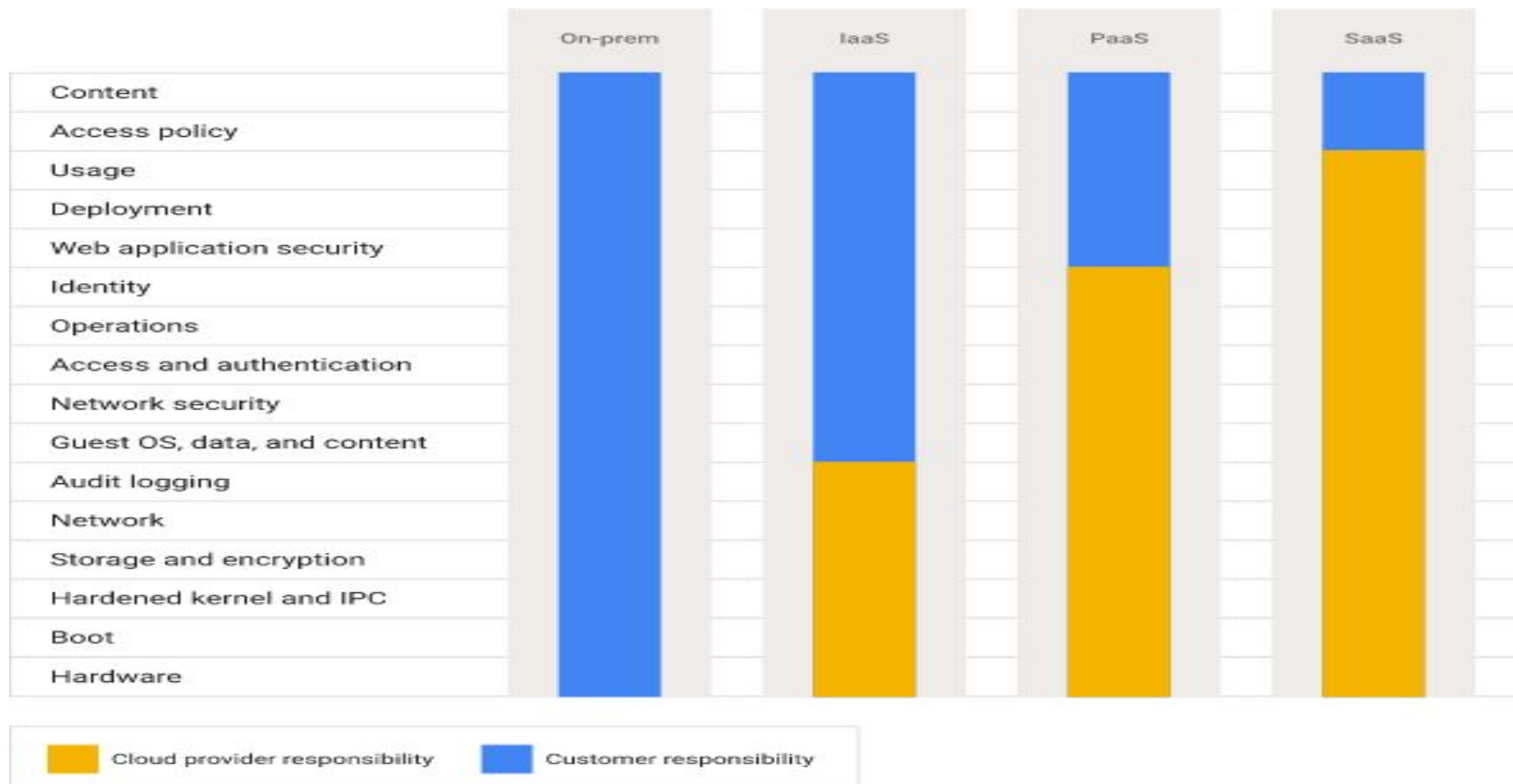# Google Cloud

By Ahsan Farooqui

Cloud Computing

Cloud computing is the on-demand availability of computing resources as services over the internet. It eliminates the need for enterprises to procure, configure, or manage resources themselves, and they only pay for what they use.

Cloud computing service models are based on the concept of sharing on-demand computing resources, software, and information over the internet. Companies or individuals pay to access a virtual pool of shared resources, including compute, storage, and networking services, which are located on remote servers that are owned and managed by service providers.

Shared Security Responsibilities

	On-prem	IaaS	PaaS	SaaS
Content				
Access policy				
Usage				
Deployment				
Web application security				
Identity				
Operations				
Access and authentication				
Network security				
Guest OS, data, and content				
Audit logging				
Network				
Storage and encryption				
Hardened kernel and IPC				
Boot				
Hardware				

Cloud provider responsibility   Customer responsibility

Google Cloud products

Browse over 100 products. New customers get **$300 in free credits** to run, test, and deploy workloads. All customers can use **25+ products for free**, up to monthly usage limits.

https://cloud.google.com/docs/get-started/aws-azure-gcp-service-comparison
https://cloud.google.com/docs/overview

Google Cloud resources

Google Cloud consists of a set of physical assets, such as computers and hard disk drives, and virtual resources, such as virtual machines (VMs), that are contained in **Google's data centers** around the globe. Each data center location is in a *region*. Regions are available in Asia, Australia, Europe, North America, and South America. Each region is a collection of *zones*, which are isolated from each other within the region. Each zone is identified by a name that combines a letter identifier with the name of the region. For example, zone **a** in the East Asia region is named **asia-east1-a**.

Geography and Regions

Google Cloud products are served from **specific regional failure domains** and are fully supported by **Service Level Agreements** to ensure you are designing your application architecture within the structure of Google Cloud.

Google Cloud infrastructure services are available in locations across North America, South America, Europe, Asia, and Australia. These locations are divided into *regions* and *zones*. You can choose where to locate your applications to meet your latency, availability, and durability requirements.

Google Cloud

DEVELOPER'S CHEAT SHEET

Created by the Google Developer Relations Team
Maintained at https://4words.dev

Feedback? 🐦 @pvergadin @GoogleCloudTech

COMPUTE

Cloud Functions	Event-driven serverless functions
App Engine	Managed app platform
Cloud Run	Serverless for containerized applications
Kubernetes Engine (GKE)	Managed Kubernetes/containers
Compute Engine	VMs, GPUs, TPUs, Disks
Bare Metal Solution	Hardware for specialized workloads
Preemptible VMs	Short-lived compute instances
Shielded VMs	Hardened VMs
Sole-tenant Nodes	Dedicated physical servers
VMware Engine	VMware on Compute Engine

STORAGE

Cloud Filestore	Managed NFS server
Cloud Storage	Multi-class multi-region object storage
Persistent Disk	Block storage for VMs
Local SSD	VM locally attached SSDs

DATABASE

Cloud Bigtable	Petabyte-scale, low-latency, non-relational
Cloud Firestore	Serverless NoSQL document DB
Cloud Memorystore	Managed Redis and Memcached
Cloud Spanner	Horizontally scalable relational DB
Cloud SQL	Managed MySQL, PostgreSQL, SQL Server
Database Migration Service	Migrate to Cloud SQL
DB Insights	SQL inspector

DATA ANALYTICS

BigQuery	Data warehouse/analytics
BigQuery BI Engine	In-memory analytics engine
BigQuery ML	BigQuery model training/serving
BigQuery GIS	BigQuery geospatial functions/support
BigQuery DTS	Automated data ingestion service
Connected Sheets	Spreadsheet interface for Bigdata
Cloud Composer	Managed workflow orchestration service
Data Fusion	Graphically manage data pipelines
Dataflow	Stream/batch data processing
Dataprep by Trifacta	Visual data wrangling
Dataproc	Managed Spark and Hadoop
Datastream	Change data capture/replication service
Pub/Sub	Global real-time messaging
Data Catalog	Metadata management service
Data Studio	Collaborative data exploration/dashboarding
Looker	Enterprise BI and Analytics
Public Datasets	Hosted data in BigQuery/GCS

HYBRID AND MULTI-CLOUD

Anthos	Enterprise hybrid/multi-cloud platform
Anthos Clusters	Hybrid/on-prem Kubernetes Engine
Anthos Config Management	Policy and security automation
Anthos Service Mesh	Managed service mesh (Istio)
Cloud Run for Anthos	Serverless development for Anthos
GCP Marketplace for Anthos	Pre-configured containerized apps
Migrate for Anthos	Migrate VMs to Kubernetes Engine
Operations	Monitoring, logging, troubleshooting
Traffic Director	Service mesh traffic management
Apigee API Management	API management, development, security

AI/ML

Vertex AI	Managed platform for ML
AutoML	Custom low-code models AI Platform
Vertex AI Data Labeling	Data labeling by humans
Deep Learning VM Images (DLVM)	Preconfigured VMs for deep learning

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Vertex AI Workbench	Jupyter-based environment for Data Science
Vertex AI Deep Learning Containers	Preconfigured containers for deep learning
Vertex AI Matching Engine	Vector similarity searches
Vertex AI Pipelines	Hosted ML workflows
Vertex AI Predictions	Autoscaled model serving
Vertex AI Training	Distributed AI training
Vertex AI Edge Manager	Deploy monitor edge inferences
Vertex Explainable AI	Understand ML model predictions
Vertex AI Feature Store	Managed ML feature repository
Vertex ML Metadata	Artifact, lineage, and execution tracking
Vertex AI Model Monitoring	Monitor models for skew/drift
Vertex AI Tensorboard	Managed TensorBoard for ML-experiment visualization
Vertex AI Vizier	Black-box hyperparameter tuning
Cloud Speech-To-Text API	Convert audio to text
Cloud Talent Solutions API	Job search with ML
Cloud Text-To-Speech API	Convert text to audio
Cloud TPU	Hardware acceleration for ML
Cloud Translation API	Language detection and translation
Cloud Video Intelligence API	Scene-level video annotation
Cloud Vision API	Image recognition and classification
Contact Center AI	AI in your contact center
Dialogflow	Create conversational interfaces
Document AI	Analyze, classify, search documents
Recommendations AI	Create custom recommendations
Vision Product Search	Visual search for products

NETWORKING

Carrier Peering	Peer through a carrier
Direct Peering	Peer with GCP
Dedicated Interconnect	Dedicated private network connection
Partner Interconnect	Connect on-prem network to VPC
Cloud Armor	DDoS protection and WAF
Cloud CDN	Content delivery network
Cloud DNS	Programmable DNS serving
Cloud Load Balancing	Multi-region load distribution/balancing
Cloud NAT	Network address translation service
Cloud Router	VPC/on-prem network route exchange (BGP)
Cloud VPN (HA)	VPN (Virtual private network connection)
Network Service Tiers	Price vs performance tiering
Network Telemetry	Network telemetry service
Traffic Director	Service mesh traffic management
Google Cloud Service Mesh	Service-aware network management
Virtual Private Cloud	Software defined networking
VPC Service Controls	Security perimeters for API-based services
Network Intelligence Center	Network monitoring and topology

IDENTITY AND SECURITY

Access Transparency	Audit cloud provider access
Assured Workloads	Workload compliance controls
Binary Authorization	Kubernetes deploy-time security
Certificate Authority Service	Managed private CAs
Cloud Asset Inventory	All assets, one place
Cloud Audit Logs	Audit trails for GCP
Cloud DLP	Classify and redact sensitive data
Cloud HSM	Hardware security module service
Cloud EKM	External keys you control
Cloud IAM	Resource access control
Cloud Identity	Manage users, devices & apps
Cloud Identity-Aware Proxy	Identity-based app access
Cloud KMS	Hosted key management service
Cloud Resource Manager	Cloud project metadata management
Security Command Center	Security management & data risk platform
Cloud Security Scanner	App engine security scanner
Confidential Computing	Encrypt data in use
Context-aware Access	End-user attribute-based access control
Event Threat Detection	Scans for suspicious activity
Managed Service for Microsoft Active Directory	Managed Microsoft Active Directory
Secret Manager	Store and manage secrets
Security Key Enforcement	Two-step verification
Shielded VMs	Hardened VMs
Titan Security Key	Two-factor authentication (2FA) device
VPC Service Controls	VPC data constraints
Chronicle	Find threats from security telemetry
VirusTotal	Research/hunt for Malware
Risk Manager	Evaluate organization's security posture
reCAPTCHA Enterprise	Protection against bot/spam/abuse
BeyondCorp Enterprise	Zero-trust secure access
Access Context Manager	Fine-grained, attribute based access-control
Web Security Scanner	Identifies web-app security vulnerabilities

OPERATIONS & MONITORING

Cloud Debugger	Live production debugging
Error Reporting	App error reporting
Cloud Logging	Centralized logging
Cloud Monitoring	Infrastructure and application monitoring
Cloud Profiler	CPU and heap profiling
Cloud Trace	App latency insights

DEVOPS CI/CD

Cloud Build	Continuous integration/delivery platform
Cloud Deploy	Deployment pipeline for GKE

Artifact Registry	Universal package manager
Cloud Source Repositories	Hosted private git repos
Container Registry	Private container registry/storage

APPLICATION INTEGRATION

Eventarc	Event-driven Cloud Run services
Cloud Scheduler	Managed cron job service
Cloud Tasks	Asynchronous task execution
Cloud Workflows	HTTP services orchestration
Pub/Sub	Global real-time messaging

API PLATFORM AND ECOSYSTEMS

API Analytics	API metrics
API Monetization	Monetize APIs
Apigee API Platform	Develop, secure, monitor APIs
API Gateway	Fully managed API Gateway
Apigee Hybrid	Manage hybrid/multi-cloud API environments
Apigee Sense	API protection from attacks
Cloud Endpoints	Cloud API gateway
Developer Portal	API management portal
Marketplace	Partner & open source marketplace
AppSheet	No-code App creation

INTERNET OF THINGS (IOT)

Cloud IoT Core	Manage devices, ingest data

GAMING

Google Cloud Game Servers	Orchestrate Agones clusters

HEALTHCARE

Cloud Healthcare API	Healthcare system GCP interoperability
Apigee Healthcare APIx	Healthcare system GCP interoperability
Healthcare Natural Language AI	Real-time insights from media-text
Cloud Life Sciences	Manage, process, transform biomedical-data

RETAIL

Vision Product Search	Visual search for products
Recommendations AI	Create custom recommendations
Visual Inspection AI	Train/deploy models to detect defects

MANAGEMENT TOOLS

VM Manager	Manage OS VM Fleets
Cloud APIs	APIs for cloud services
Cloud Billing API	Programmatically manage GCP billing
Cloud Billing	Billing and cost management tools
Cloud Console	Web-based management console
Cloud Deployment Manager	Templated infrastructure deployment
Cloud Mobile App	iOS/Android GCP manager app
Private Catalog	Internal Solutions Catalog

DEVELOPER TOOLS

Cloud Code for IntelliJ	IntelliJ GCP tools
Cloud Code for VS Code	VS Code GCP tools
Cloud Code	Cloud native IDE extensions
Cloud Tools for Eclipse	Eclipse GCP tools
Cloud Tools for Visual Studio	Visual Studio GCP tools
Gradle App Engine Plugin	Gradle App Engine plugin
Maven App Engine Plugin	Maven App Engine plugin
Cloud SDK	CLI for GCP
Cloud Shell	Browser-based terminal/CLI

MIGRATION TO GOOGLE CLOUD

BigQuery Data Transfer Service	Bulk import analytics data
Cloud Data Transfer	Data migration tools/CLI
Google Transfer Appliance	Rentable data transport box
Storage Transfer Service	Online/on-premises data transfer
Migrate for Anthos	Migrate VMs to GKE containers
Migrate for Compute Engine	Compute Engine migration tools
Migrate from Amazon Redshift	Migrate from Redshift to BigQuery
Migrate from Teradata	Migrate from Teradata to BigQuery
Cloud Foundation Toolkit	Infrastructure as Code templates
KF	Cloud Foundry to Kubernetes

GOOGLE MAPS PLATFORM

Directions API	Get directions between locations
Distance Matrix API	Multi-origin/destination travel times
Geocoding API	Convert address to/from coordinates
Geolocation API	Derive location without GPS
Maps Embed API	Display iframe embedded maps
Maps JavaScript API	Dynamic web maps
Maps SDK for Android	Maps for Android apps
Maps SDK for iOS	Maps for iOS apps
Maps Static API	Display static map images
Maps SDK for Unity	Unity SDK for games
Maps URLs	URL scheme for maps
Places API	Rest-based Places features
Places Library, Maps JS API	Places features for web
Places SDK for Android	Places features for Android
Places SDK for iOS	Places feature for iOS
Roads API	Convert coordinates to roads
Street View Static API	Static street view images
Street View Service	Street view for JavaScript
Time Zone API	Convert coordinates to timezone

WORKSPACE PLATFORM

Admin SDK	Manage Google Workspace resources
AMP for Email	Dynamic interactive email
Apps Script	Extend and automate everything
Calendar API	Create and manage calendars
Classroom API	Provision and manage classrooms
Cloud Search	Unified search for enterprise
Docs API	Create and edit documents
Drive Activity API	Retrieve Google Drive activity
Drive API	Read and write files
Drive Picker	Drive file selection widget
Email Markup	Interactive email using schema.org
Google Workspace Add-ons	Extend Google Workspace apps
Google Workspace Marketplace	Storefront for integrated applications
Gmail API	Enhance Gmail
Google Chats API	Conversational bots in chat
People API	Manage user's Contacts
Sheets API	Read and write spreadsheets
Slides API	Create and edit presentations
Task API	Search, read & update Tasks
Vault API	Manage your organization's eDiscovery

MOBILE (FIREBASE)

Cloud Firestore	Document store and sync
Cloud Functions for Firebase	Event-driven serverless applications
Cloud Storage for Firebase	Object storage and serving
Crashlytics	Crash reporting and analytics
Firebase A/B Testing	Run A/B test experiments
Firebase App Distribution	Trusted tester early access
Firebase Authentication	Drop-in authentication
Firebase Cloud Messaging	Send device notifications
Firebase Dynamic Links	Link to app content
Firebase Extensions	Pre-packaged development solutions
Firebase Hosting	Web hosting with CDN/SSL
Firebase In-App Messaging	Send in-app contextual messages
Firebase Performance Monitoring	App/web performance monitoring
Firebase Predictions	Predict user targeting
Firebase Realtime Database	Real-time data synchronization
Firebase Remote Config	Remotely configure installed apps
Firebase Test Lab	Mobile testing device farm
Google Analytics for Firebase	Mobile app analytics
ML Kit for Firebase	ML APIs for mobile

ADDITIONAL RESOURCES

Google Cloud Home Page	cloud.google.com
Google Cloud Blog	cloud.google.com/blog
Google Cloud Platform Podcast	gcppodcast.com
Kubernetes Podcast from Google	kubernetespodcast.com
Google Cloud Reader	podcasts.google.com
Google Cloud Open Source	opensource.google/projects/list/cloud
GCP Medium Publication	medium.com/google-cloud
Apigee Blog	apigee.com/about/blog
Firebase Blog	firebase.googleblog.com
Google Workspace Developers Blog	gsuite-developers.googleblog.com
Google Workspace GitHub	github.com/gsuitedevs
Google Workspace Twitter	twitter.com/gsuitedevs
Google Cloud Certifications	cloud.google.com/certification
Google Cloud System Status	status.cloud.google.com
Google Cloud Training	cloud.google.com/training
Google Developers Blog	developers.googleblog.com
Google Maps Platform Blog	mapsplatform.googleblog.com
Google Open Source Blog	opensource.googleblog.com
Google Security Blog	security.googleblog.com
Kaggle Home Page	www.kaggle.com
Kubernetes Blog	kubernetes.io/blog
Regions and Network Map	cloud.google.com/about/locations
DORA - Software & Delivery Research	cloud.google.com/devops
Cloud Security Podcast	cloud.withgoogle.com/cloudsecurity/podcast
GCP Sketchnote	goo.gle/gcpsketchnote
Google Cloud Solutions Library	cloud.google.com/solutions
Google Workspace Solutions Gallery	developers.google.com/gsuite/solutions
Google Cloud Support Hub	cloud.google.com/support-hub
GCP Pricing	cloud.google.com/pricing
GCP Pricing Calculator	cloud.google.com/products/calculator
Qwiklabs Home Page	www.qwiklabs.com
Codelabs Home Page	codelabs.developers.google.com
Reddit - www.reddit.com	
GoogleCloud	/r/googlecloud
AppEngine	/r/AppEngine
BigQuery	/r/bigquery
Dataflow	/r/dataflow
Firebase	/r/firebase
Google Apps Script	/r/GoogleAppsScript
Big Data/Data Analytics Comparisons	cloud.google.com/products/big-data
Compute Product Comparisons	cloud.google.com/products/databases
Database Product Comparisons	cloud.google.com/products/compute
Networking Product Comparisons	cloud.google.com/products/networking
Storage Product Comparisons	cloud.google.com/products/storage

Compute

- Cloud Functions: Event-driven serverless functions 🔗 📄
- App Engine: Managed app platform 🔗 📄
- Cloud Run: Serverless for containerized applications 🔗 📄
- Google Kubernetes Engine (GKE): Managed Kubernetes/containers 🔗 📄
- Compute Engine: VMs, GPUs, TPUs, Disks 🔗 📄
- Bare Metal Solution: Hardware for specialized workloads 🔗
- Preemptible VMs: Short-lived compute instances 🔗 📄
- Shielded VMs: Hardened VMs 🔗 📄
- Sole-tenant Nodes: Dedicated physical servers 🔗 📄
- VMware Engine: VMware as a service 🔗 📄
-

Database

- Cloud Bigtable: Petabyte-scale, low-latency, non-relational 🔗 📄
- Cloud Firestore: Serverless NoSQL document database 🔗 📄
- Cloud Memorystore: Managed Redis and Memcached 🔗 📄
- Cloud Spanner: Horizontally scalable relational database 🔗 📄
- Cloud SQL: Managed MySQL, PostgreSQL, SQL Server 🔗 📄
- Database Migration Service: Migrate to Cloud SQL 🔗 📄
- Cloud SQL Insights: SQL Inspector 🔗 📄

Storage

- Cloud Filestore: Managed NFS server 🔗 📄
- Cloud Storage: Multi-class multi-region object storage 🔗 📄
- Persistent Disk: Block storage for VMs 🔗 📄
- Local SSD: VM locally attached SSDs 🔗 📄
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Shared responsibility model

#GCPSketchnote
@PVERGADIA
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08.11.2021

Wait... what is Cloud again?

TRADITIONAL ON-PREMISES	INFRASTRUCTURE AS A SERVICE (IaaS)	CONTAINERS AS A SERVICE (CaaS)	PLATFORM AS A SERVICE (PaaS)	FUNCTION AS A SERVICE (FaaS)	SOFTWARE AS A SERVICE (SaaS)
Data & Configurations	Data & Configurations	Data & Configurations	Data & Configurations	Data & Configurations	Data & Configurations
Application Code	Application Code	Application Code	Application Code	Application Code	Application Code
Scaling...	Scaling...	Scaling...	Scaling...	Scaling...	Scaling...
Runtime	Runtime	Runtime	Runtime	Runtime	Runtime
OS	OS	OS	OS	OS	OS
Virtualization	Virtualization	Virtualization	Virtualization	Virtualization	Virtualization
Hardware	Hardware	Hardware	Hardware	Hardware	Hardware

You Manage   Cloud Provider Manages