### An Introduction to

# Google Cloud Platform

And, Qwiklabs

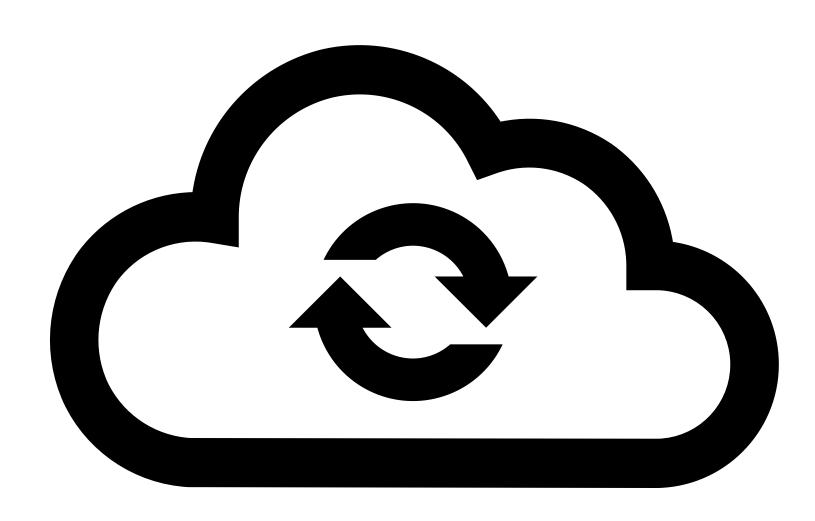
**Cloud Computing** 

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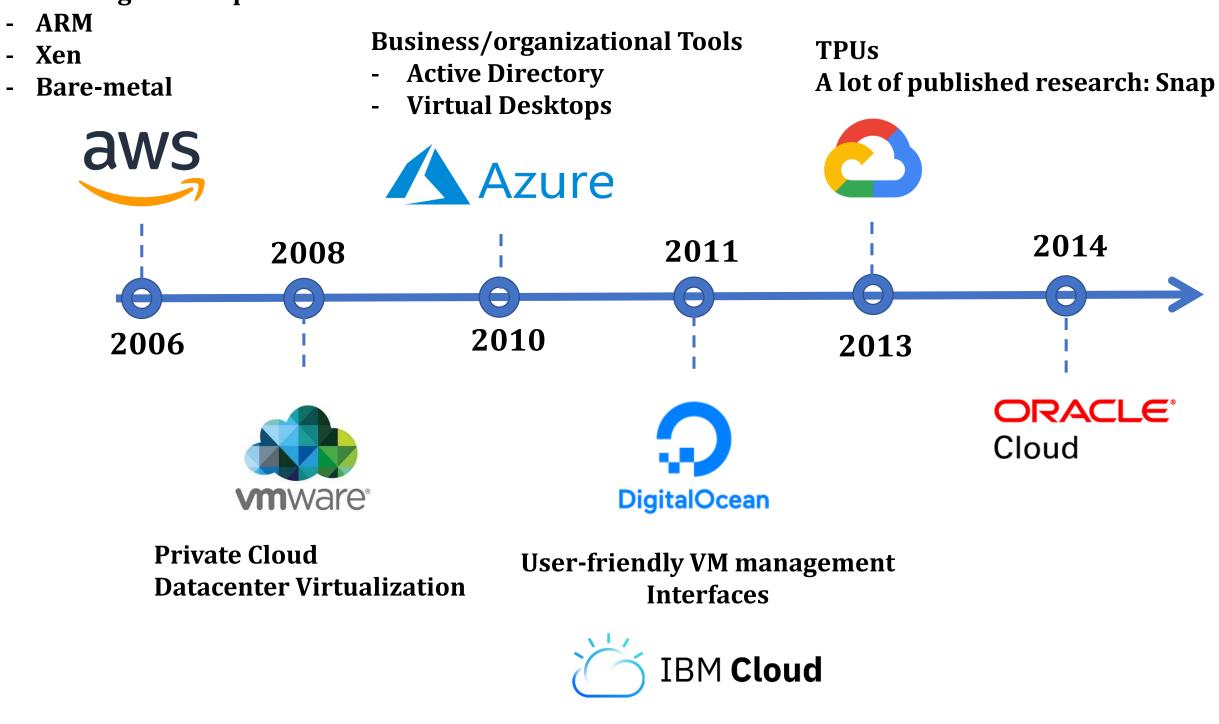
### Agenda

- ✓ Cloud providers in a nutshell
- ✓ Getting to know GCP
- ✓ Terminology
  - ✓ Abstraction levels
  - ✓ Services
  - ✓Zones/Regions
  - **✓** User Interface
- ✓ Qwicklabs: An easy way to learn GCP
- ✓ A quick tutorial on Hadoop streaming API
- ✓ Where to start with Qwicklabs



#### Cloud providers in a nutshell

#### Wide range of compute servers:



Watson

### Terminology - Abstractions

Bare Metals On-premises Datacenters	Infrastructure (IAAS)	Platform (PAAS)	Software (SAAS)	Function (FAAS)
Application	Application	Application	Application	
Data	Data	Data	Data	Data
Runtime	Runtime	Runtime	Runtime	Runtime
Middleware	Middleware	Middleware	Middleware	Middleware
Operating System	Operating System	Operating System	Operating System	Operating System
Virtualization	Virtualization	Virtualization	Virtualization	Virtualization
Computing Hardware	Computing Hardware	Computing Hardware	Computing Hardware	Computing Hardware
Storage	Storage	Storage	Storage	Storage
Networking	Networking	Networking	Networking	Networking

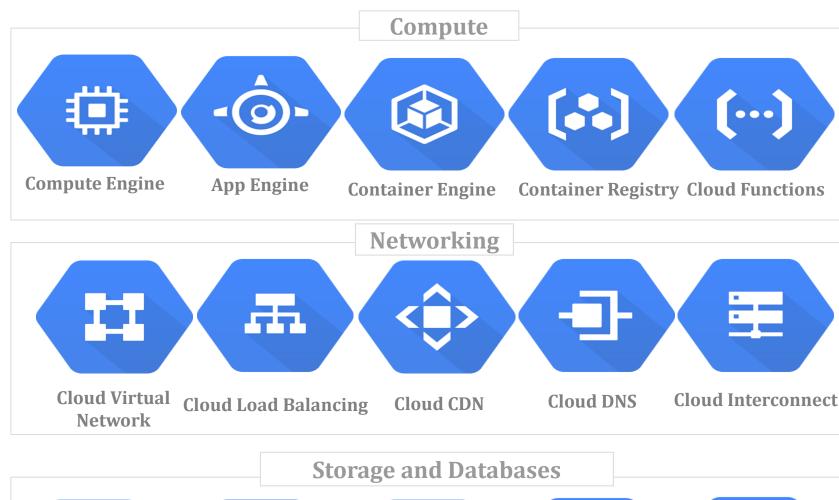


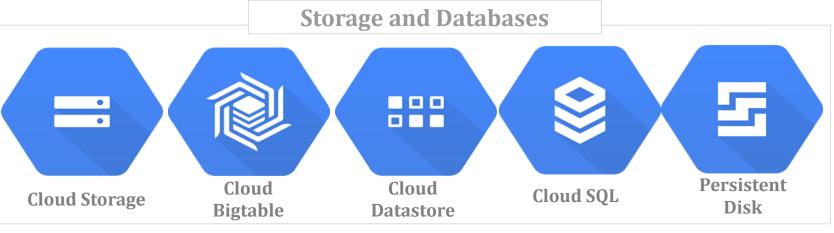


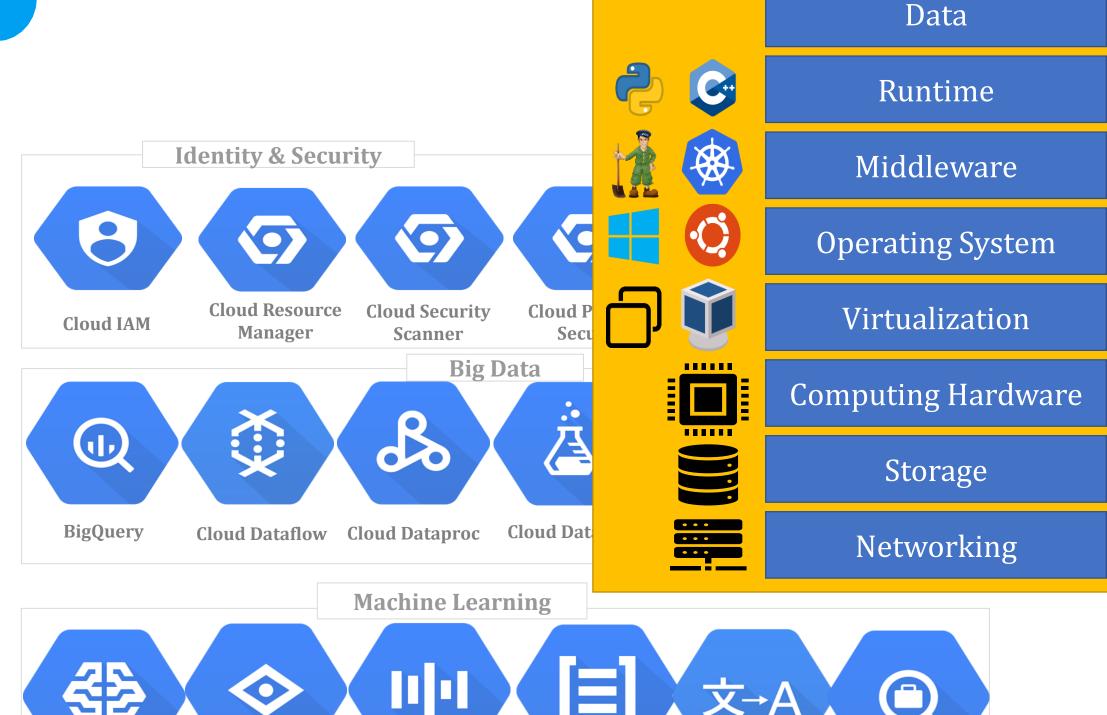




### Terminology - Services







**Jobs API** 

Application

**Speech API** 

**Cloud Machine** 

Learning

**Vision API** 

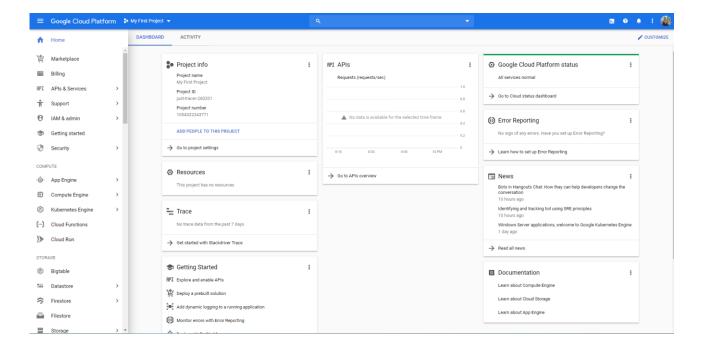
Natural Language Translation API

### Terminology – Zones and Regions

Region	Zones	Location
asia-east1	a, b, c	Changhua County, Taiwan
asia-east2	a, b, c	Hong Kong
asia-northeast1	a, b, c	Tokyo, Japan
asia-northeast2	a, b, c	Osaka, Japan
asia-northeast3	a, b, c	Seoul, South Korea
asia-south1	a, b, c	Mumbai, India
asia-southeast1	a, b, c	Jurong West, Singapore
australia-southeast1	a, b, c	Sydney, Australia
europe-north1	a, b, c	Hamina, Finland
europe-west1	b, c, d	St. Ghislain, Belgium
europe-west2	a, b, c	London, England, UK
europe-west3	a, b, c	Frankfurt, Germany
europe-west4	a, b, c	Eemshaven, Netherlands
europe-west6	a, b, c	Zürich, Switzerland
northamerica-northeast1	a, b, c	Montréal, Québec, Canada
southamerica-east1	a, b, c	Osasco (São Paulo), Brazil
us-central1	a, b, c, f	Council Bluffs, Iowa, USA
us-east1	b, c, d	Moncks Corner, South Carolina, USA
us-east4	a, b, c	Ashburn, Northern Virginia, USA
us-west1	a, b, c	The Dalles, Oregon, USA
us-west2	a, b, c	Los Angeles, California, USA

#### User Interface

#### The Console



#### **REST APIs**

#### REST Resource: v2.datasets

Methods	
delete	DELETE /bigquery/v2/projects/{projectId}/datasets/{datasetId} Deletes the dataset specified by the datasetId value.
get	<pre>GET /bigquery/v2/projects/{projectId}/datasets/{datasetId} Returns the dataset specified by datasetID.</pre>
insert	POST /bigquery/v2/projects/{projectId}/datasets Creates a new empty dataset.
list	GET /bigquery/v2/projects/{projectId}/datasets Lists all datasets in the specified project to which the user has been granted the READER dataset role.
patch	PATCH /bigquery/v2/projects/{projectId}/datasets/{datasetId} Updates information in an existing dataset.
update	PUT /bigquery/v2/projects/{projectId}/datasets/{datasetId} Updates information in an existing dataset.

#### The Cloud Shell

```
Welcome to Cloud Shell! Type "help" to get started.
Your Cloud Platform project in this session is set to just-tracer-260201.
Use "gcloud config set project [PROJECT ID]" to change to a different project.
e_sharafzadeh@cloudshell:~ (just-tracer-260201) gcp
.bash logout .bashrc .cache/ .docker/ .profile README-cloudshell.txt .theia/ .yarn/
e_sharafzadeh@cloudshell:~ (just-tracer-260201) gcmp
compgen complete compopt compose composer
e_sharafzadeh@cloudshell:~ (just-tracer-260201) gcloud compute instances list
Listed 0 items.
e_sharafzadeh@cloudshell:~ (just-tracer-260201) $

e_sharafzadeh@cloudshell:~ (just-tracer-260201) $

e_sharafzadeh@cloudshell:~ (just-tracer-260201) $

e_sharafzadeh@cloudshell:~ (just-tracer-260201) $

e_sharafzadeh@cloudshell:~ (just-tracer-260201) $
```

#### GCloud SDK

```
Your current configuration has been set to: [default]

You can skip diagnostics next time by using the following flag:
gcloud init --skip-diagnostics

Network diagnostic detects and fixes local network connection issues.

Checking network connection...done.

Reachability Check passed.

Network diagnostic passed (1/1 checks passed).

You must log in to continue. Would you like to log in (Y/n)? y

Your browser has been opened to visit:

https://accounts.google.com/o/oauth2/auth?code_challenge=Eo2wo_1a4diqldsGNB3YRdGf7JIKTtBbobni2PkzMPI&prompt=select_account&code_challenge_method=S256&access_type=offline&redirect_uri=http%3A%2F%2Flocalhost%3A8085%2F&response_type=code&cilent_id=23555940559.apps_googleusercontent.com&scope=https%3A%2F%2Flowww.googleapis.com%2Fauth%2Fcoloud-platform+https%3A%2F%2Flwww.googleapis.com%2Fauth%2Fcompute+https%3A%2F%2Flwww.googleapis.com%2Fauth%2Fcompute+https%3A%2F%2Flwww.googleapis.com%2Fauth%2Faccounts.reauth

You are logged in as: [e.sharafzadeh@gmail.com].

Pick cloud project to use:
[1] hallowed-ridge-101216
[2] just-tracer-260201
[3] loyal-prism-122407
[4] Create a new project

Please enter numeric choice or text value (must exactly match list ittem):
```

### Qwiklabs: GCP Tutorials

✓ Hands-on Labs

✓ Quests

✓ Challenges



### Qwiklabs: Demo

## Creating a Virtual Machine...

https://www.qwiklabs.com/focuses/3563?parent=catalog

#### GCP: Demo

### Hadoop Streaming API on GCP

#### Steps:

- 1. Create a VM on GCP (Alternatively we can use CS department ugrad lab machines)
- 2. Download Hadoop binaries from <a href="http://mirror.cc.columbia.edu/pub/software/apache/hadoop/common/hadoop-3.1.3/hadoop-3.1.3.tar.gz">http://mirror.cc.columbia.edu/pub/software/apache/hadoop/common/hadoop-3.1.3/hadoop-3.1.3.tar.gz</a> using wget.
- 3. Extract the Hadoop tarball (tar xfv hadoop-3.1.3.tar.gz)
- 4. Install JAVA using "sudo apt install openjdk-8-jre" (ugrad machines have JAVA installed already)
- 5. Define the environment variables for Hadoop:
  - 1. export JAVA\_HOME=/usr/lib/jvm/java-8-openjdk-amd64
  - 2. export HADOOP HOME=~/hadoop-3.1.3
- 6. Write your Python scripts (as map.py and reduce.py) and copy the data to the machine via SFTP to a directory named "cloud"
- 7. Run the map-reduce job:

\$HADOOP\_HOME/bin/hadoop jar \$HADOOP\_HOME/share/hadoop/tools/lib/hadoop-streaming-3.1.3.jar -input cloud -output output\_dir -mapper ~/map.py -reducer ~/reduce.py

### Qwiklabs: Where to go from here

- 1. "Introduction to GCP" Quest
- 2. "Kubernetes in the Google Cloud" Quest
- 3. "Networking in the Google Cloud" Quest
- 4. Lots of quests on Data Science and ML
- 5. More advanced quests on Kubernetes and Networking
- 6. Challenge your understanding

### Follow up

- Piazza use "GCP" tag
- •Email: e.sharafzadeh@jhu.edu, erfan@cs.jhu.edu
- •Office hours: shoot me an email to set a time

### Stay Tuned!

• Next Tutorial: OpenStack

