Cloud Computing Vendors and Technologies

Session 2

Popular cloud computing vendors

Popular cloud computing vendors are as follows

1. Amazon Web Services (AWS)
2. Microsoft Azure
3. Google Cloud Platform (GCP)
4. Salesforce
5. Hadoop

Free Cloud Computing Services

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Amazon Web Services (AWS)

- Amazon Web Services (AWS) is a comprehensive and widely used cloud computing platform provided by Amazon.
- It offers a wide range of cloud services, including **computing power, storage, databases, networking, machine learning, analytics, security,** and more.
- AWS provides Infrastructure as a Service (IaaS), Platform as a Service (PaaS), and Software as a Service (SaaS) offerings to cater to various business needs.

Key components and services

- **Compute Services:** AWS offers various **compute services**, including **Amazon Elastic Compute Cloud (EC2)**, which provides virtual servers in the cloud for running applications, and **AWS Lambda**, a serverless computing service that allows you to run code without provisioning or managing servers.
- **Storage Services:** AWS provides scalable and durable storage options, such as **Amazon Simple Storage Service (S3)** for object storage, **Amazon Elastic Block Store (EBS)** for block storage, and **Amazon Glacier** for long-term data archiving.
- **Database Services:** AWS offers managed database services like **Amazon Relational Database Service (RDS)** for relational databases, **Amazon DynamoDB** for NoSQL databases, and **Amazon Aurora** for high-performance relational databases.
- **Machine Learning Services**: AWS offers a suite of services for machine learning and artificial intelligence (AI) applications, such as **Amazon SageMaker** for building, training, and deploying machine learning models, and **Amazon Rekognition** for image and video analysis.
- **Analytics Services:** AWS provides various analytics services, including **Amazon Redshift** for data warehousing, **Amazon Athena** for interactive query analysis, and **Amazon Kinesis** for real-time streaming data processing.

App Engine Application Platform

cloud.google.com/appengine

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App Engine

Key features

Documentation

All features

Pricing

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- ✓ Stay agile with support for popular development languages and a range of developer tools
- ✓ Explore more products in our serverless portfolio

VIDEO

App Engine in 1 minute

1:12

Google App Engine (GAE)

- Google App Engine (GAE) is a **Platform as a Service (PaaS)** offering from Google Cloud Platform (GCP).
- It is a fully managed **serverless** platform that allows developers to build and deploy web applications and services without worrying about infrastructure management.
- Google App Engine supports **multiple programming languages** and provides a scalable and reliable environment for application development.

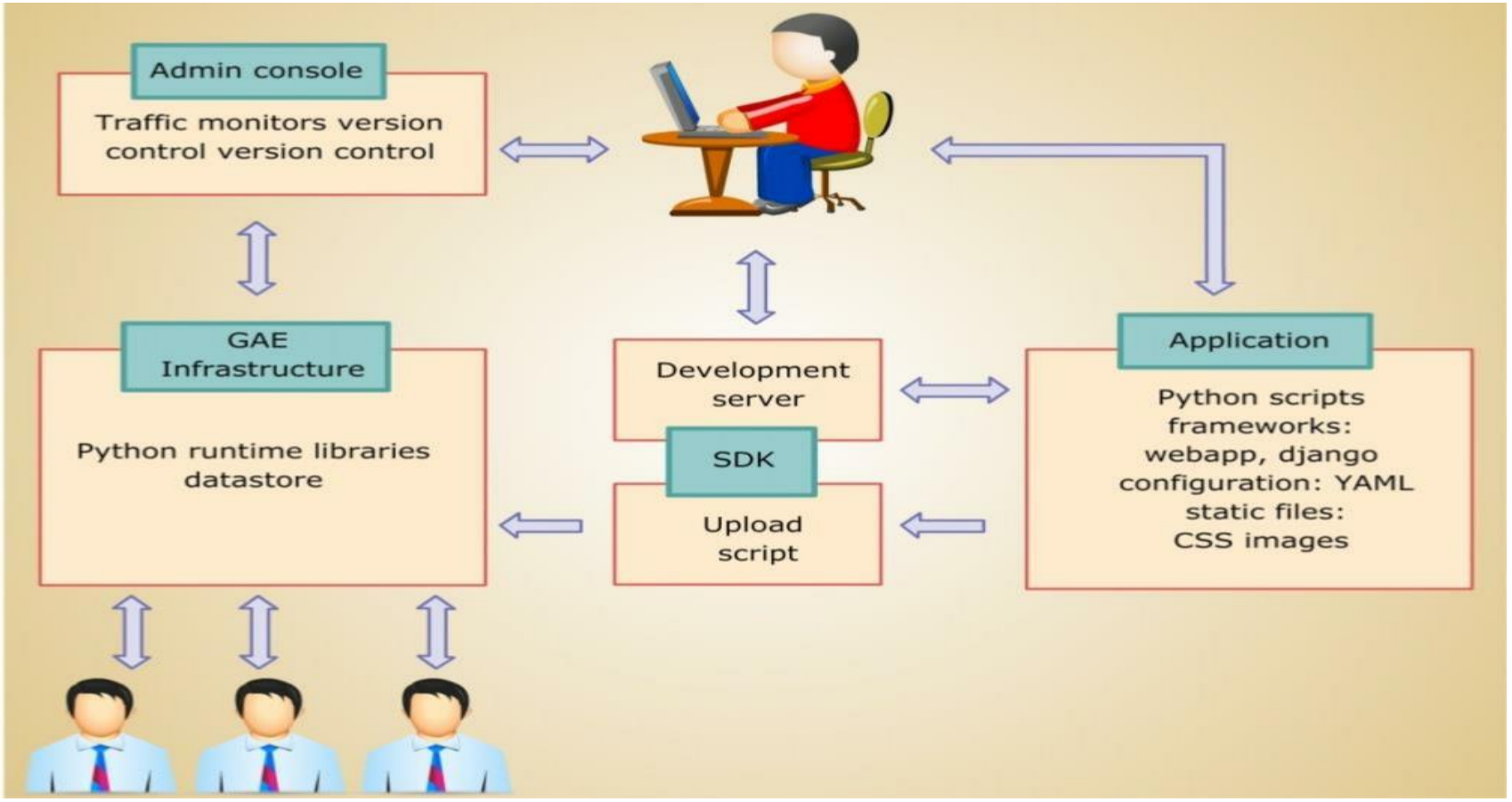
key features and components

- **Scalability:** Google App Engine automatically scales your applications based on demand. It can handle sudden traffic spikes and adjust resources accordingly, ensuring high availability and performance.
- **Flexible Runtimes:** App Engine supports multiple programming languages and environments, including **Python, Java, Go, Node.js, .NET, and Ruby**.
- **Automatic Scaling and Load Balancing:** App Engine's automatic scaling feature adjusts the number of instances dynamically based on traffic.
- **Data Storage and Persistence:** App Engine integrates with **Google Cloud Datastore**, a NoSQL document database, and **Google Cloud SQL**, a managed relational database service.
- **Task Queues and Background Processing:** App Engine includes task queues, allowing you to offload time-consuming or background tasks to be executed **asynchronously**.
- **Integrated Services:** App Engine integrates with other Google Cloud services, such as Google Cloud Storage, **Google Cloud Pub/Sub, and Google Cloud BigQuery**, allowing you to easily incorporate these services into your applications.

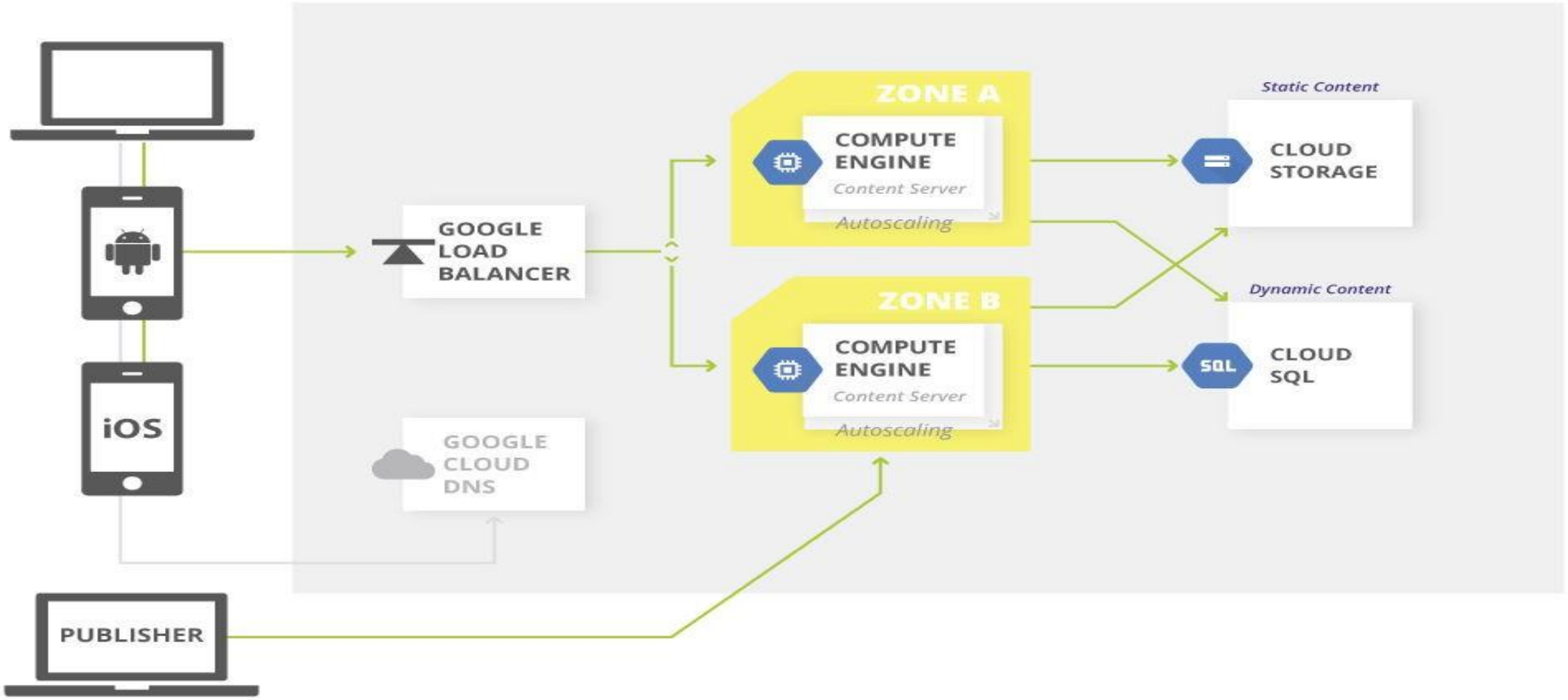
Google App Engine

Platform-as-a-Service (PaaS)

- The following figure describes the working of GAE:



Google Cloud



Cloud Computing Services | Micr

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Update

- Popular
- AI + machine learning
- Analytics
- Compute
- Containers
- Databases
- DevOps
- Developer tools
- Hybrid + multicloud
- Identity
- Integration
- Internet of Things
- Management and governance

Popular

Explore some of the most popular Azure products

Virtual Machines

Provision Windows and Linux VMs in seconds

Azure Virtual Desktop

Enable a secure, remote desktop experience from anywhere

Azure SQL

Migrate, modernize, and innovate on the modern SQL family of cloud databases

Azure Cosmos DB

Build or modernize scalable, high-performance apps

Azure Kubernetes Service (AKS)

Deploy and scale containers on managed Kubernetes

Azure Cognitive Services

Add cognitive capabilities to apps with APIs and AI services

App Service

Quickly create powerful cloud apps for web and mobile

Azure PlayFab

Everything you need to build and operate a live game on one platform

Azure Functions

Execute event-driven serverless code functions with an end-to-end development experience

Azure Quantum

Jump in and explore a diverse selection of today's quantum hardware, software, and solutions

Azure Arc

Secure, develop, and operate infrastructure, apps, and Azure services anywhere

Azure Operator Insights

Remove data silos and deliver business insights from massive datasets

Microsoft Azure

- Microsoft Azure is a comprehensive cloud computing platform provided by Microsoft.
- It offers a wide range of cloud services, including **computing power, storage, databases, networking, analytics, artificial intelligence (AI), and Internet of Things (IoT)** services.
- Azure enables organizations to **build, deploy, and manage applications** and services on a global scale.

Key components and services

- **Compute Services:** Azure provides various compute services, including **Azure Virtual Machines (VMs)** for running applications and workloads, **Azure Container Instances (ACI)** for containerized applications, and **Azure Functions** for serverless computing.
- **Storage Services:** Azure offers scalable storage options such as **Azure Blob Storage** for object storage, **Azure File Storage** for file shares, and **Azure Disk Storage** for block storage. Additionally, Azure provides managed database services like **Azure SQL Database, Azure Cosmos DB, and Azure Database** for MySQL and PostgreSQL.
- **Analytics and AI Services:** Azure offers a wide range of analytics and AI services, including **Azure Machine Learning** for building and deploying machine learning models, **Azure Cognitive Services** for adding AI capabilities to applications, and **Azure Synapse Analytics** for big data analytics and data integration.
- **Internet of Things (IoT):** Azure IoT services enable organizations to connect, monitor, and manage IoT devices and assets at scale. **Azure IoT Hub, Azure IoT Central, and Azure IoT Edge** are some of the services provided to build IoT solutions.
- **Developer Tools and DevOps:** Azure offers a variety of tools and services to support application development and DevOps processes. **Azure DevOps, Azure DevTest Labs, and Azure Functions** are some of the services enabling efficient development, testing, and deployment of applications.
- **Hybrid and Multi-Cloud Capabilities:** Azure provides hybrid cloud capabilities, allowing organizations to seamlessly **integrate on-premises environments with Azure. Azure Arc** enables management of resources across on-premises, multi-cloud, and edge environments.

Salesforce: The Customer Comp

salesforce.com/in/?ir=1

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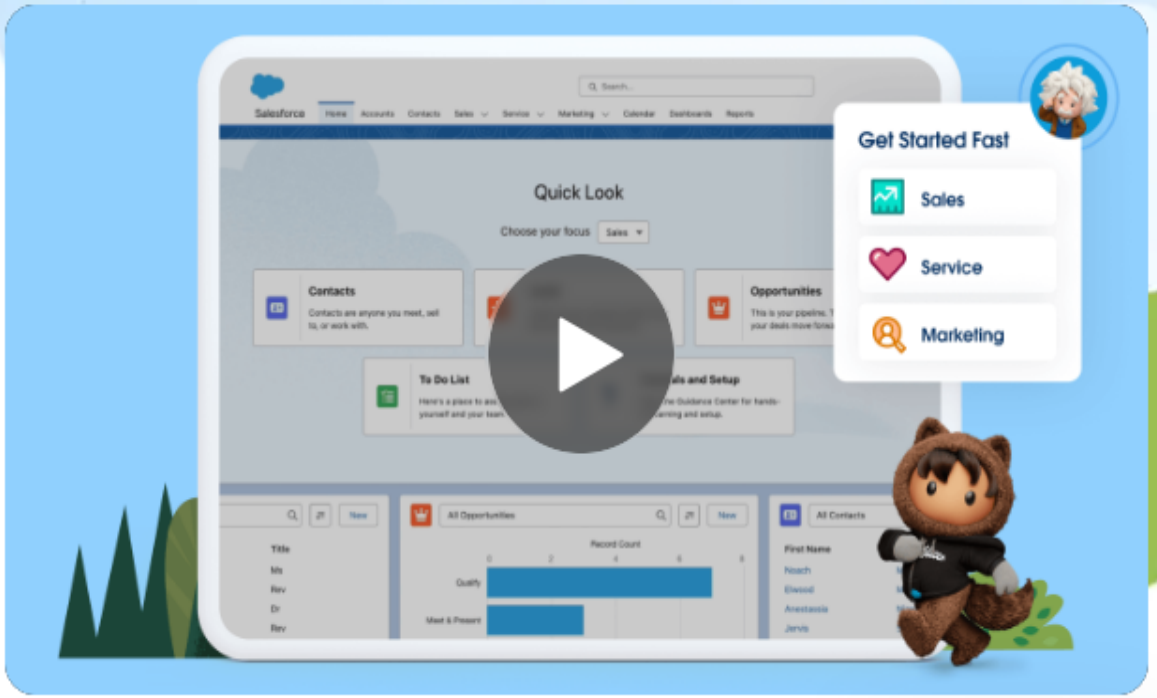

Let's Chat

Salesforce

- Salesforce is a cloud-based customer relationship management (CRM) platform that helps organizations manage and streamline their **sales, marketing, customer service, and other business operations**.
- It provides a suite of integrated tools and services designed to enhance **customer relationships, drive sales growth, and improve overall business efficiency**.

Key components and features

- **Sales Cloud:** Sales Cloud is Salesforce's CRM module focused on **sales automation**.
- **Service Cloud:** Service Cloud is Salesforce's customer service and support module. It allows organizations to manage **customer inquiries, cases, and service requests** across various channels, including **email, phone, social media, and chat**.
- **Marketing Cloud:** Marketing Cloud enables organizations to create and execute **personalized marketing campaigns** across multiple channels, such as email, social media, mobile, and advertising. It includes tools for **audience segmentation, email marketing automation, social media management, and analytics** to measure campaign effectiveness.
- **Commerce Cloud:** Commerce Cloud (formerly known as Demandware) is Salesforce's e-commerce platform. It provides capabilities for building and managing **digital storefronts**, enabling organizations to sell products and services online. Commerce Cloud supports features like **product catalog management, shopping cart functionality, and integration with payment gateways**.
- **Community Cloud:** Community Cloud allows organizations to **create online communities for customers, partners, and employees**. It enables collaboration, self-service support, and knowledge sharing within a secure and branded community environment.
- **Analytics Cloud:** Analytics Cloud (also known as Einstein Analytics) provides **data visualization and analytics capabilities**. It allows users to explore and analyze data from various sources, create interactive dashboards and reports, and gain insights into sales, marketing, and customer service performance.

Apache Hadoop

hadoop.apache.org

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Apache Hadoop

The Apache™ Hadoop® project develops open-source software for reliable, scalable, distributed computing.

The Apache Hadoop software library is a framework that allows for the distributed processing of large data sets across clusters of computers using simple programming models. It is designed to scale up from single servers to thousands of machines, each offering local computation and storage. Rather than rely on hardware to deliver high-availability, the library itself is designed to detect and handle failures at the application layer, so delivering a highly-available service on top of a cluster of computers, each of which may be prone to failures.

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Latest news

Release 3.3.4 available — 2022 Aug 8

This is a release of Apache Hadoop 3.3 line.

Modules

The project includes these modules:

- **Hadoop Common**: The common utilities that support the other Hadoop modules.

Related projects

Other Hadoop-related projects at Apache include:

- **Ambari™**: A web-based tool for provisioning, managing, and monitoring Apache Hadoop clusters

Hadoop

- Hadoop is an open-source framework for distributed storage and processing of large datasets across clusters of computers.
- It provides a scalable and fault-tolerant solution for handling big data and performing parallel data processing tasks.
- Hadoop is designed to run on commodity hardware, making it a cost-effective solution for organizations dealing with massive amounts of data.

Key components

- **Hadoop Distributed File System (HDFS):** HDFS is a distributed file system that provides high-throughput access to data across Hadoop clusters. It breaks large files into blocks and distributes them across multiple nodes in the cluster, enabling parallel processing and fault tolerance.
- **MapReduce:** MapReduce is a programming model and processing framework used for distributed data processing in Hadoop. It allows developers to write programs that can process large datasets in parallel across the nodes in a Hadoop cluster. MapReduce consists of two stages: map and reduce, where data is divided into smaller chunks, processed, and then combined to produce the final result.
- **YARN (Yet Another Resource Negotiator):** YARN is a resource management framework in Hadoop that handles resource allocation and scheduling of tasks across the cluster. It separates the processing engine (MapReduce or other frameworks) from the resource management, enabling multiple processing frameworks to run on the same cluster.
- **Hadoop Common:** Hadoop Common provides the common **libraries and utilities** required by other Hadoop components. It includes the necessary Java libraries and tools for interacting with the Hadoop ecosystem.
- **Hadoop Ecosystem Tools:** Hadoop has a rich ecosystem of tools and frameworks that extend its capabilities. Some commonly used tools include **Apache Hive (SQL-like querying), Apache Pig (data flow scripting), Apache Spark (in-memory analytics), and Apache HBase (NoSQL database).**

Architecture: Hadoop on Google Cloud Platform

- Infrastructure for MapReduce using Hadoop.
- Compute power and Cloud Storage to store the input and output of the MapReduce jobs.
- Hadoop Master: includes the HDFS **NameNode** and the MapReduce **JobTracker**.
- Nodes in the cluster will run MapReduce tasks with **DataNode** and MapReduce **TaskTracker**.
- Backing-up the storage through **Google Cloud Storage Connector for Hadoop**. HDFS, can be used, Google's Cloud Storage.

Architecture: Hadoop on Google Cloud Platform