Google Cloud Fundamentals

Google Cloud

Agenda

1. What is Cloud Computing
2. Why choose Google Cloud
3. GCP Product and Services
4. GCP Compute
5. GCP Storage
6. GCP ML APIs


What is Cloud Computing

On-demand self-service

No human intervention needed to get resources

Broad network access

Access from anywhere

Resource pooling

Provider shares resources to customers

Rapid elasticity

Get more resources quickly as needed

Measured service

Pay only for what you consume


Why Google Cloud

Productive teams with mobility & devices
G-Suite; Chrome and Android

Connect & grow ecosystems
Ready APIs (Maps, Vision, Translate etc.), Apigee, OrbitEra

Deliver new apps
App Engine, Kubernetes, Firebase, Cloud Functions

Secure & trusted infrastructure
100+ POPs globally; 600+ security engineers

Turn data into advantage
Machine Learning & Data Analytics: Cloud ML, TensorFlow, BigQuery

Google Cloud Platform offers services for getting value from data

Google Compute Engine

- High CPU, high memory, standard and Shared-core machine types.
- Persistent disks:
  - Standard, SSD, Local SSD
- Robust Networking Features.
- Per-minute billing, sustained use discounts.
- High throughput to storage at no extra cost.
- Custom machine types- only pay for the hardware you need.

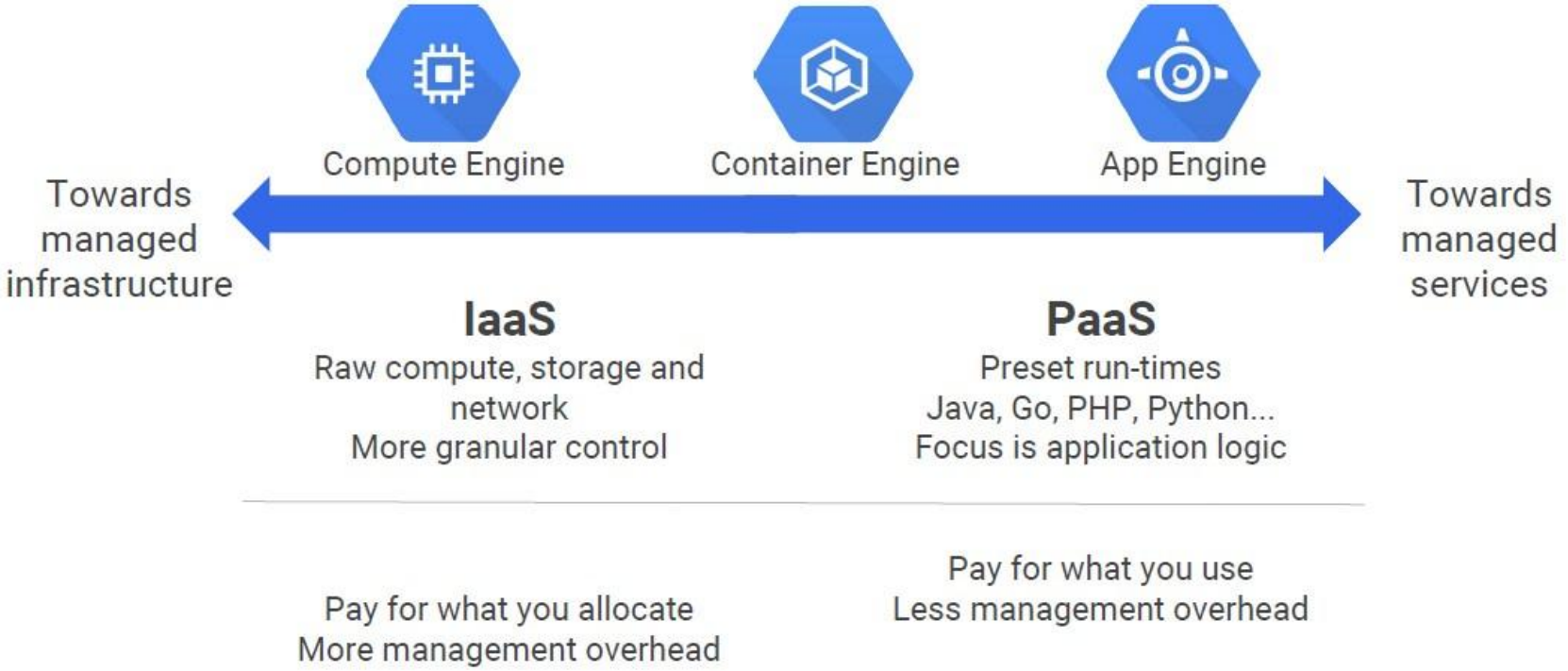
Google App Engine

- A platform(PaaS) for building scalable web applications and mobile backends
- App Engine makes deployment maintenance, and scalability easy so you can focus on innovation

Google Container Engine

- Fully managed cluster management for running containers
  - Based on Kunernetes
  - Uses Compute Engine instances and resources
- Easily update Kubernetes versions as they are released
- Manages and maintains
  - Logging
  - Health management
  - monitoring

IaaS and PaaS



Google Cloud Endpoints

- An API console to help you create and maintain APIs
- Expose your API using RESTful interface
- Supports App Engine Standard or Flexible Environment, Compute Engine, Container Engine
- Use Java or Python or any other framework and language
- Supports iOS, Android and JavaScript Clients

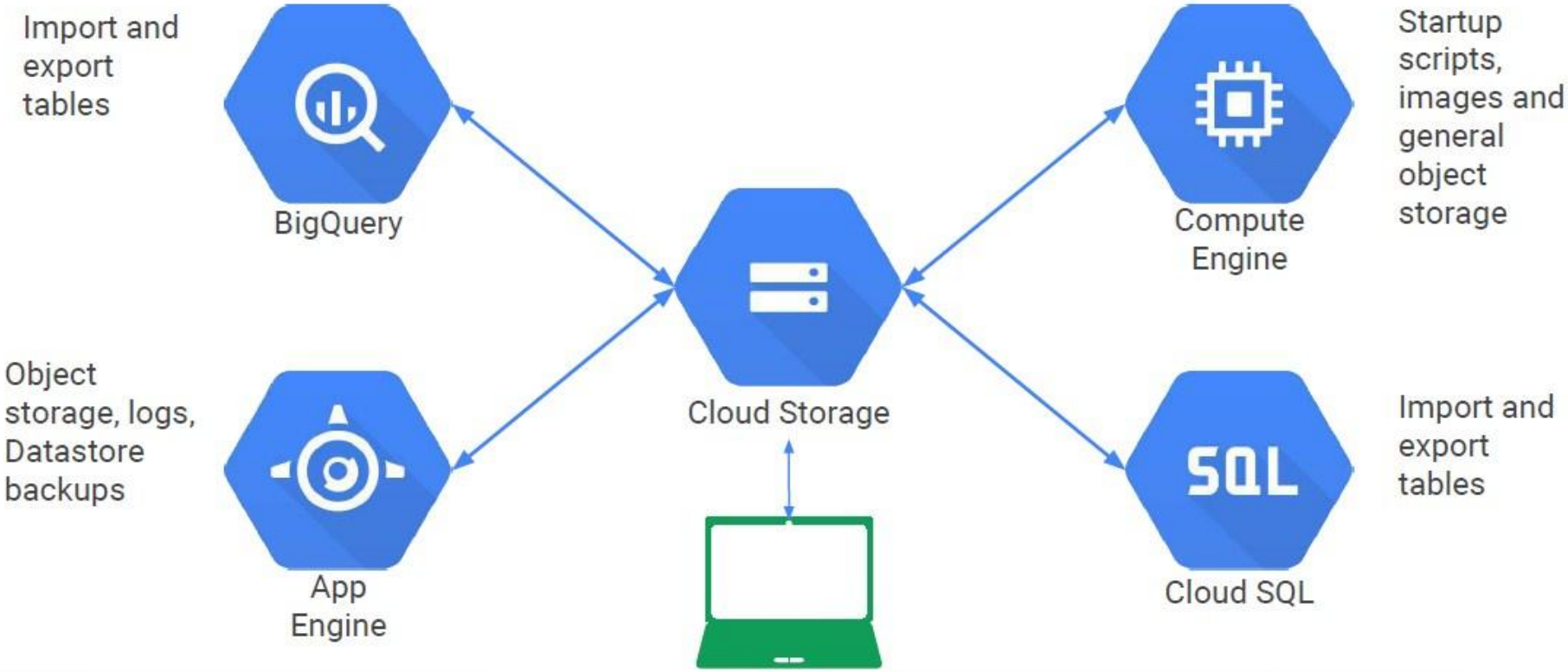
Google Cloud Datastore

- Database designed for application backends
- NoSQL store with automatic scaling to billions of rows
- Fully managed
- Built-in redundancy
- Supports ACID transactions

Google Cloud Storage

- High performance, internet-scale, immutable BLOB(binary large object) storage.
- Simple administration
  - Does not require capacity management
- Data encryption in-flight and at rest.
- Four storage classes give customers flexibility

Cloud Storage Integration



Google Cloud Bigtable

- Fully managed, NoSQL wide-column database service for large-workload applications - Terabytes to petabytes
- Integrated
  - Accessed using HBase API
  - Native compatibility with big data, Hadoop ecosystems
- Drive major applications such as google analytics and Gmail.

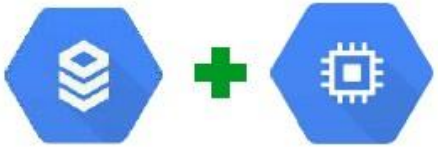
Google Cloud SQL

- Offers MySQL and PostgreSQL databases as a service
- Automatic replication
- Managed backups
- Vertical Scaling (read and write)
- Horizontal scaling (read)
- Google Security

Cloud SQL Integration

Cloud SQL can be used with App Engine using standard drivers.

You can configure a Cloud SQL instance to follow an App Engine application.



Compute Engine instances can be authorized to access Cloud SQL instances using an external IP address.

Cloud SQL instances can be configured with a preferred zone.

Cloud SQL can be used with external applications and clients.

Standard tools can be used to administer databases.

External read replicas can be configured.

Google Cloud Spanner

- Cloud Spanner is a horizontally - scalable and strongly consistent relational database.
- Cloud Spanner supports:
  - Automatic replication
  - Strong global consistency
  - Managed instances with high availability
  - SQL (ANSI 2011 with extensions)

Comparing Storage Options: Technical details

	Cloud Datastore	Bigtable	Cloud Storage	Cloud SQL (1st and 2nd Generation)	Cloud Spanner	BigQuery
Storage type	NoSQL, document	NoSQL, wide-column	Object (BLOB) store	Relational SQL	Relational SQL	Relational SQL
Overall capacity	Terabytes +	Petabytes +	Petabytes +	up to 500 GB	Petabytes	Petabytes+
Size Limits	1 megabyte / entity	Recommended: ~10 MB per cell, ~100 MB for all values per row	5 TB / object	Standard MySQL limits	10,240 MiB / row	10MB per row
Transactions	Yes	Single-row	No	Yes	Yes	No
Complex queries	No	No	No	Yes	Yes	Yes

Comparing Storage Options: use cases

Good for: Structured and unstructured binary or object data	**Good for:** Getting started, App Engine applications	**Good for:** "Flat" data, Heavy read/write, events, analytical data	**Good for:** Web frameworks, existing applications	**Good for:** Large-scale database applications (> ~2 TB)
Use cases: Images, large media files, backups	**Use cases:** User profiles, product catalog	**Use cases:** AdTech, Financial and IoT data	**Use cases:** User credentials, customer orders	**Use cases:** Whenever high I/O, global consistency is needed

Google Stackdriver

- Integrated monitoring, logging, diagnostics
- Powerful data, analytics tools
- Collaboration with PagerDuty, BMC, Splunk, otherWorks across Google Cloud Platform, AWS
- Open source agents, integration

Google Stackdriver's areas of focus

Monitoring

Platform, system, and application metrics
Uptime/health checks
Dashboards and alerts

Logging

Platform, system, and application logs
Log search/view/filter
Log-based metrics

Trace

Latency reporting and sampling
Per-URL latency and statistics

Error Reporting

Error notifications
Error dashboard

Debugger

Debug applications

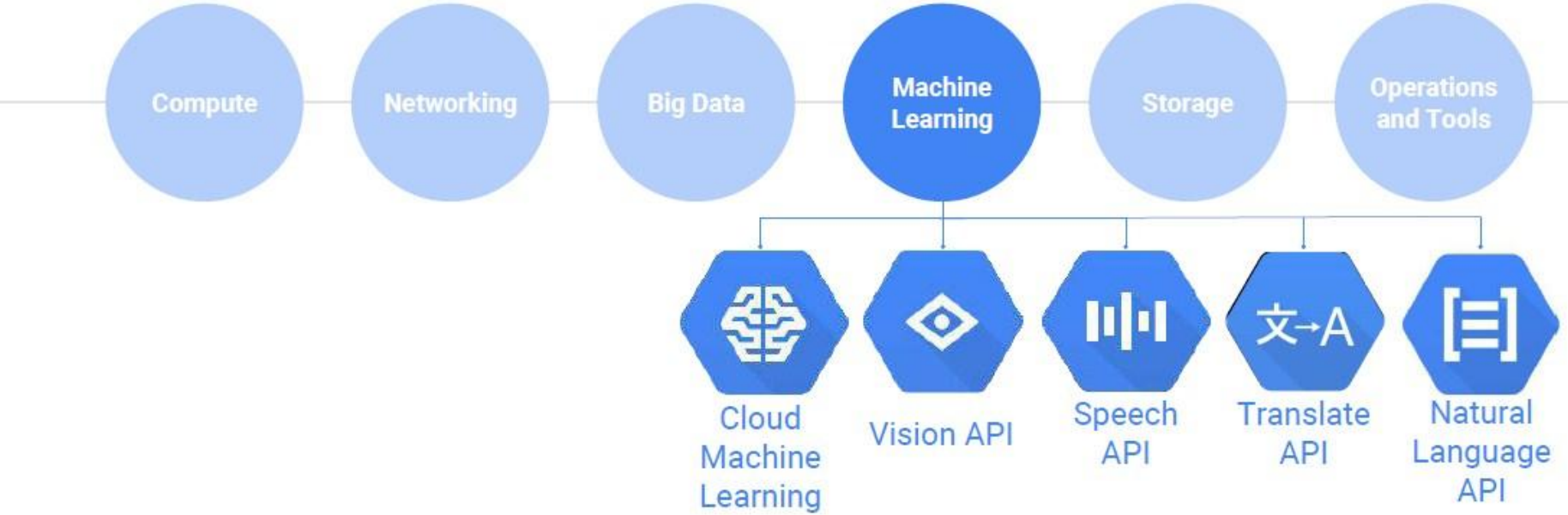
Google Cloud Source Repositories

- Fully-featured Git repositories hosted on Google Cloud Platform
- Supports collaborative development of cloud apps
- Includes integration with Stackdriver debugger

Google Cloud Deployment Manager

- Infrastructure management service
- Create a `.yaml` template describing your environment and use Deployment Manager to create resources
- Provides repeatable deployments

Google Cloud Platform



Google Cloud Machine Learning Platform

Open source tool to build and run neural network models

- Wide platform support: CPU or GPU; mobile, server, or cloud
- Developed by researchers and engineers at Google Brain

Cloud ML

Fully managed machine learning service

- Faster training, better accuracy versus competing systems
- Familiar notebook-based developer experience
- Optimized for Google infrastructure; Integrates with BigQuery and Cloud Storage

Machine Learning APIs

Pre-trained machine learning models built by Google

- *Speech*: Stream results in real-time, detects 80 languages
- *Vision*: Identify objects, landmarks, text, content
- *Translate*: Language translation including detection
- *Natural Language*: Structure, meaning of text

Vision API

- Analyze images with a simple REST API
  - Face detection, logo detection, label detection, and so on
- With the Cloud Vision API, you can:
  - Gain insight from images
  - Detect inappropriate content
  - Analyze sentiment
  - Extract text

Speech API

- Recognizes over 80 languages and variants
- Can return text in real-time
- Highly accurate, even in noisy environments
- Access from any device
- Powered by Google's machine learning

Natural Language API

- Uses machine learning models to reveal structure, meaning of text
- Extract information about people, places, events mentioned in text documents, news articles, blog posts
- Analyze text uploaded in request or integrate with Cloud Storage

Translate API

- Translate arbitrary strings between thousands of language pairs
- Programmatically detect a document's language
- Support for dozens of languages

Google Cloud Training - A roadmap for learners

Introduction to GCP

GCP Fundamentals
- Core Infrastructure -

GCP Fundamentals - Data and ML
7 Qwiklabs - GCP Essentials
GCP for AWS Professionals
G Suite Admin Fundamentals

Next Level Training

IaaS
Architecting with GCP: Core Infrastructure
Architecting: Design & Process
Deploying & Managing Windows on GCP
- coming soon -
8 Qwiklabs - Cloud Architecture

Data and Machine Learning
Data Engineering on GCP
From Data to Insights with GCP
8 Qwiklabs - Data Engineering
8 Qwiklabs - Scientific Data Processing

PaaS
Applications Development - *coming soon*
7 Qwiklabs - Developing Applications

Advanced Training *Coming Soon*

Kubernetes
Advanced Data Engineering
Advanced Machine Learning

Hello!

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THANK YOU