

Google Cloud Overview

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Microsoft

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has successfully passed all requirements for

Microsoft Certified: Azure Solutions Architect Expert

Credential ID: 3CF3D14DR253HESS1

Certification number: 46F8FB-7D3F5B

Earned on: June 14, 2024

Expires on: June 15, 2025

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Microsoft CERTIFIED EXPERT

Satya Nambiar Nohluong

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VALIDATE AT: <https://aws.amazon.com/verification>

Issue Date: June 21, 2024

Expiration Date: June 21, 2027

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New Chrome available

Alpine AWS

Certification status

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CERTIFICATION Microsoft Certified: Azure Administrator Associate Expires on June 15, 2025 at 6:59 AM (UTC +07:00) • Earned on June 14, 2024

CERTIFICATION Microsoft Certified: Azure Fundamentals Expires on May 24, 2024



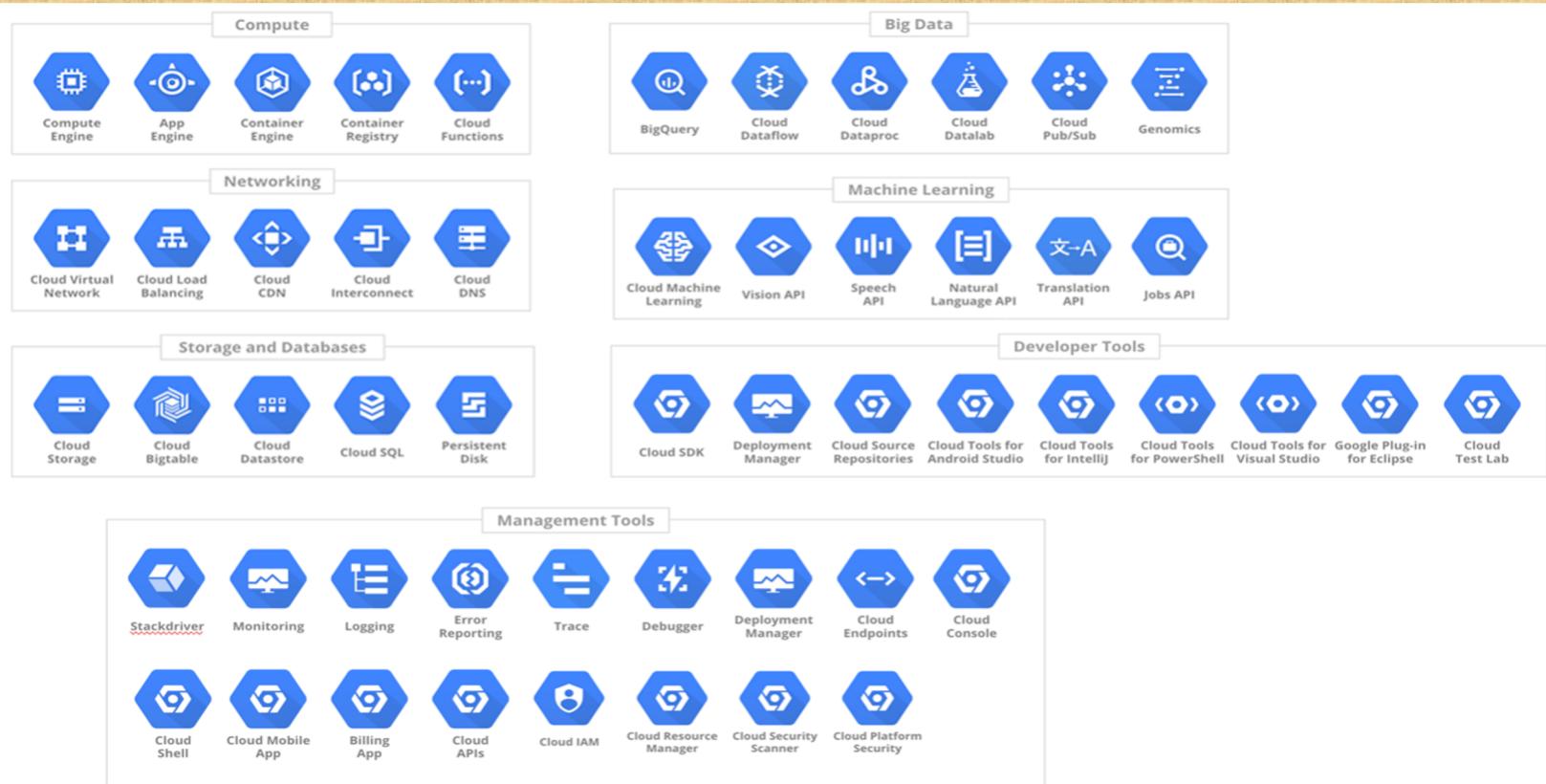
Who are you?

Goal

Help developers and sysadmins new to GCP figure out where the stuff they need is

Agenda

- Computing
- Networking
- Storage
- Big Data
- Administration
- Development
- Machine learning



Next

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UI Overview

Navigating GCP

Navigating GCP

The screenshot shows the Google Cloud Platform (GCP) Home page. On the left, there is a navigation sidebar with the following items:

- Home
- Pins appear here (with a help icon)
- RPI API Manager
- Billing
- Cloud Launcher
- Support
- IAM & Admin
- COMPUTE
- App Engine
- Compute Engine
- Container Engine
- Cloud Functions
- Networking

The main content area contains several cards:

- Compute Engine**: Shows CPU (%) and a chart message: "There is no data for this chart". A link to "Go to the Compute Engine dashboard" is present.
- Google Cloud Platform status**: Shows "All services normal" and a link to "Go to Cloud status dashboard".
- Billing**: Shows an approximate charge of "\$7.16" and a link to "View detailed charges".
- APIs**: Shows Requests (requests/sec) and a value of "0.2".
- Error Reporting**: Shows a message: "No sign of any errors. Have you set up Error Reporting?". A link to "Set up Error Reporting" is present.

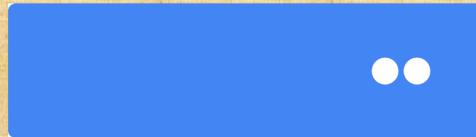
At the bottom right, there is build information: "Build CL: 153544330" and "Build label: elegant-site-201704172102-rc02".

Computing

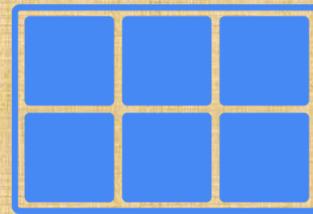
Doing things

Computing

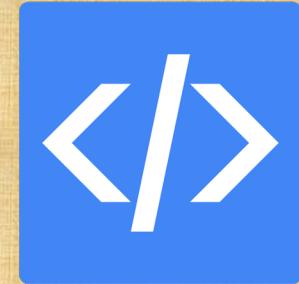
Virtual machines



Containers



Serverless



Virtual machines

Compute Engine

- 1 - 64 processors
- .6 - 416 GB (.9 - 6.5 GB per proc)
- Disk limits
 - 65 TB Persistent
 - 3 TB SSD
 - 208 RAM
- Preconfigured images
 - Can build your own (SUSE, Red Hat, Windows, etc)
- Import existing images
- Spin up in 10s of seconds
- SSH through browser
- Take snapshots



Virtual machines

Cloud Launcher

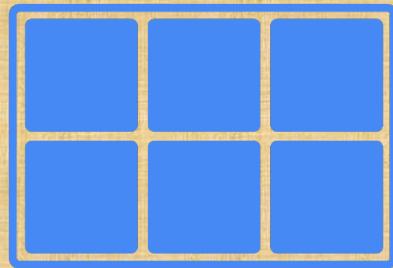
- Prebuilt software images
 - MongoDB, etc
- Single systems
- Groups of systems
 - Administer instance templates
 - Apply changes to whole group
- Still need to administer the machine



Compute Engine demo

Kick the tires and launch a
few VMs

Containers



Containers



Container Engine

- Managed Kubernetes

Kuber-what-es?

Kubernetes



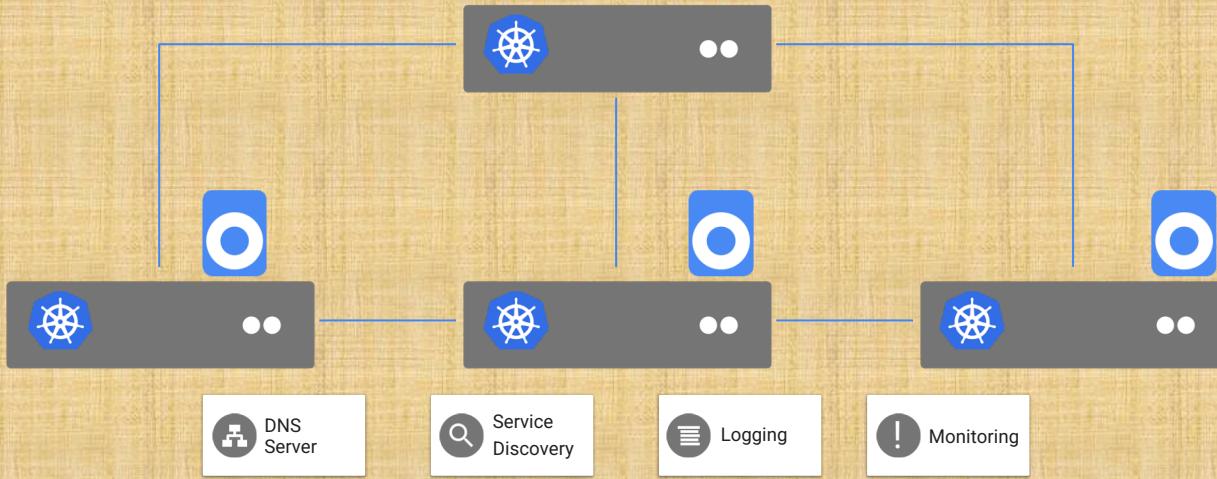
- Container Orchestration System
 - Cloud OS
 - Keeps processes running and prevents collisions
- Allows for running a large number of containers in production
- Organizing them into workloads
 - Microservices
 - Scheduled jobs
 - Batch jobs
- Configuration driven



Kubernetes

Still need to:

- Build out nodes
- Install Kubernetes
- Setup network
- Add LBs
- Setup DNS
- Configure logging and monitoring
- Persistent disks
- Kubernetes upgrades
- OS upgrades



Container Engine Container clusters

Containers package an application so it can be easily deployed to run in its own isolated environment. Containers are managed in clusters that automate VM creation and maintenance. [Learn more](#)

Create a container cluster

or

Take the quickstart



DNS
Server



Service
Discovery



Logging



Monitoring

Next

Container Engine demo

Launch a few services

Containers



Container Engine

- Managed Kubernetes
(Containers as a service)
- Smart defaults for
 - Monitoring
 - Logging
 - DNS
 - Service Discovery
- Auto scaling



App Engine flexible environment

- Custom Runtime
 - Uses Docker under the covers
 - Bring your own Dockerfile (if you want to)
- Autoscaling
- Given one endpoint per service

Containers



Container Registry

- Container image storage
- Works with
 - GKE (Container Engine)
 - App Engine flexible
 - Docker



Container Builder

- Container building as service
- Build container in the cloud
- Integrates with Container Registry
- Integrated with build processes

Serverless



App Engine flexible runtime

- Languages
 - Java 8 / Servlet 3.1 / Jetty 9
 - Python 2.7 & 3.5
 - Node.js,
 - Ruby, PHP, GO
 - Uses Docker underneath
- Open capabilities



App Engine standard runtime

- Languages
 - Python 2.7
 - Java 7
 - PHP 5.5
 - Go
- Does not use Docker underneath
- Constrained capabilities
- Incredibly rapid scale



Cloud functions (beta)

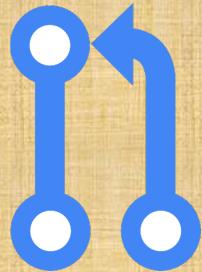
- Javascript / Node.js
- Single purpose
- Event-driven trigger
- Ex: Email function

Networking

Connecting things

Networking

Connection



Security



Availability



Connection



Cloud Virtual Network

- Create custom private cloud networks
- Set up custom routes to your other non-Google locations
- Google Cloud VPN securely connects your *existing network* to your Google Cloud Platform (GCP) network through an IPsec VPN connection.



Cloud Interconnect

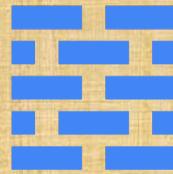
- Create a dedicated connection to Google
- Direct Peer to one of our local or regional Points of Presence
- Cloud Interconnect enables you to connect your infrastructure to Google, via enterprise-grade connections to Google's network edge.
- The connections are offered by Cloud Interconnect service providers.

Security



VPN

- Gateway to Gateway Only
- Can be used to connect to any IPSEC compliant gateway



Firewall

- Set up rules
- Apply rules to tags
- Apply tags to hosts

Availability



CDN

- Basic Content Delivery Network
- Activate through our load balancers
- Ability to cache content
- Uses HTTP headers to determine cacheability



DNS

- Manage DNS on Google's network
- SLA promises 100% availability of our Authoritative Name Servers



Load Balancers

- HTTP
- SSL
- Internal
- Network

Non-managed security solutions



Compute Engine

- Build by hand



Cloud Launcher

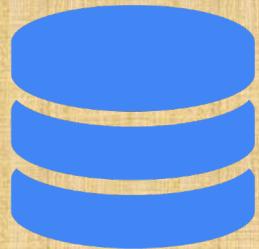
- Prebuilt solutions for:
 - Barracuda
 - Brocade
 - Cloudflare
 - more...

Storage

Keeping things

Storage

Files



Databases



Big data



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

File storage

Cloud Storage

- Multiple ways to interface with it
 - Browser, gsutil, API
- Several types
 - Multi-regional
 - Regional
 - Nearline
 - Coldline
- Create a storage bucket, choose type

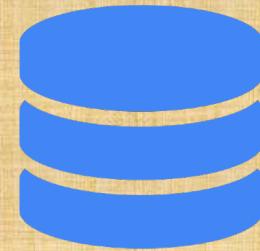


File storage

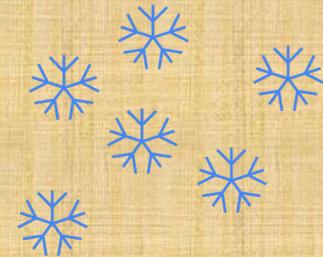
Public content



Processed data



Long term storage



	Public	Processed	Long Term Storage
Characteristics			
Uses Cases			
Storage Cost <i>GB/month</i>			
Retrieval Cost <i>GB</i>			
Storage Type			

Next

Application data

SQL



NoSQL



SQL



Cloud SQL

- Traditional SQL Server
- Vertically scalable
- Managed backups
- Easy to setup replicas
- Types
 - MySQL
 - Postgres (new)



Cloud Spanner

- Structured data
- Highly available
- Strongly consistent
- CAP theorem says impossible
- Globally distributed
- Horizontally scalable

NoSQL



Cloud Datastore

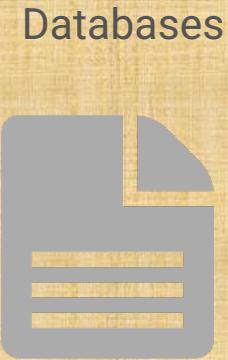
- Document based
- Indexable
- Distributed
- Giant semi-structured data sets
- Examples:
 - Product Catalogs, Real-time Inventory
- Optimized to serve high-value transactional data to applications



Cloud Bigtable

- Columnar
- Low latency
- Hbase API compatible
- Needs scale to be cost effective (> 1TB)
- Powers Google Maps, Analytics, Search, etc.
- Does not replicate across regions
- Optimized for high volumes of data and analytics

Storage



Where do you store Big Data?



Cloud
Storage



Cloud
SQL



Cloud
Datastore



Cloud
Spanner



Cloud
Bigtable

Big data

BigQuery

- Google BigQuery is an enterprise data warehouse
- Enables super-fast SQL queries using the processing power of Google's infrastructure.
- Access it through a web UI, command-line tool, REST API or SDK.
- Use 3rd party tools to analyze, visualize and load the data.



BigQuery demo

Quick demo showing BigQuery

Big data - not storage



Pub/Sub

- Messaging Bus
- Many to many
- Can easily handle 1 million messages per second



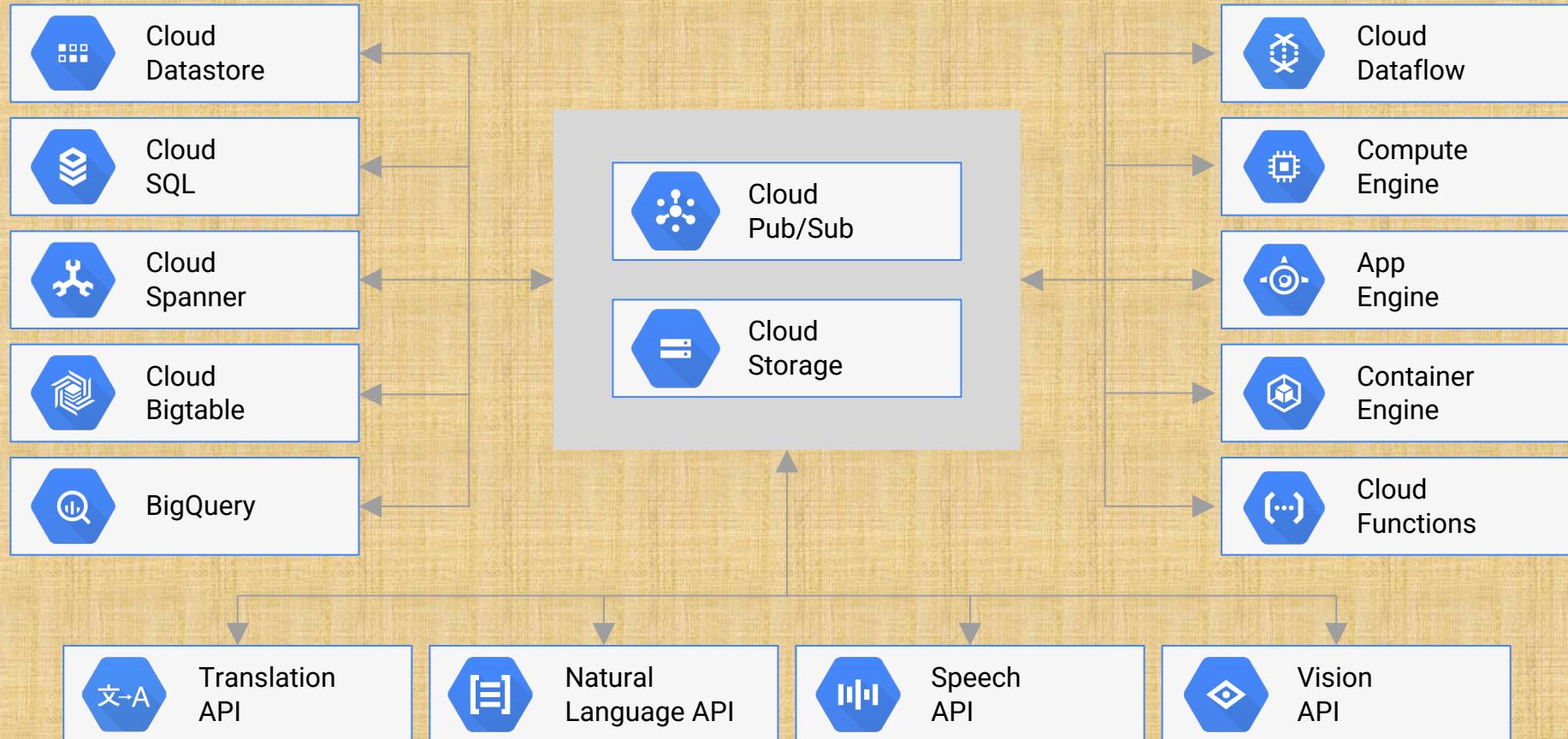
Dataflow

- Managed service for data analysis
- Apache Beam
- ETL, batch computation, and continuous computation
- Work scheduling



Dataproc

- Managed Spark and Hadoop
- With Autoscaling



What if I need something you don't offer?

Non-managed storage solutions



Compute Engine

- Build by hand



Cloud Launcher

- Prebuilt solutions for:
 - Cassandra
 - Redis
 - Mongo
 - CouchDB
 - more...

Administration

Operations

Administration

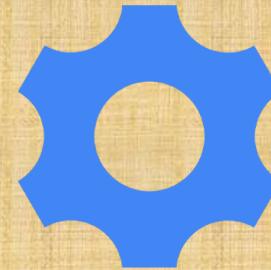
Reporting



Security



Configuration



Reporting



Stackdriver Logging

- Cross Cloud Logging
 - GCP
 - AWS
 - On Prem possible
 - SDKs
 - APIs



Stackdriver Monitoring

- Cross Cloud Monitoring
 - GCP
 - AWS
- Alerts based off
 - Logs
 - Uptime checks
 - Built in or Custom Metrics

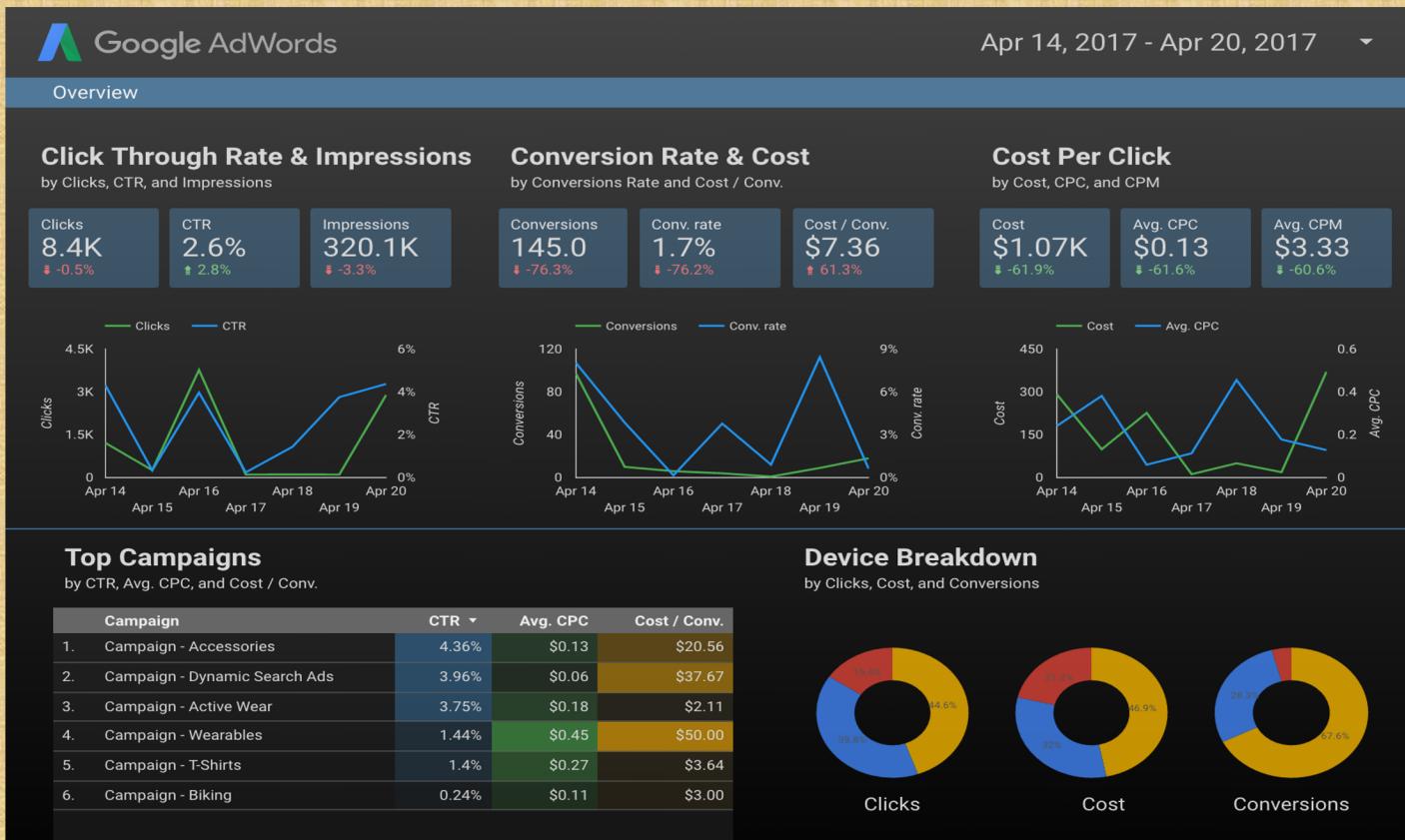
Data Studio

Data Studio (beta)

- Allows user to create Dashboards
- Creates Reports
- Transforms data
- Visualizes data
- Connect data from Cloud SQL, Big Query, etc



Data Studio



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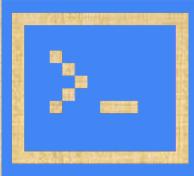
Security

Cloud IAM

- Allow for group of resources
- Role based permissions
- Fine grained controls
- Vary from product to product

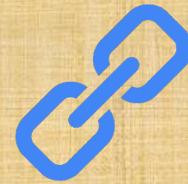


Configuration



CLI

- gcloud
- gsutil



API

- SDK for most languages
- REST endpoints
- Functional equivalent to gcloud



Deployment Manager

- Repeatable Complex deployments
- Configs
- Templates
- Disk Images
- Network setup
- more

Development

Code

Development

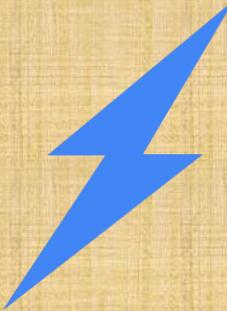
Coding



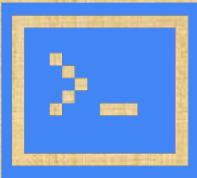
Reporting



Services



Development



SDK

- gcloud
- gsutil
- Appcfg.py
- Client SDK



Plugins

- IntelliJ
- Android Studio
- Powershell
- Visual Studio
- Eclipse



Other

- Cloud Source Repository
- Hosted GIT
- Ties into Debugging/Trace features

Development

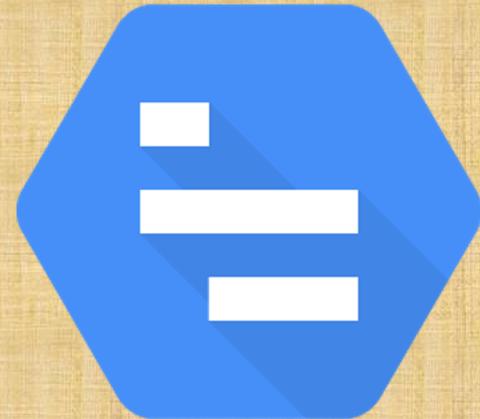
Reporting



Tracing

Stackdriver Trace

- Automatic
 - App Engine
 - Load Balancers
- Enabled through an SDK
 - Java
 - Node.js
 - Go
 - Ruby
 - Zipkin
- Links to logs



Stackdriver Trace

Trace List

+ ANALYZE RESULTS

UNDO ZOOM AUTO RELOAD 1 hour 4 hours 12 hours 1 day 3 days 1 week 1 month Custom

Overview Trace List Analysis Reports

Request URI: /pi-eater/instance/get

HTTP method: All

HTTP status: All

Service: All services

Version: All versions

(ms) Click and drag along the graph to zoom in to the selected area

Latency	HTTP Method	URI	Analysis Report	Time
67 ms	GET	/pi-eater/instance/get		6:27 AM (Just now)
92 ms	GET	/pi-eater/instance/get		6:26 AM (Just now)
58 ms	GET	/pi-eater/instance/get		6:26 AM (Just now)
62 ms	GET	/pi-eater/instance/get		6:26 AM (1 minute ago)
173 ms	GET	/pi-eater/instance/get		6:26 AM (1 minute ago)

Rows per page: 5 1 - 5 of 1000 < >

Timeline

@0 ms

/pi-eater/instance/get

Summary

Name	RPCs	Total Duration (ms)
/app_identity_service.GetAccessToken	1	0
/pi-eater/instance/get	1	92
/urlfetch.Fetch	1	44

Details

Next

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Google Cloud

Error Reporting

Stackdriver Error Reporting

- Aggregate
- Logs or API
- Alerts



Errors in the last day

1 hour 6 hours 1 day 7 days 30 days

No errors reported in the last day.

Errors in the last 30 days

Occurrences ▾	Error	Seen in	First seen	Last seen	Status	MUTE ⚡
1	59 NEW Google\Cloud\Exception\ServiceException: { "error": { "code": 429, "message": "Insufficient quota. Quota exceeded for quota metric 'http_request' at project 'whack-a-pod'. Check your usage and quota for this metric." } /base/data/ho in /base/data/home/apps/s~carnivaldemos/whack-a-pod-monitor:1.398683589	whack-a-pod-monitor:1	Jan 24, 2017	Jan 24, 2017	500	MUTE ⚡
1	7 NEW require(): Failed opening required '/base/data/home/apps/s~carnivaldemos/whack-a-pod (/base/data/home/apps/s~carnivaldemos/whack-a-pod-monitor:1.398615517398397528/api/l	whack-a-pod-monitor:1	Jan 20, 2017	Jan 20, 2017	500	MUTE ⚡
1	3 NEW Call to a member function bucket() on a non-object (/base/data/home/apps/s~carnivaldemos/pi-eater-	pi-eater-analysis:1	Jan 28, 2017	Jan 28, 2017	500	MUTE ⚡
1	3 NEW Google\Cloud\Exception\BadRequestException: { "error": { "code": 400, "message": "The Google\Cloud\RequestWrapper->send (/base/data/home/apps/s~carnivaldemos/whack-a-pod-	whack-a-pod-monitor:1	Jan 23, 2017	Jan 23, 2017	500	MUTE ⚡
1	2 NEW PHP Fatal error: The request was aborted because it exceeded the maximum execution time (set in php.ini) (/base/data/home/runtimes/php/sdk/google/appengine/api/log/LogService.php)	pi-eater-analysis:1 whack-a-pod-monitor:1	Jan 23, 2017	Jan 28, 2017	500	MUTE ⚡
1	2 NEW PHP Fatal error: The request was aborted because it exceeded the maximum execution time (set in php.ini) (/base/data/home/apps/s~carnivaldemos/whack-a-pod-monitor:1.39861998639451821/api/	pi-eater-analysis:1 whack-a-pod-monitor:1	Jan 23, 2017	Jan 28, 2017	500	MUTE ⚡
1	2 NEW Google\Cloud\Exception\ServiceException: { "error": { "code": 429, "message": "Insufficient quota. Quota exceeded for quota metric 'http_request' at project 'whack-a-pod'. Check your usage and quota for this metric." } /base/data/ho in /base/data/home/apps/s~carnivaldemos/whack-a-pod-monitor:1.398681666	whack-a-pod-monitor:1	Jan 23, 2017	Jan 23, 2017	500	MUTE ⚡
1	1 NEW Class 'Google_Service_Storage' not found (/base/data/home/apps/s~carnivaldemos/pi-eater-	pi-eater-analysis:1	Jan 28, 2017	Jan 28, 2017	500	MUTE ⚡
1	1 NEW Google\Cloud\Exception\ServiceException: Option 20056 is not supported by this curl implementation Google\Cloud\RequestWrapper->send (/base/data/home/apps/s~carnivaldemos/whack-a-pod-	whack-a-pod-monitor:1	Jan 23, 2017	Jan 23, 2017	500	MUTE ⚡
1	1 NEW Google\Cloud\Exception\ServiceException: { "error": { "code": 429, "message": "Insufficient quota. Quota exceeded for quota metric 'http_request' at project 'whack-a-pod'. Check your usage and quota for this metric." } /base/data/ho in /base/data/home/apps/s~carnivaldemos/whack-a-pod-monitor:1.398681808	whack-a-pod-monitor:1	Jan 23, 2017	Jan 23, 2017	500	MUTE ⚡
1	1 NEW Google\Cloud\Exception\GoogleException: No project ID was provided, and we were unable to automatically determine one Google\Cloud\Logging\LoggingClient->configureAuthentication (/base/data/home/apps/s~car	whack-a-pod-monitor:1	Jan 23, 2017	Jan 23, 2017	500	MUTE ⚡

Next

Debugging

Stackdriver Debugging

- App Engine
 - Java
 - Python
 - Node.js
 - Ruby
- Compute Engine
 - Java
 - Python
 - Go



Services

All those services

API Manager

API Manager Library

Dashboard Library Credentials

Google APIs Private APIs

Search all 100+ APIs

Popular APIs

Google Cloud APIs

- Compute Engine API
- BigQuery API
- Cloud Storage Service
- Cloud Datastore API
- Cloud Deployment Manager API
- Cloud DNS API
- More

Google Cloud Machine Learning

- Vision API
- Natural Language API
- Speech API
- Translation API
- Machine Learning API

Google Maps APIs

- Google Maps Android API
- Google Maps SDK for iOS
- Google Maps JavaScript API
- Google Places API for Android
- Google Places API for iOS
- Google Maps Roads API
- More

Google Apps APIs

- Drive API
- Calendar API
- Gmail API
- Sheets API
- Google Apps Marketplace SDK
- Admin SDK
- More

Mobile APIs

- Google Cloud Messaging
- Google Play Game Services
- Google Play Developer API
- Google Places API for Android

Social APIs

- Google+ API
- Blogger API
- Google+ Pages API
- Google+ Domains API

YouTube APIs

- YouTube Data API
- YouTube Analytics API
- YouTube Reporting API

Advertising APIs

- AdSense Management API
- DCM/DFA Reporting And Trafficking API
- Ad Exchange Seller API
- Ad Exchange Buyer API
- DoubleClick Search API
- DoubleClick Bid Manager API

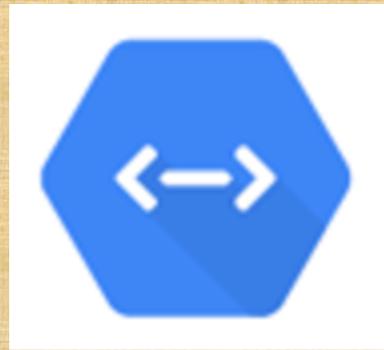
Other popular APIs

- Analytics API
- Custom Search API
- URL Shortener API
- PageSpeed Insights API
- Fusion Tables API
- Web Fonts Developer API

Cloud Endpoints

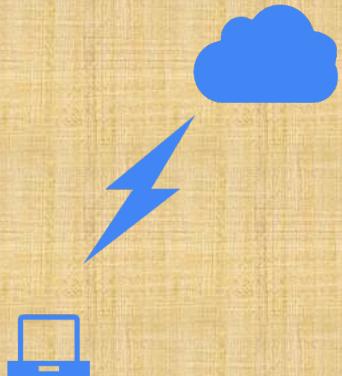
APIs

- Develop, deploy, protect and monitor your APIs
- An NGINX-based proxy and distributed architecture
- Supports Open API Specification

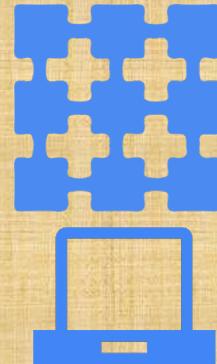


Machine learning

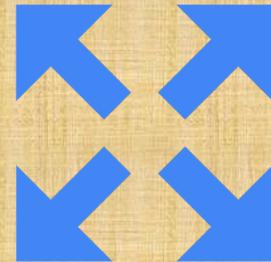
Using Models



Creating Models



Extending Models



Machine learning services



Vision API

- Face Detection
- Label Detection
- Logo Detection
- OCR
- (Video API beta)



Natural Language API

- Syntax Analysis
- Entity Recognition
- Sentiment Analysis
- Multi-Language



Speech API

- Automatic Speech Recognition
- Streaming
- 80 languages



Translation API

- Language Detection
- Translation
- Whole document

Machine learning

Cloud ML Engine

- Managed Tensor Flow

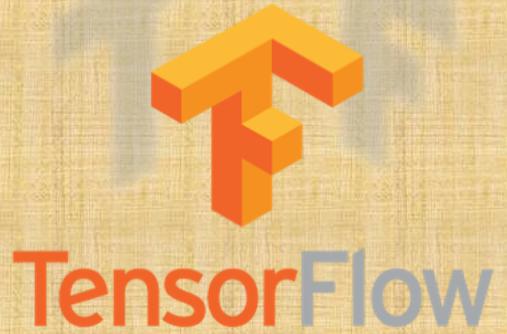


What-flow?

Machine learning

Tensor Flow

- Open Source ML Library
- Builds models
- Allows you to compute with variable levels of CPU/GPU power



Machine Learning

Cloud ML Engine

- Managed Tensor Flow
- Self-tuning
- Portable



Kaggle

Your Home For Data Science

- Machine Learning competitions
- Discover open source datasets
- Explore algorithms
- Publically share code to other data scientists

kaggle

Firebase

Complete Mobile Backend Platform

- Realtime database
- Authentication
- Storage
- Messaging
- Integrates with Cloud Functions



Apigee

Complete API Management

- Design, develop, secure API Proxies
- Both cloud and on-prem
- Fully featured “Developer Portal”
- Microservices support
- Advanced Analytics



Conversational User Experience Platform

- Build brand-unique, natural language interactions for bots, applications, services, and devices.
- Natural Language Understanding Tools
- Integration with other messaging platforms
- Cross-platform
- Multi-lingual support



Anvato

Video Software Platform

- Multi-screen live streaming, video publishing, live and video-on-demand distribution and monetization strategies.
- SDKs for multiple client types
- Cloud editing
- Video encoding
- Dynamic ad insertion
- Live streaming
- Analytics



What's Next?

— —) (° - °)

What's Next

Competition

- AWS is the leader, followed by Azure and GCP
- Look for Google to aggressively compete in this space

Advantages

- Big Data and Data Analysis
- Machine Learning
- Container support
- Community and Open-ness (open source)

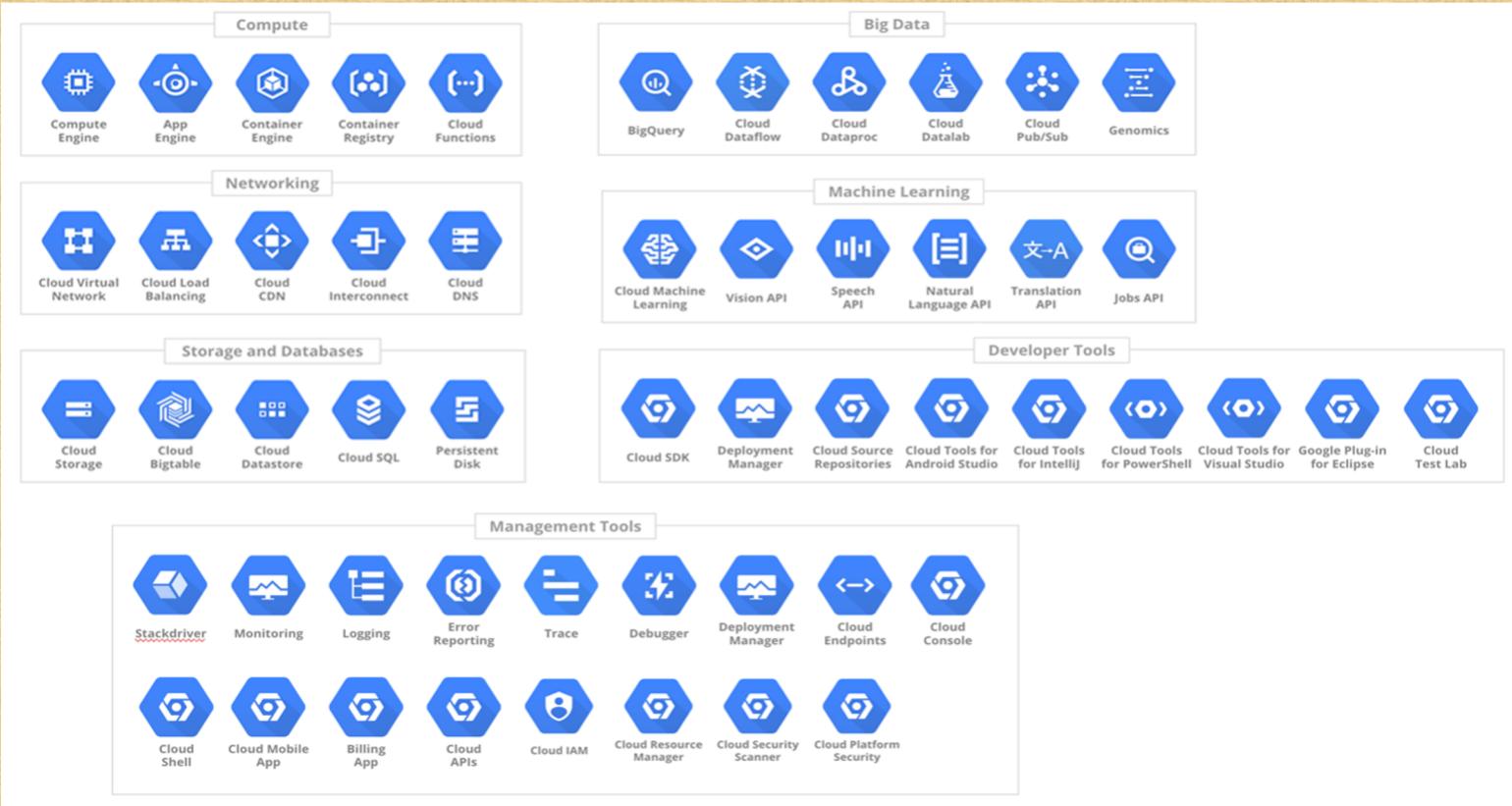
Investment

- Google invested more in their cloud than AWS and Azure combined in 2014
- Google is invested heavily in the cloud platform for the future

Conclusions

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There's a lot of stuff here



Getting Started

Let's Sign-Up get an account

1. Google Cloud Free Trial Sign-Up

URLs: <https://cloud.google.com/free>

Description : This page allows new users to sign up for a free trial with \$300 in credits, valid for 90 days.

2. Google Cloud Console (for Direct Access and Sign-Up)

URLs: <https://console.cloud.google.com>

Description : This is the main dashboard for Google Cloud. If you don't have an account, you'll be prompted to sign up.

3. Google Cloud Pricing and Account Overview

URLs: <https://cloud.google.com/pricing>

Description : This page provides more details on Google Cloud's pricing structure and plans, as well as access to sign up for an account tailored to your needs.



Thank You

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