

**JYOTI NIVAS COLLEGE
POST GRADUATE CENTRE**



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TECH - ON - TAP***

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CLOUD COMPUTING***

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ORACLE CLOUD INFRASTRUCTURE (OCI)

RUPA KUMARI(21MCA36)

Oracle cloud is cloud computing service offered by oracle corporation providing servers ,network ,applications and services through a global network of oracle corporation managed data centers. The company allows these services to be provisioned on demand over the internet .Oracle cloud provides Infrastructure as a service (IaaS), Platform as a service(PaaS),Software as service(SaaS) and Data as a service(DaaS)these services are used to build , deploy ,integrate and extend applications in the cloud. This platform supports open standard(SQL,HTML5,etc).Open source applications(Kubernetes , Hadoop ,MySQL ,Terraform etc.).

Oracle Cloud Storage:-Oracle Cloud Infrastructure provides customers with high-performance computing and low-cost cloud storage options. Through on-demand local, object, file, block, and archive storage, Oracle Cloud addresses key storage workload requirements and use cases. Customers can use the storage gateway and data transfer service to safely and securely move their data to the cloud.

-> **Block volumes:-**Reliable , high performance block storage for your cloud infrastructure. cost is ₹ 2.0261994 to store one GB per month.

-> **Object storage:-**Store any type of data in its native format at scale. cost is ₹ 2.0261994 to store one GB per month.

-> **Data Transfer service:-**Securely move large volume of data into oracle cloud at no any charge. it is free.

-> **File Storage:-**Automatically scaling network file system(NFS)with multiway replication. Cost is ₹ 23.83764 to store one GB per month.

-> **Archive Storage:-** Reliable long –term storage at one-tenth the cost of object storage. Cost is ₹ 0.20659288 to store one GB per month

.Oracle Database Services:-Oracle database services and products offer customer cost – optimized and high performance version of oracle database , the world ‘s leading converged ,multi model, database management system, as well as in –memory ,No SQL and MySQL database .

Oracle Base Database Service:- provides Oracle Databases hosted on Oracle Cloud Infrastructure. It offers single-node DB systems on either bare metal or virtual machines and 2-node RAC DB systems on virtual machines.

Oracle MySQL Cloud Service :- It provides the world’s most popular open source database powered by the Oracle Cloud, delivering a secure, cost-effective, and enterprise-grade MySQL database service for your modern applications.

References:-

<https://www.oracle.com/in/cloud/>

MICROSOFT AZURE CLOUD SERVICES

PRERANA D SALIGRAM (21MCA29)

1. Azure arc

Azure Arc is a bridge that extends the Azure platform to help you build applications and services with the flexibility to run across datacentres, at the edge and in multi-cloud environments. It allows for development of cloud-native applications with a consistent development, operations and security model. Azure Arc runs on both new and existing hardware, virtualisation and Kubernetes platforms, IoT devices and integrated systems.

Services:

- Consistent development and operation experience to run cloud-native apps anywhere and on any Kubernetes platform
- Deployment of data services like SQL and PostgreSQL as cloud-native services in your preferred environment for data insights
- Azure security and governance for applications, data, and infrastructure across diverse environments
- Flexible infrastructure and connectivity options to meet your regulatory and latency requirements

Pricing:

- Azure Arc is offered at no additional cost for managing Azure Arc-enabled servers and Azure Arc-enabled Kubernetes, though there are charges for add-on Azure management services. Azure Arc-enabled SQL Managed Instance is generally available for an additional cost. Additional data and application services are in preview and currently offered at no additional cost

2. Azure Fleet services with kubernetes

It seamlessly manages Kubernetes clusters at scale and easily handles multicloud scenarios for Azure Kubernetes Service (AKS) clusters such as workload propagation, north-south load balancing (for traffic flowing into member clusters), and upgrade orchestration across multiple clusters.

Services:

- Fleet cluster enables centralised management of all your clusters at scale
- Managed hub cluster takes care of the upgrades and Kubernetes cluster configuration for you
- Kubernetes configuration propagation lets you use policies and overrides to disseminate objects across fleet member clusters
- North-south load balancer orchestrates traffic flow across workloads deployed in multiple member clusters of the fleet

Pricing:

- There's no charge for the Azure Kubernetes Fleet Manager resource itself while it's in preview. You'll only incur charges for the AKS cluster created by Azure Kubernetes Fleet Manager on your behalf. AKS charges will include the virtual machines and associated storage and networking resources consumed for the AKS cluster.

3. Azure Cloud pricing:

- **Start free.** Get USD200 credit to use within 30 days. While you have your credit, get free amounts of many of our most popular services, plus free amounts of 40+ other services that are always free.
- After your credit, move to **pay as you go** to keep building with the same free services. Pay only if you use more than your free monthly amounts.
- **After 12 months**, you'll keep getting 40+ always-free services—and still pay only for what you use beyond your free monthly amounts

REFERENCES:

<https://azure.microsoft.com/en-in/>

AZURE BOT SERVICES AND AZURE BOARDS

RAKSHITHA J(21MCA34)

AZURE BOT SERVICES

Azure Bot Service provides an integrated development environment for bot building. Its integration with Power Virtual Agents, a fully hosted low-code platform, enables developers of all technical abilities build conversational AI bots-no code needed. The integration of Azure Bot Service and Power Virtual Agents enables a multidisciplinary team with a range of expertise and abilities to build bots inside a single software as a service (SaaS) solution. Fusion teams can easily extend bots for complex scenarios with Bot Framework Composer.

Ex:-Configure chatbots to engage with customers and employees in a wide range of languages and channels including websites, mobile apps, Facebook, and Microsoft Teams.

Pricing:-

	Free	\$1
Standard channels	Unlimited messages	Unlimited messages
Premium channels	10,000 messages/month	₹41,247 per 1,000 messages

AZURE BOARDS

Plan, track and discuss work across your teams. Azure Boards provides software development teams with the interactive and customizable tools they need to manage their software projects. It provides a rich set of capabilities including native support for Agile, Scrum, and Kanban processes, calendar views, configurable dashboards, and integrated reporting .Keep your agile project on track with it where you can track all your ideas at every development stage, use built-in scrum boards and planning tools to help your teams run sprints/stand-ups/planning meetings, and gain new insights into the health and status of your project with powerful analytics tools. The service used is paas(Platform as a service).

Pricing:-

USER LICENSES

Basic Plan	Basic + Test Plans
   	    
First 5 users free, then ₹494.97 per user per month	₹4,289.68 per user per month
Start free	30 day free trial

References:-

[Cloud Computing Services | Microsoft Azure](#)

<https://azure.microsoft.com/en-in/products/bot-services>

<https://azure.microsoft.com/en-in/products/devops/boards>

ALIBABA CLOUD SERVICES

FEBA BIJU(21MCA16)

Alibaba Cloud, also known as Aliyun, is a cloud computing company, a subsidiary of Alibaba Group. Alibaba Cloud provides cloud computing services to online businesses and Alibaba's own e-commerce ecosystem. Its international operations are registered and headquartered in Singapore. Alibaba Cloud offers cloud services that are available on a pay-as-you-go basis, and include elastic compute, data storage, relational databases, big-data processing, anti-DDoS protection and content delivery networks (CDN). It is the largest cloud computing company in China, and in Asia Pacific according to Gartner

Alibaba Cloud Object Storage Service (OSS) is a IaaS-level service that enables you to store, back up and archive any amount of non-structured data such as images, videos, documents in the cloud. Files in OSS are uploaded into a container and each file has its own unique address to access it. Using OSS, you can store and retrieve any type of data at any time and from anywhere. OSS is designed for 99.999999999% (12 9's) durability, and backed up with industry-leading SLA(service-level agreements). It helps millions of companies to build a scalable, secure and cost-effective storage foundation. It is also one of the key services that empowers Alibaba's Double Eleven event every year. OSS features are Versioning, Bucket Policy, Cross-region replication, Encryption and Data durability.

Elastic Compute Service (ECS) is a high-performance, stable, reliable, and scalable IaaS-level service provided by Alibaba Cloud. It is more convenient and efficient compared with physical servers. You can immediately acquire ECS instances and scale computing resources on-demand. ECS provides a variety of instance types that suit various business needs and help boost business growth. Alibaba Cloud Elastic Compute Service (ECS) provides fast memory and the latest CPUs to help you to power your cloud applications and achieve faster results with low latency. ECS features are Flexible Purchasing Options, Auto Scaling, Auto Provisioning, CPU options and Dedicated Host Clusters.

REFERENCES

https://in.alibabacloud.com/?utm_key=se_1007710386&utm_content=se_1007710386&gclid=EAIaIQobChMI_Zj327nx-wIVEH8rCh2Ydge1EAAYASAAEgLa0PD_BwE

<https://www.alibabacloud.com/product/object-storage-service>

<https://www.alibabacloud.com/product/ecs>

CLOUD COMPUTING SERVICE PROVIDER: SALESFORCE

POOJA (21MCA28)

SALESFORCE: Salesforce is the leader in cloud computing, offering applications for all aspects of your business, including CRM, sales, customer service, marketing automation, business analytics.

SALESFORCE SERVICE PROVIDER:

- **Service cloud**
- **Sales cloud**
- **Service Cloud:** is a customer relationship management (CRM) platform for customer service and support. Service for Apps makes it possible to embed customer support software into applications. In-app mobile support can include live agent video chat, screen sharing and on-screen guided assistance.

Features of Service Cloud include the following:

- customized reporting
- multiple languages;
- can be used through a mobile application;

Salesforce pricing: Salesforce Service Cloud has 4 pricing editions, from \$25 to \$300. A free trial of Salesforce Service Cloud is also available.

- **Sales cloud:** Salesforce based Service Cloud on its Sales Cloud product, a popular CRM software for sales professionals. The software is also integrated with Salesforce Community Cloud, which provides more communication channels for agents and customers.

Sales Cloud features:

Agent workspace: This is a comprehensive and customizable user interface (UI) for customer service agents that offers various productivity tools, analytics and customer views.

Case management: Case management is accessible via both desktop and mobile apps.

Knowledge management: Agents can create and access resources within the company's knowledge base.

Sales cloud pricing: Salesforce Service Cloud comes in four different pricing tiers: Essentials, Professional, Enterprise and Unlimited

REFERENCE:

<https://techabled.in/salesforce-services/> _

RED HAT

MYTHREYI S N (21MCA25)

Red Hat is a software company that combines open source Linux operating system components with related programs into a distribution package that customers can order. Red Hat offers a variety of open source software that DevOps engineers and businesses use. These include operating system platforms, storage, middleware, management products, as well as training, support and consulting services. Red Hat was one of the first companies to realize that free software could be sold as a product

RED HAT Services:

1. Red Hat Enterprise Linux

Red Hat Enterprise Linux supports and powers software and technologies for automation, cloud, containers, middleware, storage, application and more.

Companies using Red Hat Enterprise Linux for Apps Development include: Samsung Electronics, CIGNA corporation, cardinal Health, Novo Nordisk.

Features of Red Hat Enterprise Linux :

- It is certified for the cloud.
- Safety is the main thing.

Pricing for Red Hat Enterprise Linux:

- Red Hat Enterprise Linux Server – starting at us\$349
- Red Hat Enterprise Linux for virtual datacenters-us\$2,499

2. Red Hat OpenShift:

Red Hat's free platform as a service (PaaS) for hosting java, PHP, Ruby, python, Node.js, and Perl apps. Open shift is Red Hat's cloud computing platform as a service offering

Features for Red Hat OpenShift:

- Scalability.
- Flexibility.

Pricing for Red Hat OpenShift:

Red Hat OpenShift provides z60 days free trial, 3-year Reserved Instance - \$0.076, 1-Year Reserved Instance - \$ 0.114.

REFERENCES:

<https://www.redhat.com/en>

GOOGLE CLOUD SERVICE PROVIDERS

SMRUTHI.R(21MCA40)

Anthos:

- Build, deploy, and optimize apps on GKE and VMs anywhere—simply, flexibly, and securely
- Consistent development and operations experience for hybrid and multi-cloud environments
- Accelerate your VM-based app [migration journey](#) to containers

Key Features of Anthos:

1.Enterprise-grade container orchestration and management service: Anthos enables you to manage GKE clusters and workloads running on virtual machines across environments. Anthos simplifies your application stack, reduces the costs associated with licensing a hypervisor, and decreases time spent learning new skills.

2.Automate policy and security at scale: Define, automate, and enforce policies across environments in order to meet your organization’s unique security and compliance requirements.

3. Fully managed service mesh with built-in visibility:[Anthos Service Mesh](#) unburdens operations of development teams by empowering them to manage and secure traffic between services while monitoring, troubleshooting, and improving application performance.

4. Anthos multicloud:Anthos Multicloud API enables you to provision and manage GKE clusters running on AWS and Azure infrastructure through a centralized Google Cloud backed control plane.

5. Anthos for VMs:Anthos for VM in preview, supports development teams that want to standardize on Kubernetes but have existing workloads running on virtual machines that cannot be easily containerized.

Pricing:

Anthos on public cloud	Pay-as-you-go (hourly)	Pay-as-you-go (monthly) ^M	Subscription (monthly) ^M
Anthos (Google Cloud) ^{GC}	\$0.01096 /vCPU	\$8 / vCPU	\$6 / vCPU
Anthos (AWS) ^{AWS}	\$0.01096 /vCPU	\$8 / vCPU	\$6 / vCPU
Anthos (Azure) ^{AZ}	\$0.01096 /vCPU	\$8 / vCPU	\$6 / vCPU
Anthos (attached clusters) ^{AC}	\$0.01096 /vCPU	\$8 / vCPU	\$6 / vCPU

Dataflow:

- Fully managed data processing service
- Automated provisioning and management of processing resources
- OSS community-driven innovation with Apache Beam SDK
- Reliable and consistent exactly-once processing

Key Features of Dataflow:

1. Autoscaling of resources and dynamic work rebalancing: Minimize pipeline latency, maximize resource utilization, and reduce processing cost per data record with data-aware resource autoscaling.

2. Flexible scheduling and pricing for batch processing: For processing with flexibility in job scheduling time, such as overnight jobs, flexible resource scheduling (FlexRS) offers a lower price for batch processing.

3. Ready-to-use real-time AI patterns: Enabled through ready-to-use patterns, Dataflow's real-time AI capabilities allow for real-time reactions with near-human intelligence to large torrents of events.

Pricing:

Job type	CPU (per vCPU per hour)	Memory (per GB per hour)	Data processed during shuffle ⁴ (per GB)
Batch ¹	\$0.056	\$0.003557	\$0.011
FlexRS ²	\$0.0336	\$0.0021342	\$0.011
Streaming ³	\$0.069	\$0.003557	\$0.018

References:

<https://cloud.google.com/dataflow>

<https://cloud.google.com/anthos>

SERVICES PROVIDED BY MICROSOFT AZURE AND GOOGLE CLOUD

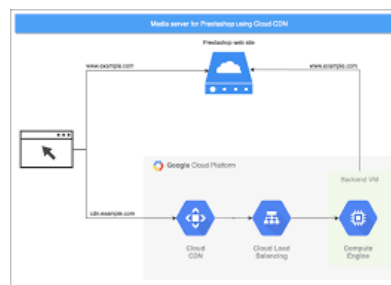
RENUKA M(21MCA35)

1. Azure Sentinel



- Microsoft Sentinel is a cloud-native security information and event manager (SIEM) platform that uses built-in AI to help analyze large volumes of data. Microsoft Sentinel aggregates data from all sources, including users, applications, servers, and devices running on-premises or in any cloud, letting you reason over millions of records in a few seconds. It includes built-in connectors for easy onboarding of popular security solutions. Collect data from any source with support for open standard formats like CEF and Syslog.
- Azure Sentinel SIEM can be considered as SaaS (Security-as-a-Service) based on its high scalability when meeting the security needs of various organizations.
- Price : \$2.46 per gigabyte (GB) of data analyzed by Azure Sentinel.

2. Google Cloud CDN



- Cloud CDN (Content Delivery Network) uses Google's global edge network to serve content closer to users, which accelerates your websites and applications.
- Cloud CDN works with the global external HTTP(S) load balancer to deliver content to your users. The external HTTP(S) load balancer provides the frontend IP addresses and ports that receive requests and the

- PAAS type of service.
- Price : free \$300 credits for 1st time user

DELL CLOUD SERVICE

STEFFI P(21MCA41)

Dell cloud service provider

Dell Technologies Cloud, powered by VMware, delivers consistent management across private, public and edge cloud infrastructure — so you can choose the best environment for each application and use case. Cloud computing services are highly scalable hardware and software resources that can be accessed via the Internet. Cloud computing services include everything from infrastructure (servers, storage and networking) to applications, databases, analytics, intelligence, software development platforms and more.

APEX Cloud service

The Dell APEX Console provides self-service access to a catalog of cloud services and guides you through the entire technology lifecycle. The APEX Console is where your as-a-service journey begins. Choose and configure your cloud and infrastructure subscriptions to match your business needs. From the Console, monitor and optimize your services, assign role-based access for users and stakeholders, and get support when you need it.

Pricing

APEX has 2 pricing edition from \$0.32 to \$118.40

Offering, Free trial ,Freemium Version, Premium Consulting

Dell CloudIQ

CloudIQ combines proactive monitoring, machine learning and predictive analytics so you can take quick action and simplify operations of your on-premises infrastructure and data protection in the cloud. CloudIQ makes it faster and easier to analyze and identify issues accurately and intelligently, by delivering:

- Centralized monitoring of performance, capacity, system components, configuration, and data protection. CloudIQ also provides details about Storage.

Pricing

CloudIQ is a no cost cloud-native application that leverages Machine Learning to proactively monitor and measure the overall health of Unity and SC Series storage systems through predictive analytics.

Reference

<https://www.dell.com/support/incidents-online/en-us/contactus/dynamic>

<https://www.dell.com/support/incidents-online/en-us/contactus/adm-support>

<https://infohub.delltechnologies.com/t/dell-powerscale-and-cloudera-cdp-private-cloud-base-reference-architecture>

AWS IN AMAZON ALEXA & AMAZON CLOUDWATCH

MEGHANA N(21MCA24)

AMAZON WEB SERVICES (AWS)

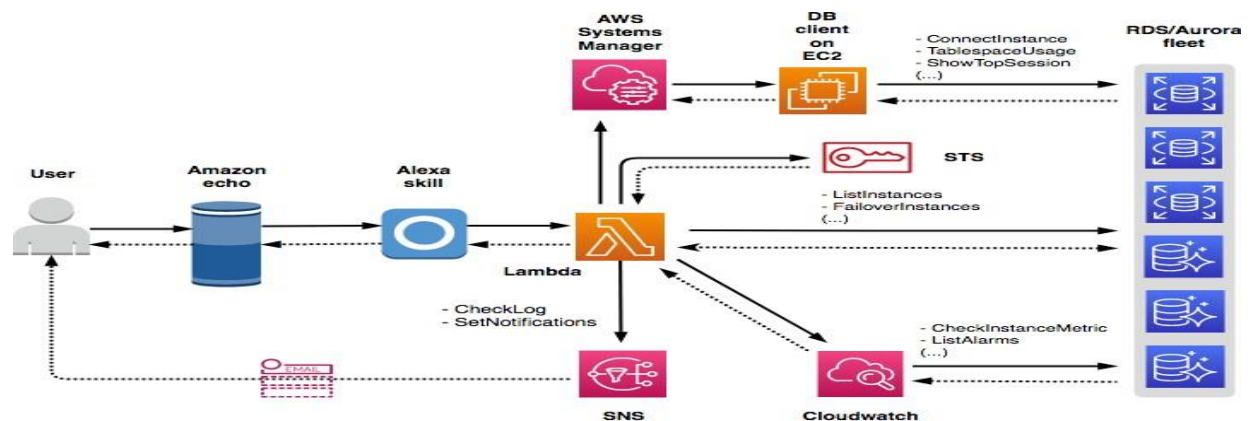
AWS is a language and operating system agnostic platform. Amazon Web Services (AWS) began offering IT infrastructure services to businesses in the form of web services -- now commonly known as cloud computing. With the Cloud, businesses no longer need to plan for and procure servers and other IT infrastructure weeks or months in advance. Instead, they can instantly spin up hundreds or thousands of servers in minutes and deliver results faster. Today, Amazon Web Services provides a highly reliable, scalable, low-cost infrastructure platform in the cloud that powers hundreds of thousands of businesses in 190 countries around the world.

AMAZON ALEXA

Alexa is a cloud-based service that powers more than 140,000 compatible devices, including Amazon Echo, Echo Show, Echo Dot, Echo Dot with clock. Alexa is a voice-controlled virtual assistant. This can play audio, control your smart home, answer questions and engage your favorite services to keep you organized, informed, safe, connected and entertained. Amazon Alexa is a mixture of Infrastructure as a Service, Platform as a Service and Software as a Service.

Alexa for Business is a service that enables organizations and employees to use Alexa to get more work done. With Alexa for Business, employees can use Alexa as their intelligent assistant to be more productive in meeting rooms, at their desks, and even with the Alexa devices they already use at home or on the go. IT and facilities managers can also use Alexa for Business to measure and increase the utilization of the existing meeting rooms in their workplace.

Pricing: Alexa for Business is a pay-as-you-go service. There are no up-front fees, and no long term commitments. Alexa for Business charges are based on the number of shared devices you register, and the number of users enrolled in your organization's account.

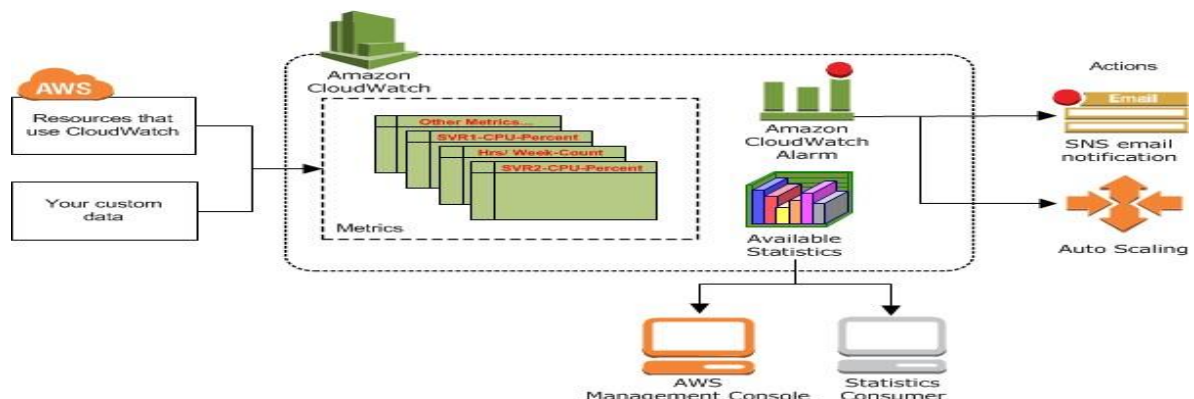


AMAZON CLOUDWATCH

Amazon CloudWatch monitors your Amazon Web Services (AWS) resources and the applications you run on AWS in real time. CloudWatch enables you to monitor your complete stack (applications, infrastructure, and services) and use alarms, logs, and events data to take automated actions and reduce mean time to resolution. Amazon CloudWatch is a mixture of Infrastructure as a Service and Platform as a Service. Amazon CloudWatch is a monitoring and management service that provides data and actionable insights for AWS, hybrid, and on-premises applications and infrastructure resources.

CloudWatch gives you actionable insights that help you optimize application performance, manage resource utilization, and understand system-wide operational health. CloudWatch provides up to one-second visibility of metrics and logs data, 15 months of data retention (metrics), and the ability to perform calculations on metrics. This allows you to perform historical analysis for cost optimization and derive real-time insights into optimizing applications and infrastructure resources. You can use CloudWatch Container Insights to monitor, troubleshoot, and alert your containerized applications and microservices. CloudWatch collects, aggregates, and summarizes compute utilization information such as CPU, memory, disk, and network data, as well as diagnostic information such as container restart failures, to help DevOps engineers isolate issues and resolve them quickly.

Pricing: You can get started with Amazon CloudWatch for free. Most AWS Services (EC2, S3, Kinesis, etc.) send metrics automatically for free to CloudWatch. Many applications should be able to operate within these free tier limits. There is no up-front commitment or minimum fee. You simply pay for what you use and will be charged at the end of the month for your usage.



REFERENCES

<https://aws.amazon.com/alexaforbusiness/>

<https://aws.amazon.com/cloudwatch/features/>

GOOGLE CLOUD SERVICES: VERTEX AI, CLOUD API

DEVIKA K(21MCA13)

Introduction

Google Cloud Platform (GCP), offered by google is a suite of cloud computing services that runs on the same infrastructure that Google uses internally for its end-user products, such as Google Search, Gmail, Google Drive, and YouTube. Alongside a set of management tools, it provides a series of modular cloud services including computing, data storage, data analytics and machine learning. Registration requires a credit card or bank account details. Google Cloud Platform provides infrastructure as a service, platform as a service, and server less computing environments.

Vertex AI

- Build, deploy, and scale machine learning (ML) models faster, with fully managed ML tools for any use case.
- New customers get \$300 in free credits to spend on Vertex AI.
- Paas (platform as a service)

Features

- Accelerate ML with a unified data and AI platform and tooling for pre-trained and custom models
- Implement MLOps practices to efficiently scale, manage, monitor, and govern your ML workloads
- Reduce training time and costs with optimized infrastructure
- End-to-end application development environment

Cloud API

- Cloud APIs are exposed as network API services to customers, such as Cloud Pub/Sub API. Each Cloud API typically runs on one or more subdomains of googleapis.com, such as pubsub.googleapis.com, and provides both JSON HTTP and gRPC interfaces to clients over public internet and Virtual Private Cloud (VPC) networks. Clients can send HTTP and gRPC requests to Cloud API endpoints directly or by using client libraries.
- All Cloud APIs accept only secure requests using TLS encryption.

Types of Cloud API

- Networking API
- Data Analytics API
- Machine Learning API

- Security and Identity API
- Management tools API

References

<https://cloud.google.com/vertex-ai>

<https://cloud.google.com/apis>

AMAZON WEB SERVICES

PADMA PRIYA (21MCA27)

AWS was launched in 2006. it is the most widely-used public cloud computing platform across the globe and one of the pioneers of on-demand computing. AWS provides more than 100 services from database management, server less computing, data warehousing to virtual ground stations for satellite communications. AWS provides all three types of services i.e. IaaS, PaaS and SaaS.

AWS Services:

1. Amazon Relational Database Cloud Service [RDS]:

Amazon RDS is a Relational Database Cloud Service. RDS service is PaaS (Platform as a Service). Amazon RDS supports PostgreSQL, MySQL, Maria DB, Oracle, SQL Server, and Amazon Aurora. Amazon RDS stores data as tables, records, and fields. Values from one table can have a relationship to values in other tables..

Features of Amazon RDS:

- Replication
- Automated backups
- Multi-AZ deployments

Pricing for Amazon RDS:

- 12 Months free
- Storage and Operations: Storage is billed per gigabyte per month.
- The price of an on-demand instance varies depending on the instance type, region etc.

1. Amazon DynamoDB:

Amazon DynamoDB is a fully managed NoSQL database service that provides fast and predictable performance. DynamoDB stores data tables, items and attributes. Items are unique in the tables. Point-in-time recovery helps protect your tables from accidental write or delete operations. point-in-time recovery, you can restore a table to any point in time during the last 35 days.

Features of Amazon DynamoDB:

- On-demand capacity mode:
- Built-in support for ACID transactions:
- On-demand backup:

Pricing for Amazon RDS:

- the first 25 gb consumed per month is free.

- DynamoDB charges per gb of disk space a table consumes.

REFERENCE

<https://aws.amazon.com/rds/mysql/>

MICROSOFT AZURE

HEMA N(21MCA20)

Azure IoT Central

Introduction:

Azure IoT Central is an IoT app platform for solution developers (such as ISVs and SIs), and it enables users to connect their devices, manage them, and produce and integrate insights into their enterprise applications to create, deploy, and operate enterprise-grade solutions that they can brand and sell directly to their clients or via Microsoft AppSource.



Features:

- Data Management can be managed directly from Azure IoT Central.
- High availability and disaster recovery capabilities are built in.
- Pricing for Azure IoT Central starts at \$0.08 per month.

Azure IoT Edge

Introduction:

IoT Edge modules are containers that run Azure services, third-party services or custom code. The IoT Edge runtime runs on each IoT Edge-enabled device and manages the modules deployed to each device.

Features:

- Development can be made easier.
- Microsoft has partnerships with DJI, Qualcomm, SAP and NVIDIA for IoT Edge services.
- IoT Edge is free of cost.

REFERENCES:

<https://apps.azureiotcentral.com>

ALIBABA CLOUD SERVICES

J AISRI.D(21MCA21)

1.Simple Application Server

A lightweight cloud server suitable for developers that is easy to set up and manage.

Features:

- Flexible Image Selection
- Integrates the features of multiple Alibaba Cloud services to help deploy and manage applications with simple configurations.
- It is a Platform as a Service.

Pricing:

vCPUs	Memory	Disk	Data Transfer	Peak Bandwidth	Pricing
2	2GB	60GB ESSD	3TB	30Mbps	\$19/mo
2	2GB	80GB ESSD	3.5TB	30Mbps	\$28/mo
2	4GB	100GB ESSD	4TB	30Mbps	\$38/mo
2	8GB	200GB ESSD	5TB	30Mbps	\$65/mo
4	16GB	400GB ESSD	6TB	30Mbps	\$110/mo

2. Server Load Balancer

Server Load Balancer (SLB) distributes network traffic across groups of backend servers to improve the service capability and application availability. It provides functions as a reverse proxy at Layer 7 (ALB) and load balancing services at Layer 4 (CLB).

Features:

- Multiple Protocols
- Multi-Level Disaster Recovery
- It is a Platform as a Service.

Pricing: The instance fee and Load Balancer Capacity Unit (LCU) fee for ALB is charged on an hourly basis. LCU fee per hour = max{Number of LCUs for new connections, Number of LCUs for concurrent connections, Number of LCUs for data transfer, Number of LCUs for rule evaluations} × LCU unit price

REFERENCES:

<https://www.alibabacloud.com/product/swas?spm=a2796.63572.6791778070.dnavproductelastic4.6d3a59e3FPtwZK>

<https://www.alibabacloud.com/product/server-load-balancer?spm=a3c0i.11085497.6791778070.dnavproductnetwork3.77143f66ESntlT>

GOOGLE CLOUD

VANDANA .R(21MCA44)

Google cloud platform is a medium with the help of which people can easily access the cloud systems and other computing services which are developed by Google. The platform includes a wide range of services that can be used in different sectors of cloud computing, such as storage and application development.

SERVICE

➤ **Compute Engine**

- Secure and customizable compute service that lets you create and run virtual machines on Google's infrastructure. It is a Infrastructure-as-a-service (IaaS).
- New customers get \$300 in free credits and 20+ free products to spend on Google Cloud upto monthly limits. All customers get a general purpose machine (e2-micro instance) per month for free, not charged against your credits. Only pay for what you use.

❖ Features:

- Cloud storage. Persistent disks feature high-performance block storage that lets users take snapshots and create new persistent disks from the snapshot.
- Confidential VMs. These VMs enable users to encrypt data while it is being processed without negatively affecting performance.

➤ **Cloud SDK**

- Libraries and tools for interacting with Google Cloud products and services. It is a Platform as a service (PaaS).
- Cloud SDK is available at no charge for users with a Google Cloud account.

❖ Features:

- Cloud SDK provides language-specific Cloud Client Libraries supporting each language's natural conventions and styles. This makes it easier for you to interact with Google Cloud APIs in your language of choice.
- Google Cloud Command Line Interface (gcloud CLI): The gcloud CLI manages authentication, local configuration, developer workflow, and general interactions with Google Cloud resources.

REFERENCES

- <https://www.edureka.co/blog/what-is-google-cloud-platform/>
- <https://cloud.google.com>

AMAZON WEB SERVICES

PRIYADARSHINI N (21MCA31)

Amazon Web Services, (AWS) is a subsidiary of Amazon that provides on-demand cloud computing platforms and APIs to individuals, companies, and governments, on a metered pay-as-you-go basis.

1) AMAZON APPSTREAM 2.0

Amazon AppStream 2.0 allows organizations to stream desktop applications from AWS to any device running a web browser, without the need to rewrite them. With AppStream 2.0, you'll have instant-on access to the application of your choice, all with a responsive user experience that works with different devices

Features

- Simple application management
- Multiple virtual machine types
- GPU optimized virtual machines
- Amazon VPC support
- Identity federation

Pricing

With Amazon AppStream 2.0, you pay only for the streaming resources that you provision plus a small monthly fee per streaming user depending on the operating system chosen. There is no upfront investment and no long-term commitment when using Amazon AppStream 2.0.

2) Amazon Cognito

With Amazon Cognito, you can add user sign-up and sign-in features and control access to your web and mobile applications. Amazon Cognito provides an identity store that scales to millions of users, supports social and enterprise identity federation, and offers advanced security features to protect your consumers and business.

Features

Identity Management, User Authentication ,Access Control, Customer Experience, Security.

Pricing

With Amazon Cognito, you pay only for what you use. There are no minimum fees and no upfront commitments. Amazon Cognito charges for identity management and data synchronization.

REFERENCES:

<https://aws.amazon.com/>

ALIBABA CLOUD COMPUTING

C H.CHANDANA(21MCA10)

- ▶ Alibaba Cloud, also known as Aliyun .Aliyun is a cloud computing company, a subsidiary of Alibaba Group.
- ▶ Alibaba Cloud provides cloud computing services to online businesses.
- ▶ Alibaba Cloud offers cloud services that are available on a pay-as-you-go basis, and include elastic compute, data storage, relational databases, big-data processing.
- ▶ It is the largest cloud computing company in China.
- ▶ As of June 2017, Alibaba Cloud is placed in the Visionaries' quadrant of Gartner's Magic Quadrant for cloud infrastructure as a service, worldwide.

Products of Alibaba Cloud:

1.PolarDB:

PolarDB is a commercial cloud based relational database product developed by theAlibaba. It is designed for clients with high read demand. PolarDB is compatible with twopopular databases: MySQL, PostgreSQL.

Pricing:

PolarDB 1 node monthly price is 2000 yuan.

MySQL High Availability edition instance (dual node) monthly price is 4100 yuan.

2.ChatApp

ChatApp is a message engine that Alibaba Cloud builds for global enterprises. ChatApp can efficiently deliver messages by using WhatsApp accounts to more than one billion WhatsApp users all over the world. ChatApp supports a variety of message types, which enhances the interaction between enterprises and customers to help enterprises create greater business value. Real users have identified ChatApp as an important function of Communication Platform as a Service (PaaS) Platforms

Pricing:

The average cost to build a chatApp like WhatsApp will range from
\$30,000 to \$70,000

AZURE CLOUD SERVICES

C SHALINI REDDY (21MCA11)

Azure cloud services accelerate the deployment of our web and cloud applications to build and deploy powerful web and cloud applications and services in minutes with azure cloud services . Once our application is deployed , azure will take care of rest.

Azure automatically scale your cloud services infrastructure based on current demand. The auto scale feature helps you manage unexpected traffic spikes by automatically scaling your Azure Cloud Services environment up or down to deliver an excellent customer experience. Set scaling limits, schedule goals and ensure that the performance of your applications can scale while simultaneously minimizing costs. Experience an excellent development environment using the Azure SDK, which integrates seamlessly with Visual Studio. Deploy applications using the language you like, including .NET, Java, Node.js, PHP, Python or Ruby. Test your application before deploying it to the cloud by using Azure Emulator, which brings the platform's key functionality right to your development computer. To deploy the new release to production, just swap the staging environment into production. Set up real-time alerts to know when service availability or other metrics may degrade. Automate operating system updates to improve the security of your environment. Focus on building great applications and do not worry about patching, faulty hardware or network issues. Azure Cloud Services helps you conveniently monitor the health and availability of your applications. The health metrics dashboard shows you key statistics at a glance.

Azure services:

Azure Sphere

Azure Digital Twins

business operations with Azure Sphere and Azure Digital Twins



ALIBABA CLOUD SERVICES

Shilpa V (21MCA39)

HTTPDNS

HTTPDNS is a domain name resolution service for apps on multiple types of platforms, such as mobile apps and desktop apps. It is a SaaS. It resolves domain names over HTTP or HTTPS. This can effectively prevent domain hijacking, improve the accuracy and stability of domain name resolution, and provide quick updates of resolution results. HTTPDNS ensures 99.99% service availability and can be used for domain name resolution regardless of whether the domain name is registered with or hosted by Alibaba Cloud.

HTTPDNS Features

Protection against Domain Hijacking: DNS resolution requests are sent directly to the HTTPDNS server, bypassing the local DNS servers of ISPs. This can prevent domain hijacking.

Simple API Operations: HTTPDNS provides simple-to-use API operations. You can call an API operation from a mobile app to resolve the domain name or call an operation from the server side. Fees are calculated based on the usage of HTTPDNS resources and the pay-as-you-go price.

Number of billed resolutions	Price (USD)
10,000	\$0.006

Elastic IP Address

EIPs are independent public IP address resources, which allow you to decouple public IP addresses from ECS instances and facilitate management. A public IP address that can be independently owned. It is an IaaS. Works with ECS instances, NAT (network address transmission) gateways, and internal-facing SLB(server load balancer) instances in a VPC(virtual private cloud).

Elastic IP Address Features

- High-speed and stable lines deployed.
- Scalability within seconds

Area	Region	Data transfer unit price (USD/GB)
	Indonesia (Jakarta) and India (Mumbai)	0.090

REFERENCES

<https://in.alibabacloud.com/en>

DIGITALOCEAN

RABIYA BASRI (21MCA33)

DigitalOcean is the unique cloud provider that offers computing services to the organization. It was founded in 2011 by Moisey Uretsky and Ben. It is one of the best cloud providers that allows us to manage and deploy web applications. DigitalOcean is a cloud computing vendor headquartered in New York City with data centers worldwide that offers an infrastructure as a service (IaaS) platform for software developers. DigitalOcean is popular with open source developers and competes with Amazon Web Services (AWS). This cloud service provider offers reliable, scalable and cost-efficient services. Companies and developers can take advantage of DigitalOcean's virtual machines known as droplets to host websites, apps and perform other computing tasks.

FEATURES OF DIGITALOCEAN

It provides high quality performance. It allows developers to use cloud servers to quickly create new virtual machines for their projects. It offers one-click apps for droplets. This app includes MySQL, Docker, MongoDB, PhpMyAdmin, WordPress and Machine Learning.

1. Droplets:

DigitalOcean Droplets are Linux-based virtual machines (VMs) that run on top of virtualized hardware. Each Droplet you create is a new server you can use, either standalone or as part of a larger, cloud-based infrastructure. Easily deploy and manage your Droplets. Reliably scale as your demand shifts. Build and monitor, and secure your apps for less. A Droplet is a virtual machine (VM) that is allocated resources, like CPU, RAM. A vCPU is a unit of processing power corresponding to a single hyper thread on a processor core.

Droplet Plans

There are five Droplet plans: one shared CPU plan and four dedicated CPU plans.

Droplet Plan	CPU	vCPUs	Memory
<i>Basic (Regular and Premium)</i>	Shared	1 - 8	1 - 16 GB RAM
<i>General Purpose</i>	Dedicated	2 - 40	8 - 160 GB RAM 4 GB RAM / vCPU
<i>CPU-Optimized</i>	Dedicated	2 - 48	4 - 96 GB 2 GB RAM / vCPU
<i>Memory-Optimized</i>	Dedicated	2 - 32	16 - 256 GB RAM 8 GB RAM / vCPU
<i>Storage-Optimized</i>	Dedicated	2 - 32	16 - 256 GB RAM 8 GB RAM / vCPU 150 - 225 GB SSD / vCPU

2. CLOUDWAYS

Cloudways managed cloud hosting means leaving the complexity of hosting websites to the experts so you can get back to building your business. Focused on speed, reliability, value, and performance. Simple and easy-to-use platform: Get unlimited websites and visits per server, powerful add-ons, flexible workflows, and easy vertical scaling so you can focus on growth, not management. Expert technical support available at all times: Focus on the work that truly matters—growing your business—while our team of in-house experts performs automatic updates, provides premium support, and stands ready to help. Optimized stack for high

PERFORMANCE:

Deploy a server with a preinstalled stack, including Nginx, Apache, and Memcached, and application-level caching to achieve optimal performance.

REFERENCES: [DigitalOcean | The Cloud for Builders](#)

IBM CLOUD SERVICES

ANDRIA DSOUZA(21MCA04)

Cloud services are infrastructure, platforms, or software that are hosted by third-party providers and made available to users through the internet.

What is IBM cloud platform?

The IBM Cloud platform combines platform as a service (PaaS) with infrastructure as a service (IaaS) to provide an integrated experience. The platform scales and supports both small development teams and organizations, and large enterprise businesses. Globally deployed across data centers around the world, the solution you build on IBM Cloud spins up fast and performs reliably in a tested and supported environment you can trust!



IBM featured products:

1. IBM SPSS Statistics
2. IBM Watson studio
3. Watson Assistant
4. IBM cognos Analytics on cloud
5. IBM Maximo
6. IBM Blueworks Live
7. IBM cloud pak for data
8. IBM Aspera on cloud
9. IBM ILOG CPLEX Optimization studio
10. IBM SPSS Modeler
11. IBM Cloud Pak for Integration

IBM SPSS Statistics:

SPSS Statistics is a statistical software suite developed by IBM for data management, advanced analytics, multivariate analysis, business intelligence, and criminal

investigation. Long produced by SPSS Inc., it was acquired by IBM in 2009. Current versions (post 2015) have the brand name: IBM SPSS Statistics.

Features:

- In SPSS, data gets stored in .SAV format. These data mostly comes from surveys. This makes the process of manipulating, analyzing and pulling data very simple.
- After getting data in the magic of SPSS starts. There is no end to what we can do with this data.
- SPSS is easy for you to learn, use and apply.
- It helps in to get data management system and editing tools handy.
- SPSS offers you in-depth statistical capabilities for analyzing the exact outcome.
- SPSS helps us to design, plotting, reporting and presentation features for more clarity.

IBM Maximo:

Maximo was originally developed by Project Software & Development Inc (PSDI) which changed its name to MRO Software in 2000. Maximo originated as a stand-alone solution running on an IBM Personal Computer. As of April 2018, it is supported on specified versions of AIX, Linux and Windows Server, previously HP-UX and Solaris were also supported. Successive versions have developed to leverage newer technologies.

Features:

- Complete view of company-wide assests.
- Multi cloud based deployment features.
- Streamlined licensing for pricing and single contract services.
- It also supports advanced asset management activities such as predictive maintenance, reliability- centered maintenance and condition-based maintenance.

REFERENCES:

<https://gcore.com>

<https://www.ibm.com/in-en/products>

<https://www.projetechnology.com/maas/what-is-maximo>

<https://www.educba.com/what-is-spss/>

AMAZON WEB SERVICES

ANANYA G S (21MCA03)

AWS was launched in 2006. It is the most widely-used public cloud computing platform across the globe and one of the pioneers of on-demand computing. AWS provides more than 100 services from database management, server less computing, data warehousing to virtual ground stations for satellite communications. AWS provides all three types of services i.e IaaS, PaaS and SaaS.

AWS Services:

1. AMAZON SIMPLE NOTIFICATION SERVICE (AMAZON SNS):

Amazon Simple Notification Service (ASNS) is a notification service provided as part of Amazon Web Services since 2010. It provides a low-cost infrastructure for mass delivery of messages, predominantly to mobile users

Features of Amazon SNS:

- Application-to-application messaging
- Application-to-person notifications
- Message security.

Pricing for Amazon SNS:

- Amazon SNS has no upfront costs. You pay based on the number of messages that you publish, the number of notifications that you deliver, and any additional API calls for managing topics and subscriptions.

2. AMAZON REDSHIFT:

Amazon Redshift is a fully managed data warehouse service in the cloud. Amazon Redshift uses SQL to analyze structured and semi-structured data across data warehouses, operational databases, and data lakes, using AWS-designed hardware and machine learning to deliver the best price performance at any scale. It provides Platform as a Service (PaaS).

Features for Amazon Redshift:

- Amazon Redshift Server less
- Query using your own tools
- Fault tolerant

Pricing for Amazon Redshift:

- With Amazon Redshift, you can start small at \$0.25(Rs.20.44) per hour and scale up to petabytes of data and thousands of concurrent users.

REFERENCES:

<https://docs.aws.amazon.com>

[Amazon Redshift - Wikipedia](#)

[AWS SNS | Simple Notification Service - Javatpoint](#)

MICROSOFT AZURE

HARSHITHA PATIL (21MCA19)

Microsoft Azure, formerly known as Windows Azure, is Microsoft's public cloud computing platform. It provides a broad range of cloud services, including compute, analytics, storage and networking. Users can pick and choose from these services to develop and scale new applications or run existing applications in the public cloud.

The Azure platform aims to help businesses manage challenges and meet their organizational goals. It offers tools that support all industries including e-commerce, finance and a variety of Fortune 500 companies and is compatible with open source technologies.

Azure stack

Purpose of Azure Stack

- It provides the consistency required by developers to build and deploy a single application for both the public and private cloud without building separate applications for each platform.
- The Microsoft Azure Stack comprises with a wide variety of Azure services that can be hosted on the on-premises data center such as Azure App Services, Azure Virtual Machines, Azure Functions, and also provides services like Azure Active Directory to manage Azure Stack Identities

Azure ExpressRoute

- Azure ExpressRoute is a service that, with the help of a connectivity provider, helps us in establishing a private connection to extend your on-premises networks to the Microsoft cloud.
- So, Azure ExpressRoute works like a VPN setup between you and the Microsoft cloud. The connection types include point-to-point ethernet network, any-to-any (IPVPN) network, and virtual cross-connection through a co-location facility.

Azure ExpressRoute Pricing

- In both metered and unlimited plans, ExpressRoute provides local and premium tiers as well as a standard tier in the unlimited plan. For Zone 1, which includes the US, Canada, parts of Europe, etc., the pricing in metered data plan based on circuit bandwidth, which ranges from \$55 per month for 50 Mbps in the local tier to \$6,400 per month for 10 Gbps in the premium tier.
- In the unlimited plan, the data is charged only from 1 Gbps bandwidth and it ranges from \$1,200 per month for 1 Gbps in the local tier to \$54,300 per month for 10 Gbps in the premium tier.

References

- <https://azure.microsoft.com/en-in/>
- <https://www.techtarget.com>

HPE GREENLAKE AND CLOUDSIGMA

VAISHNAVI P(21MCA43)

HPE GREENLAKE

In June 2018, Hewlett Packard Enterprise launched a hybrid cloud service called Glenlake Hybrid Cloud, built on top of HPE's One Sphere cloud management, offered under its brand HPE green Lake.

Glenlake is designed to provide cloud management, cost control, and compliance control capabilities, and will run on AWS and Microsoft Azure. Green Lake includes cloud data services for containers, machine learning, storage, compute, data protection and networking through a management portal called GreenLake Central.

GreenLake Hybrid Cloud customers can have their cloud infrastructure - both public and private - designed, configured and deployed by HPE, and then maintained, supported and optimised on an ongoing basis. The new service supports public cloud deployments on Microsoft Azure and AWS, and private cloud infrastructure via Microsoft Azure Stack and HPE ProLiant for Azure Stack, all of which is managed by HPE OneSphere, the company's over-arching management layer.

CLOUD SIGMA

Founded 2009 in Switzerland, 15 Cloud locations (Europe, the US, Middle East and APAC).

CloudSigma, a pure-cloud IaaS and PaaS provider with advanced hybrid hosting solutions enabling the digital industrial economy, offers highly-available, flexible, enterprise-class cloud servers and cloud hosting solutions in Europe, The US, APAC, and the Middle East.

CloudSigma is the most customizable cloud provider on the market, giving customers full control over their cloud and eliminating restrictions on how users deploy their computing resources. With CloudSigma, customers can provision processing, storage, networks, and other fundamental computing resources as they please, as well as easily deploy any compatible operating system or application with full root/administrative access.

CloudSigma's PaaS solution offers a next-generation container-based cloud platform with certified runtimes for Java, PHP, Ruby, Python, .NET, Node.js, and Go.

PaaS platform enables the provision of fully managed, scalable environments for Kubernetes and Docker environments in minutes.

CloudSigma is increasingly being recognized for its advancement in the cloud industry.

REFERENCES

[HPE GreenLake - Edge-to-cloud platform | HPE India](#)

[Cloud servers & Hosting | Switzerland Europe US APAC \(cloudsigma.com\)](https://cloudsigma.com)

IBM CLOUD SERVICES: WATSON STUDIO, DB2

JHANCY.S(21MCA22)

INTRODUCTION

The IBM Cloud® platform combines platform as a service (PaaS) with infrastructure as a service (IaaS) to provide an integrated experience. The platform scales and supports both small development teams and organizations, and large enterprise businesses. IBM Cloud provides solutions that enable higher levels of compliance, security, and management, with proven architecture patterns and methods for rapid delivery for running mission-critical workloads.

WATSON STUDIO

IBM Watson® Studio empowers data scientists, developers and analysts to build, run and manage AI models, and optimize decisions anywhere on IBM Cloud Pak® for Data. Unite teams, automate AI lifecycles and speed time to value on an open multicloud architecture. It provides PaaS as a service.

FEATURES

- AutoAI for faster experimentation
- Advanced data refinery
- Open source notebook support
- Integrated visual tooling

DB2

IBM Db2 on Cloud is a fully managed SQL cloud database that offers a dedicated operations team, point-in-time recovery, high-availability disaster recovery (HADR) technology with multizone region support and independent scaling to protect your enterprise applications.

FEATURES

- Modernize mission-critical apps
- Power real-time analytics
- Build cloud-native apps
- Secure and govern your data

REFERENCES

<https://cloud.ibm.com/docs/overview?topic=overview-what-is-platform>

<https://www.ibm.com/cloud/watson-studio>

<https://www.ibm.com/in-en/db2>

GOOGLE KUBERNETES ENGINE

AMRITHA BALAKRISHNAN (21MCA02)

GKE is a simple way to automatically deploy, scale, and manage Kubernetes. google Kubernetes engine provides an PaaS and IaaS as a service.

When using GKE, Kubernetes apps run on a cluster, which is made up of at least one control plane and machines called nodes. Nodes run the services supporting the containers that make up your workloads. The control plane then decides what runs on those nodes, including scheduling and scaling. It provides features such as:

Automatic provisioning and management, Pod and cluster autoscaling, Prebuilt Kubernetes applications & templates, Container-native networking and security, Automated tools for easily migrating workloads, Backup for GKE, Identity and access management, Security and compliance and many more. Some of the benefits of Kubernetes are:

Automated operations Kubernetes: has built-in commands to handle a lot of the heavy lifting that goes into application management, allowing you to automate day-to-day operations. You can make sure applications are always running the way you intended them to run. Infrastructure **abstraction:** When you install Kubernetes, it handles the compute, networking, and storage on behalf of your workloads. This allows developers to focus on applications and not worry about the underlying environment.

Service health monitoring Kubernetes: continuously runs health checks against your services, restarting containers that fail, or have stalled, and only making available services to users when it has confirmed they are running.

REFERENCES

<https://www.techtarget.com/searchitoperations/definition/Google-Container-Engine-GKE#:~:text=Google%20Kubernetes%20Engine%20%28GKE%29%20is%20a%20management%20and,system.%20Organizations%20typically%20use%20Google%20Kubernetes%20Engine%20to%3A>

[Kubernetes - Google Kubernetes Engine \(GKE\) | Google Cloud](#)

MICROSOFT AZURE CDN AND AZURE BACK UP

ASHRITHA G (21MCA07)

Azure content delivery network (CDN)

Azure Content Delivery Network (CDN) offers developers a global solution for rapidly delivering high-bandwidth content to users by caching their content at strategically placed physical nodes across the world.

The benefits of using Azure CDN to deliver web site assets include:

- ✓ Better performance and improved user experience for end users, especially when using applications in which multiple round-trips are required to load content.
- ✓ Large scaling to better handle instantaneous high loads, such as the start of a product launch event.

Features of Azure CDN

- ✓ Dynamic site acceleration
- ✓ CDN caching rules
- ✓ HTTPS custom domain support
- ✓ Azure diagnostics logs

Azure Backup service

The Azure Backup service provides simple, secure, and cost-effective solutions to back up your data and recover it from the Microsoft Azure cloud. Azure Backup provides independent and isolated backups to guard against unintended destruction of the data on your VMs. Backups are stored in a Recovery Services vault with built-in management of recovery points. Configuration and scaling are simple, backups are optimized, and you can easily restore as needed.

Key benefits of Azure Backup are:

- ✓ Scale easily.
- ✓ Get unlimited data transfer.
- ✓ Keep data secure.
- ✓ Centralized monitoring and management.

References:

- <https://learn.microsoft.com/en-us/azure/cdn/cdn-overview>
- <https://learn.microsoft.com/en-us/azure/backup/backup-overview>

AMAZON WEB SERVICES

LAKSHMI SHRUTHI J (21MCA23)

Amazon Web Services, (AWS) is a subsidiary of Amazon that provides on-demand cloud computing platforms and APIs to individuals, companies, and governments, on a metered pay-as-you-go basis.

1) AWS Lamba

AWS Lambda is a serverless, event-driven compute service that lets you run code for virtually any type of application or backend service without provisioning or managing servers. AWS Lambda is a Platform as a Service (PaaS).

AWS Lambda used for a wide range of applications like:

- Helps you for ETL process.
- Allows you to perform real-time file processing and real-time stream processing.
- Use for creating web applications.
- Use in Amazon products like Alexa Chatbots and Amazon Echo/Alexa.
- Data processing (real-time streaming analytics).
- Automated Backups of everyday tasks.
- Scalable back ends (mobile apps, lot devices).

Pricing for Lambda

There is no additional charge for creating Lambda functions. There are charges for running a function and for data transfer between Lambda and other AWS services. Some optional Lambda features (such as provisioned concurrency) also incur charges.

2) AWS Elastic Beanstalk

AWS Elastic Beanstalk is an AWS managed service for web applications. Elastic beanstalk is a pre-configured EC2 server that can directly take up your application code and environment configurations and use it to automatically provision and deploy the required resources within AWS to run the web application.

Unlike EC-2 which is Infrastructure as a service, Elastic beanstalk is a Platform as A service (PAAS) as it allows users to directly us a pre-configured server for their application.

Pricing for AWS Elastic Beanstalk

There is no additional charge for Elastic Beanstalk. You pay only for the underlying AWS resources that your application consumes.

References:

<https://aws.amazon.com>

MICROSOFT AZURE

1. Azure global infrastructure

Priyanka N(21mca32)

Introduction:-

Azure global infrastructure is made up of two key components—physical infrastructure and connective network components. The physical component is comprised of 200+ physical datacentre, arranged into regions, and linked by one of the largest interconnected networks on the planet.

Microsoft Azure is a service created by Microsoft to provide cloud computing for creating and managing applications and services using a cloud environment. Azure provides software as a service (SaaS), platform as a service (PaaS)

What are the main features of Azure:-

- *High-performance, highly durable block storage.
- *Massively scalable, secure data lake functionality built on Azure Blob Storage.
- *Simple, secure and server less enterprise-grade cloud file shares.

Pricing:-In the Azure global infrastructure the customer may be see the saving estimation between 11% between 65%.the pay of the rating cost is \$4.868 and reduce the rating cost of 3 years of saving plan.

2. Azure Datacenter

Introduction:-

There must be a place where all the data is stored. Microsoft has datacenter all over the world from where Windows Azure services are managed. Azure provides software as a service (SaaS), platform as a service (PaaS)

Features:-

- *Increased Productivity.
- *redundancy and flexibility.
- *Improved Energy Efficiencies.

Pricing:-In the Azure global infrastructure the customer may be see the saving estimation should be 75%.the pay of the rating cost is \$0.0943 and reduce the rating cost of 3 years of saving plan is \$0.014 and the temporary storage data is 50gb.

References:-

<https://www.coursera.org/learn/azure-infrastructure>

AZURE CLOUD SERVICES

CHITHRA AV (21MCA12)

Azure Advisor

Azure Advisor analyses your configurations and usage telemetry and offers personalized, actionable recommendations to help you optimize your Azure resources

It provides Platform as a services (PaaS)

Feature

- Best practices to optimize your Azure workloads
- Step-by-step guidance
- Alerts to notify you about new and available recommendations

Pricing and SLA

- Azure Advisor is **free**
- As a free service, Azure Advisor has **no SLA**.

Azure Automation

Azure Automation delivers a cloud-based automation, operating system updates, and configuration service that supports consistent management across your Azure

It provides Infrastructure as a service (IaaS)

Feature

- Save time and lower overhead cost
- Deliver more reliable services
- Faster
- Collect inventory and track changes

Pricing and SLA

- Azure automation is free
- No SLA is provided for the free tier of Azure Automation.

REFERENCES

https://www.google.com/search?q=windows+azure+virtual+machines&rlz=1C1RXQR_enIN1032I_N1032&oq=windows+azure+virtual+ma&aqs=chrome.1.69i57j0i13i512l6j0i13i30l3.24823j0j7&sourceid=chrome&ie=UTF-8

TENCENT CLOUD SERVICE PROVIDER

UMA BHUVANESHWARI (21MCA42)

Tencent Cloud is one of the leading cloud providers in the world with a focus on helping global enterprises succeed in China. With an extensive presence across China, global engagement teams based around the world, and decades of experience deeply rooted in delivering optimal digital engagement to its massive user base, Tencent Cloud offers a powerful and robust cloud solution that is specifically designed to address unique challenges faced by enterprises as they expand into China. Tencent Cloud is part of a rich digital ecosystem that includes some of China's top social, messaging, mobile payment, gaming, digital literature, music streaming, and video platforms. With over a billion users, Tencent is a global technology leader and the largest technology company in Asia.

Features:

Website: <https://intl.cloud.tencent.com>

Headquarters: Nanshan District, Shenzhen

Type: Public Company

Founded: 2013

Product's of tencent cloud:

Cloud Block Storage:

Tencent Cloud Block Storage (CBS) provides a persistent block storage service for CVM instances

Benefits of cloud block storage:

Easy to Use: CBS can be used and managed through simple operations such as creation, mounting, unmounting and deletion, reducing the costs of manual management and deployment. Multiple Storage Types: CBS offers three volume options including HDD cloud disk, premium cloud disk and SSD cloud disk to meet different business storage requirements. Elastic Scalability: One single cloud disk can store up to 16 TB of data, and up to 10 cloud disks (160 TB) can be mounted to one single CVM instance.

Tencent DB for MySQL:

Tencent DB for MySQL makes it simple to deploy and use MySQL database in the cloud

Benefits of tencent db mysql:

Reliable Backup and Recovery: Provide 99.9996% data reliability and 99.95% service availability with comprehensive automatic data backup and lossless recovery mechanism. Easy Data Migration: Migrate data from other MySQL database sources to the cloud seamlessly Secure Disaster Recovery Solution: Sync data in real time between on-premises MySQL database and Tencent DB for MySQL Comprehensive Daily Monitoring: Monitor the status of your database

Oracle Cloud Infrastructure (OCI)

OCI is a cloud computing service, which provides on-demand cloud computing platforms and the application programming interface's (API) for reliable, scalable, and inexpensive cloud computing services. This allows for building, testing, deploying and managing applications and services.

Oracle Cloud provides Infrastructure as a Service (IaaS), Platform as a Service (PaaS), Software as a Service (SaaS), and Data as a Service (DaaS).

Integration Services

OCI integration services connect any application and data source to automate end-to-end processes and centralize management. The broad array of integrations, with prebuilt adapters and low-code customization, simplify migration to the cloud while streamlining hybrid and multi-cloud operations. It provides:-

- Application integration and low-code automation
- Process Automation
- Oracle GoldenGate
- API full lifecycle management
- Kafka and event streaming

Cloud Networking

OCI networking and connectivity products and services enable customers to manage and scale their networks. Customers can connect securely to a customizable, isolated virtual cloud network (VCN), and take advantage of inexpensive data egress charges.

Granular access control of networking technologies provides connectivity solutions across both physical and virtual networks. It provides:-

- IPv6 Support
- Network Visualizer
- Dynamic routing gateway
- Encrypted traffic at 100 Gb/sec
- Flexible load balancers
- Minimal latency HPC

Inbound data transfer is free, and it offer a high threshold for free outbound data transfer—the first 10TB free for each regional zone. After that, outbound data transfer rates are based on geography.

References:-

<https://www.oracle.com/in/cloud/>