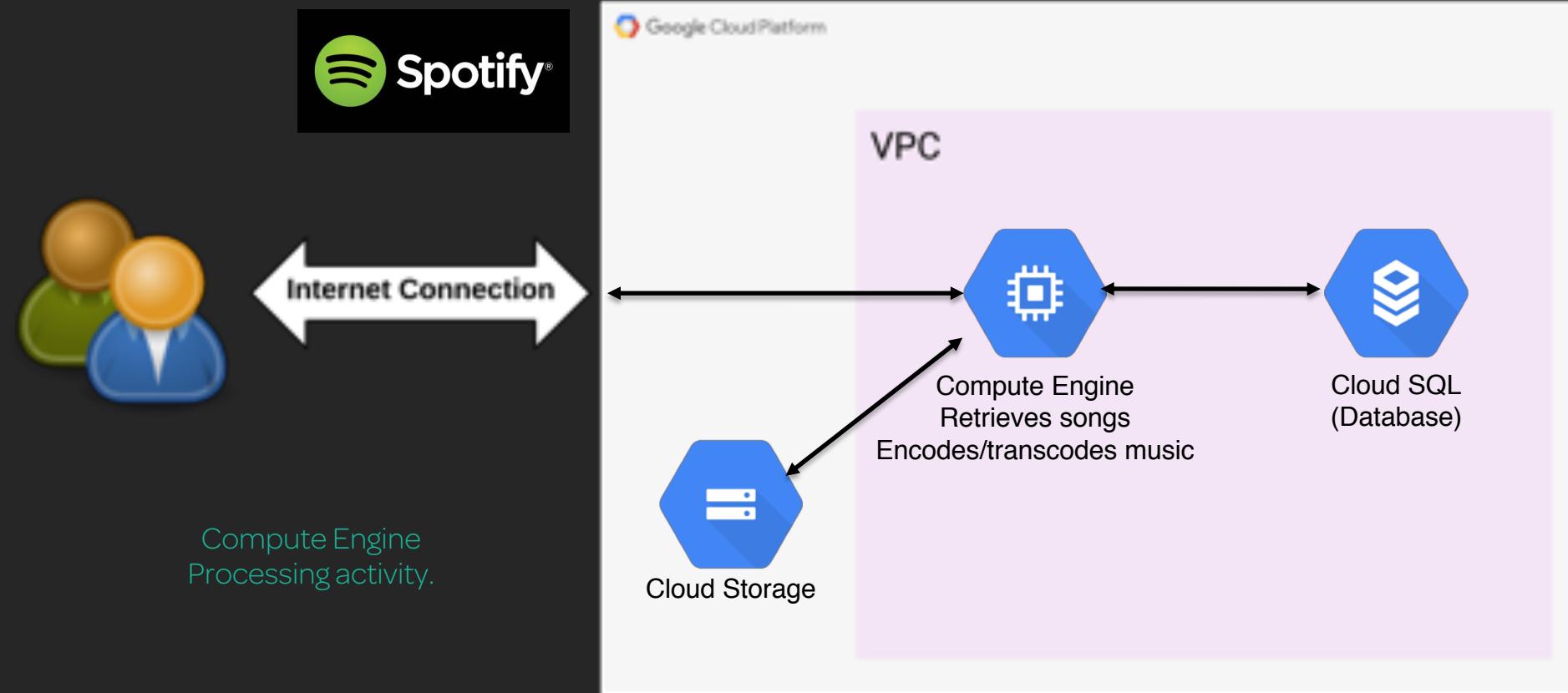


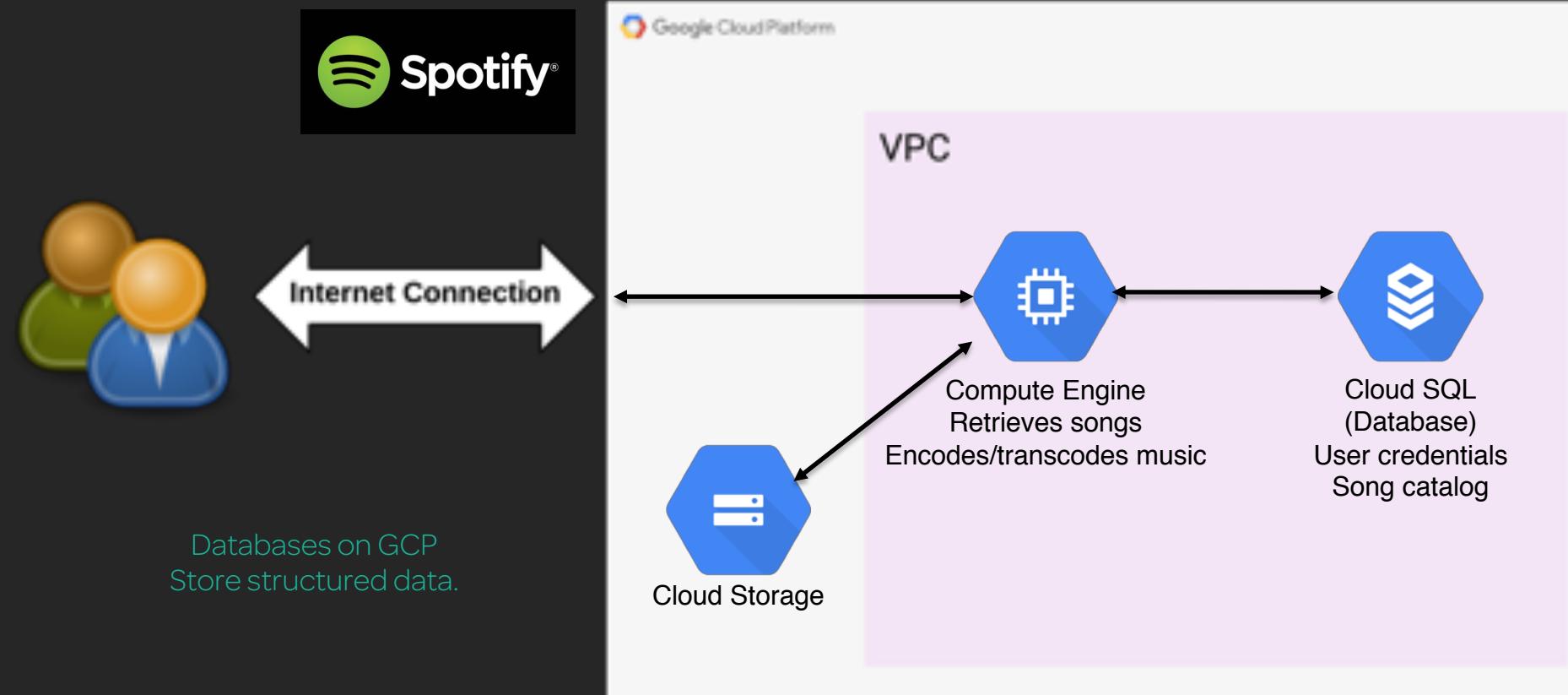
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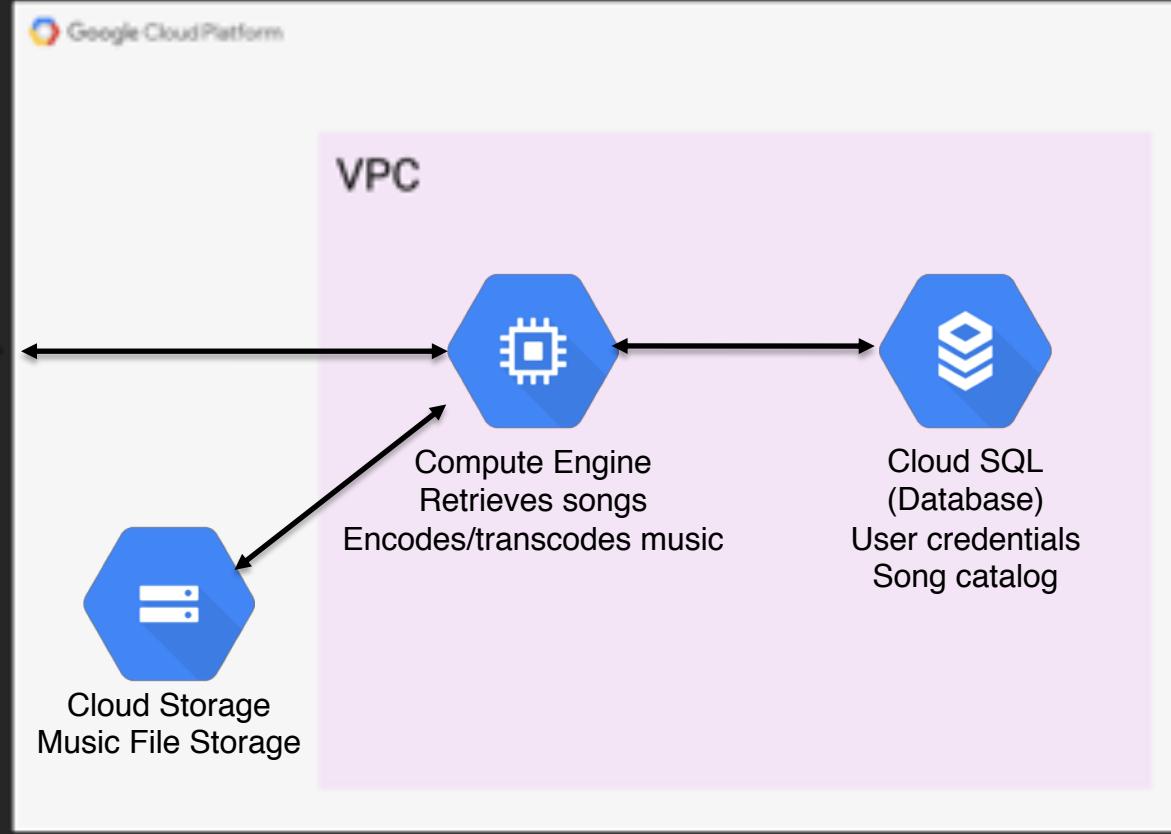
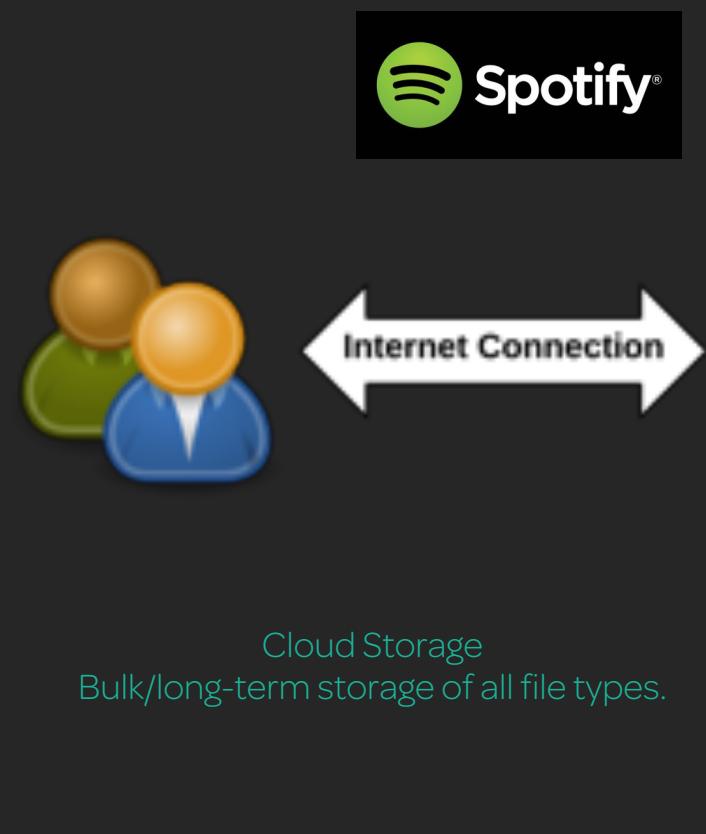
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Google Cloud Concepts

GCP Global Physical Infrastructure

Where are these servers located?

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Oversimplification of Concepts

- Provide a beginner's frame of reference
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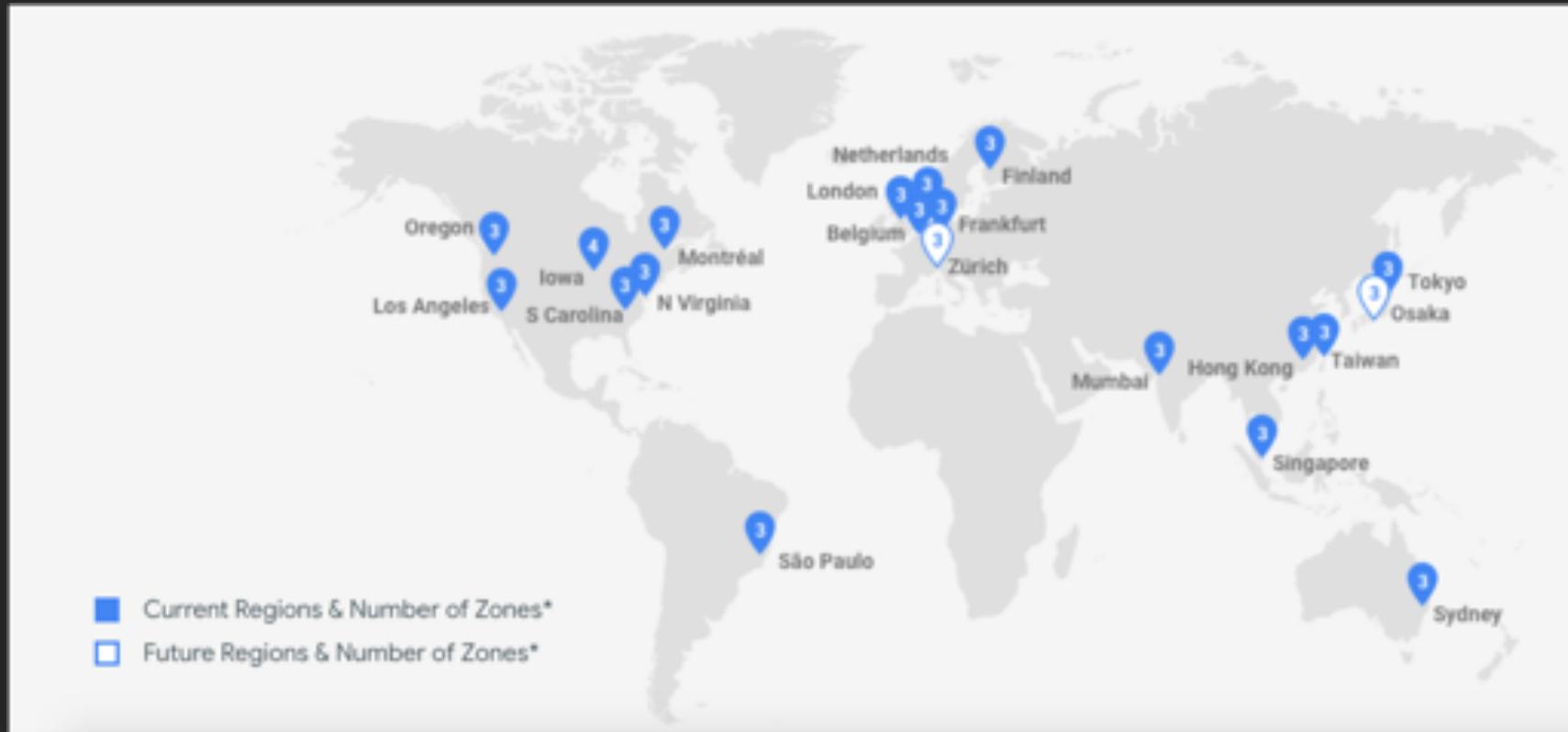


Where are these servers located?

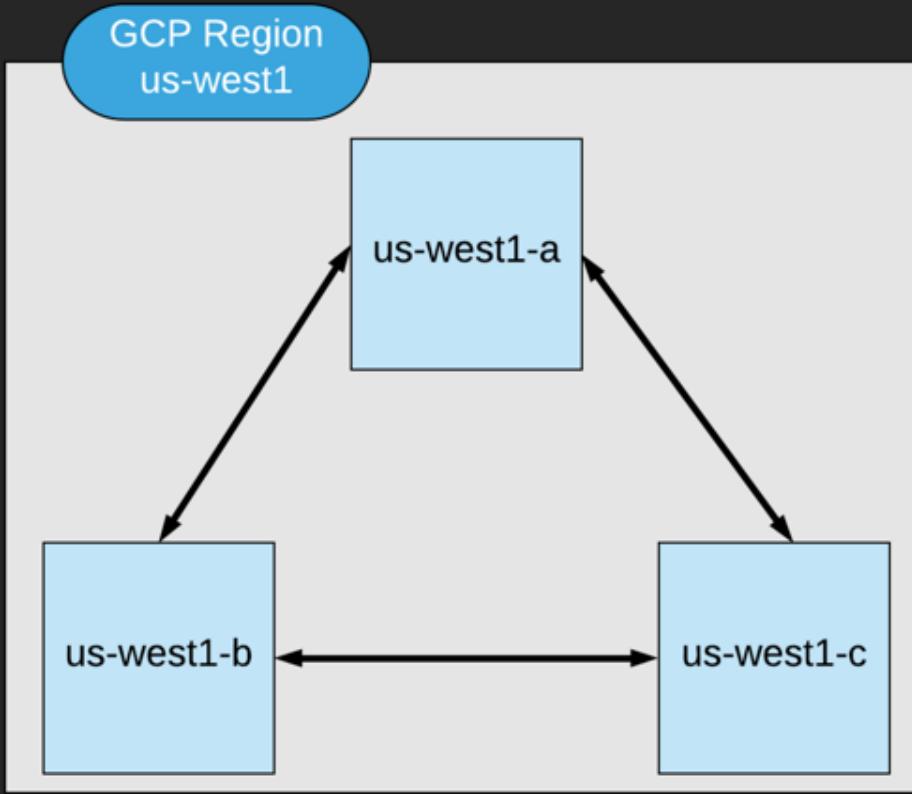
The 'Cloud'?
.....maybe not



GCP Global Infrastructure



Regions and Zones



Regions and Zones (cont.)

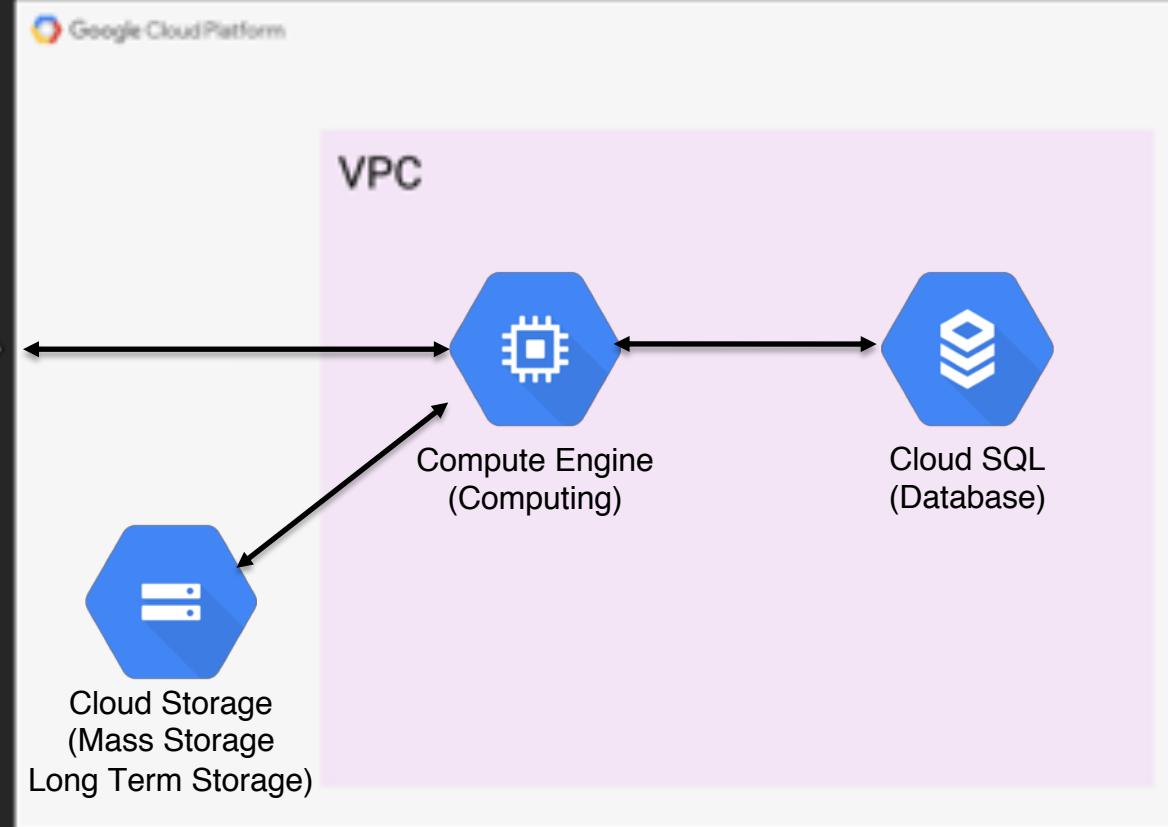
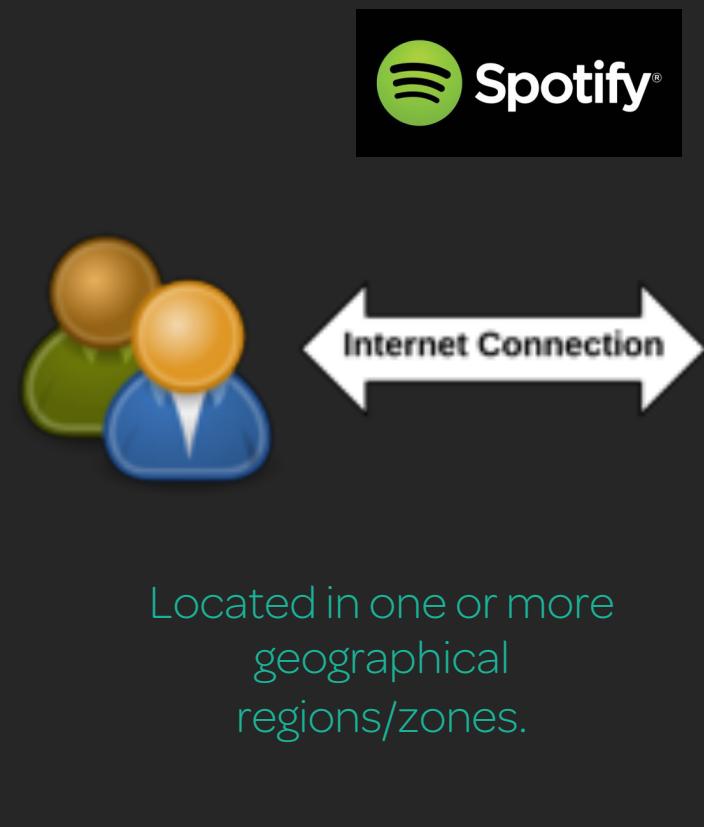
Zones = Isolated Data Center

Region = Geographic Group of Zones

Regions = High Availability

Zones = Fault Tolerance







Google Cloud Concepts

Next Steps

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What's next?

Google Cloud Professional

- Google Cloud Essentials course
- Topical non-certification deep dives
- Google Cloud Engineer – first certification stop

Supporting skills

- Linux Essentials
- Multi-cloud (AWS/Azure)
- DevOps

Explore learning paths!

The screenshot displays a grid of learning modules categorized by skill level: Beginner, Intermediate, and Advanced. Each category has four items:

- Certification Prep:** Content designed to prepare you for the certification exam, and provide you with the requisite hands-on experience.
 - Google Cloud Certified Professional Data Engineer (16h 32m)
 - Google Certified Professional Cloud Architect - Part 3 (8h 36m)
 - Google Certified Professional Cloud Architect - Part 2 (16h 27m)
 - Google Certified Professional Cloud Architect - Part 1 (15h 53m)
- Beginner:** Content designed to introduce platforms, services, tools, and concepts in a simplified manner.
 - DevOps Essentials (4h 17m)
 - Serverless Concepts (1h 59m)
 - Practice Exam Challenge: QUIZ: Setting up a Cloud Solution Environment (30m)
 - Practice Exam Challenge: QUIZ: Managing Billing Configuration (30m)
- Intermediate:** Content designed to build upon fundamental skill sets and develop in-depth knowledge of specific platforms, services, and features.
 - Google Cloud Certified Associate Cloud Engineer (8h 29m)
 - Google Cloud Security Essentials (10h 5m)
 - Python 3 Scripting for System Administrators (8h 44m)
 - Google App Engine Deep Dive (6h 47m)
- Advanced:** Content designed to develop advanced expertise in specific platforms, services, and features.

View All buttons are present in each category section.